ARTEMIS GOLD INC

Blackwater Mine

Closure and Post-Closure Water Management Plan

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TABLES

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

ARD	Acid rock drainage
BC	British Columbia
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECD	Environmental Control Dam
EIS	Environmental Impact Statement
ELoMC	Environmental Life of Mine Committee
EMA	*Environmental Management Act*
EMLI	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
EMPR	British Columbia Ministry of Energy, Mines and Petroleum Resources
EMS	Environmental Management System
ENV	British Columbia Ministry of Environment and Climate Change Strategy
FWR	Freshwater Reservoir
FWSS	Freshwater supply system
GMP	Groundwater Monitoring Program
IFN	Instream flow needs
KP	Knight Piésold Ltd.
km	Kilometer
LGO	Low grade ore
m	Meter
m asl	meters above sea level
MDMER	Metals and Diamond Mining Effluent Regulations
ML	Metal leaching
MSDP	Mine Site Water and Discharge Monitoring and Management Plan
MRC	Mine Review Committee
MWWMP	Mine Waste and Water Management Plan
NAG	Non-acid generating
OMS	Order management system

PAG	Potentially acid generating
POC	Parameter of concern
QP	Qualified professional
RCP	Reclamation and Closure Plan
TRP	Trigger response plan
TSF	Tailings Storage Facility
SBEB	Science-based environmental benchmark
WBM	Water balance model
WMP	Water Management Pond
WQG	Water quality guideline
WQM	Water quality model
WTP	Water Treatment Plant
YDWL	Yinka Dene Water Law

Table of Concordance

This section presents the tables of concordance for regulatory conditions for the Post-Closure Water Quality Management Plan for the Blackwater Gold Mine under Environmental Assessment Certificate M19-01, *Mines Act* Permit M-246, and *Environmental Management Act* (EMA) Effluent Permit 110652. The objective of this section is to facilitate screening checks to ensure regulatory conditions are met and to allow for cross-referencing between conditions and components of this plan.

Table of Concordance with Environmetal Assessment Certificate M19-01 for the Blackwater Gold Mine

Condition No.	Title	Condition	Location in this Plan
EA Certificate M19-01			
34	Closure and Post-Closure Water Quality Management Plan	The Holder must retain a Qualified Professional to develop a plan for water quality management during Closure and Post-Closure.	Section 6.0
34		The plan must be developed in consultation with EMPR, ENV, and Aboriginal Groups.	Section 1.4; Appendix A Section 1.2
34		The plan must include at least the following:	N/A
34 a)		continuation of mitigation measures identified in paragraphs a) and b) i) of Condition 33 (Mine Waste and Water Management Plan);	Section 1.5 Section 2.3 Section 3.2
34 b)		identification of the proposed water treatment technology for use at Closure and Post-Closure, including:	Section 2.5
34 b) i)		- whether and how the water treatment technology differs from the technology proposed in the Application (Document: February 15, 2017, Blackwater Gold Project: Water Treatment Responses for Comments 1266, 1270, 1271, 1272, and 1273);	Appendix A Section 2.3.2.2
34 b) ii)		- an assessment and identification of the timing for when the treatment is expected to be required, including identification of the factors considered in the assessment;	Section 2.5
34 b) iii)		- identification and description of any new information available on the water treatment technology referred to in paragraph b) i) that could affect the conclusions in the environmental assessment on the effectiveness of the treatment or the confidence in the treatment being effective;	Section 2.5 Appendix A Section 2.3.2.1
34 b) iv)		- if information in paragraph b) iii) indicates the water treatment technology will have a lower level of confidence or be less effective than identified in the Application, identification of the additional mitigation measures that will be applied; and	Section 2.5
34 b) v)		- if new or changed water treatment technology is proposed in Closure or Post-Closure: i) demonstration that the water treatment technology can achieve downstream water quality required by Condition 26 (Water Quality Management); and ii) demonstration that the technology is technically feasible;	Section 2.6 Appendix A Sections 2.3.2.1, 2.4.2
34 c)		description of how any water treatment by-products will be managed;	Appendix A Section 2.3.2.3
34 d)		the means by which the Holder will actively fill the pit with water in Closure to address ML/ARD;	Section 2.2
34 e)		description of any additional monitoring, mitigation and/or management measures, additional to water treatment, needed to support the effectiveness of water treatment or achieving the water quality required by Condition 26, Water Quality Management, such as methods for maintaining adequate water quality in the Pit Lake; and	Section 3.0
34 f)		identification of mitigation measures to limit seepage from TSF C from entering the TSF pond D such that seepage does not cause the quality of water discharged from TSF pond D to the receiving environment to exceed limits required by Condition 26 (Water Quality Management).	Section 2.3
34		The Holder must provide this draft plan that was developed in consultation with EMPR, ENV, and Aboriginal Groups to EMPR, ENV, Aboriginal Groups and the EAO for review at the time of the Holder's planned commencement of Operations.	N/A
34		The plan must be updated at least every five years from the commencement of Operations. The Holder may change the frequency of the plan updates, if authorized by the EAO.	Section 4.1
34		The plan, and any updates and amendments thereto, must be implemented to the satisfaction of a Qualified Professional throughout Operations, Closure and Post-Closure, and to the satisfaction of the EAO.	Section 4.0

Table of Concordance with *Mines Act* Permit M-246 for the Blackwater Gold Mine

Condition No.	Title	Condition	Location in this Plan
***Mines Act* permit M-246**			
C.5.(g)(i)	Post-Closure Water Management Plan	Six months prior to commencing construction of the TSF-C dams above 1283 masl, the Permittee must submit a Post-Closure Water Management Plan to the Chief Permitting Officer for approval. The Permittee must ensure that the plan is prepared by a Qualified Professional and includes, but is not limited to, the following:	Section 6.0
C.5.(g)(i) (a)		A demonstration of completion of near-term evaluations as listed in Document 2.38	Appendix A Section 1.2
C.5.(g)(i) (b)		An updated surface water and groundwater model, including a modelling scenario demonstrating the feasibility of using dilution to treat sulphate in Pit Lake discharge after discontinuing membrane treatment, as described in Document 2.39	Appendix A Sections 2.2, 2.4
C.5.(g)(i) (c)		A demonstration of the feasibility of achieving environmental and reclamation objectives for Pit Lake water quality by either Post-Closure water treatment or an alternative water management option, including management of brine and/or solid water treatment by-products, as applicable;	Appendix A Sections 2.2, 2.4
C.5.(g)(i) (d)		Recommendations for further evaluations; and	Appendix A Section 3.0
C.5.(g)(i) (e)		An updated cost estimate for Post-Closure water management.	Provided under separate cover.

Table of Concordance with *Environmental Management Act* Effluent Permit 110652 for the Blackwater Gold Mine

Condition No.	Title	Condition	Location in this Plan
***Environmental Management Act* effluent permit 110652**			
3.11.1	Post-Closure Water Management Plan	The permittee must provide the director with the Post-Closure Water Management Plan and all deliverables in accordance with the requirements outlined in the Mines Act permit M-246. The deliverables must be provided to the director for approval within the timelines outlined in the Mines Act permit M-246 requirements.	Present document.
3.11.2		The director may require additional information to be provided by the permittee upon receipt and review of the deliverables submitted as part of the Post-Closure Water Management Plan.	N/A
3.11.3		The permittee must cause a Qualified Professional to modify or amend the submitted deliverables as required by the director and the permittee must, within the timeframe specified by the director, resubmit to the director the deliverables with required modifications or amendments.	N/A

N/A: not applicable

1.0 Introduction

1.1 Overview and Plan Structure

This Closure and Post-Closure Water Management Plan has been prepared by Lorax Environmental Services Limited (Lorax), Knight Piésold Ltd. (KP), and BQE Water (BQE) with and on behalf of Blackwater Gold Ltd. (BW Gold) for the Blackwater Gold Mine (the Mine). The plan has been developed to meet conditions prescribed under:

- Environmental Assessment Certificate (EAC) M19-01 Condition 34: “Closure and Post-Closure Water Quality Management Plan”.
- *Mines Act* permit M-246 Condition C.5.(g)(i) “Post-Closure Water Management Plan”.
- *Environmental Management Act* (EMA) effluent permit 110652 Condition 3.11 “Post-Closure Water Management Plan”.

The water management approach presented herein is based on water balance model (WBM) and water quality model (WQM) updates conducted since the Blackwater Joint Permit Application (version 12b; Lorax 2021) and the subsequent model update developed in support of the Joint Permit Application Technical Review (version 13e; Lorax 2022), following the regulatory conditions listed above. The methods and results of the WBM and WQM updates are presented in Appendix A.

The water management strategy presented in this plan reflects the premise that water contained or collected at facilities across the mine site in Closure and Post-Closure can be effectively managed and discharged without treatment at a Membrane Water Treatment Plant (WTP; and therefore, no brine is generated during Post-Closure in the updated scenario). This assumption is based on water balance model and water quality model updates that demonstrate contact water can be managed (using a Metals WTP) to achieve water quality guidelines in the Mine receiving environment in Closure and Post-Closure (Appendix A). Water management approaches described in this document therefore reflect mine schedule, infrastructure, and related WBM and WQM assumptions (e.g., groundwater flow paths, geochemical source terms, etc.) available at the time of writing that will be refined through the Mine life.

This plan has been developed based on schedule drivers identified in EAC M19-01 Condition 34, which requires a draft plan to be submitted for review at the commencement of the Mine’s Operations phase. As of the time of writing, the Operations phase is anticipated to begin in the second half of 2024. An additional schedule consideration in the development of this plan is Condition C.5.(g)(i) of the *Mines Act* permit, which requires the submission of a Post-Closure Water Management Plan to the Chief Permitting Officer six months prior to commencing construction of the Tailings Storage Facility-C dams above 1283 m.

The objectives of this plan are presented below (Section 1.2), followed by a summary of the roles and responsibilities involved in this plan (Section 1.3). A summary of consultation and engagement related to this plan is presented in Section 1.4, followed by an overview of the water management approach for the Closure and Post-Closure phases for the Blackwater Mine in Section 1.5. The remaining sections of this plan are organized as follows:

- Section 2: Closure and Post-Closure water management.
- Section 3: Adaptive management and monitoring.
- Section 4: Plan updates and reporting.
- Section 5: Key milestones.

- Section 6: Qualified Professionals (QPs).

1.2 Purpose and Objectives

Overall objectives of Closure and Post-Closure water management at the Blackwater Mine are to:

- Maintain acceptable water quality and water level within the Pit Lake to allow for discharge of Pit Lake water to the environment.
- Maintain neutral pH conditions within the Tailings Storage Facility (TSF) to allow for controlled seepage collection and discharge to the environment.
- Minimize the need for active water treatment of contact waters.
- Minimize effects to the Project receiving environment, including surface and groundwaters, through active metals treatment, optimized discharge of contact water, and maintenance of water management infrastructure to ensure discharged contact water is of sufficient quality to meet British Columbia water quality guidelines (BC WQGs) for aquatic life, science-based environmental benchmarks (SBEBs), and Yinka Dene Water Law (YDWL).
- Maintain instream flow needs (IFN) in Davidson Creek.

To achieve the above objectives, the water management strategy prioritizes the following activities in Closure and Post-Closure:

- Accelerating Pit Lake filling by directing contact water from the mine site (collected from the Environmental Control Dam (ECD), TSF C, and Upper Waste Stockpile) to the Pit Lake once Open Pit mining ceases.
- Treating water from the ECD, Upper Waste Stockpile, and Pit Lake in Late Closure and Post-Closure at a Metals WTP prior to release downstream to meet water quality objectives in the receiving environment.
- Diverting non-contact water around the TSF in Post-Closure to Davidson Creek to support IFN.
- Discharging water from TSF C to facilitate discharge from the ECD.

The purpose of this specific Plan is to detail the management of mine waste and water (quantity and quality) during the Project Closure and Post-Closure phases to facilitate BW Gold's achievement of the above objectives. Work conducted in support of this plan has been focused on demonstrating the feasibility of the proposed water management approach and to meet regulatory requirements outlined in BW Gold's EAC, the *Mines Act* and EMA permits identified in Section 1.1, and BW Gold's *Fisheries Act* Authorization, as described in Appendix A. Of note, this plan presents information at a level of detail intended to demonstrate the feasibility of the Closure and Post-Closure water management approach presented herein, per *Mines Act* permit condition C.5.(g)(i) (b), as a foundational condition driving Post-Closure Water Management planning.

This plan has linkages to several other plans developed by BW Gold to support mine planning and environmental management, including:

- Metal Leaching/Acid Rock Drainage (ML/ARD) Management Plan;
- Mine Water and Discharge Management and Monitoring Plan;
- Reclamation and Closure Plan;
- End Land Use Plan; and
- Aquatic Effects Monitoring Plan.

1.3 Roles and Responsibilities

BW Gold has the obligation of ensuring that commitments are met and that relevant obligations are made known to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at the mine site is essential to meet Environmental Management System (EMS) objectives.

Table 1-1 provides an overview of general environmental management responsibilities for the Construction and Operations phases for key positions that will be involved in environmental management. Other positions not specifically listed in Table 1-1 but who will provide supporting roles include independent environmental monitors, an Engineer of Record for the Tailings Storage Facility, an Independent Tailings Review Board, TSF qualified person, geochemistry qualified professional, and other qualified persons and qualified professionals. It is anticipated that roles and responsibilities will be updated as the Mine progresses towards the Closure and Post-Closure phase, with primary roles and responsibilities reflecting greater focus on reclamation, maintenance, and care-taking, rather than production and operations.

Table 1-1: Blackwater Gold Mine Roles and Responsibilities

Role	Responsibility
Chief Executive Officer	The Chief Executive Officer is responsible for overall Mine governance. Reports to the Board.
Chief Operating Officer	The Chief Operating Officer is responsible for engineering and Mine development and coordinates with the Mine Manager to ensure overall Mine objectives are being managed. Reports to Chief Executive Officer.
Vice President Environment & Social Responsibility	The Vice President Environment & Social Responsibility is responsible for championing the Environmental Policy Statement and EMS, establishing environmental performance targets and overseeing permitting. Reports to Chief Operating Officer.
General Manager	The General Manager is responsible for managing permitting, the Mine's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported, Putting People First, Outstanding Corporate Citizenship, High Performance Culture and Rigorous Mine Management and Financial Discipline. Reports to Chief Operating Officer.
Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate some of their responsibilities to other qualified personnel. Reports to General Manager.
Construction Manager	The Construction Manager is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the Construction phase. Reports to General Manager.
Environmental Manager or designate	The Environmental Manager is responsible for the day-to-day management of the Mine's environmental programs and compliance with environmental permits, updating EMS and management plans. The Environmental Manager or designate will be responsible for reporting non-compliance to the Construction Manager, and Engineering, Procurement and Construction Management (EPCM) contractor, other contractors, the Company and regulatory agencies, where required. Supports the Construction Manager and reports to Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to Mine Manager.
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous groups. Reports to VP Environment & Social Responsibility.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to Indigenous Relations Manager.
Environmental Monitors	Environmental Monitors (includes Environmental Specialists and Technicians) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to Environmental Manager.
Aboriginal Monitors	Aboriginal Monitors are required under EAC Condition 17 and will be responsible for monitoring for potential effects from the Mine on the Indigenous interests. Indigenous Monitors will be involved in the adaptive management and follow-up monitoring programs. Report to Environmental Manager.
Employees and Contractors	Employees are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to departmental managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in EMPs and social Management Plans. Per EAC Condition 34, the present water management plan will be implemented with oversight from and to the satisfaction of an appropriate Qualified Professional(s) throughout the Mine Operations, Closure, and Post-Closure phases.

1.4 Consultation and Engagement

The Mine site is located within the traditional territories of Ulkatcho First Nation, Lhoosk'uz Dené Nation, Skin Tyee Nation, and Tsilhqot'in Nation. The Mine's proposed transmission line passes through the traditional territories of the Saik'uz, Stellat'en and Nadleh Whut'en First Nations (collectively, the Nechako First Nations), as well as the traditional territories of the Nazko First Nation, Nee-Tahi-Buhn Band, Cheslatta Carrier Nation, and Yekooche First Nation (BC EAO 2019).

This plan and its contents are founded on several rounds of feedback between BW Gold and Aboriginal Groups, BC Ministry of Environment and Climate Change Strategy (ENV), and BC Ministry of Energy, Mines and Low Carbon Initiatives (EMLI). In November 2021, BW Gold submitted a joint Mines Act/ Environmental Management Act permit application to EMLI, ENV, the Nechako First Nations, and Ulkatcho First Nation and Lhoosk'uz Dené Nation (collectively referred to as the Mine Review Committee, or "MRC") for the development of the Blackwater mine. After an application screening process, BW Gold resubmitted their application package to the MRC in March 2022. During a second round of screening review and subsequent technical review of the permit application, all parties of the MRC had the opportunity to submit several rounds of comments and information requests related to the application. Through a technical review period spanning approximately 10 months, parties expressed their views and provided BW with written comments with respect to the potential risk of long-term water quality impacts, particularly concerning the potential for accumulation of a water treatment residue consisting of a sulphate-rich brine in the Open Pit from the operation of the Membrane Water Treatment Plant (WTP; specific comments related to Post-Closure treatment and brine management are presented in Appendix A). Commitments defined as part of the MRC technical review process (e.g., the Brine Management Work Plan; Section 2.1) were integrated into Permit M-246 and PE-110652 as permit conditions.

BW Gold and its consultants presented updates on these commitments to the Environmental Life of Mine Committee (ELoMC) in the August 17, 2023 ELoMC, including an interim water balance and water quality model update presented by KP, Lorax, and BQE, which ultimately forms the basis of this plan. During that meeting, comments and input from several committee members were recorded (discussed further in Section 2.1). On September 1, 2023, additional written comments were provided by Source on behalf of Nechako Nations (Section 2.1). In the October 19, 2023, ELoMC meeting, BW Gold and Lorax presented responses to the September 1, 2023 comments for discussion and review by the ELoMC. Following the October 19, 2023 meeting, no further comments were received and BW Gold and its consultants proceeded with drafting the present Closure and Post-Closure Water Management Plan based on the series of communications and comments received from EMLI, ENV, and Aboriginal Groups since the Joint Permit Application submission.

The above process is considered to meet EAC Condition 34, which prescribes that the present plan must be developed in consultation with EMPR (EMLI), ENV, and Aboriginal Groups. It is noted engagement on end land use planning goals will be informed by the End Land Use planning and development, as required under Mines Act permit condition C.16. Please refer to Appendix A for further detail.

1.5 Overview of Closure and Post-Closure

1.5.1 Water Management

This section presents a brief overview of the water management approach for the Closure and Post-Closure phases of the Blackwater Gold Mine and the basis of the present plan.

During the Operations phase, the goal of the water management system is to meet the Project's operational and potable water demands while limiting the amount of surplus water stored onsite and the potential adverse effects to the receiving environment (Figure 1-1). Operational demands are driven by the process plant water needs and the waste management strategy to saturate potentially acid generating (PAG) and metal leaching (ML) waste materials.

During the Early Closure phase, water collected from the mine site is directed to the Pit Lake to prioritize rapid pit filling. Water directed to the Pit Lake includes water from the TSF, ECD, Upper Waste Stockpile, and Water Management Pond (WMP) seasonally during low flows. The Freshwater Reservoir (FWR) and Freshwater Supply System (FWSS) are operational to meet IFN, as required. A flow schematic showing water management during the Early Closure phase is presented on Figure 1-2.

Late Closure begins a few years before the Pit Lake water level reaches its target closure level and excess mine site water is no longer directed to the Pit Lake. During this phase, mine site water is no longer directed to the Pit Lake to assist in rapid filling. During this period, contact water collected at the ECD and Upper Waste Stockpile is treated at the Metals WTP prior to release downstream at rates that vary with the natural hydrograph to meet WQGs. Water in excess of what can be released downstream, considering WTP treatment capacity and water quality targets, is directed to the Pit Lake. Water begins to discharge from TSF C and TSF D via the closure spillway to the plunge pool. In addition, water from the TSF is also actively managed and directed to the TSF closure spillway to increase streamflow and facilitate discharge of water collected at the ECD. The WMP is decommissioned in Late Closure. The FWR and FWSS continue to operate to meet IFN in Davidson Creek and non-contact water is directed around the Mine to the FWR to the extent possible. The Pit Lake continues to fill during Late Closure with groundwater inflows and surface water runoff and water directed from the ECD, as required. A flow schematic showing water management in during the Late Closure phase is presented on Figure 1-3.

During the Post-Closure phase, water from the Pit Lake begins to be treated at the Metals WTP to maintain the surface water elevation of the lake below the pit rim (Figure 1-4). Treated water from the Pit Lake, ECD, and Upper Waste Stockpile is released downstream at rates that meet WQGs and that vary with the natural hydrograph with water in excess of what can be discharged directed to the Pit Lake for discharge during a later month. Water continues to discharge from TSF C and TSF D via the closure spillway and is actively managed as required to facilitate discharge of water collected at the ECD during lower flow periods. The FWR and FWSS are decommissioned once IFN and water quality objectives can be met in Post-Closure. Effluent from the Metals WTP is sent to the plunge pool on Davidson Creek along with non-contact water directed around the Mine. The Membrane WTP is not operational in Post-Closure. A flow schematic showing water management in during the Post-Closure phase is presented on Figure 1-5.

Non-contact water is directed around TSF C and TSF D to the extent possible via the Central Diversion System and Northern Diversion System in Late Closure and Post-Closure. Effluent from the Metals WTP and flows diverted around TSF C and TSF D are directed to the FWR while it is operational and to the plunge pool once the FWR is decommissioned in Post-Closure. The water management plan schedule in Closure and Post-Closure is shown in Table 1-2.

General activities proposed for the Closure and Post-Closure phases are summarized further below. Please refer to the Construction Environmental Management Plan for a description of activities and water management for the Construction phase, and Mine Waste and Water Management Plan (EAC Condition 33) as well as the Mine Site and Discharge Monitoring and Management Plan for a description of activities and water management during the Operations phase.

Where differences exist between this plan and the currently-authorized infrastructure, discharges, or schedule, BW Gold will pursue permit amendments in order to authorize the updates described here.

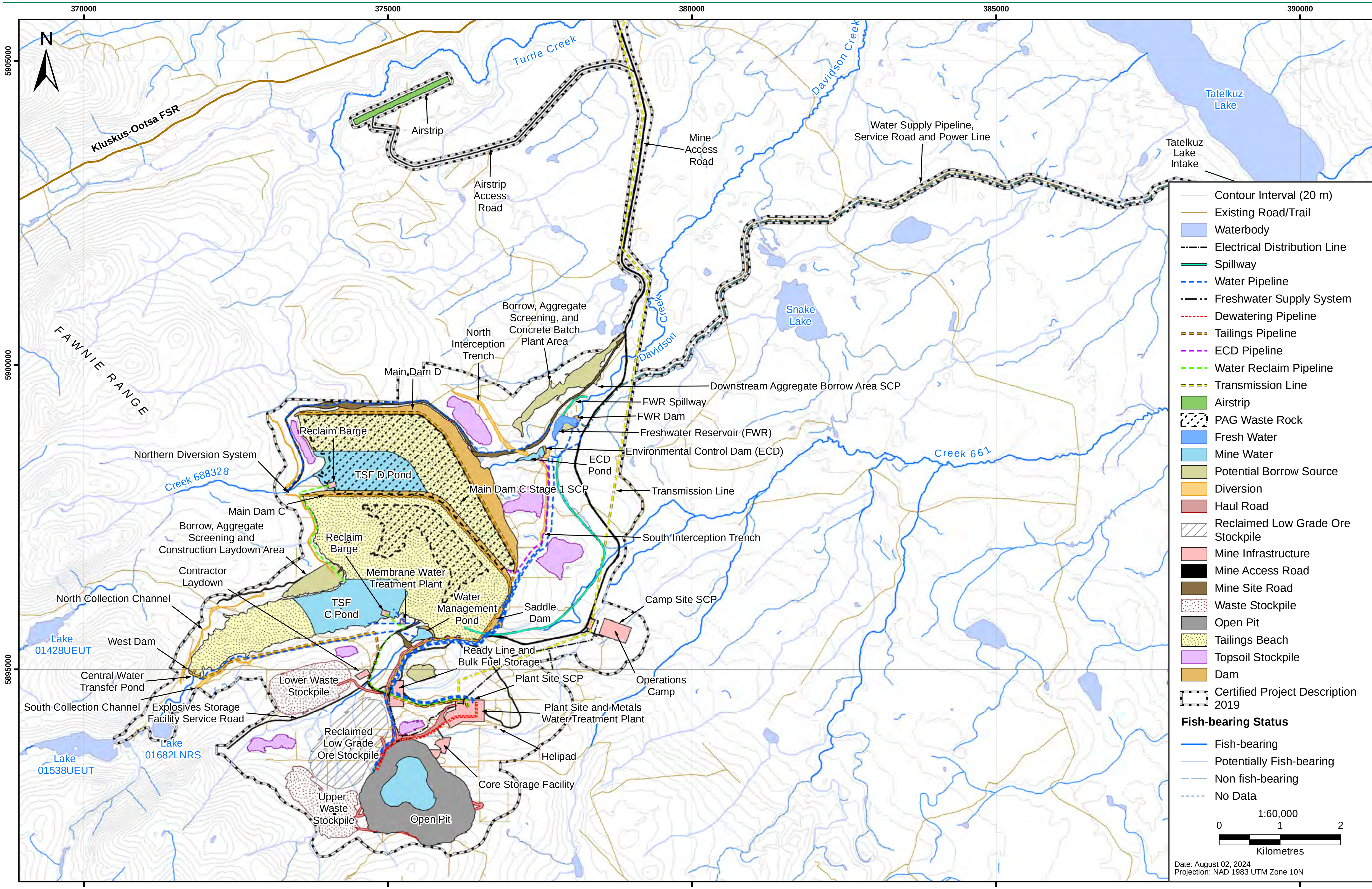


Figure 1-1: General Arrangement of Blackwater Mine for Operations Year +23

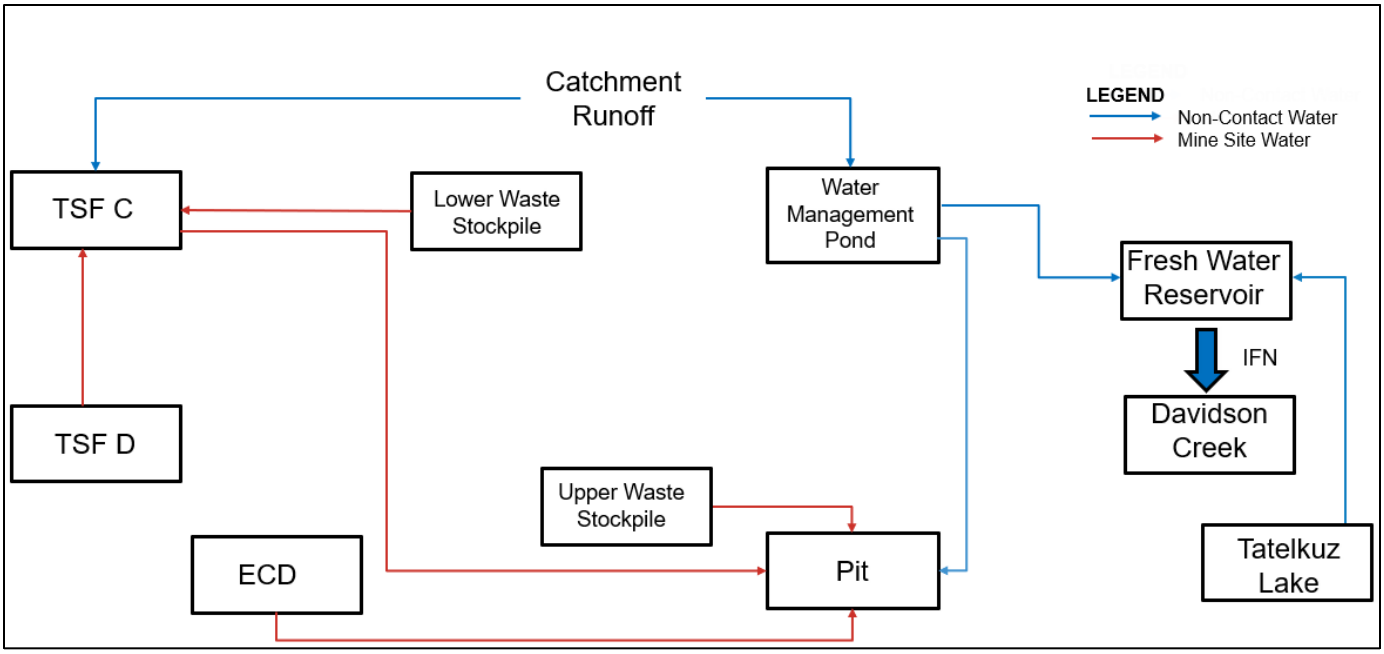


Figure 1-2: Early Closure Phase Flow Schematic

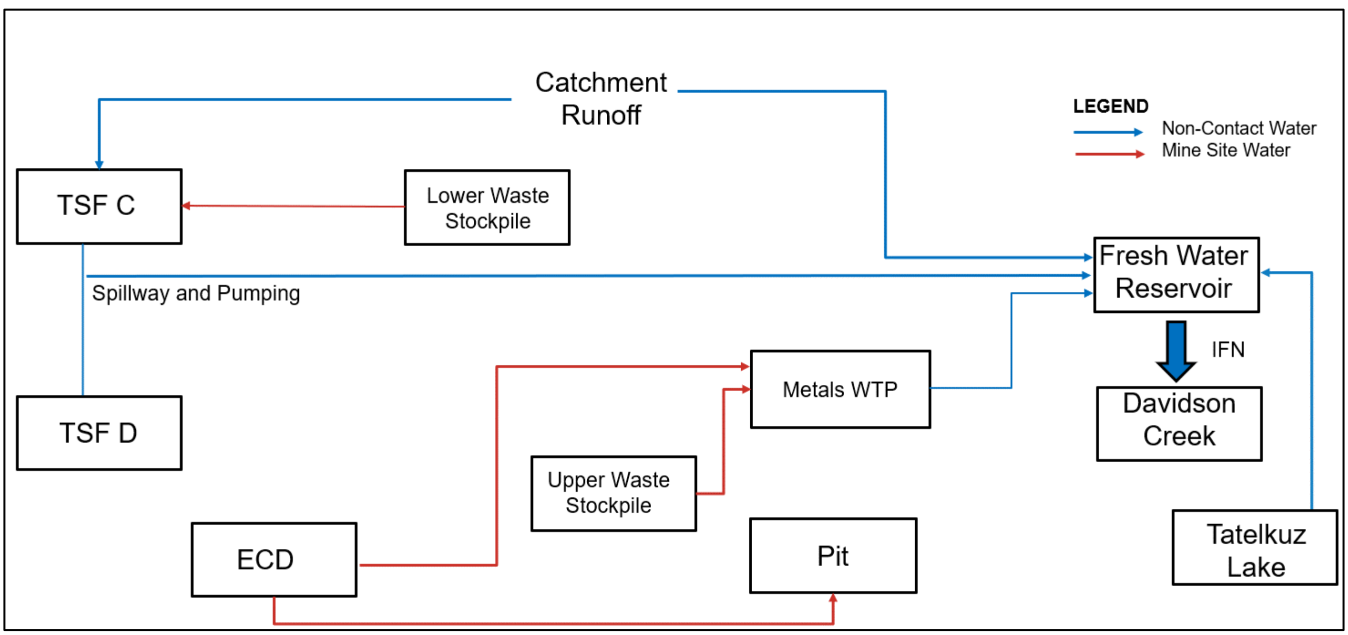


Figure 1-3: Late Closure Phase Flow Schematic

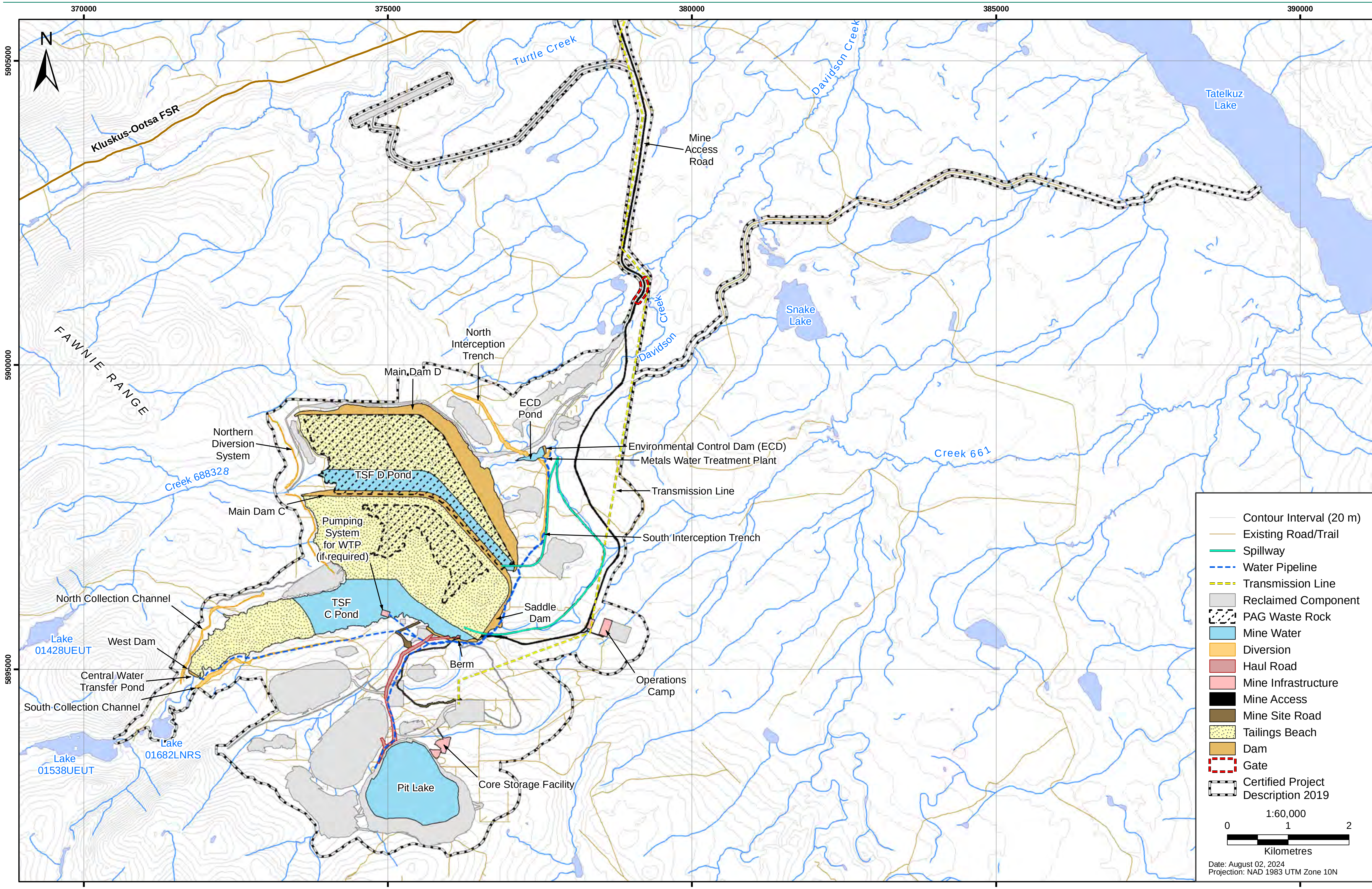


Figure 1-4: General Arrangement of Blackwater Mine at Post-closure Year 46+

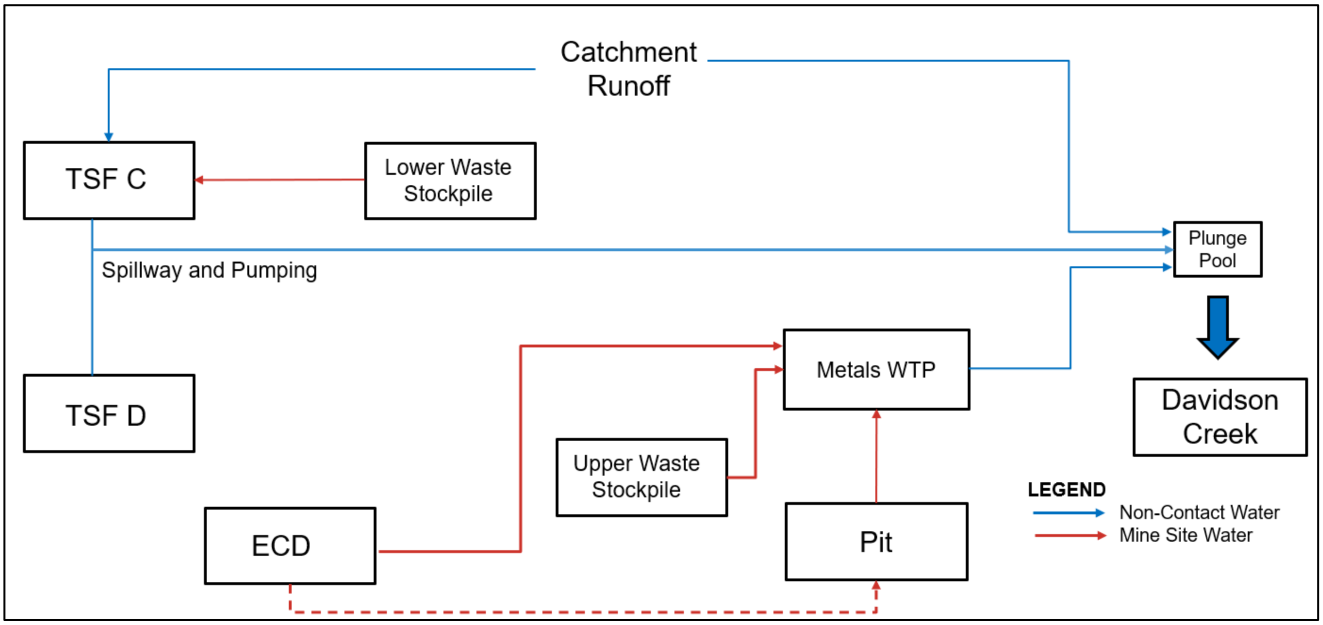


Figure 1-5: Post-Closure Phase Flow Schematic

Table 1-2: Water Balance Model Timeline of Water Management Plan

Facility	Mine Process and Water Management Activity		Early Closure																				Late Closure			Post-Closure																					
		Mine Year	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
		Year	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091
TSF C	TSF C Pond pumped to Pit Lake		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																								
	TSF C Pond pumped to plunge pool (for ECD discharge)																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■ to Year 89->
	TSF C Pond discharges via Closure Spillway																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
TSF D	TSF D Pond pumped to TSF C		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																									
	TSF D Pond discharges via Closure Spillway																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Open Pit	Pit Lake filling to target elevation		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																						
	Pit Lake pumped to Metals WTP																									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Upper Waste Stockpile	Water collected from Stockpile to Open Pit		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																									
	Water collected from Stockpile to Metals WTP																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
ECD	ECD pumped to Pit Lake		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
	ECD pumped to Metals WTP																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
WMP	Water Management Pond surplus pumped to FWR		■	■	■	■	■	■	■	■	■	■	■	■	■																																
	Water Management Pond to Pit Lake in Winter Months		■	■	■	■	■	■	■	■	■	■	■	■	■																																
FWR	Freshwater Reservoir discharges to Davidson Creek		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																						
FWSS	Pumps water from Tatelkuz Lake		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																						
Metals WTP	Treat water from ECD and Upper Waste Stockpile																						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Treat water from ECD, Upper Waste Stockpile, and Pit Lake																									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Diversions	Central Diversion Area directed to WMP		■	■	■	■	■	■	■	■	■	■	■	■	■																																
	Central Diversion Area directed to FWR/ plunge pool															■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Northern Diversion Area directed to FWR/ plunge pool															■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Notes:
1. The timeline presented is based on the results of average climate inputs to the WBM.
2. Post-Closure begins when the Pit Lake reaches its target elevation and treatment of Pit Lake water at the Metals WTP begins. Water discharges from the TSF via the closure spillway.
3. Mine year 24 equal to calendar year 2047. Calendar years reflect estimates at the time of writing and may vary depending on mine schedule.
4. Colours differentiate between different facilities/infrastructure

1.5.2 Closure Activities and Infrastructure

The Closure phase starts with the cessation of ore processing. While Open Pit mining ceases during the Operations phase in Year +18, processing of stockpiled Low Grade Ore (LGO) continues until Year +23, representing the conclusion of the Operations phase. Water from the TSF, ECD, Upper Waste Stockpile, and seasonally from the WMP is directed to Pit Lake for accelerated filling from Year +19 through the Closure period.

Decommissioning of mine infrastructure is anticipated to be completed in Year +24 and Year +25, followed by revegetation. Water management activities are largely driven by filling the Open Pit with site water to create a Pit Lake. Components are progressively closed and reclaimed as they are no longer required. Figure 1-1 presents the mine site general arrangement for Year +23 (end of Operations, onset of Closure).

At the onset of the Closure period, reclamation begins at LGO Stockpile footprint and decommissioning of processing plant begins. Reclamation maintenance, if needed, occurs at the Upper and Lower Waste stockpiles, Ex-pit haul roads, and explosives storage facilities. It is anticipated the Membrane WTP may be retained onsite for a period of time as a water management contingency, but is otherwise demobilized at some time during the Closure or Post-Closure phase.

In the following year, reclamation is proposed to begin at the helipad, truck shop/mine dry/office, Ready Line and Bulk Fuel Storage area. Subsequent reclamation occurs at processing plant, camp facilities, construction laydown areas, waste management facilities, potable and fire water supplies, certain roads, and certain components of the power supply.

Activities to support the early Closure phase are as follows:

- Workforce – staffing as required for closure and reclamation activities
- Open Pit
  - Contact water continues to be preferentially directed to the Open Pit to accelerate filling of the Pit Lake
- Processing Facilities
  - Decommissioning and reclamation
- Tailings Storage Facility
  - Reclamation of dams/tailings beaches
- Waste Stockpiles
  - Lower Waste Stockpile – Rehandling material for reclamation purposes followed by reclamation and monitoring.
  - Upper Waste Stockpile – Reclamation followed by monitoring.
- LGO Stockpile
  - Reclaimed with monitoring and maintenance as required
- Topsoil Stockpiles
  - Handling and distribution of salvaged soil with eventual closure and reclamation of the stockpiles
- Mine Service and Haul Roads
  - Operation and maintenance of roads needed for the Closure phase
  - Decommissioning and reclamation of other roads

- Power Supply and Distribution
  - Operation and maintenance of power supply and distribution needed for the Closure phase
  - Decommissioning and reclamation of other components of the power supply
- Ancillary Structures
  - Helipad – Decommissioning and reclamation
  - Camp Facilities – Decommissioning and reclamation
  - Construction Laydown Areas – Decommissioning and reclamation
  - Truck shop and wash/Mine office – Modification for vehicle servicing, fuel storage and dispensing, mine site shop, warehousing, offices and accommodations for Closure Phases
  - Ready Line and Bulk Fuel Storage area – Decommissioning and reclamation
  - Waste Management Facilities – Decommissioning and reclamation
  - Potable and fire water supplies – Decommissioning and reclamation
  - Communications – Decommissioning and reclamation

Security - Replace manned gatehouse with security gate and fencing

- Borrow Pits, and Aggregate Screening
  - Decommissioning and reclamation
- Offsite Infrastructure (Non-Application Components)
  - Airstrip and airstrip access road – Decommissioning and reclamation

Additional activities initiated to support the Late Closure phase are as follows:

- Water Treatment
  - Relocation of the Metals WTP to a new location adjacent to the ECD
  - Treatment of water from the ECD and Upper Waste Stockpile at the Metals WTP prior to discharge to Davidson Creek
- Tailings Storage Facility
  - Active discharge of water from the TSF to augment flows downstream during lower flow periods to assist with release of water from the ECD, as applicable.
- Water Management Pond
  - Decommissioning and reclamation

1.5.3 Post-Closure Activities and Infrastructure

The Post-Closure phase is planned to begin in approximately Year +47, following the completion of closure activities including the filling of the Pit Lake and initiation of discharge to the environment. As of the beginning of the Post-Closure period, final building structures and mobile equipment are removed, and operation of the Metals WTP recommences. Components are progressively closed and reclaimed to their final state as they are no longer required. Figure 1-5 presents the mine site general arrangement for Year +47 (end of Closure, onset of Post-Closure).

Activities conducted as part of the Post-Closure phase are as follows:

- Workforce – minimum staff, as required.

- Open Pit
  - Pit Lake water level maintained at or below design maximum
- Tailings Storage Facility
  - Closed when water quality objectives met
  - Ongoing monitoring and reporting on stability of TSF dams
  - Active discharge of water from the TSF to augment flows downstream during lower flow periods to assist with release of water from the ECD, as applicable.
- Water Treatment
  - Treatment of water from the ECD, Pit Lake, and Upper Waste Stockpile at the Metals WTP prior to discharge to Davidson Creek
- Freshwater Reservoir
  - Decommissioning and reclamation as flow needs allow
- Mine Service and Haul Roads
  - Operation and maintenance of roads needed for the Post-Closure phase
  - Decommissioning and reclamation of unused roads
- Power Supply and Distribution
  - Operation and maintenance of power supply and distribution needed for the Post-Closure phase
  - Decommissioning and reclamation of other components of the power supply
- Security
  - Security gate access
- Offsite Infrastructure (Non-Application Components)
  - FWSS pumphouse and pipeline – Decommissioning and reclamation
  - Transmission Line – Operation and maintenance for Water Treatment Plan at mine site

2.0 Water Management

2.1 Groundwater Management

Management and monitoring of groundwater flows within the mine site footprint during Operations are addressed in Section 7.3 of the Mine Site Water and Discharge Monitoring and Management Plan (MSDP; BW Gold 2022a). Groundwater quality and quantity monitoring conducted at the Mine during all phases of development is presented in a Groundwater Monitoring Program (GMP) plan in accordance with Section 4.7 of PE-110652. During Operations, the Non-Point Source Discharge to Ground Trigger Response Plan (TRP; as part of the GMP) serves as a proactive tool to identify the preliminary signs of contact water (seepage) in the groundwater system and promote a response or remedial action, if required, to manage and mitigate seepage to ensure impacts to the receiving environment are avoided. These plans continue and are applied during the Closure and Post-Closure phases. A description of groundwater management and estimated rates of seepage from each facility in Closure and Post-Closure is provided below.

Seepage from the TSF, Pit Lake, Lower Waste Stockpile, and Upper Waste Stockpile reports to the Mine receiving environment in Closure and Post-Closure and requires management. The Plant Site and LGO Stockpile footprint are reclaimed in Closure and groundwater management for these facilities is not anticipated following Operations. Rates of potential seepage from the facilities and anticipated flow paths to downstream discharge locations were estimated with the numerical groundwater model developed for the Mine (KP 2021b) and are summarized in the water balance model report submitted in the Joint Permit Application (KP 2021a).

Seepage from the TSF is collected at the ECD throughout Operations, Closure, and Post-Closure. Results of the seepage analysis indicate that approximately 65 to 70 L/s could leave the TSF through the foundation material and embankments during Closure and Post-Closure. The majority of this seepage is predicted to report to the drains beneath Main Dam D, the ECD, and seepage interception trenches during Closure and Post-Closure.

Seepage from the TSF reporting to the drains of the West Dam is directed to the West Dam seepage collection system and pumped back into TSF C. Potential seepage from TSF C and TSF D that is predicted to bypass existing collection measures during Closure and Post-Closure is predicted to report to Davidson Creek and a tributary to Creek 661 (KP 2021b).

In Post-Closure, the Pit Lake is not maintained as a groundwater sink and potential seepage is estimated to occur from the Pit Lake at a rate of 1.2 L/s when the Pit Lake water level is maintained a few meters below the pit rim (KP 2021b). This estimated rate of seepage includes approximately 0.02 L/s seepage captured in the drains of Man Dam D and the ECD seepage collection system. An additional 0.13 L/s seepage is predicted to report to the southern tributary of Creek 505659, where approximately 85% of the seepage is predicted to be collected by the Pit Lake Seepage Collection System (KP 2021a). The Pit Lake Seepage Collection System is comprised of an engineered French Drain constructed along the existing southern tributary drainage. Water collected in the Pit Lake Seepage Collection System is directed back to the Pit Lake. The remaining Pit Lake seepage is predicted to primarily report to surface drainages contributing to the TSF closure spillway channel, with lesser amounts to Creek 505659 (a tributary of Creek 661) and Davidson Creek.

The water management components for the Lower and Upper Waste Stockpiles are designed to limit contact water reporting to the environment to the extent possible. Collection channels constructed along the periphery of each stockpile direct water to a collection pond lined with an HDPE geomembrane to limit seepage losses. The collection ponds are maintained in a dewatered condition to the extent practical. Reclamation of the waste stockpiles during Closure includes placement of a soil cover and re-vegetation as described in Section 4.7.3 of the Reclamation and Closure Plan (RCP; BW Gold 2022b). The Lower Waste Stockpile Collection Pond and collection channels are decommissioned during Closure. The Upper Waste Stockpile Collection Pond and collection channels continue to be maintained so that contact water that discharges at the toe of the stockpile can be collected and directed for treatment, if required.

Potential seepage from the Lower Waste Stockpile footprint to groundwater is predicted to contribute to TSF C Pond Main Dam D drains where it is managed at the ECD, the South Collection Channel (of the Central Diversion System), and Mine Area Creek. It contributes to the WMP in Closure and to the closure spillway in Post-Closure. Seepage from the two collection channels surrounding the Lower Waste Stockpile is estimated to contribute to the TSF C Pond and the WMP before the channels and pond are decommissioned by the start of Post-Closure (KP 2021a).

Potential seepage from the Upper Waste Stockpile footprint to groundwater is predicted to be captured at drains located in the stockpile footprint, which is directed to the Upper Waste Stockpile Collection Pond. The remaining seepage in Closure and Post-Closure is predicted to contribute to the Open Pit/Pit Lake and to the WMP when it exists in Early Closure or be directed to the TSF Closure spillway once the WMP is decommissioned. Seepage from the collection channel on the periphery of the Upper Waste Stockpile is estimated to contribute to the WMP in early Closure or the TSF Closure spillway once the WMP is decommissioned.

2.2 Pit Lake Water Management

After mining of the Open Pit ceases and the LGO is being processed (starting in Year 18), the Open Pit fills naturally with groundwater inflows and surface water runoff to create a Pit Lake. Surplus water from TSF C and water collected at the ECD and from the Upper Waste Stockpile will be pumped to the Pit Lake to accelerate filling during Years +18 to +23. Water from the TSF, ECD, and Upper Waste Stockpile continues to be directed to the Pit Lake during Closure to accelerate pit filling along with water seasonally from the WMP in late summer through winter (August through March; KP 2022a). This accelerated filling achieves the key objective for filling the Open Pit of submerging the majority of the pit wall surface below water to minimize the oxidation of sulphide minerals in exposed pit walls, and thus reducing the generation of ML/ARD from the pit wall rock.

Water from the TSF, WMP, and Upper Waste Stockpile is no longer directed to the Pit Lake in Late Closure a few years before the Pit Lake water level reaches its target closure level. After that point, the Pit Lake continues filling with groundwater inflows and surface water runoff and water directed from the ECD. During the Post-Closure phase, water from the Pit Lake begins to be treated at the Metals WTP to maintain the surface water elevation of the lake below the pit rim. The water elevation in the Open Pit during Post-Closure will be maintained below the natural spill point, a few meters below the rim, which will reduce the seepage from the upper benches of the pit. At this water level, the Pit Lake is not anticipated to be a groundwater sink during Post-Closure and seepage from the Pit Lake is anticipated.

Seepage from the Pit Lake is predicted to report to TSF C, Creek 505659 (a tributary of Creek 661), the TSF Closure Spillway channel, and Davidson Creek (KP 2021b). As discussed in Section 2.1, the Pit Lake Seepage Collection System is constructed along the southern tributary of Creek 505659 to capture seepage that discharges toward that tributary. Water collected in the Pit Lake Seepage Collection System is pumped back to the Pit Lake.

2.3 TSF Water Management

The TSF is designed to permanently store tailings, PAG waste rock, and potentially ML non-acid generating waste rock (NAG3; considered to have the highest zinc leaching potential amongst the NAG rock) in two adjacent sites, TSF C and TSF D. Each site is also designed for the storage of mine contact water. TSF C is constructed first to provide storage capacity for start-up of the Processing Plant and is designed to contain tailings for 21 years of mine operations and PAG/NAG3 waste rock until Year +6. TSF D is constructed adjacent to and downstream of TSF C beginning in Year +5 to provide additional storage capacity for PAG/NAG3 waste rock and tailings. TSF D is designed to contain PAG/NAG3 waste rock generated during mining between Year +6 and Year +18 and up to approximately two years of tailings beginning in Year +21 when TSF C reaches design capacity (KP 2022b). Tailings and waste rock are deposited strategically in TSF C and later in TSF D to achieve ML/ARD management objectives and to create the desired pond configuration for storage of mine contact water. The life of mine development plan for the TSF is further described in the *TSF Life of Mine Design Report* (KP 2022b).

The operational strategy for the TSF upon entering Closure is to manage water in a manner that is consistent with the design objectives for the facility, including the following:

- Prevention of ARD and minimization of ML from potentially reactive tailings and waste rock to the extent practicable;
- Control, collection, and diversion of non-contact surface water flows;

- Limiting accumulation of surplus water within the TSF to the maximum extent practicable.

Geochemical stability of the PAG tailings is achieved through placement of a NAG waste rock and overburden slurried cover at Closure, as well as a water pond that covers a portion of the TSF and maintains saturated conditions for buried PAG and tailings. The Closure cover depth is planned to be approximately 130 cm, with the final depth to be confirmed through research trials. A NAG waste rock and overburden cover (approximately 30 cm) is placed on the PAG tailings surface, most likely slurried (like tailings placed during Operations; see Section 4.2.2 of the RCP (BW Gold 2022b)). A growth medium cover of overburden (approximately 70 cm) overlain by 30 cm of mixed-parent-material surface is placed by truck and dozer, dumped, and spread to cover the above-water beaches. The current cover design assumes the TSF beach is trafficable by heavy equipment. Additional detail on the layered closure cover is provided in the RCP.

Both TSF C and TSF D contain a surface pond during Closure, which receives surface runoff into the TSF basins. Tailings are deposited strategically in TSF C and TSF D to create the final pond configuration and direct runoff on the final tailings surface to the respective ponds. The final years of tailings deposition occur in a manner that places the ponds adjacent to the spillway for each facility. The nominal volume of the closure pond in each facility is 2 Mm^3 (Table 7.2-2 of MSDP). The final configuration of the TSF in Post-Closure is shown in Figure 1-4. The volume of water in the TSF in Early Closure is controlled by pumping water from the TSF to the Pit Lake to assist in rapid pit filling. In Late Closure and Post-Closure, the TSF C Pond and TSF D Pond volumes are limited by the invert elevation of the closure spillway, once the spillway is activated, which limits the year-over-year accumulation of water stored in the TSF.

The water management strategy for water discharge from TSF C in Late Closure and Post-Closure currently includes passive discharge via the closure spillway to the plunge pool and active discharge (pumping) to increase downstream flows during low flow periods and facilitate discharge of water collected at the ECD. Considerations include pump and pipeline capacity and the minimum TSF C Pond volume required for active discharge. The WBM predicts that the period of active management of water discharge from the TSF C could continue up to Year +97 for the water management strategy modelled under the full range of climate conditions considered (Appendix A).

Seepage from TSF C and TSC D is captured at the ECD in Closure and Post-Closure and directed to the Pit Lake or for treatment prior to release in Davidson Creek.

EAC Condition 34 f) on water quality management requires “identification of mitigation measures to limit seepage from TSF C from entering the TSF pond D such that seepage does not cause the quality of water discharged from TSF pond D to the receiving environment to exceed limits required by Condition 26”. Condition 34 f) is met by the placement of a tailings cover over the waste rock in TSF D. When Main Dam D is constructed, seepage from TSF C will initially contribute to the water ponded behind Main Dam D. Discharge of tailings into TSF D starting in Year +21 forms a cover over the waste rock impounded in TSF D. Results of three-dimensional numerical groundwater modelling (KP 2021b) indicates that an upward flow of groundwater through the tailings units to the TSF D supernatant pond is not expected when a tailings cover is present over the waste rock. The tailings cover is expected to hydraulically isolate the TSF D pond from flow below the tailings, causing seepage originating from TSF C to remain within the underlying waste rock or foundation materials rather than to discharge to the TSF D pond. These TSF C seepage flow paths are consistent with the seepage conditions assumed and modelled in the Effects Assessment (KP 2016).

2.4 Environmental Control Dam Water Management

TSF D seepage and runoff is collected at the ECD. The ECD is constructed approximately 1,000 m downstream of Main Dam D and upstream of the FWR at a topographic low point in Davidson Creek. The

ECD is constructed in Year +6 prior to PAG/NAG3 waste rock placement in TSF D. Two seepage interception trenches (north and south of Davidson Creek) are excavated through the surficial sand and gravel terraces downstream of Main Dam D and report to the ECD pond. The trenches are excavated into low-permeability subgrade soils and each extends approximately 1.6 km north and south of the ECD. The ECD manages seepage and storm water inflows and utilizes a pumpback system to convey the recovered flows to the TSF during Operations and Closure. The ECD can hold a water volume of approximately 194,000 m3. The ECD was designed to contain continuous seepage and runoff from events up to the 1 in 10-year, 24 hour storm without any overflow through the spillway when the pond is at the design minimum water level the start of the storm (KP 2022b). Seepage through the ECD is captured in a foundation drain system and sump and pumped back to the ECD.

The ECD and seepage interception trenches continue to collect seepage from the TSF throughout Closure and Post-Closure. Water collected at the ECD is directed to the Pit Lake during early Closure to assist in rapid filling of the Pit Lake. Once the Pit Lake approaches the target closure lake elevation, water from the ECD is directed to the Metals WTP for treatment and release to Davidson Creek at rates that meet downstream water quality objectives. Water collected at the ECD in excess of what can be treated and released, considering the Metals WTP treatment capacity and downstream water quality objectives, is directed to the Pit Lake. The volume of water collected at the ECD that can be treated and released via the Metals WTP increases over time as sulphate concentrations in TSF seepage reporting to the ECD decrease. In the long-term (Post-Closure), the majority of the water collected at the ECD is anticipated to be directed for treatment at the Metals WTP and released downstream rather than pumping up to the Pit Lake.

Results of water quality sampling of the ECD Pond in Late Closure and Post-Closure determines the volume of ECD water that is directed for treatment and released to Davison Creek versus directed to the Pit Lake. Monitoring of water quality collected at the ECD is discussed in Section 3.2.

2.5 Treatment

All active water treatment pauses from Year 18+ (late Operations) onwards, through the duration of the Closure phase as contact waters are preferentially directed into the pit to accelerate filling. Once the Pit Lake has reached its target elevation, a Metals WTP becomes operational to treat ECD and Upper Waste Stockpile water up to a rate of 155 L/s (5 Mm^3/year). During months in which the Metals WTP has additional capacity, Pit Lake water is also directed to the Metals WTP for treatment. Treated effluent is discharged to Davidson Creek. The Membrane WTP, which was operational during the Operations phase, does not operate from Year +18 onwards.

For the purposes of this plan, it is assumed the Metals WTP commissioned and operated for the Mine Operations phase is re-commissioned to treat contact water in the Late Closure through Post-Closure phases. Operational monitoring of the Metals WTP during the Operations phase will be used to inform adaptive management and planning for the Metals WTP in the Late Closure and Post-Closure phases (Section 3.0). Please refer to Appendix A for further detail on the design, treatment technology, and waste management for the Metals WTP.

2.6 Discharge Management

2.6.1 Overview

Management of mine site water discharge is optimized in the Closure and Post-Closure phases with the objective of achieving water quality that meets permit limits, BC water quality guidelines or approved

SBEBs, YDWL, and meeting IFN in Davidson Creek under a range of climate conditions. Final discharge for contact waters from the Mine to the receiving environment in the Closure and Post-Closure phases are anticipated from the:

- FWR in Closure (and potentially under select conditions in Post-Closure; refer to Appendix A for further detail);
- TSF closure spillway in Late Closure and Post-Closure;
- Metals WTP in Post-Closure.

In Early Closure, all mine site contact water is directed to the Pit Lake to assist with pit filling and no water treatment is active. IFN in Davidson Creek is met by discharging water from the FWR. The FWR receives water pumped from the WMP, non-contact runoff from contributing catchments, and Tatelkuz Lake water via the FWSS. The FWR and FWSS continue operating through the Closure phase and will be decommissioned in Post-Closure when water quality and IFN criteria can be met.

To avoid reliance on long-term treatment at a Membrane WTP, the discharge strategy approximates the hydrograph in Davidson Creek and directs a smaller volume of water to the Metals WTP for treatment and release during the lower flow periods than higher flow months. The Metals WTP does not remove sulphate from treated water; therefore, the volume of water from the ECD and Pit Lake directed for treatment at the Metals WTP and release downstream is primarily determined based on meeting water quality targets for sulphate.

In Late Closure, water collected at the ECD and Upper Waste Stockpile starts to be directed for treatment at the Metals WTP and released downstream at a rate that meets water quality guidelines. Water collected at the ECD in excess of what can be discharged is directed to the Pit Lake. Water in the TSF begins to discharge via the TSF closure spillway to Davidson Creek as described in Section 2.3. Non-contact flows diverted via the Northern Diversion System are directed to the FWR and flows diverted via the Central Diversion System are directed to the TSF closure spillway channel.

In Post-Closure, discharge from the Metals WTP and non-contact flows diverted via the Northern Diversion System are directed to Davidson Creek once the FWR is decommissioned.

2.6.2 Discharge Infrastructure

The FWR represents a final discharge point for the Mine in Closure. Water releases from the FWR are managed using the primary outlet works comprising a low-level outlet and surface-level outlet for flows up to 1.68 m^3/s and an overflow spillway designed to discharge higher flows and maintain dam safety. The outlet design provides some system redundancy at the planned flowrates and flexibility for adaptive management if IFN are adjusted in the future based on the results of environmental monitoring programs. Water pumped from Tatelkuz Lake via the FWSS in Closure is typically routed to the FWR to provide an additional source of water to maintain discharges to Davidson Creek but can also be directed to Davidson Creek via connection to the Temperature and Flow Control Chamber if required due to FWR maintenance or to meet discharge temperature targets.

Permitted discharge rates from the FWR are specified in PE-110652 up to 300,000 m^3/day (maximum) and an annual average of 48,500 m^3/day. This maximum authorized rate has been set to enable the calculation of discharge fees as required by the Permit and Approval Fees and Charges Regulation.

Discharge from the TSF in Late Closure and Post-Closure includes passive discharge via the closure spillway to the plunge pool and active discharge (pumping) from TSF C. Considerations include pump and pipeline capacity, the minimum TSF C Pond volume required for active discharge, and instrumentation requirements to facilitate and manage discharge. Discharge from TSF D pond is limited to passive discharge from the spillway. Non-contact water diverted around the mine site via the Central

Diversion System is directed to the TSF closure spillway once the WMP is decommissioned.

The Metals WTP treatment capacity is up to 155 L/s. The WTP effluent discharges via a pipe to the FWR during Closure and to the plunge pool on Davidson Creek once the FWR is decommissioned in Post-Closure.

The plunge pool is located at the downstream extent of the TSF closure spillway and is constructed in approximately Year +12. The plunge pool is a rip rap lined segment along Davidson Creek at the base of the TSF closure spillway to reduce erosion. Once the FWR is decommissioned, the plunge pool receives water from the TSF closure spillway and effluent from the Metals WTP. IFN values are to be met in Davidson Creek at the plunge pool once it is constructed.

3.0 Adaptive Management and Monitoring

3.1 Adaptive Management Framework

Condition 3 of the EAC requires that, where an EAC condition plan includes monitoring, a discussion of adaptive management must be included to address the circumstances that will necessitate the implementation of alternate or additional mitigation measures to address potential effects of the Mine.

Figure 3-1 identifies the components of the adaptive management framework. Per this conceptual framework, the present plan incorporates adaptive management as follows:

- Plan: Planned water management activities are identified in Section 2.0.
- Do: Implementing the management measures described in Section 2.0
- Monitor: Conducting monitoring programs as described in Section 3.2 of this plan.
- Adjust: Reviewing qualitative and quantitative triggers for upset conditions to determine whether mitigation measures related to the failure of any component needs to be altered or additional measures implemented.

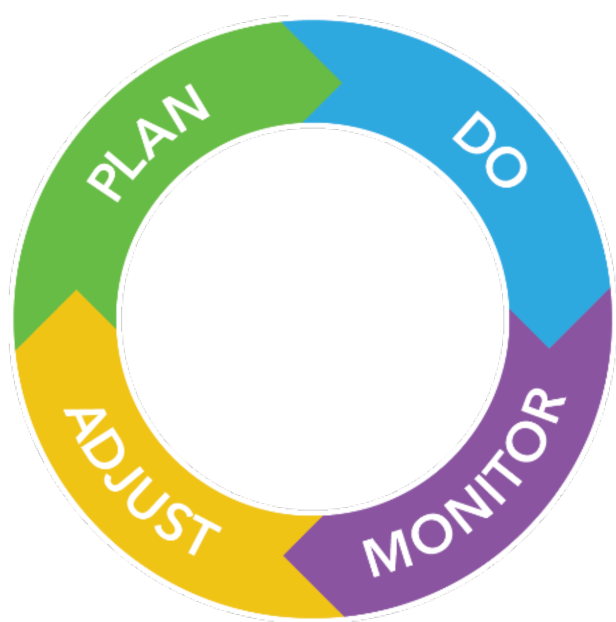


Figure 3-1: Adaptive Management Framework

A monitoring framework for the Closure and Post-Closure phases is presented in Section 3.2. The framework includes monitoring water quality and quantity at various mine site and discharge locations. The results of routine monitoring provide the basis from which mitigations and/or site processes are adjusted, per the mine adaptive management framework (Figure 3-1).

In addition to the Closure and Post-Closure monitoring program (Section 3.2), several adaptive management components developed for the Operations phase are anticipated to continue through or provide frameworks for the Closure and Post-Closure phases until they are no longer applicable, including:

- Routine water quality and quantity monitoring under the MSDP.
- The monitoring program used to document the year-over-year water accumulation in the TSF, including methods, frequency, and timing (described in Section 5.2.2 of the MWWMP for the Operations period).
- Monitoring of the low grade ore contact water is described in Section 7.1 of the MWWMP.
- An adaptive management plan for the TSF pond and LGO stockpile as part of the Operations-phase OMS Manual and associated Quality Performance Objectives and Trigger Action Response Plans for the constructed facilities.
- A Trigger Response Plan for the FWR and Downstream Aggregate Borrow Area Sediment Control Pond discharge quality per PE-110652 and ENV (2022).

Once implemented, the effectiveness of the mitigation strategies applied as part of adaptive management response are monitored and evaluated. The mitigation strategies may be subsequently altered, or additional mitigation measures considered depending on the results of the monitoring program, as appropriate. This Closure and Post-Closure Water Management Plan is a living document with the expectation that the plan will evolve and be updated as described in previous sections and in response to changing conditions or development at the site, updates to scientific methods, and through consultation and discussions with Aboriginal Groups and other stakeholders.

3.2 Closure and Post-Closure Monitoring

Closure and early Post-Closure water quality and quantity monitoring programs are largely a continuation of monitoring programs for the mine site area and receiving environment for the Operations phase (per Mines Act permit M-246 and PE-110652) until mine site and receiving environment conditions begin to achieve steady-state. At that time, monitoring is subsequently scaled back spatially and temporally as appropriate and as approved by regulators, but is anticipated to continue so long as active treatment and/or water management is required. Effluent monitoring under MDMER continues until the mine achieves recognized closed mine status. Similarly, the scope, content and frequency of reporting of the monitoring results in the Closure and early Post-Closure phases is anticipated to represent a continuation of Operations phase requirements, until monitoring results support a scaling-back of reporting requirements.

Details of the water quantity and water quality monitoring locations within the mine site are summarized in Permit M-246 and PE-110652 for the Operations phase, with further detail provided in the MSDP (i.e., Table 9-1 of BW Gold Ltd. (2022a)). The following mine site water quality sampling locations are monitored in Closure and Post-Closure, per the RCP, unless otherwise approved by regulators:

- Upper and Lower Waste stockpiles’ collected waters;
- TSF C pond;
- TSF D pond;

- West Dam seepage sump;
- ECD pond;
- Pit Lake;
- FWR (while operational);
- TSF Spillway.

Monitoring is also conducted within the Pit Lake at multiple depths, per *Mines Act* permit M-246 Condition C.4(b)(iv)(b). Monitoring is also conducted for the Metals WTP influent and effluent, as required, to evaluate treatment efficiency and treated discharge quality, as well as the Central Diversion System water transfer pond (water quality and quantity). New monitoring stations are also anticipated to support Closure and Post-Closure monitoring programs and will be identified as the Mine progresses.

As described in the RCP, the following parameters are measured:

- pH and conductivity (field and laboratory);
- Alkalinity;
- Anions (sulphate, chloride, bromide, fluoride);
- Nitrogen species (nitrate, nitrite, ammonia);
- Cyanide species (total Cyanide, Weak Acid Dissociable Cyanide); and
- Total and dissolved metals.

With respect to groundwater levels and quality, monitoring wells that are upgradient and downgradient of the TSF and Open Pit at Closure continue to be monitored in the Post-Closure phase at the same frequency as proposed for the Operations phase, unless otherwise approved by regulators. The monitoring wells, type, and frequency are listed in Table 4.10-1 of the RCP. Groundwater quality and quantity monitoring conducted at the Mine during all phases of development is presented in a Groundwater Monitoring Program (GMP) plan in accordance with Section 4.7 of PE-110652. A Non-Point Source Discharge to Ground Trigger Response Plan (TRP) implemented with the GMP serves as a proactive tool to identify the preliminary signs of contact water (seepage) in the groundwater system and promote a response or remedial action, if required, to manage and mitigate seepage to ensure impacts to the receiving environment are avoided.

4.0 Plan Updates and Reporting

This section includes detail on future updates to the present management plan and reporting prescribed under this plan.

4.1 Plan Updates

Because this plan has been developed to satisfy regulatory requirements identified in both EAC Certificate Condition 34 and *Mines Act* Permit M-246 Condition C.5.(g), two obligations for plan updates are considered:

- EAC Condition 34, which states: “The plan must be updated at least every five years from the commencement of Operations. The Holder may change the frequency of the plan updates, if authorized by the EAO.”

- *Mines Act Permit* M-246 Condition C.5.(g)(ii), which states: “Six months prior to Phase 2 commissioning of the Processing Plant, the Permittee must submit an updated Post-Closure Water Management Plan to the Chief Permitting Officer for approval…”:

It is noted that PE-110652 requires submission of the updated plan to the director in accordance with requirements outlined in *Mines Act* permit M-246 and does not specify a reporting or update schedule.

Based on the above conditions, the present plan will be updated by 2029 at the latest following the commencement of the Operations phase in 2024, per EAC Condition 34 (i.e., five years after the commencement of Operations). However, BW Gold may elect to update the plan earlier than 2029 to better align with the Mine Plan and Reclamation Report Update, which will first occur in 2028.

4.2 Reporting

The scope, content and frequency of reporting on the implementation of water management or of altered or new mitigation measures is defined for Operations phase activities under permit M-246 and PE-110652. It is anticipated the framework established for Operations, in conjunction with approaches described in the Condition 33 Mine Waste and Water Management Plan (MWWMP), will serve as the basis for reporting for the Closure and Post-Closure phases.

Relevant deliverables identified for the Operations phase include the following under *Mines Act* permit M-246 and PE-110652:

- Annual Report and Evaluation, conducted annually per Condition 5.3 of PE-110652.
- Water Treatment Performance Report, submitted as part of the Annual Report per Condition 3.12 of PE-110652.
- Aquatic Effects Monitoring Program interpretive report, submitted as part of the Annual Report per Condition 4.6.5 of PE-110652.
- Annual Reclamation Report, including a materials inventory and a summary of any geochemical analysis conducted per Conditions C.3(e)(i) and C.3(e)(ii), a quantitative comparison of relevant surface water, groundwater, and ML/ARD monitoring data to source terms used in water quality predictions and results of surface water and groundwater models per Condition C.4(d)(ii), and treatment reporting per Condition C.5(e) of permit M-246.
- MSDP review and update, conducted annually and submitted as part of the Annual Reclamation Report per Conditions C.4(a)(c) and C.4(a)(d) of permit M-246.
- Site-wide water balance updates and reconciliation, conducted annually and documented as part of the Annual Reclamation Report per Condition C.4(c)(i) of permit M-246.
- Surface Water Quality Report summarizing updates made to the site-wide water quality model. To be developed every 5 years as part of the Mine Plan and Reclamation Report per condition C.4.c.(ii).

The scope, content and frequency of reporting in the Closure and early Post-Closure phases is anticipated to scale back as site activity declines and monitoring results for the site suggest a transition to a steady-state.

As required by EAC Condition 5, reports will be submitted to EAO and Aboriginal Groups within the following timelines:

- At least 30 days prior to the start of Closure.
- on or before March 31 in each year after the start of Closure until the end of Closure;
- at least 30 days prior to the start of Post-Closure; and

- on or before March 31 in each year after the start of Post-Closure until the end of Post-Closure.

As required by EAC Condition 3, a record of consultation shall be maintained regarding this plan's content and adaptive management. The consultation record shall be available upon request by the EAO or other party.

5.0 Key Milestones

Table 5-1 summarizes the anticipated schedule for key milestones and deliverables under the Closure and Post-Closure Water Management Plan. This section is also intended to illustrate the proposed schedule for implementing the plan and the milestones leading up and contributing to its implementation.

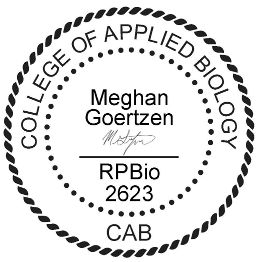
Table 5-1: Schedule of Key Milestones Related to the Closure and Post-Closure Water Management Plan

Date	Description	Key Deliverables and Outcomes
H2 2024	Commencement of Operations Delivery date for draft Closure and Post-Closure Water Management Plan under EAC M19-01 Condition 34: The Holder must provide this draft plan that was developed in consultation with EMPR (EMLI), ENV, and Aboriginal Groups to EMPR (EMLI), ENV, Aboriginal Groups and the EAO for review at the time of the Holder's planned commencement of Operations.	Draft version of this plan is provided to EMLI, ENV, Aboriginal Groups and EAO for review.
TBF	Delivery date for Closure and Post-Closure Water Management Plan under *Mines Act* Permit M-246, Condition C.5.(g)(i): *Six months prior to commencing construction of the TSF-C dams above 1283 masl, the Permittee must submit a Post-Closure Water Management Plan to the Chief Permitting Officer for approval.*	Final version of this plan (for the initial review cycle) is provided to EMLI, ENV, Aboriginal Groups and EAO.
March 31, 2028	Submission of first Mine Plan and Reclamation Report Update (five-year cycle) Submission of first Closure and Post-Closure Water Management Plan update (one year ahead of five-year cycle), in sync with Mine Plan and Reclamation Report Update. Delivery date for updated Closure and Post-Closure Water Management Plan under EA Certificate M19-01 Condition 34: *The plan must be updated at least every five years from the commencement of Operations. The Holder may change the frequency of the plan updates, if authorized by the EAO.*	Mine Plan and Reclamation Report Update First update of Closure and Post-Closure Water Management Plan
TBF	Delivery date for updated Closure and Post-Closure Water Management Plan under *Mines Act* Permit M-246, Condition C.5.(g)(ii): *Six months prior to Phase 2 commissioning of the Processing Plant, the Permittee must submit an updated Post-Closure Water Management Plan to the Chief Permitting Officer for approval. The Permittee must ensure that the updated plan is prepared by a Qualified Professional and includes, but is not limited to, the following:* *(a) A demonstration of completion of long-term evaluations as listed in Document 2.38;* *(b) A demonstration of the implementation of recommendations referred to in Condition C.5.(g)(i), or justification for not implementing recommendations;* *(c) Recommendations for further evaluations; and* *(d) An updated cost estimate for post-closure water management.*	First or second subsequent update of Closure and Post-Closure Water Management Plan

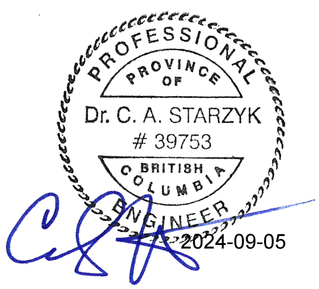
TBF: Date to be finalized as near-term mine schedule is completed.

6.0 Qualified Professionals

This management plan has been prepared and reviewed by, or under the direct supervision of, the following Qualified Professionals[1]. It has been prepared in accordance with the professional standards governing the Qualified Professional(s). Any statements of fact included in this document, are, the to best knowledge and belief of the Qualified Professional, true, based on appropriate review and investigation. Any opinions expressed in the document are, based on professional judgement and review of available information, fair and reasonable.



Meghan Goertzen, RPBio
Senior Toxicologist
Lorax Environmental Services Ltd.
For sections related to surface water quality, water quality modelling results, and discharge quality.



KNIGHT PIÉSOLD LTD.
PERMIT NUMBER
1001011
EGBC PERMIT TO PRACTICE

Cindy Starzyk, P.Eng.
Specialist Hydrogeological Engineer
Knight Piésold Ltd.
For sections related to water balance modelling and water management.

[1] The Qualified Professionals for technical opinions presented in this document are indicated above; however, multiple authors and Qualified Processionals contributed to information that underlies this document and which forms the basis for professional opinions presented herein, as identified in Section 2.5 (Source Documents) of Appendix A.

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Appendix A. Technical Report for 2024 Closure and Post-Closure Water Management Plan

ARTEMIS GOLD INC

Blackwater Mine

Technical Report for 2024 Closure and Post-Closure Water Management Plan

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Appendix D: Brine Management Work Plan Task 4: Parameter of Concern Technical Memorandum

Appendix E: Treatment Efficiency Investigations

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FIGURES

TABLES

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

°C	degrees Celsius
ARD	Acid rock drainage
BAT	Best Achievable Technology
BC	British Columbia
BWRO	Brackish water reverse osmosis
CCME	Canadian Council of Ministers of the Environment
D-	Dissolved
DOC	Dissolved organic carbon
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECD	Environmental Control Dam
EIS	Environmental Impact Statement
ELoMC	Environmental Life of Mine Committee
EMA	*Environmental Management Act*
EMLI	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
EMPR	British Columbia Ministry of Energy, Mines and Petroleum Resources
ENV	British Columbia Ministry of Environment and Climate Change Strategy
FWR	Freshwater Reservoir
FWSS	Freshwater supply system
HCT	Humidity cell test
IFN	Instream flow needs
IX	Ion exchange
KP	Knight Piésold Ltd.
LoM	life of mine
m	Meter
m asl	meters above sea level
ML	Metal leaching
MRC	Mine Review Committee

MWWMP	Mine Waste and Water Management Plan
NAG	Non-acid generating
NF	Nanofiltration
PAG	Potentially acid generating
POC	Parameter of concern
QEMSCAN	Quantitative evaluation of materials by scanning electron microscopy
QP	Qualified professional
RCP	Reclamation and Closure Plan
SWRO	Sea water reverse osmosis
T-	Total
TDS	Total dissolved solids
TSF	Tailings Storage Facility
TSS	Total suspended solids
SBEB	Science-based environmental benchmark
WBM	Water balance model
WMP	Water Management Pond
WQG	Water quality guideline
WQM	Water quality model
WTP	Water Treatment Plant
YDWL	Yinka Dene Water Law

1.0 Introduction

1.1 Overview

This Technical Report has been prepared by Lorax Environmental Services Ltd. (Lorax), Knight Piésold Ltd. (KP), and BQE Water (BQE) with and on behalf of Blackwater Gold Ltd. (BW Gold) for the Blackwater Gold Mine (the Mine). It has been developed to support the Closure and Post-Closure Water Management Plan (BW Gold 2024), which is founded on technical investigations, water balance updates, and water quality model updates that are detailed in the present report.

Information presented in this report, as an appendix of the Closure and Post-Closure Water Management Plan (BW Gold 2024), is intended to meet the conditions of Environmental Assessment Certificate (EAC) M19-01 Condition 34 "Closure and Post-Closure Water Quality Management Plan", which states the plan must include the following:

a) *continuation of mitigation measures identified in paragraphs a) and b) i) of Condition 33 (Mine Waste and Water Management Plan);*

b) *identification of the proposed water treatment technology for use at Closure and Post-Closure, including:*

   - *whether and how the water treatment technology differs from the technology proposed in the Application (Document: February 15, 2017, Blackwater Gold Project: Water Treatment Responses for Comments 1266, 1270, 1271, 1272, and 1273);*
   - *an assessment and identification of the timing for when the treatment is expected to be required, including identification of the factors considered in the assessment;*
   - *identification and description of any new information available on the water treatment technology referred to in paragraph b) i) that could affect the conclusions in the environmental assessment on the effectiveness of the treatment or the confidence in the treatment being effective;*
   - *if information in paragraph b) iii) indicates the water treatment technology will have a lower level of confidence or be less effective than identified in the Application, identification of the additional mitigation measures that will be applied; and*
   - *if new or changed water treatment technology is proposed in Closure or Post-Closure:*
     - *demonstration that the water treatment technology can achieve downstream water quality required by Condition 26 (Water Quality Management); and*
     - *demonstration that the technology is technically feasible;*

c) *description of how any water treatment by-products will be managed;*

d) *the means by which the Holder will actively fill the pit with water in Closure to address ML/ARD;*

e) *description of any additional monitoring, mitigation and/or management measures, additional to water treatment, needed to support the effectiveness of water treatment or achieving the water quality required by Condition 26, Water Quality Management, such as methods for maintaining adequate water quality in the Pit Lake; and*

f) *identification of mitigation measures to limit seepage from TSF C from entering the TSF pond D such that seepage does not cause the quality of water discharged from TSF pond D to the receiving environment to exceed limits required by Condition 26 (Water Quality Management).*

This technical report is also intended to meet the following conditions of *Mines Act* permit M-246 Condition C.5.(g)(i) “Post-Closure Water Management Plan”, which includes the following:

- Six months prior to commencing construction of the TSF-C dams above 1283 masl, the Permittee must submit a Post-Closure Water Management Plan to the Chief Permitting Officer for approval. The Permittee must ensure that the plan is prepared by a Qualified Professional and includes, but is not limited to, the following:
  a) *A demonstration of completion of near-term evaluations as listed in Document 2.38*
  b) *An updated surface water and groundwater model, including a modelling scenario demonstrating the feasibility of using dilution to treat sulphate in Pit Lake discharge after discontinuing membrane treatment, as described in Document 2.39*
  c) *A demonstration of the feasibility of achieving environmental and reclamation objectives for Pit Lake water quality by either Post-Closure water treatment or an alternative water management option, including management of brine and/or solid water treatment by-products, as applicable;*
  d) *Recommendations for further evaluations;*

Since approval of *Mines Act* permit M-246 (“Permit M-246”) and EMA effluent permit 110652 (“PE-110652”) on March 8, 2023 and May 2, 2023, respectively, BW Gold and its consultants have conducted several investigations and model optimization exercises to update the approach to Closure and Post-Closure water management. As such, the water management approach (and model results that form basis of this plan) presented in the Closure and Post-Closure Water Management Plan (BW Gold 2024) is updated from the approach presented in the water balance model (WBM) and water quality model (WQM) developed in support of the Blackwater Joint Permit Application (version 12b; KP 2021b; Lorax 2021) and the subsequent model update developed in support of the Joint Permit Application Technical Review (version 13e; KP 2022a: Lorax 2022e). Further background information on the development and fulfillment of Permit M-246 and PE-110652 conditions relating to the Closure and Post-Closure Water Management is presented in Section 1.2. This background is followed by an overview of the updated water management approach for the Closure and Post-Closure phases for the Blackwater Mine (Section 1.3).

Section 2 presents the approach for developing the water management framework and plan for Closure and Post-Closure, including a summary of water balance model updates, treatment investigations, and water quality model updates. Technical reports that underly information presented in Section 2 are appended. Section 3 presents a summary of recommendations for further evaluation to support ongoing refinement and updates to the Closure and Post-Closure Water Management Plan, followed by authorship in Section 4.0.

1.2 Background

This section presents a summary of the interactions that took place between BW Gold and its regulators after the Joint Permit Application was submitted, which led to several of the investigations and updates presented in the present Technical Report (and are prescribed under *Mines Act* permit M-246). This section also presents a table of concordance with near-term evaluations identified in Lorax (2022d; “Document 2.38”) to investigate Post-Closure membrane treatment and brine management alternatives, per Mines Act permit M-246 Condition C.5.(g)(i) (Table 1-1).

In November 2021, BW Gold submitted a joint *Mines Act* / *Environmental Management Act* Permit Application to regulators for the development of the Blackwater mine. After an application screening process, BW Gold resubmitted their application package to the Mine Review Committee (MRC) in March 2022.

Through several rounds of review of the Joint Permit Application, spanning approximately 10 months, reviewing parties provided BW Gold with written comments with respect to the potential risk of long-term water quality impacts, particularly concerning the potential for accumulation of a water treatment residue consisting of a sulphate-rich brine in the Open Pit from the operation of the Membrane Water Treatment Plant. One comment, 411c, from British Columbia Ministry of Energy, Mines and Low Carbon Innovation (EMLI) was used as a jumping off point to address a similar concern raised by other MRC parties including the Nechako First Nations' (NFNs) technical consultants (Source) to guide additional water balance and water quality work aimed to mitigate the potential for long-term water quality impacts due to long-term storage of brine in the Pit Lake. Comments on Post-Closure water management, treatment, and brine management submitted during the Review Phase of the Blackwater Gold Mine Joint Permit Application Technical Review are presented in Appendix A1.

Further to comment 411c, BW Gold received a letter from British Columbia Ministry of Environment and Climate Change Strategy (ENV) on October 5, 2022, that detailed additional requirements to be fulfilled for Post-Closure water management planning. Similar comments were received from the NFNs (e.g. comment 490; Appendix A1). This feedback led to the development of a Brine Management Work Plan (also referred to as the 411c Work Plan), which was submitted to the MRC by BW Gold in response to Application Information Request 411c during the Application technical review process (Lorax 2022d). That Work Plan outlined near-term and long-term evaluations proposed by BW Gold to refine Post-Closure water management planning and identify a long-term plan that reduced reliance on a treatment system that would produce a brine waste.

In response to the provision of the Brine Management Work Plan and based on follow-up correspondence between the MRC and BW Gold, both EMLI and ENV developed conditions that were accepted into the final *Mines Act* M-246 and *Environmental Management Act* 110652 permits. The accepted conditions included the evaluations proposed within the Brine Management Work Plan, notably *Mines Act* Permit Condition C.5.(g)(i) a ("A demonstration of completion of near-term evaluations as listed in Document 2.38", where Document 2.38 is the Brine Management Work Plan). The table of near-term evaluations is reproduced in Table 1-1 below. Table 1-1 also details the location within the present Plan of each Near Term Evaluation output and supporting information as appropriate to demonstrate BW Gold's Compliance with this condition. A key outcome of the near-term evaluations is an updated water balance and water quality model scenario for the Post-Closure period, which is present further below.

Related to the near-term evaluations described above, *Mines Act* Permit Condition C.5.(g)(i) b ("An updated surface water and groundwater model, including a modelling scenario demonstrating the feasibility of using dilution to treat sulphate in Pit Lake discharge after discontinuing membrane treatment, as described in Document 2.39", where "Document 2.39" is BQE (2022)), also requires an updated water balance and water quality model. The water balance/water quality model updates presented in this plan (Section 2.2 and 2.4) represent an update of the water management concept demonstrated in BQE (2022).

A water balance and water quality model update was presented by KP and Lorax in the August 17, 2023 Environmental Life of Mine Committee (ELoMC) meeting, alongside a treatment investigation update by BQE. Modelling efforts as part of the Brine Management Work Plan and updated water quality predictions for the Post-Closure period without Membrane Water Treatment Plant (WTP) operation were presented, as required under Permit M-246 Conditions C.5.(g)(i) a and b. During that meeting, comments and input from several committee members were recorded. A table of all comments received from the ELoMC on the August 2023 updated model presentation and BW Gold and/or QP responses provided to those comments is presented in Appendix A2. A table of concordance for the same comments and the corresponding response information in the present document is presented in Table 1-2.

In the October 19, 2023, ELoMC meeting, Lorax presented responses to the September 7, 2023 comments provided by Nechako Nations. Following this presentation, no further comments were received on the updates presented for the Brine Management Work Plan and no additional changes were made to the water balance or water quality models since those presented in the August 17, 2023 ELoMC meeting. BW Gold proceeded to develop this Post-Closure Water Management Plan based on the model output and water management regime as presented.

The above timeline illustrates how the approach to the Closure and Post-Closure water management plan has been developed since the Application submission, based on several concurrent treatment and water balance/water quality model investigations and with stakeholder consultation. The following sections summarize the technical investigations conducted since the Brine Management Work Plan was submitted to MRC and the outcomes of those investigations, including water balance model updates (led by KP; Section 2.2), treatment investigations (led by BQE; Section 2.3), and source term and water quality model updates (led by Lorax; Section 2.4). The results of these investigations form the basis of BW Gold's Closure and Post-Closure Water Management Plan (BW Gold 2024).

Table 1-1: Near-term evaluations to investigate Post-Closure membrane treatment and brine management alternatives, presented in Lorax (2022d; "Document 2.38")

No.	Task	Description	Key Deliverables and Outcomes Identified in Lorax (2022d)	Response to Task and Location of Response or Relevant Information
1	Identify if there is a preferred alternative treatment option for Post-Closure (excluding reverse osmosis or nano-filtration)	Complete a risk assessment to identify if there is a preferred alternative treatment option for Post-Closure (excluding reverse osmosis or nano-filtration) considering the technologies presented in a previously submitted memo from BQE. The risk assessment will aim to provide a comparison to the base case treatment scenario (reverse osmosis) for Post-Closure including, but not limited to: -treatment effectiveness, -achievability of BC WQGs, -predicted effluent quality post-closure, -operating and capital costs, and -long-term management of treatment by-products.	Technical memorandum	Not included in this Plan as it was previously submitted as part of the Joint Permit Application Technical Review process. Reference: BQE (2022)
2	Report on alternative treatment option (if one is identified through the risk assessment)	Develop a Post-Closure treatment report that summarises the parameter of concern evaluation as well as the relative risk of the base case scenario (reverse osmosis) compared to the identified preferred alternative treatment option (if one is identified through the exercise above), including considerations of future risk (feasibility of developing a water treatment technology for treatment of the brine or management of other treatment residuals).	Technical memorandum	Not included in this Plan as it was previously submitted as part of the Joint Permit Application Technical Review process. Reference: BQE (2022)
3	Evaluate Parameters of Concern in Post-Closure	Identify and summarize parameters of concern (POC) in all potential sources of effluent discharge to Davidson Creek in Post-Closure, including the Open Pit and tailings storage facilities (TSF), considering applicable BC water quality guidelines.	Technical memorandum	Not included in this Plan as it was previously submitted as part of the Joint Permit Application Technical Review process. Reference: Lorax (2022b)
4	Confirm parameters of interest that will be the focus of Work Plan optimization investigations (Tasks 5, 6, 7)	Evaluate parameters of interest that require treatment via the Membrane WTP in order to meet environmental guidelines and cannot be treated via other treatment systems that do not produce a brine (e.g., Metals WTP). During mine plan development (pre-Application), SO_4 was identified a key parameter that could only be treated via nanofiltration membrane treatment technology. Sulphate has been a focus owing to challenges in treatment, but other parameters may also need consideration.	Technical memorandum, followed by incorporation of outcomes in item 7)	Appendix D. Sulphate and ammonia were identified as parameters that should be the focus of optimization investigations. Membrane treatment was identified as the preferred treatment method for both parameters in the Mine Post-Closure phase. As priority parameters of interest, sulphate and ammonia should be evaluated for mitigation and management options that ultimately minimize the Mine need for Membrane Treatment following mine closure.
5	Investigate source reduction and optimized discharge of SO4 (and other parameters of interest) accumulated onsite	a. Investigate optimized use and ratios of freshwater make-up water in the mill (e.g., non-contact waters, treated water from Metals WTP, pit depressurization well water) vs. the use or reclaim water to reduce SO_4 concentrations in mill effluent, and assess potential to allow for discharge to the environment during Operations, Closure and Post-Closure to avoid accumulation of brine that needs management into perpetuity.	Evaluated through item 7); interim modelling update to be provided June 1, 2023.	This item is not included in the present model update. This potential option was investigated at the onset of model development. It was considered non-feasible, in part due to existing water balance optimizations required to ensure sufficient water availability for mill operations while maintaining IFN in Davidson Creek. Therefore, it was not included as part of quantitative modelling under Task 7.
		b. Investigate through model sensitivity optimized parameter load discharge in phase with annual climate-driven hydrograph during Operations, Closure and Post-Closure, with consideration of combining pit water with TSF water during Closure, induced hardness and IFN constraints during all three mine phases.	Evaluated through item 7); interim modelling update to be provided June 1, 2023.	This optimization is integrated in the updated model output presented in Section 2.2 and Section2.4 2.4, which serve as the basis for the proposed site-wide water management approach. Optimized parameter load discharge was developed for the WBM/WQM for the Closure and Post-Closure phases. Operations

No.	Task	Description	Key Deliverables and Outcomes Identified in Lorax (2022d)	Response to Task and Location of Response or Relevant Information
				phase discharge was not developed in this exercise; it is anticipated that such optimization would result in an improvement to predicted concentrations of Parameters of Concern (sulphate and ammonia) in the Post-Closure phase and may be considered in future WBM/WQM updates.
		c. Investigate alternative brine storage location, if applicable.	Evaluated through item 7), if applicable.	This item is not included in the present model update. The WBM/WQM updates presented in this document present a feasible scenario in which sulphate discharged from the site can be managed to meet BC WQGs in the receiving environment without treatment in a Membrane WTP. As such, no brine is produced in the scenario and an investigation for an alternative brine storage location is no longer relevant.
6	Investigate treatment optimizations and alternatives	a. Investigate upgrades to Membrane WTP to improve treatment efficiency for high-salinity influent.	Investigation may result in updated treatment terms evaluated through item 7); interim modelling update to be provided June 1, 2023.	Appendix E (Treatment Optimization Evaluations); summarized in Section 2.3. Interim modelling update for June 1, 2023 was agreed upon by BWG and regulators as not required. Updated treatment terms would apply to the Operations phase and were not integrated in the WBM/WQM update presented in the present plan. It is anticipated that such updates, if implemented during Mine Operations, would result in an improvement to predicted concentrations of Parameters of Concern (sulphate and ammonia) in the Post-Closure phase and may be considered in future WBM/WQM updates
		b. Investigate feasibility of salt cake precipitation from brine and associated long-term storage for solids waste.	To be documented as a Mine contingency within the water balance/water quality model report (item 7)	
		c. Evaluate treatment optimizations for high TDS influent (e.g., option to extend pit storage life).	Investigation may result in updated treatment terms evaluated through item 7); interim modelling update to be provided June 1, 2023.	
7	Develop water balance/water quality model scenario	Develop water balance/water quality model (WB/WQM) sensitivity(ies) that evaluate and ultimately identifies preferred options identified in tasks 1-6 above.	1. Water balance and water quality model. 2. Modelling report that summarizes key outcomes, recommendations, and updated Post-Closure water management plan if applicable.	Appendix B (Water Balance Model Update); summarized in Section 2.2. Appendix C (Water Quality Model Update); summarized in Section 2.4. The updated water management plan for Closure and Post-Closure presented in BW Gold (2024) reflects the culmination of water balance and water quality model updates identified through Tasks 1-6 above, as well as recommendations (Section 3.0) for ongoing evaluations.

Table 1-2: Environmental Life of Mine Committee Comments on the August 17, 2023 Brine Management Work Plan update

Comments recorded during the meeting (not captured in written comments submitted after August 17, 2023)	Response Location in this Document
Laurie asked if climate change scenarios had been considered in the updated models that were presented. Cindy noted that the models were currently in the early stages of development and that sensitivities, including climate change, would be incorporated later. Travis confirmed that climate change would be included.	Section 2.2.4
Farzad expressed the reduction in SO_2 consumption for cyanide detoxification and what changed in processing led to that change. John noted that this was information provided by the metallurgists at BW Gold.	Section 2.4.1
Erin highlighted that ENV will be interested in the assumptions made in relation to dilution and discharge to the receiving environment, and how they contribute to the water quality predictions at WQ28.	Sections 2.2, 2.4.2 Appendices B and C
Comments submitted in writing (Source Environmental Associates Inc., September 1, 2023)	
The statement "water from Pit Lake sent to WTP if capacity remains" on slide 13 prompts the question whether the implication is that water might be transferred without proper treatment in cases where the water treatment plant's capacity is already stretched. Please explain what this statement means.	Appendix A2 Section 2.2
Slide 15 introduces an update regarding the modelled target Pit Lake water level, now established at 10 meters below the pit rim (1,471 meters above sea level). This adjustment represents a 30-meter increase from the prior assumed level, effectively altering the pit's status from a groundwater sink. It is imperative to gain a comprehensive understanding of the ramifications this change holds for groundwater quality. Specifically, we request a detailed elucidation on how the upward revision of the Pit Lake water level could impact the surrounding groundwater quality. Are there potential risks of contamination due to increased interaction between the lake and the groundwater system?	Appendix A2 Section 2.2
The latest outcomes from the WBWQ model underscore the necessity for a dynamic approach to water management, contingent upon water quality considerations stemming from diverse sources. Considering these findings, it becomes imperative to formulate a comprehensive water management plan for Post-Closure, encompassing specifics for attaining the intended dilution levels. This must include details about the range of water sources to be managed, the methodologies for achieving the desired dilutions, and a comprehensive breakdown of potential additional costs linked to this evolved water management approach. These insights will be instrumental in guiding the decision-making process and facilitating a comprehensive understanding of the project's financial and operational landscape.	Appendix A2 Section 2.2
A key aspect that appears absent from the presented slides (17, 19, etc.) is a comprehensive explanation concerning the exclusion of membranes from the revised water treatment scheme, and its subsequent connection to the newfound availability of dilution capacity for sulphate management. Membranes, operating under purely physical principles, should theoretically have little bearing on dilution potential – a point that warrants elucidation. During the presentation, the response provided emphasized the viability of dilution in the updated model due to notable reductions in sulphate loading, achieved through modifications in the cyanide detox reagent and subsequent decreases in reagent consumption. The assertion that alterations in cyanide detoxification reagents can singularly account for a substantial reduction in sulphate concentration is questionable, given that the capacity of reagents to influence dissolved sulphate is limited, resulting in the precipitation of surplus reagents as gypsum or calcium sulphite. The correlation between decreased reagent consumption and a significant reduction in sulphate concentration demands a more detailed justification. This includes any amendments in cyanide dosage, updated SO2 dosages, and an in-depth clarification on how reduced SO2 consumption could lead to the observed decline in sulphate concentration. Considering the utilization of acidic and lime-based reagents for detoxification, any excessive reagent should not have been factored into the dissolved species within the water quality models. Given the complexity of these factors, we look forward to receiving a detailed account that will help us establish a comprehensive understanding of how these variables collectively contribute to the alteration in sulphate concentration, as observed in the updated model.	Appendix A2, Appendix C Section 2.4.1
The statement on Slide 19 that the "Updated model assumes a degree of microbially-mediated conversion of ammonia to nitrate" necessitates a clarification on the derivation of the associated rates. This requires a detailed explanation of the methods utilized to arrive at these rates. It is important that this assumption undergoes a rigorous assessment, supplied with clear justifications that include a direct comparative analysis of factors such as temperatures, solar exposure duration, pond depths, and ice coverage span with multiple relevant reference sites to substantiate the validity of the assumption. The significance of this exercise becomes even more pronounced considering the updated WBWQM scenario indicates a 14% frequency of exceedances for ammonia levels. The potential for exacerbating this percentage if the assumptions remain unverified underscores the importance of their accuracy. Considering this, we propose the implementation of pilot trials during the operational phase. This measure will serve to validate the feasibility of the approach and provide empirical confirmation of the assumption's validity. This approach aligns with the principles of robust decision-making and ensures that our strategies are underpinned by sound scientific data.	Appendix A2, Appendix C Section 2.4.1
The predicted concentrations on Slide 44 that show how frequently ammonia (14%) and antimony (39%) are exceeding the BC WQGs at WQ28. There is not sufficient information in the presentation to understand whether ammonia and antimony are predicted to exceed the Yinka Dene Water Law (YDWL) standards at WQ7 on Davidson Creek. This uncertainty gains greater significance when viewed through the lens of the inherent uncertainty in modelling outcomes and the assumptions underpinning both water treatment processes and the rates of natural attenuation for substances. It is recommended that predictions are provided for WQ7 and if needed (i.e., if exceedances are predicted), a thorough reassessment of the current water management practices and treatment strategies be conducted, with a focus on curbing the prevalence of such exceedances to achieve the YDWL standards and safeguard the integrity of water resources as mandated by the YDWL.	Section 2.4.2, Appendix C

1.3 Overview of Closure and Post-Closure Water Management

This section presents a brief overview of the water management approach devised for the Closure and Post-Closure phases of the Blackwater Gold Mine (updated from the Joint Permit Application) that form the basis of the Closure and Post-Closure Water Management Plan. The approach is founded on the outcomes of technical investigations and updates that are detailed in Section 2.

The overarching objectives of Closure and Post-Closure water management at the Mine are to minimize effects to the Mine receiving environment by meeting IFN in Davidson Creek and water quality objectives in the receiving environment, and the need for active treatment of contact waters, specifically membrane treatment. To achieve these objectives, the water management strategy presented in the Closure and Post-Closure Water Management Plan (BW Gold 2024) prioritizes the following activities in Closure and Post-Closure:

- Accelerating Pit Lake filling by directing contact water from the mine site (collected from the ECD, TSF C, and Upper Waste Stockpile) to the Pit Lake once Open Pit mining ceases.
- Treating water from the ECD, Upper Waste Stockpile, and Pit Lake in Late Closure and Post-Closure at a Metals WTP prior to release downstream to meet water quality objectives in the receiving environment.
- Diverting non-contact water around the TSF in Post-Closure to Davidson Creek to support IFN.
- Discharging water from TSF C to facilitate discharge from the ECD.

During the Operations phase, the goal of the water management system is to meet the Project's operational and potable water demands while limiting the amount of surplus water stored onsite and the potential adverse effects to the receiving environment (Figure 1-1). Operational demands are driven by the process plant water needs and the waste management strategy to saturate potentially acid generating (PAG) and metal leaching (ML) waste materials. This water management approach is consistent with the approach originally presented in the Mine's Joint Permit Application (March 2022).

During the Early Closure phase, water collected from the mine site is directed to the Pit Lake to prioritize rapid pit filling. Water directed to the Pit Lake includes water from the TSF, Environmental Control Dam (ECD), Upper Waste Stockpile, and Water Management Pond (WMP) seasonally during low flows. The Freshwater Reservoir (FWR) and Freshwater Supply System (FWSS) are operational to meet IFN, as required. This water management approach is also consistent with the approach originally presented for Closure in the Mine's Joint Permit Application (March 2022). A flow schematic showing water management in during the Early Closure phase is presented on Figure 1-2.

Late Closure begins a few years before the Pit Lake water level reaches its target closure level and excess mine site water is no longer directed to the Pit Lake. Water management during this period differs from the approach proposed in the Mine's Joint Permit Application. During this period, contact water collected at the ECD and Upper Waste Stockpile is treated at the Metals Water Treatment Plant (WTP) prior to release downstream at rates that vary with the natural hydrograph to meet WQGs (Figure 1-3). Water in excess of what can be released downstream, considering WTP treatment capacity and water quality targets, is directed to the Pit Lake. Water begins to discharge from TSF C and TSF D via the closure spillway to the plunge pool. In addition, water from the TSF is also actively managed and directed to the TSF closure spillway to increase streamflow and facilitate discharge of water collected at the ECD. The WMP is decommissioned in Late Closure. The FWR and FWSS continue to operate to meet IFN in Davidson Creek and non-contact water is directed around the Mine to the FWR to the extent possible.

During the Post-Closure phase, water from the Pit Lake begins to be treated at the Metals WTP to maintain the surface water elevation of the lake below the pit rim (Figure 1-4). Water treated from the Pit

Lake, ECD, and Upper Waste Stockpile is released downstream at rates that meet WQGs and that vary with the natural hydrograph with water in excess of what can be discharged directed to the Pit Lake for discharge during a later month (Figure 1-5). Water continues to discharge from TSF C and TSF D via the closure spillway and is actively managed as required to facilitate discharge of water collected at the ECD during lower flow periods. The FWR and FWSS are decommissioned once IFN and water quality targets can be met in Post-Closure. Effluent from the Metals WTP is sent to the plunge pool on Davidson Creek along with non-contact water directed around the Mine. The Membrane WTP is not operational in Post-Closure. Therefore, no WTP brine waste (retentate) requires management.

In the Joint Permit Application during the Post-Closure phase, water from the ECD, Pit Lake, and Upper Waste Stockpile was directed in the long-term to the Membrane WTP for treatment prior to release. Make-up water was obtained from the TSF to meet a constant influent rate to the WTP as required (190 L/s; 6 Mm^3/yr; KP 2021b, 2022a). Brine from the Membrane WTP was sent to the Pit Lake (1.5 Mm^3), which was operated as a groundwater sink by keeping the Pit Lake water level at or below an elevation of 1,440 masl (KP 2022a).

The above modifications from the Joint Permit Application have resulted in small changes to the Closure and Post-Closure phase schedules in the updated models as follows (model years shown reflect water balance Average Climate Case):

1. Construction phase: Year -2 to Year -1.
2. Operations phase: Year +1 to Year +23.
3. Closure phase:
    a. Early Closure: Year +24 to approximately Year +43, ending a few years before the Pit Lake reaches its target elevation.
    b. Late Closure: Approximately Year +44 to Year +46, ending when the Pit Lake has filled to its target elevation; and
4. Post-closure phase: Year +47 onward.

Overall, this updated water management strategy presented here demonstrates that water contained or collected at facilities across the mine site in Closure and Post-Closure can be feasibly managed and discharged without treatment at a Membrane WTP. The modelling method and results that underly the proposed water management strategy are presented in further detail in Sections 2.2 and 2.4, and corresponding Appendices B and C, respectively.

Where differences exist between currently-authorized activities or discharges and those proposed based on the updated WBM and WQM, BW Gold will pursue permit amendments as required in order to authorize the proposed updates as appropriate.

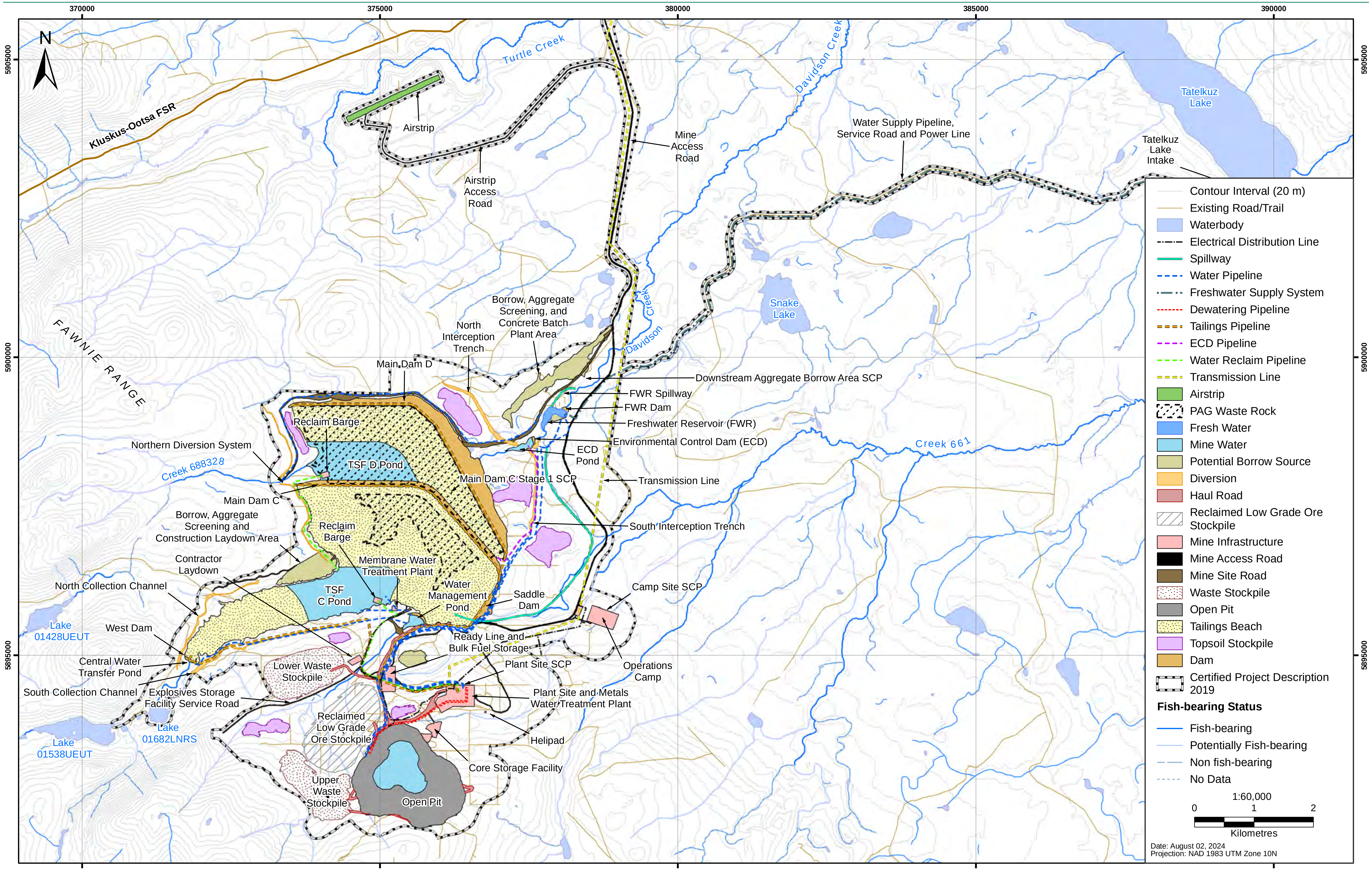

Figure 1-1: General Arrangement of Blackwater Mine for Operations Year +23

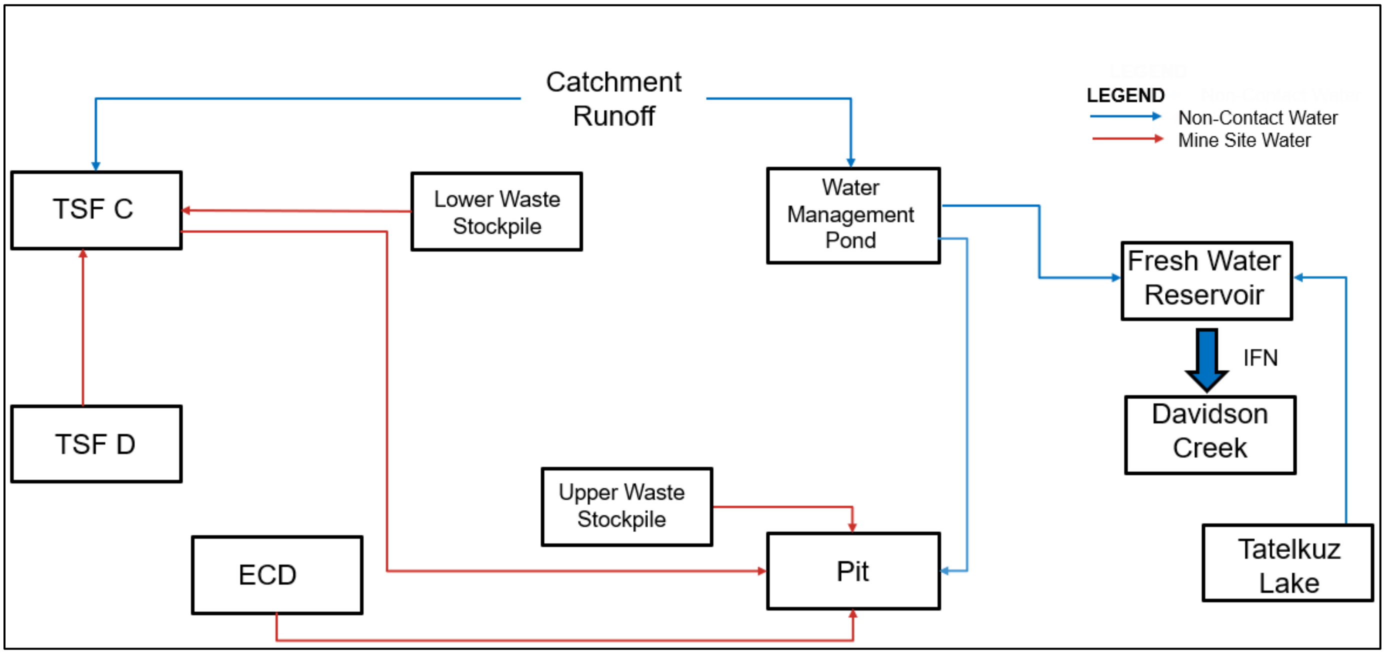

Figure 1-2: Early Closure Phase Flow Schematic

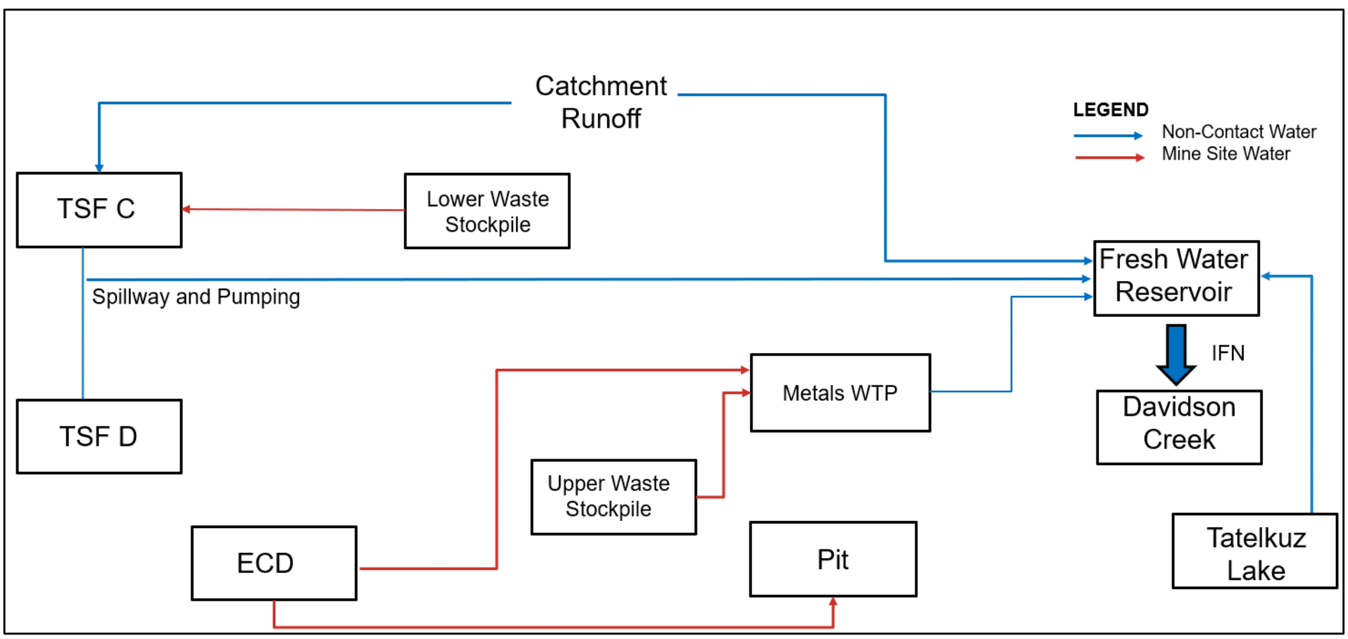

Figure 1-3: Late Closure Phase Flow Schematic

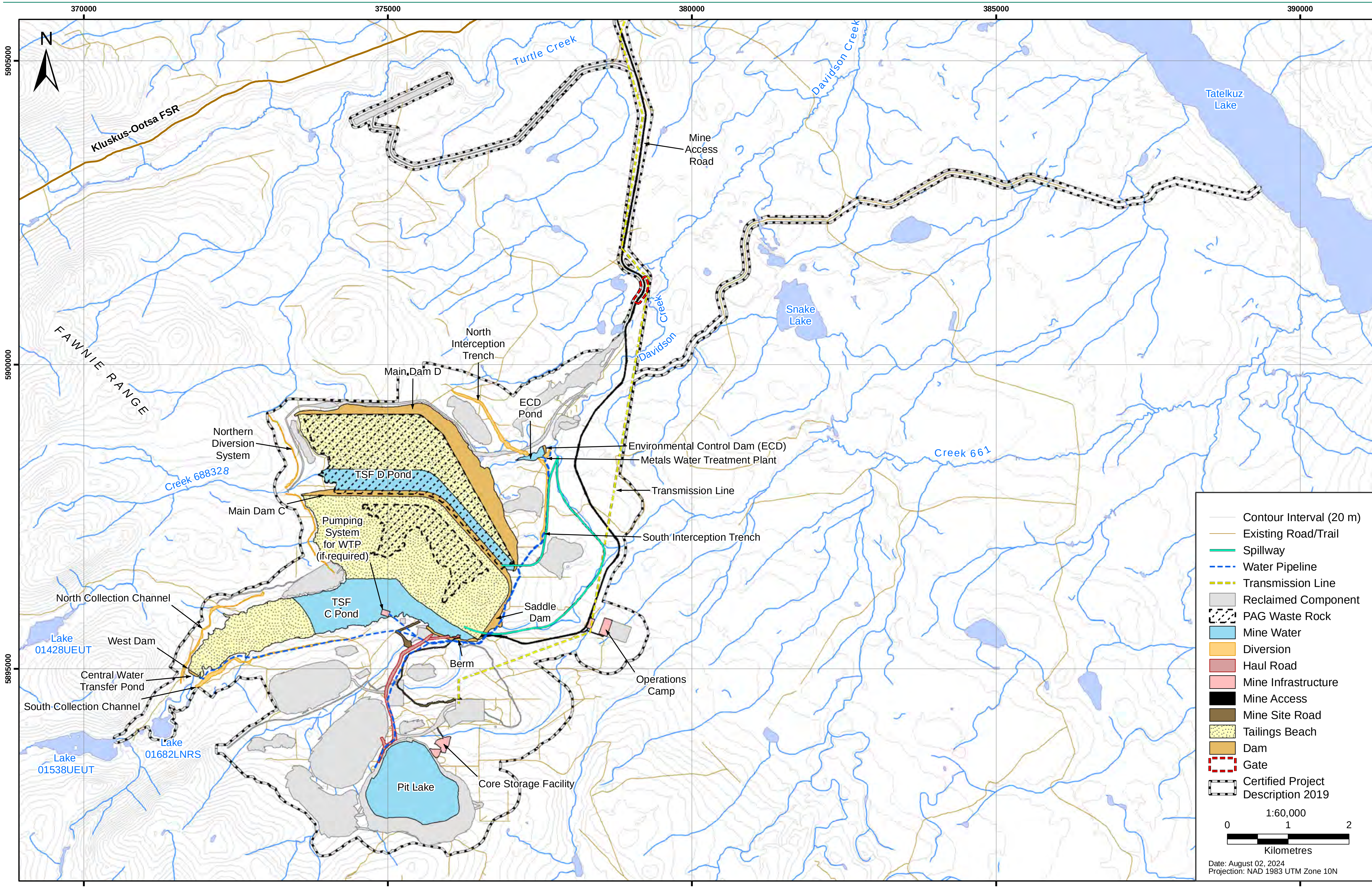

Figure 1-4: General Arrangement of Blackwater Mine at Post-closure Year 46+

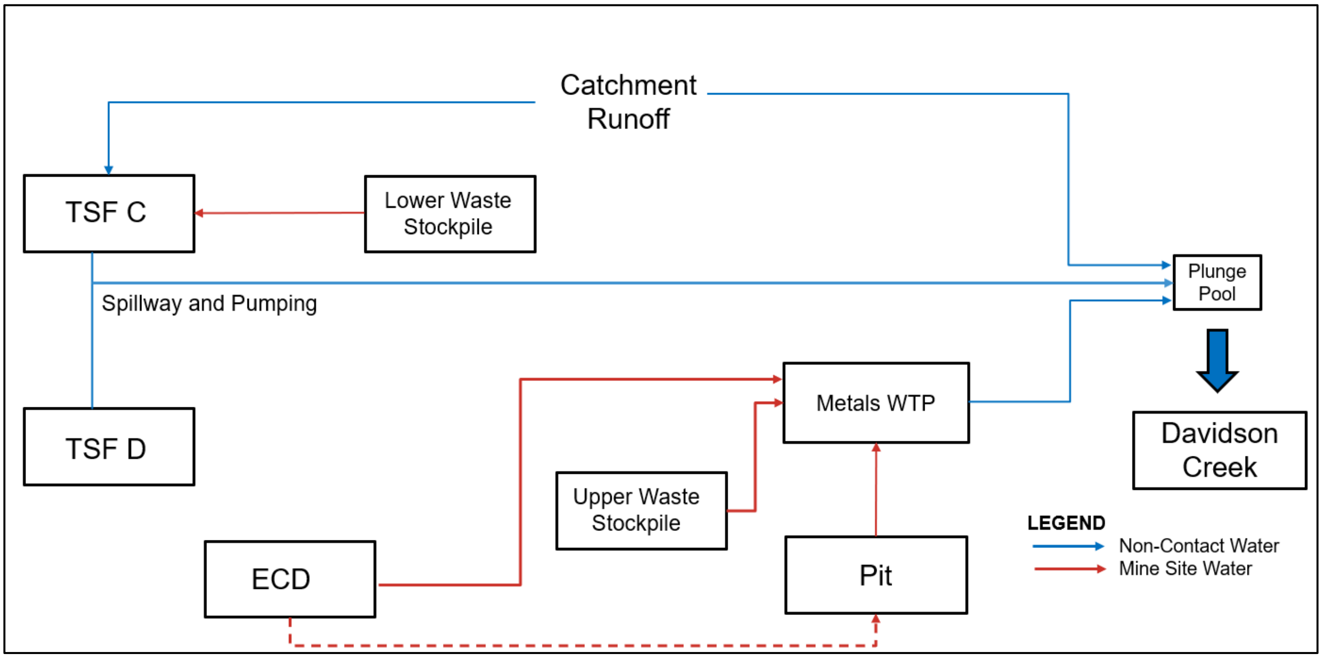

Figure 1-5: Post-Closure Phase Flow Schematic

Table 1-3: Water Balance Model Timeline of Water Management Plan

Facility	Mine Process and Water Management Activity		Early Closure																				Late Closure			Post-Closure																						
		Mine Year	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
		Year	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091
TSF C	TSF C Pond pumped to Pit Lake																																													
	TSF C Pond pumped to plunge pool (for ECD discharge)																																													to Year 89->
	TSF C Pond discharges via Closure Spillway																																													
TSF D	TSF D Pond pumped to TSF C																																													
	TSF D Pond discharges via Closure Spillway																																													
Open Pit	Pit Lake filling to target elevation																																													
	Pit Lake pumped to Metals WTP																																													
Upper Waste Stockpile	Water collected from Stockpile to Open Pit																																													
	Water collected from Stockpile to Metals WTP																																													
ECD	ECD pumped to Pit Lake																																													
	ECD pumped to Metals WTP																																													
WMP	Water Management Pond surplus pumped to FWR																																													
	Water Management Pond to Pit Lake in Winter Months																																													
FWR	Freshwater Reservoir discharges to Davidson Creek																																													
FWSS	Pumps water from Tatelkuz Lake																																													
Metals WTP	Treat water from ECD and Upper Waste Stockpile																																													
	Treat water from ECD, Upper Waste Stockpile, and Pit Lake																																													
Diversions	Central Diversion Area directed to WMP																																													
	Central Diversion Area directed to FWR/ plunge pool																																													
	Northern Diversion Area directed to FWR/ plunge pool																																													

Notes:
1. The timeline presented is based on the results of average climate inputs to the WBM.
2. Post-Closure begins when the Pit Lake reaches its target elevation and treatment of Pit Lake water at the Metals WTP begins. Water discharges from the TSF via the closure spillway.
3. Mine year 24 equal to calendar year 2047. Calendar years reflect estimates at the time of writing and may vary depending on mine development.
4. Colours differentiate between different facilities/infrastructure

2.0 Methods and Technical Evaluation

Overall objectives of Closure and Post-Closure water management at the Blackwater site are to:

- Maintain acceptable water quality and water level within the Pit Lake to allow for discharge of Pit Lake water to the environment.
- Maintain neutral pH conditions within the Tailings Storage Facility (TSF) to allow for controlled seepage collection and discharge to the environment.
- Minimize the need for active water treatment, specifically membrane treatment, of contact waters.
- Minimize effects to the Project receiving environment, including surface and groundwaters, through active metals treatment, optimized discharge of contact water, and maintenance of water management infrastructure to ensure discharged contact water is of sufficient quality to meet British Columbia water quality guidelines (BC WQGs) for aquatic life, science-based environmental benchmarks (SBEBs), and Yinka Dene Water Law (YDWL).
- Maintain instream flow needs (IFN) in Davidson Creek.

Technical investigations and model updates conducted in support of the Closure and Post-Closure Water Management Plan integrate the above objectives and have focused on demonstrating the feasibility of the proposed water management approach to meet regulatory requirements outlined in BW Gold's EAC, the *Mines Act* and EMA permits, and BW Gold's *Fisheries Act* Authorization. Of note, the present Technical Report presents information at a level of detail intended to demonstrate the feasibility of the proposed Closure and Post-Closure water management approach, per *Mines Act* permit condition C.5.(g)(i)(b) as a foundational condition driving Post-Closure water management planning.

2.1 Water Quality Guidelines, Benchmarks and Standards

Water balance and water quality model outputs were screened against a series of guidelines and benchmarks to evaluate the feasibility of the Post-Closure water management regime under evaluation.

Target IFN flows for Davidson Creek immediately downstream of the FWR were developed by Palmer Environmental Consulting Group (Palmer) to reduce the Mine's impacts on fish and fish habitat. Target IFN flows are discussed in detail in the Fisheries Offsetting Plan (Palmer 2021) and vary throughout the year according to the natural hydrograph. Mean monthly IFN criteria are met at the downstream extent of the FWR, or at the plunge pool located at the downstream extent of the FWR and TSF closure spillway when it exists in Year +12 onward. IFN flows on Davidson Creek are met by pumping water stored in the WMP to the FWR and pumping supplemental water via the FWSS from Tatelkuz Lake to the FWR as required. IFN criteria are summarized in Table 2-1 as monthly averages of the biological stanza-based IFN flows developed by Palmer (2021) for the purpose of water balance modelling and approved under Condition 2.2.9.2 of BW Gold's *Fisheries Act* Authorization.

Table 2-1: Davidson Creek Instream Flow Needs (Mean Monthly Flows)

Month	IFN (L/s)
December – March	80
April	115
May	458
June	560
July	225
August	150
September – November	120

Notes:
IFN values are presented as monthly averages input to the water balance model. Refer to the *Blackwater Project Fisheries Offsetting Plan: Instream flow needs for Davidson Creek* (Palmer 2021) for instantaneous IFN criteria.

Water quality model predictions for Davidson Creek were compared to BC Water Quality Guidelines for the protection of aquatic life to evaluate the feasibility of the water management approach evaluated in the water balance and water quality model (Table 2-2). This approach was driven by EAC Condition 26 a), which states that “During Construction, Operations, Closure, and Post-Closure, the Holder must ensure the Mine does not cause downstream water quality to exceed BC Water Quality Guidelines, unless the Holder has developed and ENV has accepted one or more Science Based Environmental Benchmarks (SBEBs)…”. With respect to SBEBs, it is noted an SBEB was approved by ENV for D-Al in Davidson Creek on March 30, 2023.

Aquatic life guidelines used for screening that are hardness-dependent were calculated using predicted hardness, calculated from the predicted Ca and Mg concentrations for the same corresponding model node and time step. This approach is consistent with the approach proposed in the Brine Management Work Plan (Lorax 2022d). A similar approach was used for the nitrite guideline (chloride-dependent) Aquatic life guidelines for ammonia, D-Cu, and D-Zn are also calculated using pH, DOC, and/or temperature. These parameters are not tracked in the model; as such, the same-month median statistic from the corresponding node’s baseline dataset was used to calculate guidelines.

In addition to the BC aquatic life guidelines described here, model predictions for Mo were screened against their corresponding BC wildlife/livestock guideline, which is notably lower than the corresponding aquatic life guideline. This approach was conservatively used because, while aquatic life is considered the most sensitive water usage for the Mine’s receiving environment, it is plausible that intermittent wildlife usage may occur within downstream catchments. This screening approach informed the relative risk associated with that type of water usage. Wildlife/livestock guidelines are otherwise higher than corresponding aquatic life guidelines for other parameters.

In addition to BC WQGs, BW Gold will operate in a manner that supports the achievement of Yinka Dene Water Law (YDWL) water standards in lower Davidson Creek. This reach is considered subject to Class 3 YDWL standards, which are generally set equal to BC or CCME water quality guidelines. Similarly, Class 2 YDWL standards are considered to apply to Chedakuz Creek, whereby these standards are generally set equal to 50% of the receiver’s assimilative capacity.

Table 2-2: Approved and working British Columbia water quality guidelines for aquatic life used to screen model output

	BC Guideline for Aquatic Life*	
Parameter	**Short-term**	**Long-term**
$T\text{-}NH_3\text{-}N$[b]	7.97	1.53
$NO_3\text{-}N$	32.8	3
$NO_2\text{-}N$[b]	0.06	0.02
Cl-	600	150
F[b]	0.84	-
SO_4[b]	-	128
CN-WAD	0.01	0.005
T-Ag[b]	0.0001	0.00005
T-Al[b]	-	0.193
T-As	-	0.005
T-B	-	1.2
T-Ba	-	1
T-Be	-	0.00013
T-Co	0.11	0.004
T-Cr	-	0.001
T-Fe	1	-
T-Hg	-	0.00002
T-Mn[b]	0.86	0.73
T-Mo	46	7.6
T-Ni[b]	-	0.025
T-Pb[b]	0.017	0.0040
T-Sb	0.25	0.074
T-Se	-	0.002
T-Tl	-	0.0008
T-U	-	0.0085
D-Cd[b]	0.000164	0.000085
D-Cu[b]	0.00527	0.00088
D-Fe	0.35	-
D-Zn[b]	0.0173	0.00304

Notes:
All units mg/L.
*Class 3 YDWL standards are generally set equal to BC or CCME water quality guidelines.
[a]British Columbia approved and working water quality guidelines for the protection of freshwater aquatic life (BC ENV 2019, 2023).
[b]Aquatic life guideline is calculated based on ambient water conditions. Values shown in table are calculated from conservative baseline conditions for WQ28: minimum monthly median hardness (29.0 mg/L as $CaCO_3$), chloride (0.25 mg/L), dissolved organic carbon (2.4 mg/L), median pH (7.8), and assumed temperature of 15°C.

2.2 Water Balance Model

2.2.1 Overview

Background

An updated water balance model was developed for the Blackwater Mine (subsequent to the Joint Permit Application submission) under an updated Closure and Post-Closure water management scenario to inform the present water management plan. Specifically, an updated WBM scenario is presented (version “v2h”) that is paired with an updated WQM described below (Section 2.5) that reflects a Closure and Post-Closure water management regime in which the Membrane WTP does not operate in Post-Closure. The sections below describe updates to the water management strategy and WBM assumptions as part of the update. A detailed description of the water balance model update and results is provided in Appendix B.

The Life of Mine (LoM) WBM originally submitted with the Joint Permit Application is documented in the *Life of Mine Water Balance Model Report* (KP 2021b) submitted as Appendix 5-B of the Application. That report includes a detailed discussion on the baseline watershed model and water balance model methodology. The modelling was subsequently updated during the Application technical review phase to optimize water management practices in Closure and Post-Closure (“v13e”; KP 2022a). The water balance model presented below builds upon the optimized Closure and Post-Closure v13e model (KP 2022a) prepared during the Application technical review phase. The water balance model and water management strategy during Baseline, Construction, and Operations phases of the mine life are unchanged from what is presented in the *Life of Mine Water Balance Model Report* (KP 2021b).

Climate Inputs

Climate inputs to the WBM to assess the Closure/Post-Closure water management strategy are unchanged from earlier versions of the water balance modelling (KP 2021b; 2022a). Climate inputs to the modelling are based on a 40-year long-term synthetic climate record extending from November 1980 through October 2020. The monthly long-term temperature and precipitation synthetic climate record are provided in the *Baseline Watershed Model report* (Appendix A of KP 2021b). The Closure/Post-Closure water management strategy was assessed by modelling two climate scenarios:

- Average climate conditions: Climate inputs to the WBM consisted of mean monthly temperature and precipitation values averaged from the 40-year long-term synthetic climate record.
- Variable Climate Case model (VCC Model): The VCC Model comprises 40 separate model iterations that are generated by iteratively stepping the long-term climate record through the WBM, consistent with the model methodology described in KP (2021b). Each of the 40 iterations of the VCC Model represents the positioning of a different historical climate year in the first year of the model. The remaining historical climate data is input to the WBM in the same order that it occurred in the historical record, thereby preserving the natural sequence of the historic climate record. The climate record is repeated end-on-end until the end of the modelled period.

The updated Closure/Post-Closure water management strategy was initially developed using average climate inputs to the WBM. The performance of the proposed Closure/Post-Closure water management strategy was then evaluated against a range of wet and dry periods by inputting the 40-year historic climate record into the WBM to assess potential influence of climate variability on surface and groundwater flows and mine water management. A detailed description of the Mine climate record and methodology for including it in the WBM is provided in KP (2021b).

2.2.2 Water Balance Model Updates and Assumptions

Water Management Updates

Revisions to the WBM to represent the updated water management strategy during Late Closure and Post-Closure are outlined below. The water management strategy during Early Closure is unchanged from that presented in KP (2022a) and includes directing all mine site water collected at the TSF, ECD, Upper Waste Stockpile, and seasonally from the WMP to the Pit Lake to assist in rapid pit filling.

The late Closure phase starts a few years before the Pit Lake water level reaches the target long-term water level. During this phase, mine site water is no longer directed to the Pit Lake to assist in filling. Water collected at the ECD and Upper Waste Stockpile begins to be directed to the Metals WTP for treatment prior to release downstream at rates that meet water quality targets, and water in excess of what can be released is directed to the Pit Lake. Water begins to discharge from TSF C and TSF D via the closure spillway to the plunge pool and is also actively managed and directed to the TSF closure spillway to increase streamflow and facilitate discharge of water collected at the ECD during low flow periods.

In the Post-Closure phase, water begins to be withdrawn from the Pit Lake for treatment at the Metals WTP to maintain the surface water elevation of the lake below the pit rim. Water collected at the ECD and Upper Waste Stockpile continues to be treated at the Metals WTP prior to release and TSF C and TSF D Pond water continues to discharge via the closure spillway and is actively managed as required.

Modelled Sulphate Concentrations

Predicted concentrations of sulphate in TSF C Pond, ECD, and Pit Lake water were included in the updated WBM to allow the monthly volume of mine site water discharge to be estimated in the water balance. The inclusion of sulphate concentrations in the water balance was an iterative process whereby initial flows generated using average climate inputs to the water balance model were provided to Lorax as inputs for developing water quality predictions for a model simulation. The sulphate predictions were then fed back into the WBM to refine the allowable mine site discharge predictions.

The predicted sulphate concentrations incorporated in the WBM were developed only using flows representing average climate inputs. As a result, the representative sulphate concentrations entered into the WBM for each mine facility do not change during wet and dry conditions. This means that the dilution associated with additional runoff generated during wetter conditions is not accounted for in the WBM and the volume of water that can be discharged during wetter conditions is likely underestimated. Sulphate concentrations were incorporated into the WBM for the purpose of estimating the allowable volume of monthly discharge. The water quality predictions for the modelled scenarios are based on results from the WQM as discussed in Section 2.5.

Pit Lake

The Pit Lake receives water from the TSF, ECD, WMP, and Upper Waste Stockpile during early Closure consistent with KP (2022a). Water from the TSF, WMP, and Upper Waste Stockpile is no longer directed to the Pit Lake in Late Closure a few years before the lake level reaches the long-term target water level. This water level was assigned as 15 m below the pit rim (i.e., 1,467 masl) in the WBM scenario modelled. The Pit Lake continues to fill at a slower rate during Late Closure with groundwater inflows, surface water runoff and water directed from the ECD, as required.

Water from the Pit Lake is then directed to the Metals WTP in the WBM and Post-Closure starts once the Pit Lake reaches its target long-term water level, which is specified in the scenario modelled as 10 m below the pit rim (i.e., 1,472 masl).

The elevations assigned in the WBM that trigger when mine site water is no longer directed to the Pit Lake and Pit Lake treatment starts were selected as a starting basis to allow the feasibility of the

Closure/Post-Closure water management strategy to be assessed. These water levels will be evaluated in future updates to the water management strategy as discussed in Section 3.10. The long-term Post-Closure Pit Lake elevation assigned in the WBM is approximately 30 m higher than the target Pit Lake elevation specified in the previous water balance model in KP (2022a) that maintains the Pit Lake as a groundwater sink during Post-Closure.

Seepage from the Pit Lake to the receiving environment is modelled to start when the Pit Lake reaches an elevation of 1,467 masl. Rates of Pit Lake seepage to downstream discharge locations were assigned consistent with rates specified in the original model submitted in the Joint Permit Application (KP 2021b).

Environmental Control Dam (ECD)

Water from the ECD is directed to the Pit Lake during early Closure. Once the Pit Lake approaches the target lake Closure elevation and late Closure starts, water from the ECD is directed to the Metals WTP at rates that meet downstream water quality targets. Water collected at the ECD in excess of what can be released downstream, considering the Metals WTP treatment capacity and water quality targets, is directed to the Pit Lake. As described above, the volume of water that can be discharged each month is calculated in the WBM using predicted concentrations of sulphate in water collected at the ECD. The volume of water collected at the ECD that can be discharged via the Metals WTP each month increases over time as sulphate concentrations decrease in TSF seepage reporting to the ECD.

The ECD Pond design can hold a water volume of approximately 194,000 m^3. The ECD pond is represented in the WBM with a minimum volume of water and does not temporarily store water from one month to the next.

Tailings Storage Facility (TSF)

Water from the TSF is directed to the Pit Lake during early Closure. In Late Closure, water from the TSF C Pond is no longer directed to the Pit Lake and discharges passively via the closure spillway. Water from the TSF C Pond is also actively managed (discharged) as required to increase downstream flows during low flow periods in Late Closure and early Post-Closure to facilitate discharge of water collected at the ECD. The ability to actively discharge water from TSF C Pond is incorporated into the WBM when capacity remains at the Metals WTP to treat additional water but discharge from the ECD is limited during periods of low flow downstream.

Additional assumptions for the design criteria for the discharge strategy and infrastructure built into the WBM, such as pump and pipeline capacity, assume the maximum rate of discharge is up to 270 m^3/hr (75 L/s) and active discharge from the TSF C Pond can occur if the pond volume is greater than 1.5 Mm^3. These design criteria will be refined as the Closure/Post-Closure water management strategy is further developed.

The water management strategy for TSF D is unchanged from earlier modelling (KP 2021b; 2022a).

2.2.3 Water Balance Model Results

Key results of the water management strategy are discussed below for average and variable climate conditions assessed with the WBM. Tables presenting annual water balances at key Mine facilities based on average climate inputs to the WBM are provided in the model report in Appendix B.

Late Closure is modelled to begin in Year +44 (2067) under average climate conditions and between Years +40 and +42 with variable climate conditions. In Late Closure, mine site water is no longer directed to the Pit Lake for rapid pit filling; water collected at the ECD starts to be treated and released downstream and water in the TSF Ponds starts to discharge via the closure spillway.

Post-Closure, and the start of Pit Lake water treatment at the Metals WTP, is modelled to begin in Year +47 (2070) under average climate conditions and between Years +42 and +45 under variable climate conditions.

Environmental Control Dam (ECD)

Water collected at the ECD starts to be directed for treatment and release downstream starting in Year +44 under average climate inputs. At the start of Late Closure, slightly more than half of the water collected annually at the ECD is directed to the Metals WTP and discharged to the receiving environment while the remaining volume of water is directed to the Pit Lake. These simulated volumes are shown on Figure 2-1 and are calculated in the WBM based on the projected sulphate concentrations in the ECD water. Sulphate concentrations in TSF seepage collected at the ECD are projected to decrease over time (Section 2.5.2), which allows an increasingly greater volume of water from the ECD to be directed to the Metals WTP over time. By approximately Year +63 (2086), all water collected at the ECD annually (2.7 Mm^3) is directed to the Metals WTP for discharge in the long-term in the water balance with average climate inputs to the model.

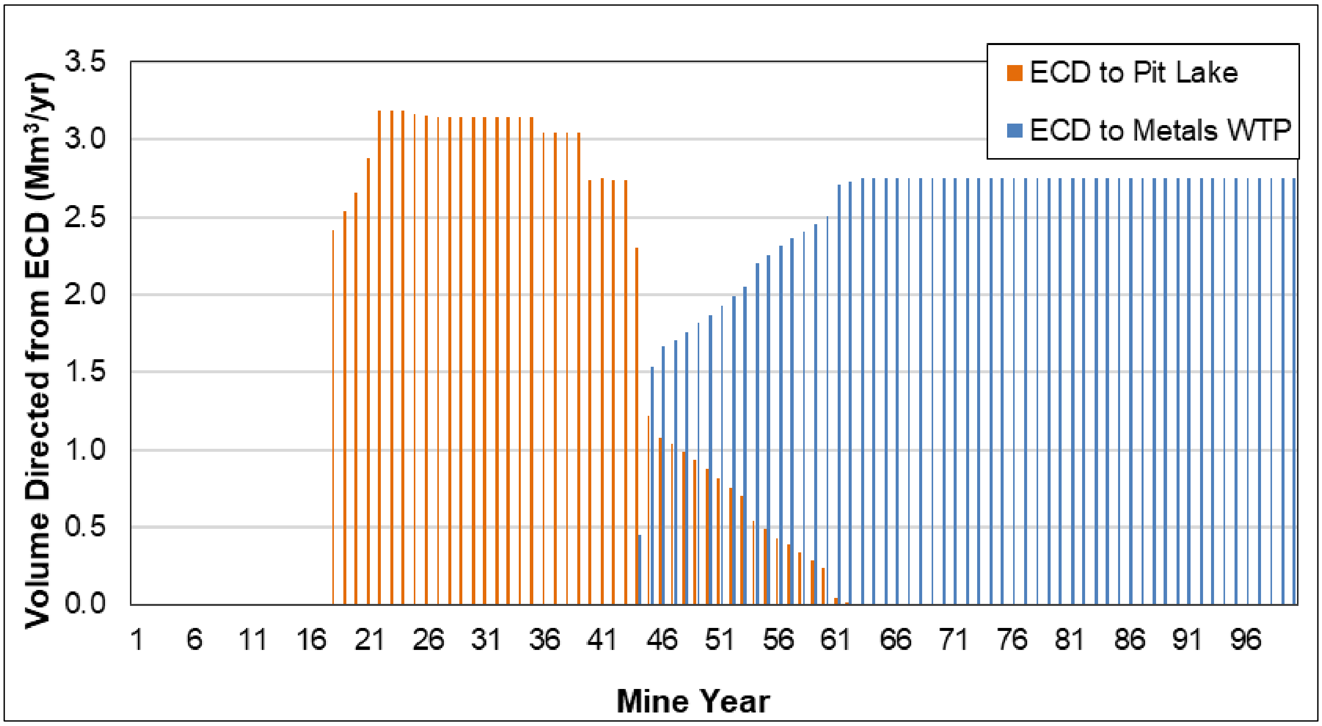

Figure 2-1: Modelled Discharge from ECD (Average Climate)

With variable climate inputs to the WBM, the monthly volume of water collected at the ECD is predicted to exceed the modelled rate of treatment at the Metals WTP during the wetter months. Water in excess of the modelled treatment capacity is directed to the Pit Lake for storage during those months and is discharged during a later month. The simulated rates that water is directed to the Pit Lake using variable climate inputs to the water balance are shown on Figure 2-2. The predicted rates are shown for various percentiles and the maximum rate of all 40 iterations of the variable climate model. The maximum modelled flow of 158 L/s in the long-term predictions is generated by one month in the historical climate associated with the highest simulated streamflow as it iteratively cycles through each mine year in the VCC Model.

The ECD Pond can hold a volume of approximately 194,000 m^3; this storage capacity is not currently considered in the WBM and the ECD is maintained empty each month. If this temporary storage capacity were considered, more than half of the months where water is modelled to go to the Pit Lake during Post-Closure would instead be expected to be held at the ECD and directed to the Metals WTP in the next month.

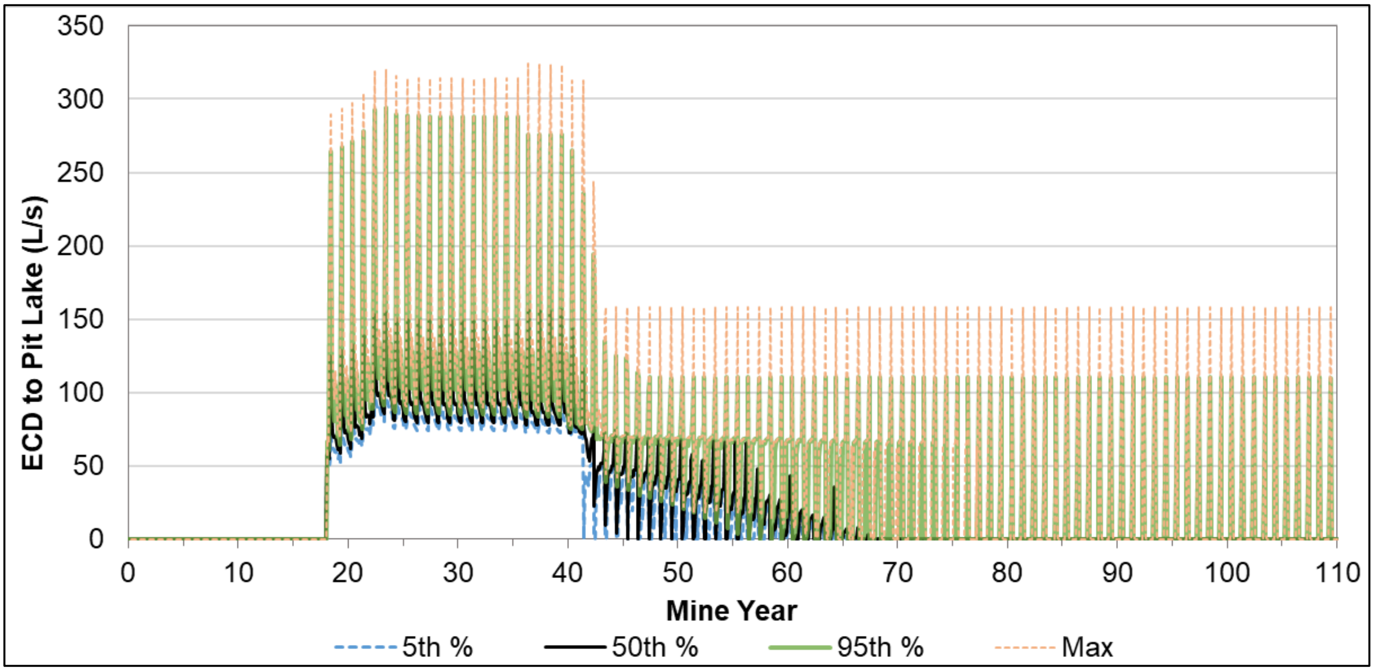

Figure 2-2: Modelled Flows Directed from ECD to Pit Lake (Variable Climate)

Notes:
Water is directed in the WBM from the ECD to the Pit Lake in long-term Post-Closure (later than approximately Year +70) during wetter months when the volume of water collected at the ECD exceeds the modelled maximum treatment rate at the Metals WTP of 155 L/s.

Metals WTP

Treatment of water collected at the ECD and Upper Waste Stockpile at the Metals WTP is initiated by Year +44 for all climate scenarios assessed. Water from the Pit Lake begins to be treated at the Metals WTP by Year +47 for all climate scenarios assessed.

The Metals WTP is specified to have a treatment rate of up to 155 L/s in the WBM, which is equivalent to an annual treatment capacity of up to approximately 4.9 Mm^3. The modelled sources of influent to the Metals WTP under average climate inputs to the model are shown on Figure 2-3. In the long-term, the average annual volume requiring treatment is predicted to be approximately 3.5 Mm^3, and as high as 3.9 Mm^3 towards the end of the period when water from the ECD is still being directed to the Pit Lake.

The predicted range of treatment rates at the Metals WTP using variable climate inputs are shown on Figure 2-4. In the long-term, monthly treatment rates varying between 80 to 155 L/s are predicted to be sufficient to treat water from the ECD and keep the Pit Lake water level within the target range.

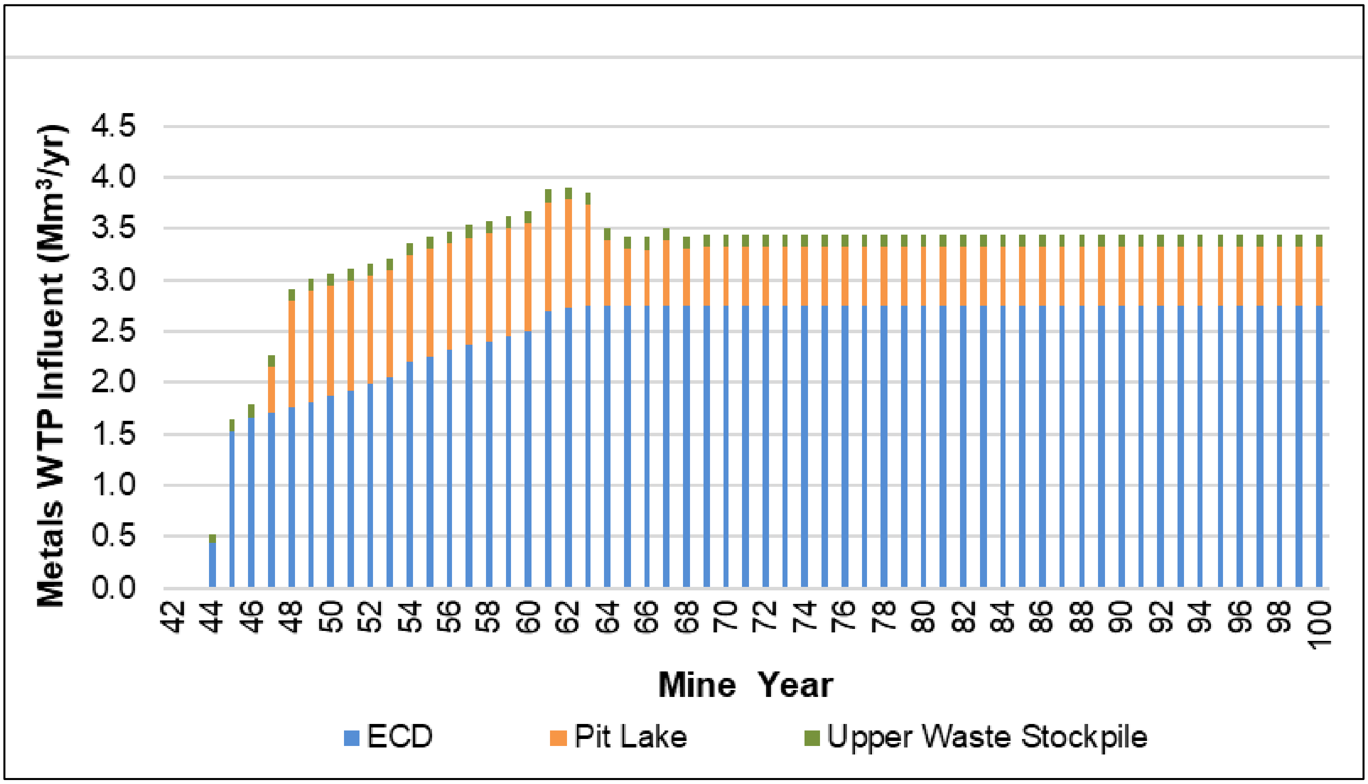

Figure 2-3: Annual Metals WTP Influent Water Sources (Average Climate)

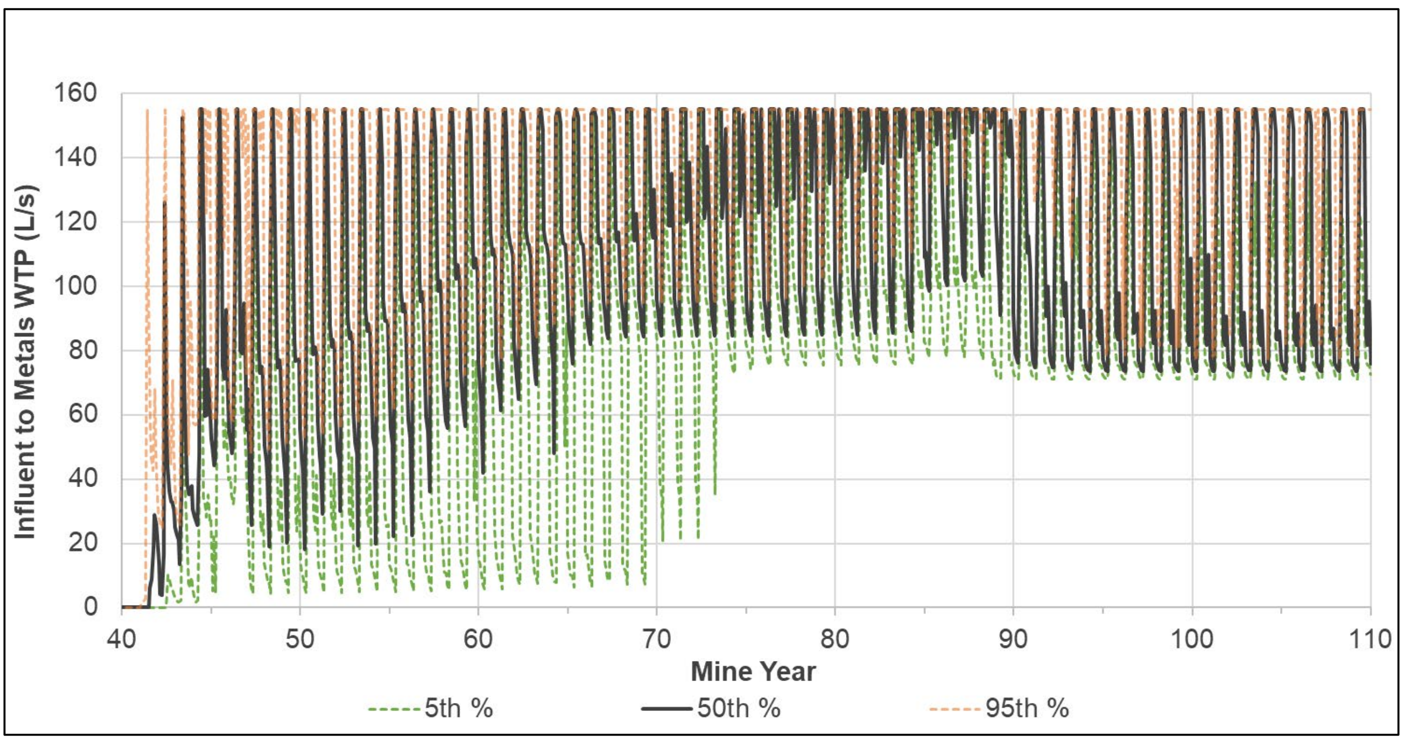

Figure 2-4: Metals WTP Influent Rates (Variable Climate)

Tailings Storage Facility

The predicted TSF C Pond volume using variable climate inputs to the model is presented on Figure 2-5. The simulated TSF C Pond during Operations through approximately Year +37 is unchanged from earlier modelling (KP 2021a; 2022a). Water begins to discharge from TSF C via the closure spillway in Year +45 (2068) with average climate inputs to the model and as early as Year +41 with variable climate inputs to the model. The TSF C Pond volume is modelled to be drawn down below the 2 Mm^3 nominal Post-Closure design volume by the active discharge (pumping) of water from the pond to the closure spillway to facilitate discharge of water collected at the ECD. This period of active management of water discharge from the TSF is modelled to continue until Year +90 using average climate inputs and continues until between Year +85 and Year +97 using variable climate inputs.

The predicted TSF D volume is unchanged from KP (2021b).

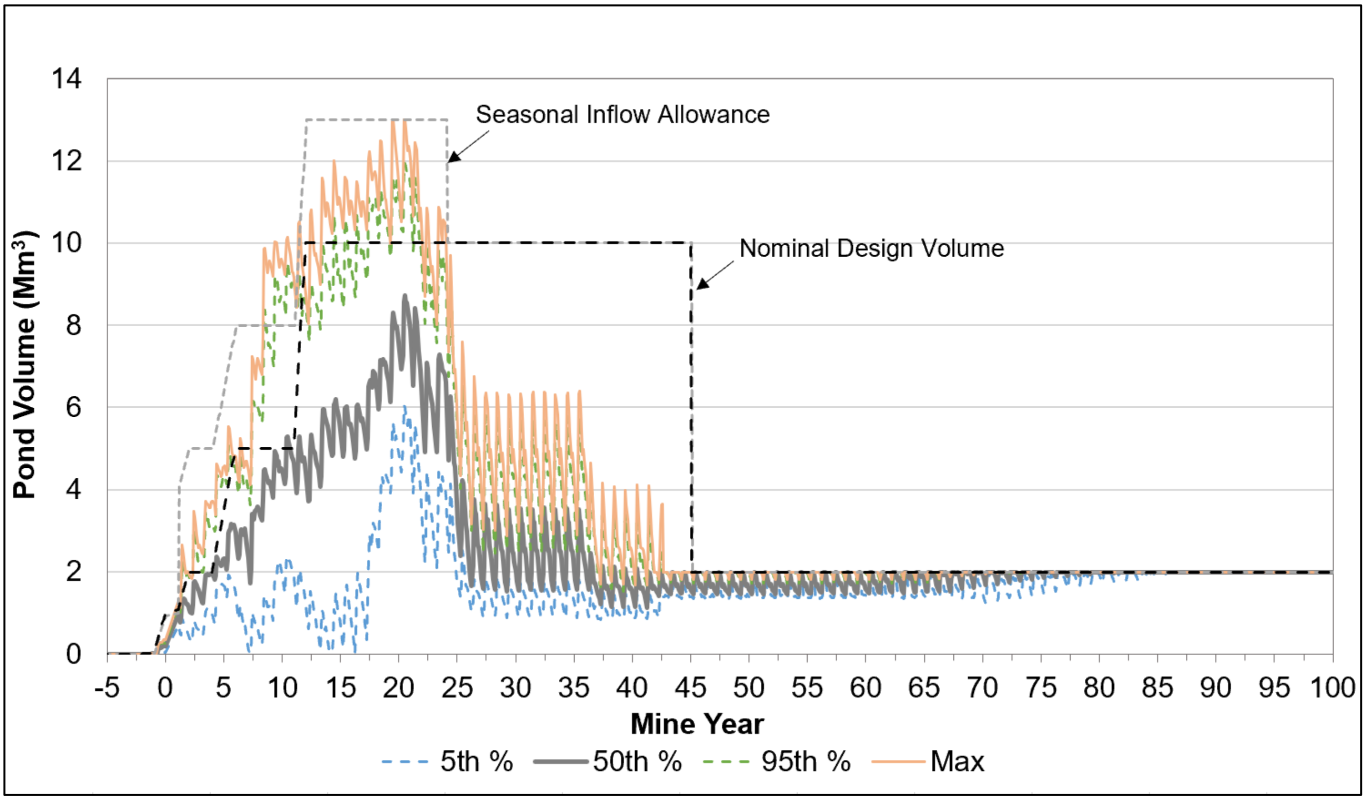

Figure 2-5: TSF C Pond Volume (Variable Climate)

Notes:
The simulated TSF C Pond volumes in Operations and early Closure are unchanged from earlier modelling (KP 2021b; 2022a).

Pit Lake

The simulated Pit Lake volume using average and variable climate inputs to the WBM are presented on Figure 2-6. The simulated Pit Lake volume with variable climate inputs is larger than the simulated volume with average climate inputs attributed to the increased volume of water directed to the Pit Lake during wet conditions. The simulated Pit Lake volume remains below the pit rim (maximum pit volume is 216 Mm^3) for all model iterations.

The Pit Lake is not maintained as a groundwater sink in this model scenario to allow the predicted water quality in Davison Creek with the inclusion of Pit Lake seepage in the model to be assessed. The changes incorporated in the updated Closure and Post-Closure water management strategy, particularly that brine is no longer generated and directed to the Pit Lake, result in improved Pit Lake water quality in the long-term compared to the Pit Lake water quality predictions presented in the Application. The actual target level for the Pit Lake will be designed based onsite specific factors and water management considerations as part of detailed Closure planning. Maintaining a lower Pit Lake water level could be accommodated by discontinuing pumping of water from TSF C to the Open Pit earlier than modelled.

The Pit Lake is predicted to reach the specified target elevation that initiates treatment at the Metals WTP between Years +42 and +47 under all climate conditions modelled. The modelled treatment rate of 155 L/s is sufficient to maintain the Pit Lake level below the lowest point of the pit rim in all variable climate model iterations. All water that leaves the Pit Lake is treated at the Metals WTP prior to release downstream.

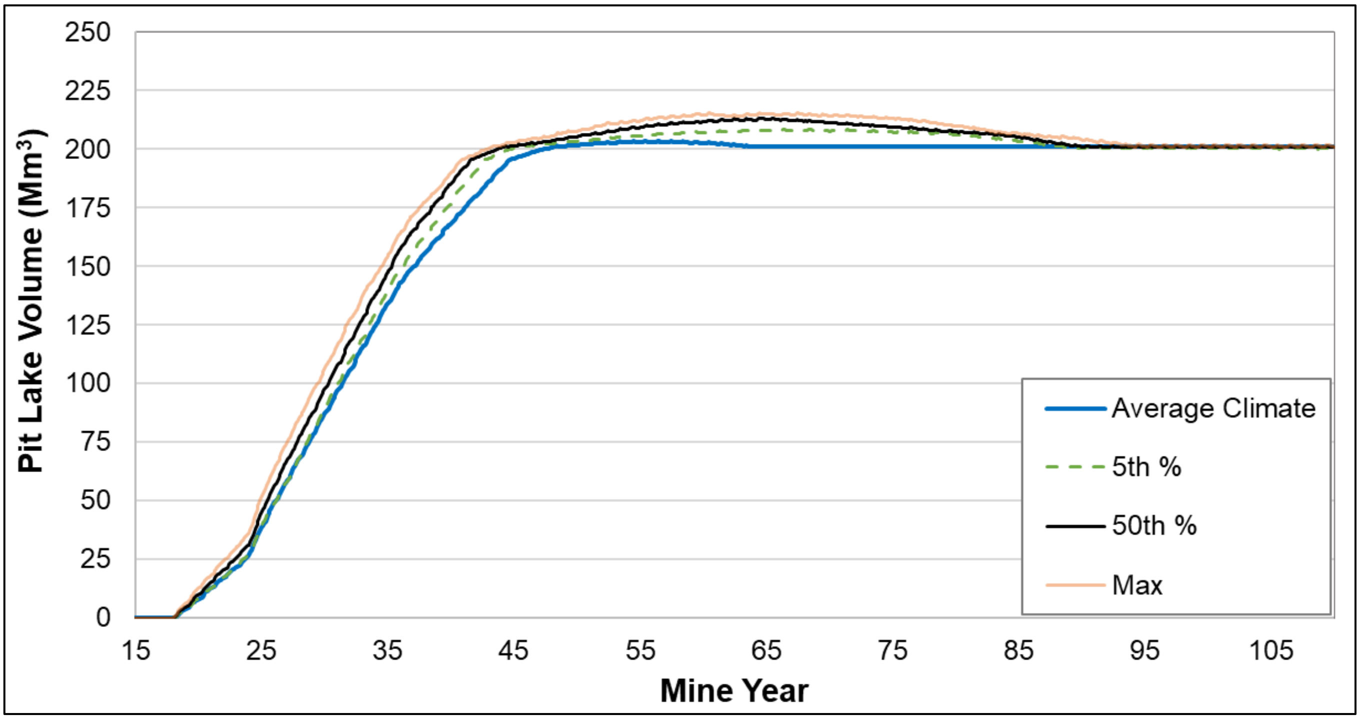

Figure 2-6: Pit Lake Volume (Average and Variable Climate)

Notes:
1. The maximum volume of the Open Pit at the pit crest (1,481 masl) is 216 Mm^3.
2. 5^{th}, 50^{th}, and Max represent the predicted percentiles and maximum Pit Lake volume of all 40 iterations of the VCC Model.

Long-term average annual water contributions to the Pit Lake total approximately 1.3 Mm^3 in Post-Closure when water from the ECD is no longer directed to the Open Pit. Contributions to the Pit Lake comprise direct precipitation, runoff from the upgradient catchment, and groundwater inflows at the approximate distribution shown in Table 2-3. The Pit Lake volume is maintained in equilibrium in the long-term under average climate conditions by pumping 0.6 Mm^3 water annually to the Metals WTP (equivalent to an average annual rate of 20 L/s). A little over half of the water contributing to the Pit Lake is lost to evaporation annually.

Table 2-3: Long-Term Annual Pit Lake Water Balance (Average Climate)

	Inputs (Mm^3)				Losses (Mm^3)			
Post-Closure	**Pit Wall Runoff**	**Groundwater Inflow**	**Precipitation on Pit Lake**	**Total Inputs**	**Evaporation from Pit Lake**	**To Metals WTP**	**Seepage**	**Total Losses**
Mm^3/yr	0.3	0.2	0.7	1.3	0.7	0.6	0.03	1.3
Percent	0.24	0.18	0.57	-	0.52	0.45	0.03	-

Mine Site Discharge

The simulated discharge hydrograph at the plunge pool located at the downstream extent of the mine site is shown on Figure 2-7 along with the sources of water comprising the monthly mine site discharge. Results are presented for average climate conditions in long-term (steady state) Post-Closure when water collected at the ECD is no longer directed to the Pit Lake. The sources of water comprising the mine site discharge are also summarized on an annual basis in Table 2-4.

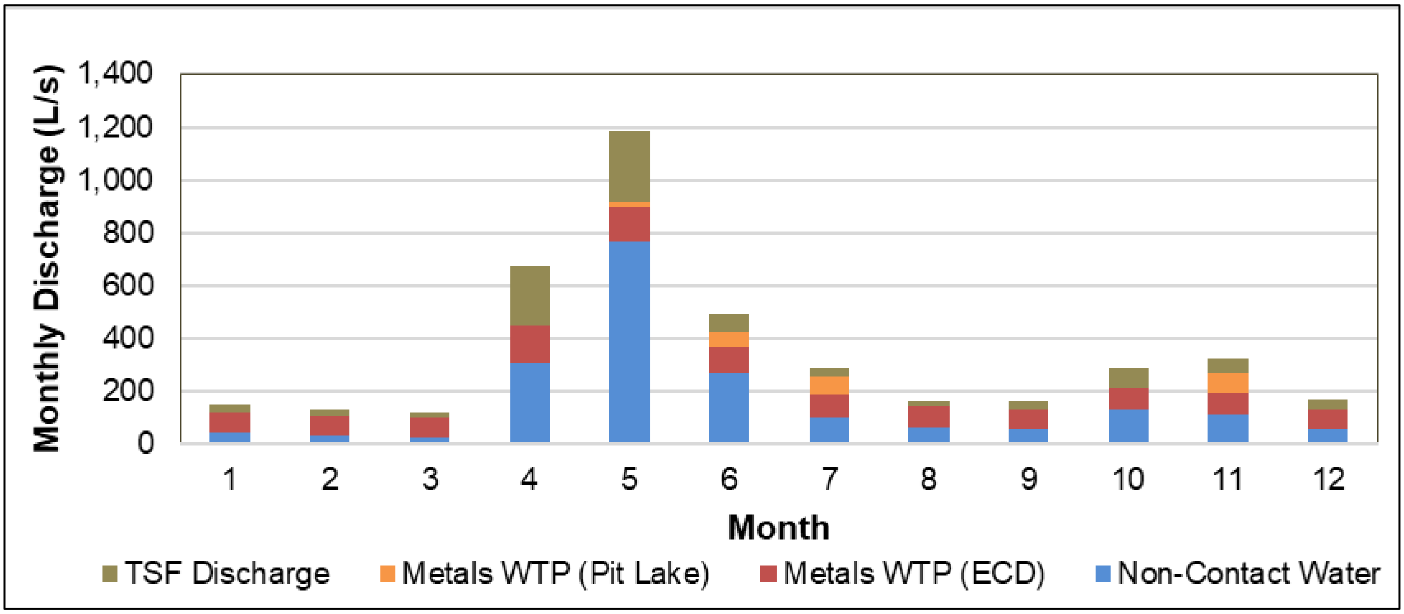

Figure 2-7: Post-Closure Plunge Pool Hydrograph and Water Sources (Average Climate)

Notes:

1. Monthly results shown for mine Year +100 using average climate inputs to the WBM.

Table 2-4: Long-Term Annual Water Balance of Predicted Mine Site Discharge

	Flows Leaving Downstream Extent of Mine (Mm3)					
Post-Closure	**Non-Contact Water**	**ECD and Upper Waste Stockpile via Metals WTP**	**Pit Lake via Metals WTP**	**Seepage Contact Water**	**TSF Pond Discharge**	**Total Discharge**
Mm^3/yr	5.2	2.9	0.6	0.1	2.3	11
Percent	0.47	0.26	0.05	0.01	0.21	-

Receiving Environment Streamflows

Tables presenting the predicted mean monthly streamflow and predicted percent change in streamflow for each Mine phase with average climate inputs are provided in the water balance model update report in Appendix B. The IFN values are to be met in Davidson Creek at the downstream extent of the FWR (the plunge pool after Year +12); this location is generally consistent with model node/hydrology station H2B. IFN reported by Palmer (2021) are summarized on a monthly basis in Table 2-5.

IFN flow criteria in Davidson Creek are met in all months during the Closure phase by directing non-contact water around the mine site to the downstream environment to the extent practical. Supplemental water is pumped from the FWSS from Tatelkuz Lake to the FWR as required during this phase to maintain a suitable source of freshwater to provide IFN.

The FWR and FWSS are decommissioned when water quality and downstream flow criteria (IFN) can be met. The scenario modelled assumes the FWR and FWSS are decommissioned in all model scenarios at the start of Year +47 (the start of Post-Closure). Flow predictions at model node H2B for long-term Post-Closure (Year +100) are presented in Table 2-5 for average climate results and the results of the 40 model iterations of the VCC Model. With variable climate inputs to the model, model results suggest the lower range (i.e., 5th percentile) of predicted Post-Closure streamflows at H2B in the months of May though July could be less than IFN, which is consistent to results presented during the Application review phase (KP 2022i). These simulated Post-Closure flows are similar to or slightly higher than the predicted lower range of flows during the baseline period (Table 2-6), which indicates the Post-Closure flows are representative of the range of flows expected in the natural environment during existing (pre-mining) conditions. Modifications to the Post-Closure water management strategy or implementation of mitigations could be considered, if required, if results of ongoing monitoring suggest that Post-Closure streamflows need to be augmented above the natural range of flows observed during the baseline period.

The modelled streamflows at model node H2B at the transition between Late Closure and Post-Closure are less than IFN during late winter months (February and March) and in June when average climate is input to the model, which is similar to the months during baseline conditions that are modelled to have average monthly flows below IFN (Table 2-6). Sulphate concentrations in water collected at the ECD continue to decrease over time, which allows a progressively greater volume of water to be discharged from the ECD and streamflows to increase. Starting in Year +60, June is the only month that IFN is not met at model node H2B in Post-Closure in the long-term under average climate conditions; however, monthly June Post-Closure flows (491 L/s) are higher than June baseline flows (472 L/s).

Table 2-5: Model Node H2B Predicted Streamflows (L/s) during Post-Closure (Year 100)

Month	IFN	Average Climate Flows	Variable Climate Flows				
			Minimum	5th	50th	95th	Maximum
1	80	144	92	97	131	204	237
2	80	128	87	92	117	166	233
3	80	117	87	87	114	146	159
4	115	675	116	119	528	1137	1617
5	458	1184	299	344	1292	2392	2846
6	560	491	209	253	530	1100	1479
7	225	284	185	207	287	723	1286
8	150	161	152	159	220	400	841
9	120	160	122	127	205	342	433
10	120	362	125	132	215	716	850
11	120	246	110	143	226	410	441
12	80	168	98	104	157	285	312

Notes:
1. Average Climate flows calculated using average climate inputs to the WBM.
2. Minimum, maximum and percentile flows calculated using the 40 iterations of the VCC Model during Year +100 (Post-Closure).
3. Simulated flows highlighted red are less than the monthly IFN.

Table 2-6: Model Node H2B Predicted Streamflows (L/s) during Baseline Conditions

Month	IFN	Average Climate Flows	Variable Climate Flows				
			Minimum	5th	50th	95th	Maximum
1	80	96	31	35	84	150	167
2	80	78	25	28	68	120	133
3	80	63	19	24	60	100	106
4	115	763	21	27	623	1376	1989
5	458	1476	273	305	1579	2782	3248
6	560	472	135	159	539	1237	1879
7	225	209	107	131	248	852	1614
8	150	143	89	96	158	452	1039
9	120	118	72	83	139	354	525
10	120	300	59	70	147	867	1038
11	120	266	47	57	145	377	409
12	80	126	38	45	107	194	215

Notes:
1.Average Climate flows calculated using average climate inputs to the WBM.
2. Minimum, maximum and percentile flows calculated using the 40 iterations of the VCC Model during Baseline conditions.
3. Simulated flows highlighted red are less than the monthly IFN.

2.2.4 Climate Change

The objective of this water balance model scenario was to assess the feasibility of the Closure and Post-Closure water management strategy. Developing a water balance model sensitivity to assess the influence of climate change was outside the scope of the work and will be presented in an update to this plan. Climate change considerations are discussed below.

Predicted future climate conditions for the Mine were assessed in the *2020 Hydrometeorology Report* (KP 2021c). Results of that assessment indicate that for a climate change scenario that represents greenhouse gas emissions scenario RCP4.5, mean temperature at the Mine is predicted to increase by up to 1.8 C seasonally by the 2050s and mean seasonal precipitation is predicted to increase by 0.7% in the summer and up to 9.2% in the fall. By the 2080s, seasonal temperatures could increase up to 2.8°C from present day and seasonal precipitation could increase by 0.7% in the summer and up to 13% in the fall.

Monthly flows for a climate change scenario were assessed using the WBM submitted in the Joint Permit Application (KP 2021b). The future predicted climate using RCP4.5 for the 2050s resulted in a net increase in annual streamflows of 6 to 10% in Davidson Creek relative to the base case simulation and predicted changes to the hydrograph as follows:

- Freshet was predicted to occur one month earlier in the modelled climate change scenario compared to the base case and was associated with higher streamflows in the future relative to current conditions. Increased fall rains were predicted to result in increased fall flows. Winter low flows were generally predicted to be the same as the base case or decrease slightly in higher elevation sub-catchments and were predicted to increase in lower elevation sub-catchments. Late summer streamflows were generally predicted to decrease.

- The Pit Lake water level was predicted to reach its target elevation and initiate Post-Closure approximately two years earlier in the climate change scenario than in the base case WBM.

Climate change is anticipated to have a similar influence on the updated Closure/Post-Closure water management strategy as the changes described above by shortening the time it takes for the Pit Lake to fill to the target water level if water continues to be managed as modelled. Discontinuing the pumping of TSF water to the Pit Lake sooner than modelled or decreasing the amount of non-contact runoff that is directed to the Pit Lake in Closure would decrease the volume of water sent to the Pit Lake and slow the filling time if warranted. Higher peak flows during freshet could result in a greater volume of water reporting to the ECD over a shorter period of time. The maximum treatment rate of the Metals WTP in the Late Closure and Post-Closure phases should be evaluated as the water management strategy is further developed to confirm the rate is suitable for long-term management of the expected range of flows.

2.3 Treatment

2.3.1 Operation-phase Membrane Water Treatment Plant Investigations

A Membrane WTP is included in the Operations phase of the Mine to help manage water inventories in the TSF. Operation of the Membrane WTP is not expected during the Operations phase under average or drier than average climate conditions and is operational up to 7 months per year in wetter climate conditions. Updated water balance/water quality modelling demonstrates that Membrane WTP operation is not required beyond the Operations phase of the Project.

Implementation of membrane treatment, either nanofiltration (NF) or reverse osmosis (RO), does not reduce sulphate inventories in the TSF; its primary function is to generate clean water that meets BC WQGs for discharge into Davidson Creek. As part of near-term evaluations (Table 2-1), membrane treatment optimizations and alternatives were investigated to minimize brine volume and improve sulphate control by precipitating sulphate as a solid byproduct. A risk assessment was completed to determine preferred alternative treatment technologies for removing calcium sulphate and sodium sulphate – these are the two primary forms of dissolved sulphate in TSF water. Ion exchange (Sulf-IXC) and barium precipitation (using $BaCO_3$) were identified as preferred alternatives, and they were carried forward into a bench scale testing program for further assessment. Objectives, scope items and outcomes for water treatment near-term evaluations are summarized in Table 2-7.

Results of investigations are not included in the WBM/WQM updates presented in Section 2.5 but represent contingencies available to BW Gold if additional SO_4^{2-} mitigation during Operational processing is required. Refer to further detail in BQE technical report, 411c Workplan – Near Term Investigation 6 in Appendix E.

Table 2-7: Summary of Water Treatment Near Term Investigations

Evaluation #	Objective	Scope Items	Outcomes
6a	Investigate upgrades to Membrane WTP to improve treatment efficiency for high-salinity influent	Evaluate ion exchange calcium removal softening pre-treatment to decrease gypsum scaling potential and increase RO treatment water recovery	• Calcium softening is not recommended due to short loading cycle, high regeneration frequency, and inefficiency of regeneration using RO brine
		Test and compare the performances of two different, commonly available RO membranes for water treatment	• Brackish water (BWRO) membranes are recommended over sea water (SWRO) membranes because lower operating pressures are required, and similar effluent qualities are achievable
		Assess and verify that RO treated effluent can meet BC WQGs	• Both BWRO and SWRO membranes produced treated water that complies with BC WQGs
6b	Investigate feasibility of salt cake precipitation from brine and associated long-term storage for solids waste	Evaluate gypsum desaturation from RO brine for one and two-stage RO process	• Quantitative gypsum desaturation achieved for one and two-stage RO process i.e., sulphate that is associated with calcium that is above gypsum desaturation limits was precipitated as gypsum and removed as a solid by-product
		Evaluate Sulf-IXC ion exchange treatment of gypsum desaturated RO brine to remove additional sulphate that cannot be removed via gypsum desaturation alone, especially sodium-associated sulphate	• Sulf-IXC increases overall sulphate removal • It can remove sulphate associated with sodium • Overall sulphate removal depends on the solubility of CO_2, which is temperature and pressure dependent
		Evaluate barium carbonate treatment of gypsum-desaturated RO brine to remove additional sulphate that cannot be removed via gypsum desaturation alone, including sodium-associated sulphate	• Barium carbonate increases overall sulphate removal • It can remove sulphate associated with sodium • Overall sulphate removal depends on barium carbonate dosage • Overall kinetics of using barium carbonate to remove sulphate is very slow and takes at least two hours due to the low solubility of barium carbonate
		Provide proof-of-concept and laboratory data to support sulphate removal estimates and associated capital and operating cost estimate calculations for these treatment processes for 6c	• Key performance indicators including reagent usage, water recovery, sulphate removal, and solid generation were recorded for each bench test to inform the treatment process evaluations conducted in 6c
6c	Evaluate treatment optimizations for high TDS influent (e.g. option to extend pit storage life)	Develop a list of viable treatment options for each phase of operation based on lab testing results from 6a and 6b scopes of work	Viable treatment options included: • Single stage RO with desaturation gypsum removal • Two stage RO with desaturation gypsum removal • Sulf-IXC applied to membrane retentate stream (either one stage or two stage RO) • BaCO3 applied to membrane retentate stream (either one stage or two stage RO)
		Summarize capital cost, operating cost, sulphate removal, brine generation and solid generation for each option	The following ranges were determined for the Operations phase Membrane WTP: • Capital Cost: 8.0-15.8 $M CAD • Operating Cost: 0.82-2.12 $M CAD/year • SO_4^{2-} Removal Rate: 0-54% • Brine Generation: 75,000-300,000 m^3/year • Solids Generation: 0-4,100 dmt/year
		Determine the preferred treatment option for each phase of operation based on cost, performance, waste generate and treatment risks	• The preferred treatment option is two stage RO operation with gypsum desaturation and Sulf-IXC applied on the final membrane retentate stream • RO and gypsum desaturation processes maximize gypsum removal and Sulf-IXC targets sodium sulphate removal • The system can be built-up in phases to increase sulphate removal as needed by the Mine – the system starts with single stage RO • Add on circuits include gypsum desaturation, additional RO stages and Sulf-IXC

2.3.2 Post-Closure Metals Water Treatment Plant

Per the Mine schedule, all active water treatment will pause from Year 18+ (late Operations) onwards, through the duration of the Closure phase as contact waters are preferentially directed into the pit to accelerate filling. Once the Pit Lake has reached its target elevation, the updated Post-Closure Water Management Plan (BW Gold 2024) assumes a Metals WTP will treat ECD and Upper Waste Stockpile water up to a rate of 155 L/s (5 Mm^3/year). The timing of the onset of metals treatment is based on the requirement to treat pit water prior to discharge to the environment due to elevated metals concentrations (i.e., the need to discharge water from the pit to maintain target water elevation dictates the timing of metals treatment).

During months in which the Metals WTP has additional capacity, Pit Lake water will also be directed to the Metals WTP for treatment. Treated effluent is discharged to Davidson Creek. For the purposes of the plan, it is assumed the Metals WTP commissioned and operated for the Mine Operations phase is re-commissioned to treat contact water in the Late Closure through Post-Closure phases. Information presented in the Joint Permit Application for the Metals WTP is summarized in the following sections. Operational monitoring of the Metals WTP during the Operations phase will be used to inform adaptive management and planning for the Metals WTP in the Late Closure and Post-Closure phases (BW Gold 2024). The Membrane WTP, which was operational during the Operations phase, does not operate from Year +18 onwards.

2.3.2.1 Metals Water Treatment Plant Description

This section summarizes the detailed design, treatment methodology, and other relevant considerations of the Metals WTP that was originally presented as part of the Joint Permit Application. Please refer to Section 5.6.4 of the Joint Permit Application for further detail.

During the Operations phase, water collected from the Open Pit (dewatering wells and pit sump) along with water collected from the Upper and Lower Waste stockpiles is treated for metals at the Metals WTP prior to use in the mill or being discharged to the WMP. The Metals WTP is located at the Plant Site during Operations. Maximum Metals WTP influent rates are planned to ramp up in three phase (Phase 1 in Years -1 to 4 at 105 L/s; Phase 2 in Years 5 to 8 at 155 L/s; Phase 3 in Years 9 to 17 at 205 L/s; McCue Engineering Contractors 2021). A metals treatment pond upstream of the Metals WTP will temporarily collect and store water from all the sources before treatment. One upstream pond will initially be constructed with a volume of 4,600 m^3 to handle flows from Year 1 through Year 4. A second pond will be added to provide an additional storage capacity in Year 5 of 4,400 m^3 (totalling 9,000 m^3). Water would be stored in the Open Pit sump in the event that the metals treatment pond reaches its maximum capacity.

During the Late Closure and Post-Closure phases, the Metals WTP is assumed to operate up to a rate of 155 L/s. The same treatment methodologies and efficiencies are assumed in the water quality model for both the Operations and Post-Closure phases. Metals treatment is anticipated to be required at the onset of the Late Closure phase through Post-Closure due to elevated metal concentrations predicted in contact waters that would result in BC WQG exceedances in Davidson Creek if discharged without treatment.

The Metals WTP design is based on hydroxide-sulphide integration technology and has been designed to target total suspended solids (TSS) and metals identified as parameters of concern (POCs) in mine contact water for the Operations phase as part of the Joint Permit Application (Appendix 5-G of the Joint Permit Application). The selection of this treatment technology is based on the results of a Best Achievable Technology (BAT) study conducted as part of the Joint Permit Application.

The treatment of the mine contact water in the Metals WTP will consist of a three-stage precipitation, coagulation, and flocculation chemical program and solids removal. The chemical reactions will take place in a four-chamber reactor tank where each precipitant is added to the first three chambers and the flocculant added to the fourth chamber. Two inclined-plate clarifiers will be used for solids settling and removal, one following the first precipitation stage and the other one after the water is treated through the second precipitation, third precipitation, and flocculation stages. Following the second clarifier the water will be directed to multimedia filters and bag filters as polishing stages for solids removal. As a final step, the water will be buffered to a suitable pH before discharge.

A Best Available Technology (BAT) evaluation was completed for the Metals WTP as part of the Joint Application. Seven technologies were identified as part of that evaluation:

1. Hydroxide Precipitation
2. Sulphide Precipitation
3. Hydroxide-Sulphide Integration
4. Ion Exchange
5. Ultrafiltration
6. Nano-filtration
7. Reverse Osmosis

Each technology was characterized using four categories based on technical, environmental and social/community/indigenous factors, and market factors (refer to Attachment 7 “Alternative Technology Matrix” in Appendix 5-G of the Joint Permit Application for further detail). Rating scales were developed for each of the factors using a five point scale against which each alternative is scored. Each factor was weighted to relevancy to the Mine, with a weighting of one being the least relevant to the Mine and a weighting of three being the most relevant. The scores and weightings were used to calculate a merit rating for each of the candidate technologies. The recommended option or BAT for the Mine was selected based on the scores.

Overall, the hydroxide-sulphide integration technology (candidate three) scored the highest overall with a score of 110, indicating that it is the BAT for the Metals WTP. A bench test program was completed in 2016 indicating that a two-stage hydroxide-sulphide precipitation process was able to achieve treatment targets and flocculation was able to further reduce the concentration of some parameters (Appendix 5-G of the Joint Permit Application). The bench test program was completed in 2021 validating the treatment results observed in 2016 (Appendix 5-G of the Joint Permit Application).

With respect to treatment effectiveness, the effectiveness of the treatment process is based on the bench testing summarized below. It has been observed during bench testing programs that the concentrations of the parameters of concern can be effectively reduced to below the treatment targets with a hydroxide/sulphide precipitation process.

In 2016, it was concluded that a two-stage hydroxide/sulphide precipitation process (2016 Test 9) was able to achieve treatment targets, which were two times BC water quality guidelines (see Appendix 5-G of the Joint Permit Application). Promising results were also achieved with flocculated two-stage hydroxide/sulphide precipitation process (2016 Test 10). Flocculation was able to further reduce the concentration of some parameters including cobalt, manganese, and nickel.

A supplemental bench test program was developed based on the 2016 results for Test 9 and Test 10. The objective of the 2021 supplemental bench test, which included flocculated hydroxide and sulphide precipitation was to validate the removal of manganese. It consisted of hydroxide and sodium sulphide precipitation followed by flocculation. The 2021 bench test used a water sample collect from a flowing exploration hole approximately 90 m away from the deposit area. The bench test was performed using the following chemicals:

- o Ferric Sulphate Liquid (12% Fe), $Fe_2(SO_4)_3$
- o Hydrated Lime Powder, $Ca(OH)_2$, made into 15% lime slurry
- o Sodium Sulphide Liquid (15% Na_2S)
- o Polyclear A2501K, made into 0.25% w/w polymer solution.

The two-stage hydroxide and sodium sulphide precipitation program consisted of the following major steps:

- Stage 1:
  - Because of the higher pH of the water sample, Stage-1 of hydroxide precipitation was not conducted.
- Stage 2:
  - Addition and rapid mixing of a known dosage of ferric sulphate into water sample.
  - Addition and moderate mixing of 15% lime slurry into water sample to target pH of 9.0.
  - Mixing of sample for three minutes.
  - Addition and moderate mixing of known dosage of sodium sulphide into the water sample.
  - Mixing of sample for three minutes.
  - Addition and slow mixing of known dosage of polymer solution into the water sample.
  - Mixing of sample for 20 minutes.
  - Settling of sample for 11 minutes.
  - Filtration of water through a 20-micron filter.
  - Vacuum filtration of the collected filtered water through a 1.5-micron Whatman filter.
  - Collection of filtered water sample for laboratory analyses.

Samples were collected for total metals, dissolved metals, pH, TSS, and submitted to ALS Canada Ltd. (ALS) under Chain of Custody. The results for 2016 bench test 9 and 10, and 2021 supplemental bench test are summarized in Table 2-8. The concentration of dissolved manganese in the 2021 was observed to be lower than the BC water quality guideline for total manganese, which is in accordance with the 2016 bench Test 10 results.

Table 2-8: Summary of Metals WTP Bench Test Results (reproduced from Table 5.6-11 of Chapter 5 of the Joint Permit Application)

Parameters of Concern	Units	2016 Synthetic Inlet Water	2016 Bench Test 9	2016 Bench Test 10	2021 Test Water Sample	2021 Bench Test
pH	pH units	4.23	6.84	6.89	7.14	8.69
TSS	mg/L	4.5	-	31.4	19.4	<3.0
Metals (Dissolved)						
Aluminum	mg/L	2.21	0.0161	0.119	0.0019	0.0048
Antimony	mg/L	0.304	0.0078	0.0129	<0.0001	<0.0001
Arsenic	mg/L	0.00864	0.00043	0.00046	0.00016	0.0001
Cadmium	mg/L	0.0291	<0.000005	<0.000005	0.0000092	<0.000005
Cobalt	mg/L	0.0094	0.00094	0.00021	<0.0001	0.0001
Copper	mg/L	0.04	<0.0002	0.00029	<0.0002	<0.0002
Iron	mg/L	0.032	<0.01	<0.01	<0.01	<0.01
Manganese	mg/L	1.37	0.624	0.226	1.21	0.359
Nickel	mg/L	0.0168	0.00171	0.00051	<0.0005	0.00346
Lead	mg/L	0.106	<0.00005	<0.00005	<0.00005	<0.00005
Zinc	mg/L	4.23	<0.001	0.000059	0.0063	0.0018

2.3.2.2 Comparison to Treatment Proposed in the EA Certificate Application

In response to review comments from MEM and ENV on its EA Certificate Application /EIS, New Gold (the proponent for the Blackwater Mine at the time) proposed an updated water management plan for the Closure and Post-Closure phases as part of its Application. The updated water management plan included active treatment and was supported by updated surface water quality model results and an updated assessment of potential effects. This information is presented in *Document: February 15, 2017 Blackwater Gold Project: Water Treatment Responses for Comments 1266, 1270, 1271, 1272, and 1273* (ERM 2017; Appendix F), which is cited in Condition 34 b) i) of the approved EA Certificate, and is summarized below.

Per ERM (2017), the proposed water management approach during late Operations and Closure (Years 18-41) included the following:

- TSF C supernatant and ECD captured flows are pumped to the Open Pit.
- Active treatment occurs on a recycle loop of TSF D supernatant for:
- dissolved metals (model Year 31 through 37) by a 285 L/s Metals WTP; and
- sulphate, ammonia, and dissolved metals by an ion exchange and nanofiltration (IX+NF) WTP (i.e., Membrane Treatment; Year 38 through 41).
- After Year 37, deposition of a constant 37 L/s of brine from the IX+NF WTP at depth in the Pit Lake.

- No surface contact water discharged to the receiving environment.

The proposed water management approach for Post-Closure in the EA Application (Year 42 onwards; ERM 2017) included the following:

- Seepage collected at the ECD, infiltration through Dam D, and non-contact groundwater flows are treated by the IX-NF WTP (149 L/s).
- IX+NF WTP influent rates are augmented in low flow months using TSF D supernatant to maintain a constant 149 L/s treatment rate.
- Deposition of a constant 37 L/s flow of brine from the IX+NF WTP at depth in the Pit Lake.
- Treatment of Open Pit overflow by Metals WTP (209 L/s) with treated water directed to TSF D.
- TSF D pond discharges via the Spillway.
- Water discharged via the TSF D spillway (i.e., supernatant), the ECD area, background catchment, and untreated surface runoff below Dam D are blended in a plunge pool prior to release to Davidson Creek.

A key difference in treatment technology from ERM (2017) and the present water management plan, a is the present plan no longer includes treatment using an IX+NF WTP in the Post-Closure phase. Updates to the source terms, water balance, and water quality model described in Section 2 of the present plan demonstrate the feasibility of a Closure and Post-Closure water management scenario without the benefit of this type of treatment technology.

With respect to the Metals WTP proposed for the Post-Closure phase in the present water management plan, the same treatment technology is proposed for Post-Closure water management in ERM (2017). As described above, the selection of the treatment technology for metals removal for the EAC/EIS submission was supported by a bench test program in 2016. The results of the bench test identified a two-stage hydroxide-sulphide precipitation process with flocculation that was able to achieve desired treatment levels and supported the selection of the metals treatment technology proposed. A subsequent bench test program was completed in 2021, validating the treatment results observed in 2016 (McCue 2021). These results, supported by the BAT conducted as part of the joint Mines Act/ Environmental Management Act permit application submitted for the Blackwater Mine provide confidence that the Metals WTP system proposed here will function as intended.

As detailed in Section 2.3.2 of the present plan, the updated water quality model scenario evaluates a scenario in which a Metals WTP, but not a Membrane WTP, operates through the Post-Closure period. The results of this modelling exercise suggest water quality required by Condition 26 of the EA Certificate can be achieved.

2.3.2.3 Waste and By-Products

There are two waste streams generated by the Metals WTP: 1) an unconsolidated settled sludge, and 2) a backwash. With respect to the sludge, for the Operations phase WTP, each litre of inlet water is anticipated to generate approximately 0.04 L of sludge corresponding to a 4% sludge production rate (McCue 2021).

During the Operations phase, sludge from the Metals WTP will be directed to the TSF for storage. Sludge mass from the Metals WTP will represent a relatively small proportion of the total waste mass within the TSF (< 0.05%) and is unlikely that the leaching of such by-products will contribute significantly to the contaminant load balance for the TSF. To confirm these assumptions, treatment sludge from the Metals WTP will undergo detailed characterization, including detailed solid-phase characterization (grain size, elemental abundance, sequential extractions, and high-resolution microscopy) and kinetic test work (saturated columns) (Section 3.11). The results will be used to revise water quality predictions and refine mitigation and storage planning for the Operations and Post-Closure phases, as required. Options for Post-Closure sludge management include onsite storing subject to analytical testing during the Operation phase and regulatory approval, and/or shipment offsite to an approved industrial waste facility.

In addition to unconsolidated settled sludge, the Metals WTP produces a backwash water from the multimedia filters. Backwashing involves the occasional reversing of flow of water through the filter bed to remove trapped suspended solids. As such, backwash is anticipated to contain high levels of TSS and may be managed by directing to the Pit Lake.

2.4 Water Quality Model Refinements

An updated water quality model was developed for the Blackwater Gold Mine (subsequent to the Joint Permit Application submission) under an updated Closure and Post-Closure water management scenario to inform the present water management plan. Specifically, an updated WQM scenario is presented (version “v2h”) that is paired with an updated WBM described above (Section 2.2) that reflects a Closure and Post-Closure water management regime in which the Membrane WTP does not operate in Post-Closure. The sections below describe updates made to geochemical source terms and model architecture as part of the overall model update, which represent refinements from initial assumptions underlying the Application model work (e.g., gypsum solubility within the TSF).

Revised water quality predictions for key mine site facilities and the receiving environment at the Blackwater Gold Mine are also summarized in the following sections. Please refer to Appendix C for a detailed description of water quality model updates and corresponding results.

2.4.1 Source Terms Updates and Water Quality Model Assumptions

Pit Wall Source Terms

As part of the model update, pit wall source terms have been updated to include exhaustion of reactive mineral phases in acidic wall rock exposures over time in Post-Closure. In the Application model, static source terms were developed for PAG1, PAG2, NAG3, NAG4 and NAG5 rock types that were applied in both Operations and Post-Closure with no consideration for depletion of reactive mineral phases over time. This was a highly conservative assumption, particularly for acidic wall rock which will experience rapid depletion of sulphide minerals and trace metal at the rapid weathering rates expected to occur under acidic conditions. For example, the PAG1 base case humidity cell test (HCT) loading rates used in source term development were estimated to be 31 mg/kg/wk. At this loading rate, the total sulphur in PAG1 rock (0.67 wt.%) would be exhausted after 4.2 years of weathering. Similarly rapid depletion rates are observed for the trace metals Cd, Co, Cu, Ni and Zn. Based on these observations, significant depletion can be expected over the >80 year Post-Closure model horizon.

Parameters with loading rates that will result in appreciable changes in solid-phase metal content in wall rock include SO_4, Cd, Co, Cu, Ni and Zn. For these parameters, the loading rates were adjusted in the v2h model update proportional to the rate of removal of these elements. That is, once 50% of the solid phase Zn was leached from PAG1 wall rock the Zn loading rate will be 50% of the HCT upscaled rate used in the Application model. This adjustment was only made for the parameters listed above in PAG1 and PAG2 wall rock because neutral-pH wall rock exposures do not experience an appreciable change in solid-phase sulphur or metal content over the Post-Closure model horizon. In order to maintain ion balance the major cations Ca, Mg and Na were adjusted proportional to SO_4 decay, contributing to the overall decline in TDS from wall rock runoff. The depletion was not initiated until 2070 in the model as a conservative precaution and in consideration of continued wall rock ravelling that may occur in early Closure. The resulting pit wall updates for acidic PAG1 and PAG2 wall rock are shown in Table 2-9. Note that the end of Operations concentration shown in Table 2-9 was applied for the duration of the Post-Closure period in the Application v13e model.

Table 2-9: Pit wall source terms for acidic PAG1 and PAG2 wall rock in Post-Closure in the v2h model update.

	PAG 1 - acidic				PAG 2 – acidic			
Parameter (mg/L)	2047*	2080	2110	2133	2047*	2080	2110	2133
SO_4	1067	917	530	215	600	477	183.0	88
Ca	233	201	116	47	209	168	65	31
Cd	1.5	1.1	0.47	0.12	0.096	0.10	0.073	0.058
Co	0.82	0.62	0.28	0.07	0.25	0.26	0.20	0.16
Cu	0.24	0.26	0.25	0.24	0.055	0.052	0.050	0.049
Mg	112	97	56	23	21	17	6.4	3.1
Na	32	87	50	19	5.0	4.0	1.5	0.7
Ni	0.87	0.75	0.44	0.18	0.32	0.34	0.27	0.23
Zn	157	129	67	23	9.7	9.2	9.0	8.0

*The end of Operations source term in 2047 was applied for the duration of the Post-Closure phase in the Application v13e model.

Mill Source Term

Mill reagent usage is the primary source of SO_4 in Post-Closure TSF seepage. Sulphate in the mill originates from SO_2 air used to detoxify CN as per the following reaction:

$$CN^- + SO_2 + O_2 + H_2O = CNO^- + H_2SO_4$$

The end products of this reaction are cyanate, which rapidly hydrolyzes to ammonia and hydrogen sulphate. The theoretical consumption of SO_2 air is a 1:1 molar ratio with CN (i.e., 2.5 g SO_2 : 1 g CN) as per the above stoichiometry. In practice, this ratio will vary depending on the presence of other reduced species which can consume SO_2 and variations in WAD-CN content.

The v13e Application model assumed a relatively high SO_2 air dosage of 6 g SO_2 : 1 g CN. Since Application submission, the SO_2 air usage has been revised based on a review of metallurgical data completed by JAT MetConsult Ltd (Appendix C of the Water Quality Model Update Report [Appendix C of this plan]). This review concluded that a dosage of 0.88 kg of SO_2 and 0.6 kg/t of NaCN per tonne of ore is required. A 10% safety factor was incorporated to SO_2 dosing, resulting in a recommended dosage of 0.96 kg SO_2 per tonne of ore. Assuming tailings are produced at a nominal 45% solids content, this model update reduces the amount of SO_4 added in the mill from 2,300 mg/L (Application v13e model) to 1,200 mg/L (updated v2h model).

The reagent dosage and resulting concentrations applied in the Application v13e model and updated v2h model are shown in Table 2-10. No other changes were made to the mill process water or related TSF source terms.

Table 2-10: Mill reagent usage and resulting process water concentrations applied in the Application model (v13e) and the updated model (v2h)

Parameter	Units	Updated Model (v2h)	Application Model (v13e)
Mill Reagent Addition			
SO_2 Air	kg/t	0.96	1.9
NaCN	kg/t	0.6	0.6
NaOH	kg/t	0.077	0.04
HCl	kg/t	0.1	-
$CuSO_4$	kg/t	0.07	-
Resulting Concentrations			
SO_4	mg/L	1207	2300
Na	mg/L	267	230
CNO-N and NH_3-N	mg/L	140	140
Cl	mg/L	80	-

Gypsum Formation, Storage and Dissolution

Gypsum may occur within the mill and tailings discharge as a result of SO_2 air and lime usage within the process, and reliance on reclaim water from the TSF pond. The influence of gypsum formation on SO_4 and Ca concentrations was captured in the Application model. The Application assumed that gypsum present within the tailings would influence TSF seepage for the duration of Post-Closure, and did not consider long-term depletion of gypsum present within the TSF. In the updated v2h model, gypsum formation, storage and dissolution are tracked within the mill, TSF C and TSF D, and is described below.

Gypsum formation in the mill is predicted by applying the Na-dependent gypsum solubility relationship defined in the Application and tracking the mass of gypsum discharged to TSF C and TSF D and its accumulation during Operations (Figure 2-8). Dissolution of gypsum is modelled using the same Na-dependent gypsum solubility relationship used to model gypsum formation in the Application. The loss of gypsum is tracked during the Post-Closure period. The loss rate is determined by the solubility of gypsum in seepage chemistry, and the seepage flow rate (Figure 2-9 and Figure 2-10). Overall, the results show that gypsum will be depleted from TSF D by 2054, while only a small portion of gypsum stored in TSF C will be released in the Post-Closure model horizon (i.e., before 2133). Stored gypsum is depleted faster in TSF D because it receives less gypsum from the mill and experiences higher seepage rates.

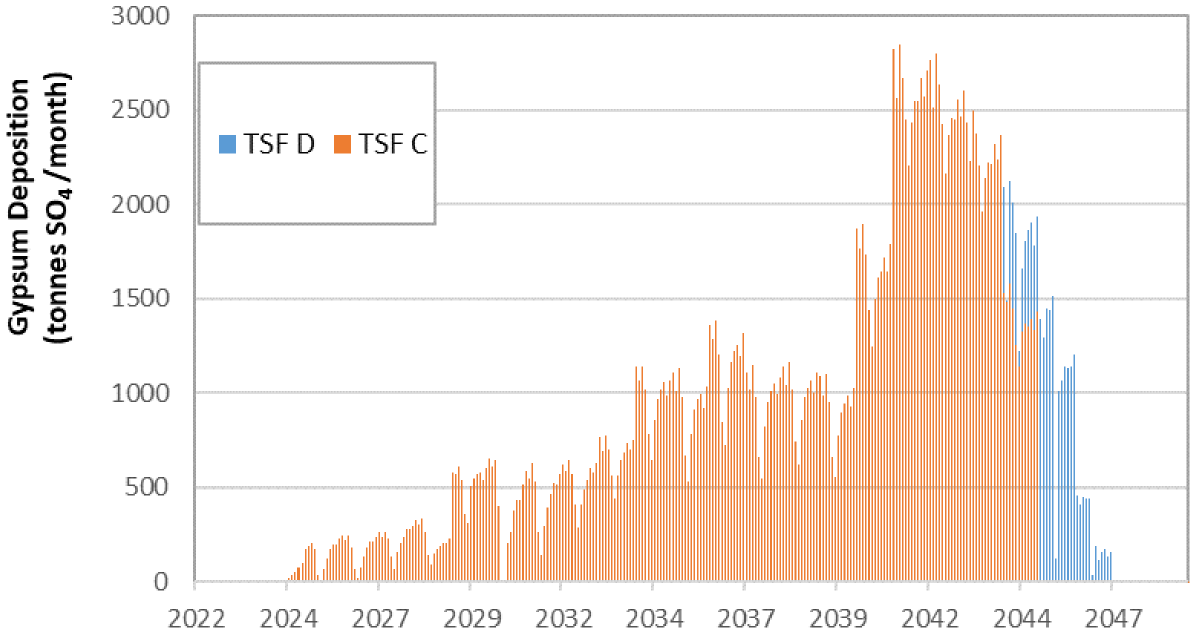

Figure 2-8: Monthly gypsum mass discharged to TSF D or TSF C from the mill during Operations.

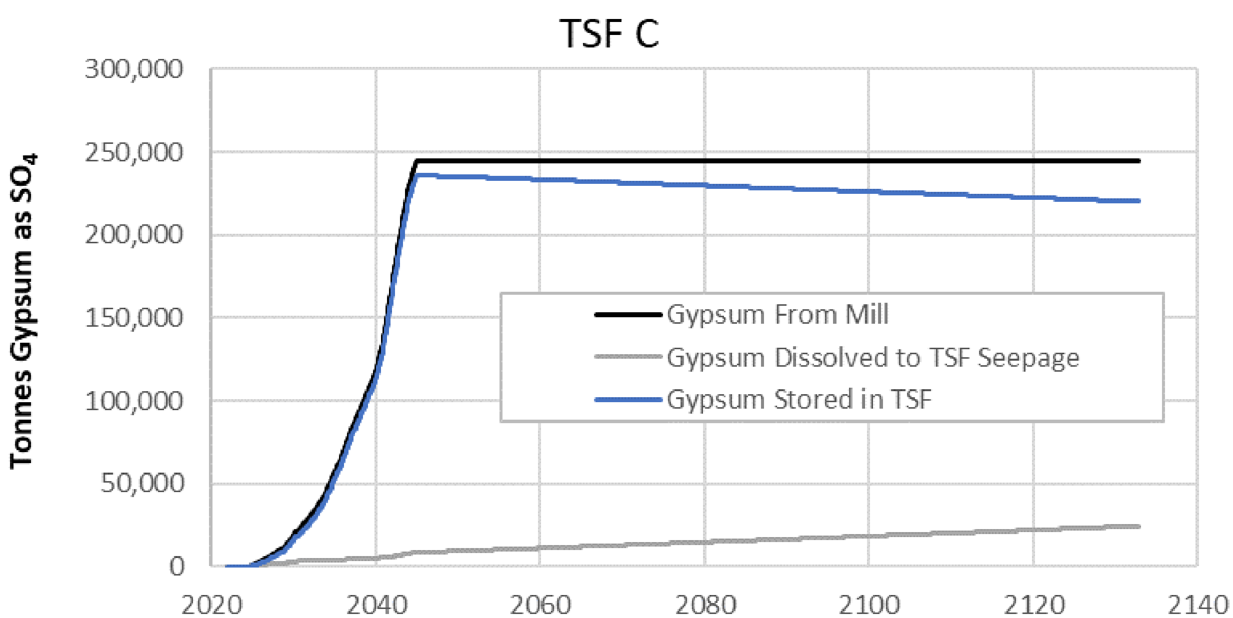

Figure 2-9: Gypsum deposition, storage and dissolution in TSF C during Operations and Post-Closure period.

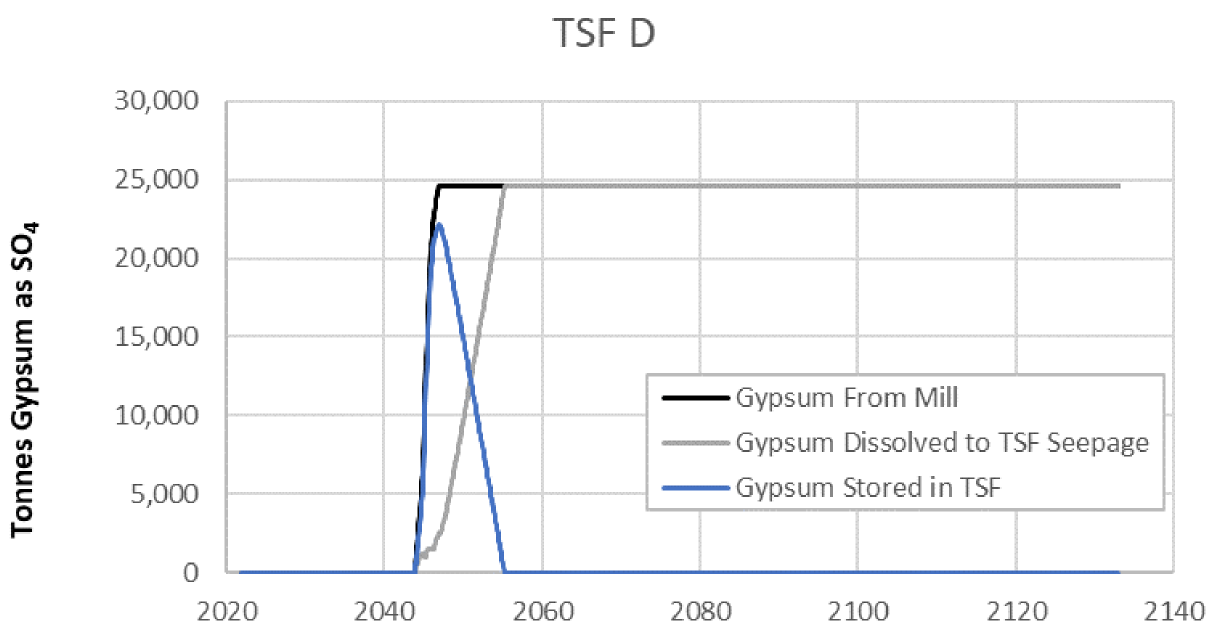

Figure 2-10: Gypsum deposition, storage and dissolution in TSF D during Operations and Post-Closure period.

TSF Pore Water Rinsing

The TSF seepage concentrations are expected to evolve throughout Operations and Post-Closure as mill reagents are rinsed from the system. The Application model predicted annualized seepage concentrations for the Operations period and applied source terms calculated for the final year of Operations to the entire Post-Closure period. In reality, water soluble species and mill reagents will gradually be rinsed over time from the TSF. To account for this, major ions and parameters present as a result of reagent usage are modelled to be rinsed from TSF pore water reservoir over time in the updated v2h model. Parameters that are allowed to rinse in Post-Closure include SO_4, Ca, Na, T-CN, WAD-CN and NH_3. The supply of SO_4 and Ca is gradually replenished by gypsum dissolution, as discussed in the previous section. Trace metals and other parameters are assumed to remain constant throughout the Post-Closure phase, and have not been updated from the Application model.

Nitrification in Pit Lake

Nitrogen species are subject to biological transformations in aquatic systems. Ammonia represents a key nitrogen species that is expected to decay in the receiving waterbodies via various processes, including nitrification, biological uptake, and volatilization. Of these processes, biological uptake and volatilization are expected to have limited impact on nitrogen concentrations in the Pit Lake given the limited photic zone depth relative to the total Pit Lake depth. Hence, nitrification is considered the most likely process to influence nitrogen concentration in the Pit Lake, which would occur throughout the entire water column.

Nitrification is a process in which ammonia is oxidized to nitrite and nitrate sequentially by nitrifying bacteria (Bernhard, 2010). Nitrite is an intermediate product generated via ammonia oxidation, the first and rate–limiting step of nitrification. Once generated, nitrite is expected to be quickly consumed via further oxidation to nitrate. The rate of nitrification is dependent on ambient conditions, including dissolved oxygen, temperature, pH, and ammonia concentration. Nitrification was applied to the Pit Lake in the WQM update as follows:

- A conservative nitrification rate of 0.005 mg/L/d is adopted from literature (Nilsson & Widerlund, 2018; Chlot et al., 2011) based on observations and simulations for cold climate mining ponds with comparable water quality as predicted in the Pit Lake.

- Nitrification is applied over the growing season (June – September), when water temperatures are more favorable for bacterial growth.
- The modelled mass ratio of ammonia decay and nitrate production is 1:1 based on stoichiometry and conservation of mass.
- Nitrification is applied until ammonia is reduced to the minimum concentration (0.005 mg/L).

2.4.2 Results

This section summarizes updated water quality model predictions that highlights model nodes of interest and certain parameters that illustrate key loading terms within the model. Please refer to Appendix C for a detailed description of updated model results alongside tabulated summaries and time series plots showing model output.

Comparison of v13e and v2h Models

TSF Seepage

As described above, several modifications to the v2h model were implemented to refine TSF seepage water quality predictions. The outcome of these model updates as manifested in TSF C and D seepage chemistry are illustrated in Figure 2-11 and Figure 2-12, respectively.

The v2h model predictions show that concentrations of tracked mine-related parameters in TSF D will decline rapidly compared to TSF C. This is driven by the faster seepage rate, lower initial concentrations, and depletion of the stored gypsum reservoir approximately six years after the onset of Closure (i.e., by 2054). Concentrations in TSF C, which will receive the majority of the tailings, show a more gradual decline in concentrations. Note that the decline in Ca and SO_4 from TSF C is driven by rinsing of Na which lowers the solubility of gypsum, and not the depletion of stored gypsum.

Concentrations in TSF D and TSF C are initially elevated in the v2h model predicted chemistries compared to the Application model (v13e). Concentrations rapidly decline in TSF D, and by 2060 most concentrations are below that of the Application model, which assumed static source terms. Conversely, owing to the slow rate of rinsing in TSF C most concentrations remain above the static Application model predictions at the end of the Post-Closure model horizon.

The largest differences in concentrations are for Cl and cyanide species. The higher Cl concentrations were introduced from updated mill reagent usage which now includes 0.1 kg/t HCL, which was not tracked in the Application model version. T-CN and WAD-CN are predicted in higher concentrations because these parameters are now tracked conservatively within the TSF pore water similar to other mill reagents. The Application model used saturated column effluent to predict seepage concentrations.

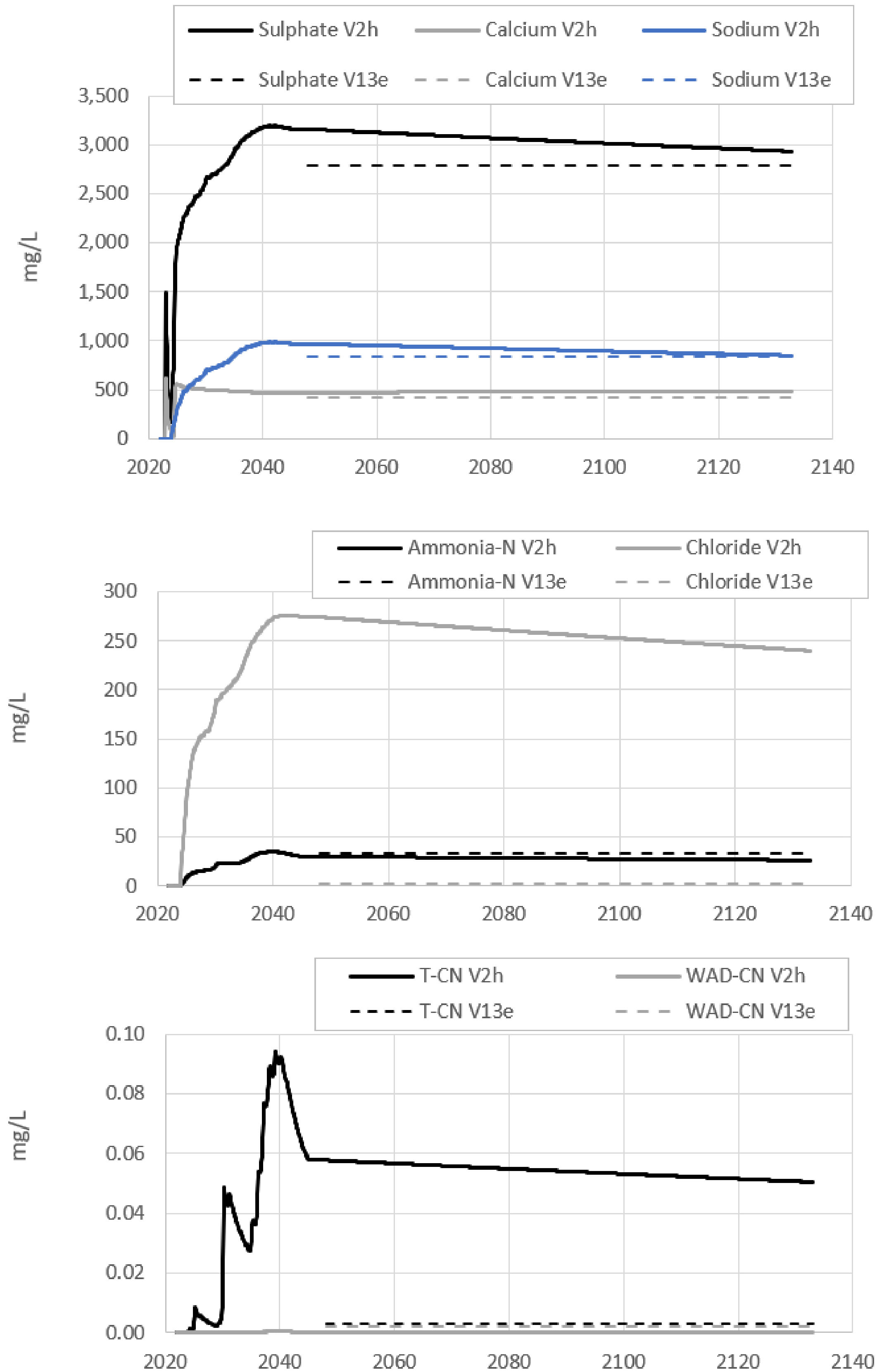

Figure 2-11: TSF C seepage concentrations from v2h model for sulphate, calcium and sodium (top), ammonia and chloride (middle), and T-CN and WAD-CN (bottom) compared to v13e model Post-Closure predictions.

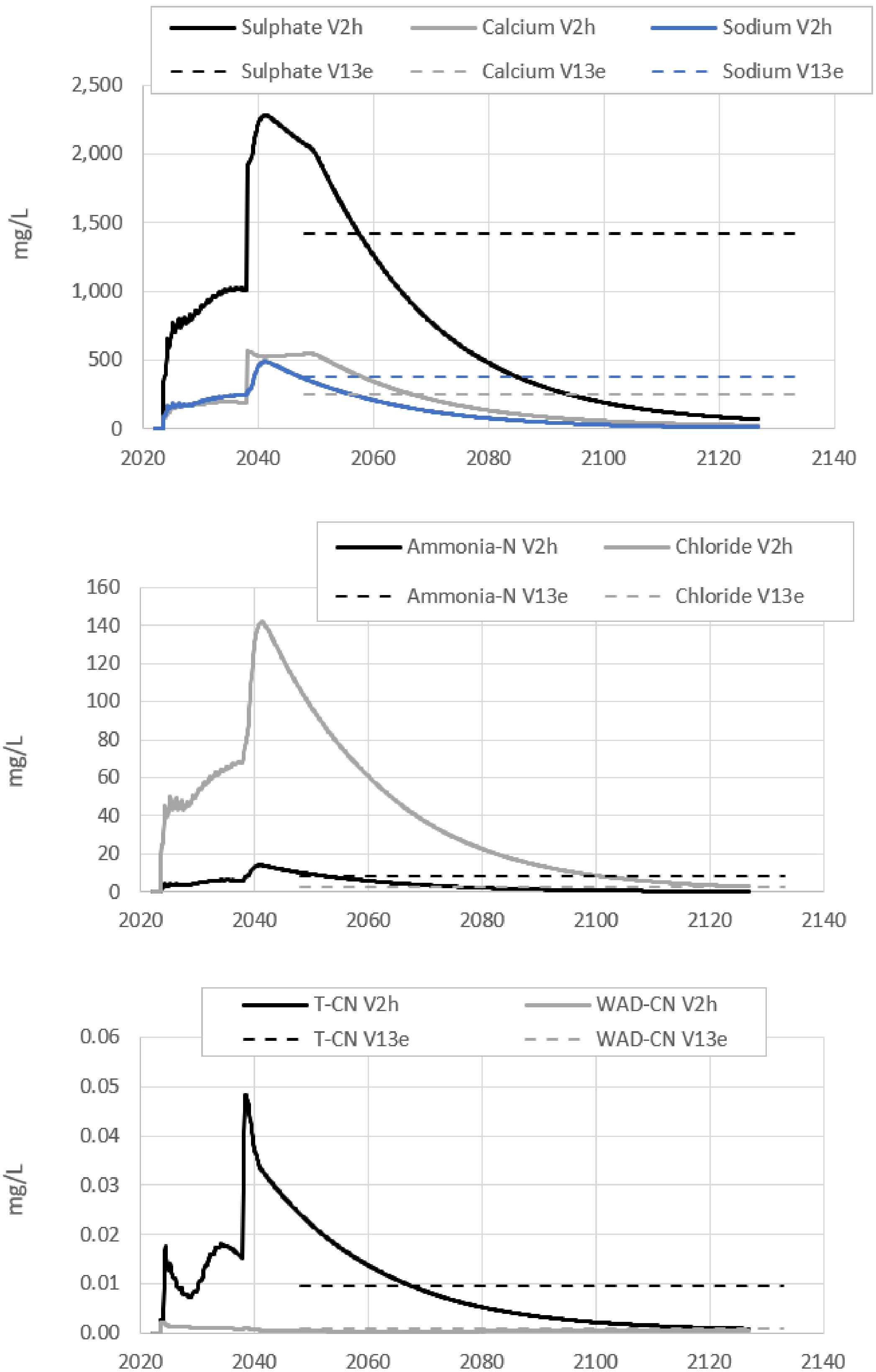

Figure 2-12: TSF D Seepage concentrations from v2h model for sulphate, calcium and sodium (top), ammonia and chloride (middle), and T-CN and WAD-CN (bottom) compared to v13e model Post-Closure predictions.

Pit Lake

In the v2h model, the absence of brine input to the Pit Lake results in substantially lower concentrations of sulphate, ammonia, and certain metals in the Post-Closure phase compared to the v13e model (Figure 2-13; Appendix C). Ammonia concentrations are further reduced in the v2h model due to the effect of nitrification applied to the Pit Lake. In the v13e model, predicted concentrations for major ions such as sulphate and sodium, and certain metals reflected a gradually increasing concentration over time reflecting the accumulation of brine in the Pit Lake, and no nitrification was assumed to occur.

Other model differences that contribute to changes in predicted concentrations include the Pit Lake no longer being operated as a groundwater sink (as was the case in the v13e model) resulting in a higher final Pit Lake elevation in the v2h model. Accordingly, there is less exposed pit wall and lower loading contributions (e.g., Cd, Zn) from the pit wall in the v2h *versus* the v13e model, paired with pit wall term updates that assume a degree of metal depletion over time. Overall, pit wall runoff (for metals) and ECD water (sulphate and ammonia) represent primary loading sources to the Pit Lake in the v2h model.

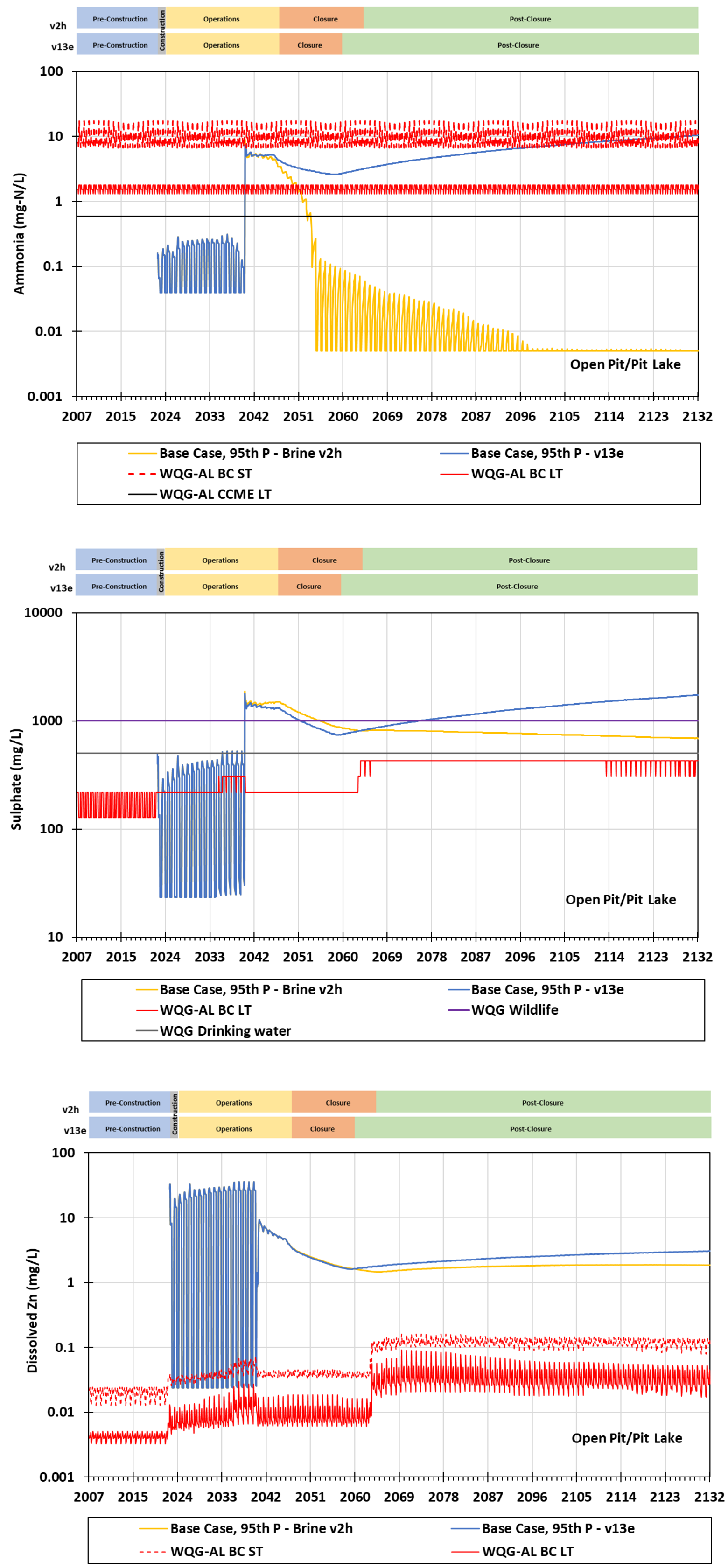

Figure 2-13: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for the Open Pit/Pit Lake.

TSF

Overall, concentrations of major ions and metals in TSF C and D ponds show minor differences between the v2h and v13e models (Figure 2-14; Appendix C). During the Closure phase, primary differences in predicted concentrations for major ions (e.g., sulphate) and certain metals are attributed to a small extension of the Closure period in the v2h model compared to the v13e model, and associated TSF water management (e.g., pump back of TSF D water to TSF C is extended by a few years in the v2h model). After Closure and following the onset of Post-Closure, predicted concentrations in TSF ponds between the v13e and v2h models are comparable.

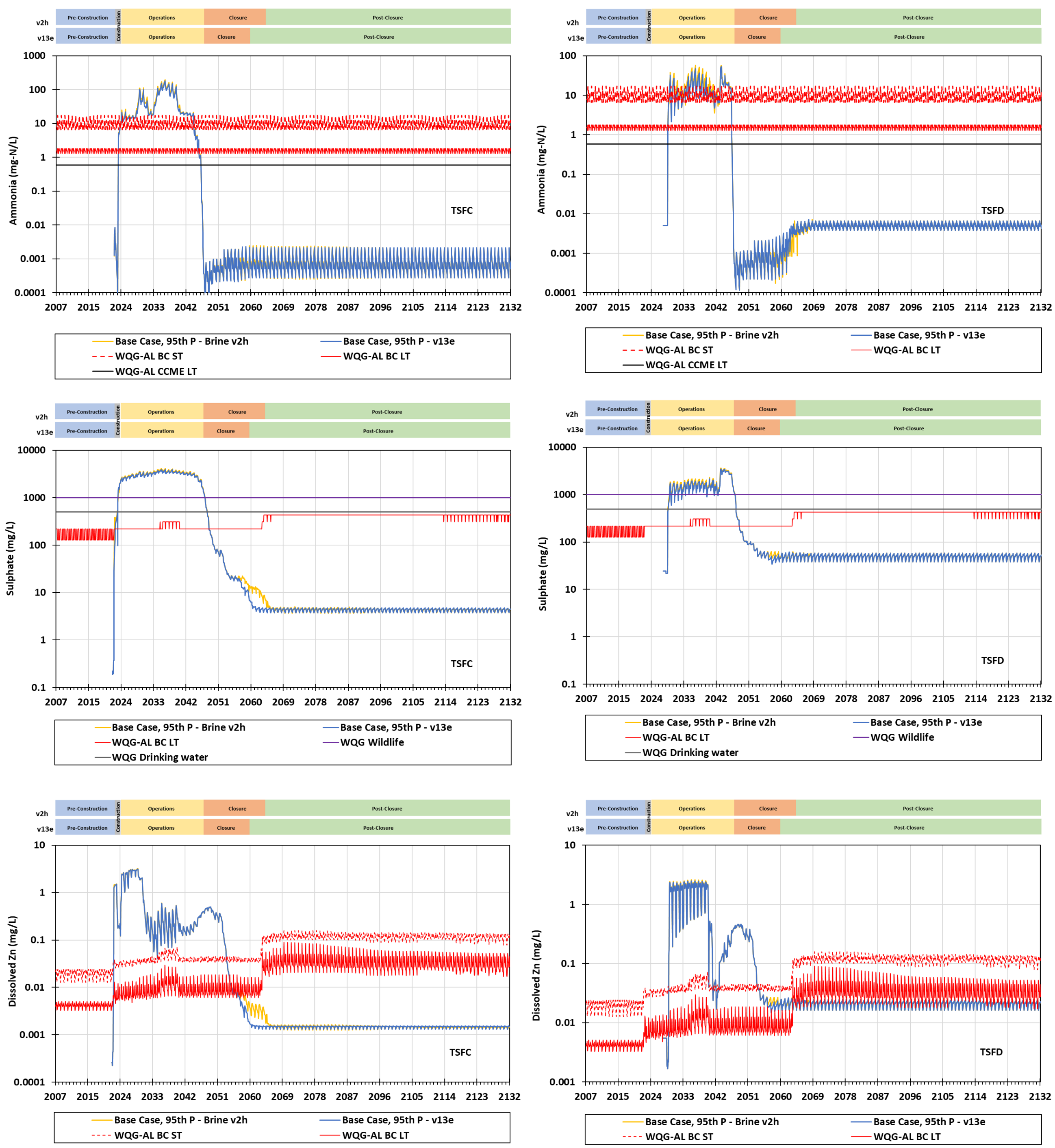

Figure 2-14: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h95th percentile Variable Climate Case simulations for the TSF C and TSF D.

ECD

As described above for TSF Seepage, the most notable differences in ECD predictions are reflected in concentrations for sulphate and ammonia, both of which are subject to TSF load accumulation and flushing applied in the v2h model (Figure 2-15; Appendix C). As such, predicted concentrations of these parameters are higher in the Closure and early Post-Closure period in the v2h model compared to the v13e, reflecting higher flushing rates of these parameters driven by TSF D in the v2h model. As the TSF D load of these parameters decays as the Post-Closure phase continues, the primary loading source to the ECD is increasingly dominated by TSF C. Flushing rates for all parameters from TSF to ECD were assumed to be constant through the Post-Closure phase in the v13e model. Predicted concentrations for other parameters are otherwise similar between models, with the exception a prolonged Closure phase transition in the v2h model as compared to the v13e model.

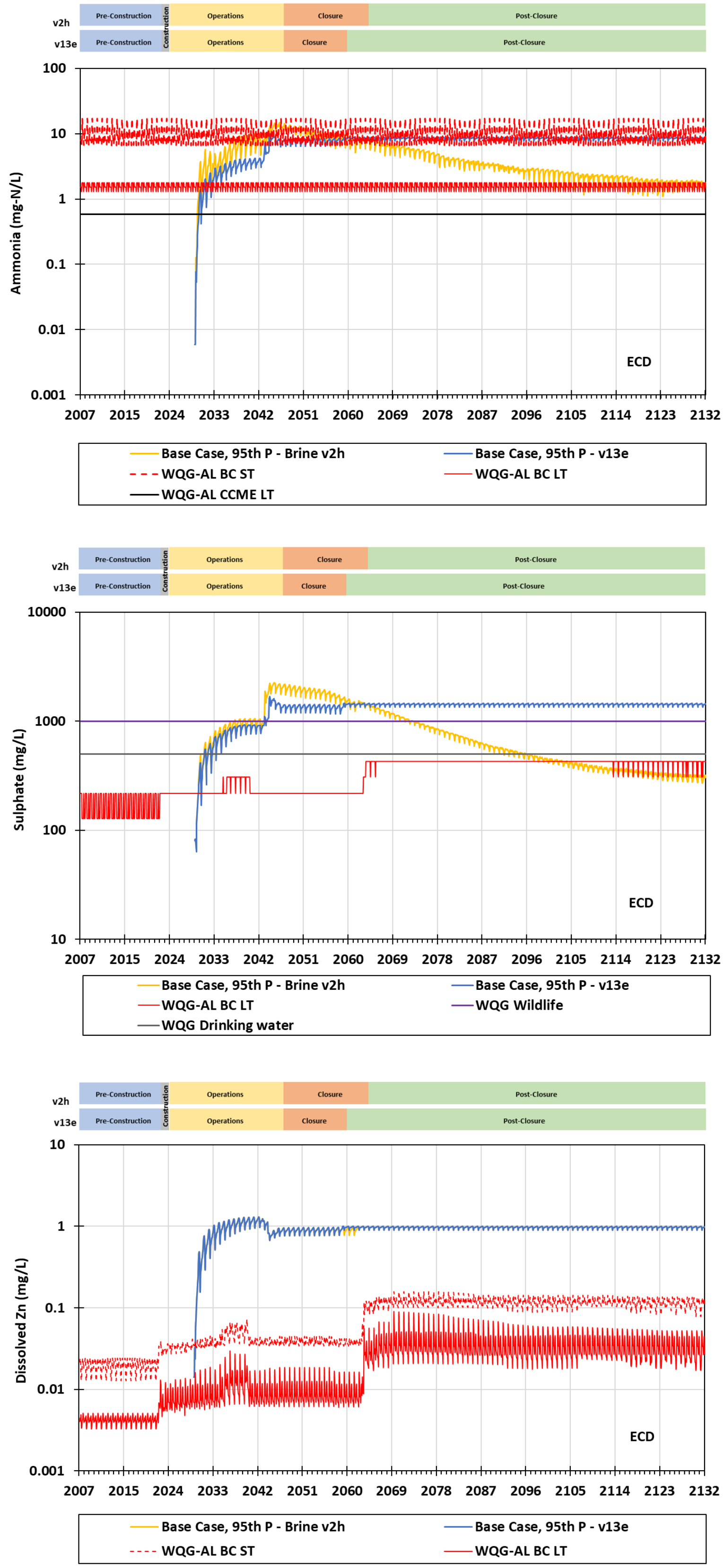

Figure 2-15: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for the ECD.

Potential Discharge Points

This section summarizes water quality results for three model nodes that may represent points of final discharge for contact waters to the receiving environment in the Closure and Post-Closure phases:

- The Freshwater Reservoir,
- The Metals WTP, and
- The TSF Spillway.

The FWR represents a final discharge point for the Mine during the Operation and Closure phases. The FWR and FWSS are assumed to continue operating through the Closure phase in both models and these facilities will be decommissioned when water quality and downstream flow criteria (IFN) can be met. In both the v13e and v2h models, FWR decommissioning is set to occur at the conclusion of the Closure phase in the Average Climate Case in both the v13e and v2h models (i.e., end of Year 46 or 2069 in the Average Climate Case of the v2h model). In the v2h model Variable Climate Case, the FWR is also coded to be decommissioned in 2069 in all climate iterations; however, the year in which Post-Closure begins (for the purpose of this analysis, the year in which Pit Lake water treatment begins is considered the onset of the Post-Closure phase) may occur earlier than 2069 in certain climate iterations. As such, the technical constraints imposed on the model result in certain climate iterations allowing the FWR to function as the Mine's primary discharge point to the receiving environment in the first few years of Post-Closure. Ultimately, as noted above, the FWR and FWSS will be decommissioned when water quality targets and downstream flow criteria (IFN) can be reliably met.

In general, predicted concentrations of most parameters at FWR are similar between the v13e and v2h models (Figure 2-16; Appendix C). Starting in 2058 in the v2h model, sulphate and ammonia show an increase in concentration at the FWR for a period of six years, following decommissioning of the WMP in 2059. After 2059, WMP surplus water is no longer pumped to the FWR; however, the water balance assumes seepage from TSF C continues to report to the FWR until 2065, after which FWR concentrations for both sulphate and ammonia decrease well below Operations and Closure phase concentrations until decommissioning in 2069. In the v13e model, TSF C seepage and WMP discharge were assumed to both continue to report to the FWR through to FWR decommissioning in 2059.

Figure 2-16: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for the FWR.

The Metals WTP treats ECD, Pit Lake and Upper Waste Stockpile water collected from the mine site prior to release downstream. In the v2h model update, treatment is initiated in the water balance in late Closure when the Pit Lake elevation reaches 15 m below the pit rim, at which point ECD and Upper Waste Stockpile water are directed for treatment for the remainder of the model timeline. Once the Pit Lake elevation reaches 10 m below the pit rim (i.e., the onset of the Post-Closure phase), Pit Lake water is also directed for treatment for the remainder of mine life. The Metals WTP is expected to discharge to Davidson Creek in Post-Closure following the decommissioning of the FWR. In the v13e model, the Metals WTP was assumed to not operate during the Closure and Post-Closure modelled period. Rather, contact water was directed to the Membrane WTP prior to release to Davidson Creek.

Sulphate and ammonia are not treated by the Metals WTP. Therefore, predicted effluent quality for the Metals WTP in the v2h model update largely reflects ECD, Pit Lake, and Upper Waste Stockpile water quality (as influent), during which concentrations of these parameters are predicted to decline over time as a result of TSF flushing (Figure 2-17; Appendix C). Conversely, the Metals WTP is assumed to consistently treat Zn to 0.0005 mg/L. Therefore, predicted concentrations of this parameter in Metals WTP effluent are equal to 0.0005 mg/L through the modelled period.

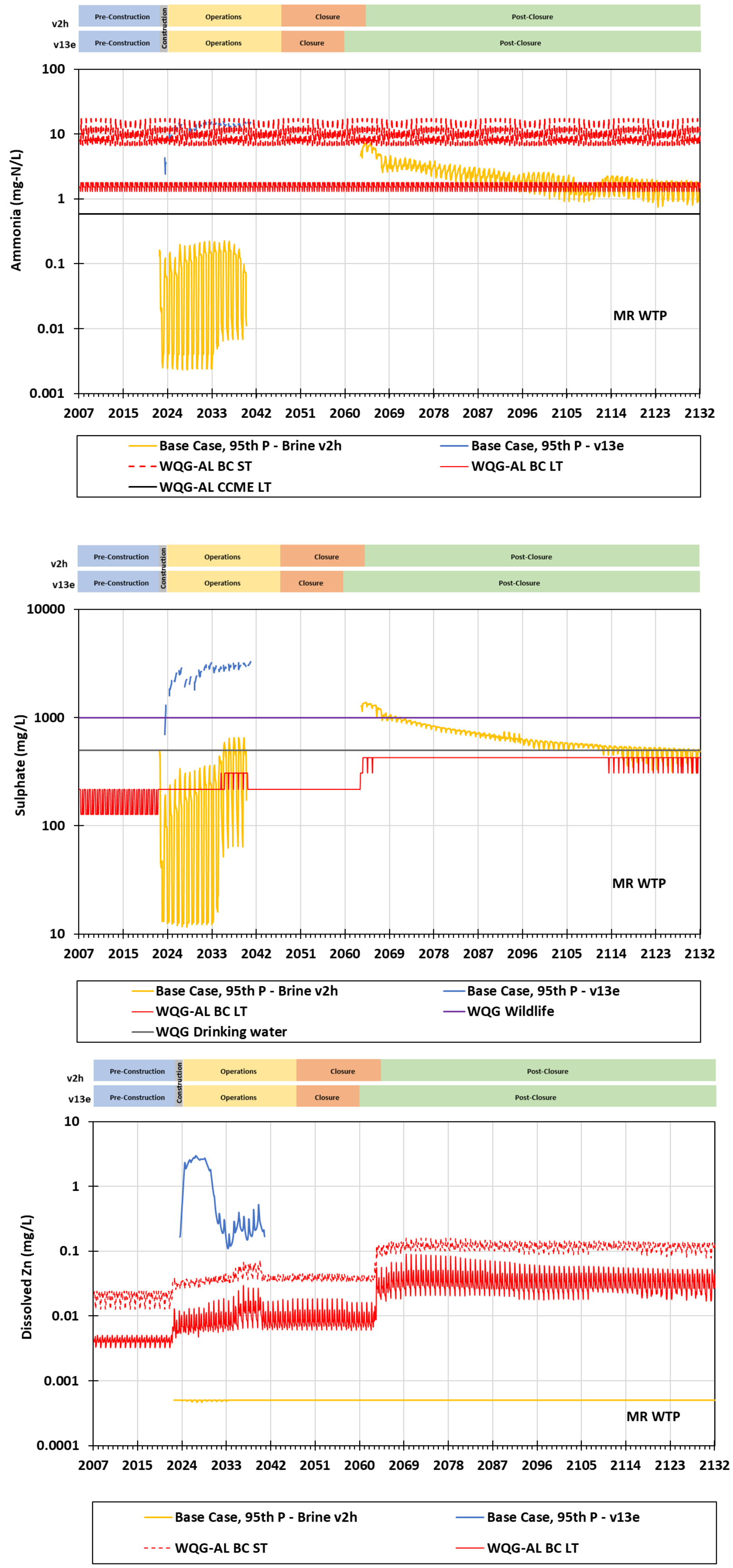

Figure 2-17: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for the Metals WTP.

The TSF Spillway discharges to Davidson Creek via a plunge pool in Post-Closure. Prior to Post-Closure, flow in the Spillway represents a minor volume in both the v13e and v2h models and receives water from runoff within the catchment contributing to the spillway and Plant Site seepage. However, in Post-Closure, considerable volumes of discharge from TSF C and TSF D ponds are predicted to report to the TSF Spillway. In addition, the TSF spillway begins to receive seepages from the UWS and LWS. The v2h Post-Closure predictions are generally similar to the v13e predictions for the Closure phase and the first half of the modelled Post-Closure phase period (Figure 2-18; Appendix C). Starting in 2093 in the v2h model, the water quality model assumes Pit Lake Seepage begins to report to the Spillway node resulting in a concentration increase for sulphate, nitrate, and metals associated with Pit Lake water (most notably Cd and Zn). A secondary concentration increase is predicted for sulphate, ammonia and certain metals (e.g., As, Co) due to the water quality model assumption that TSF C seepage to the Spillway initiates in approximately 2105.

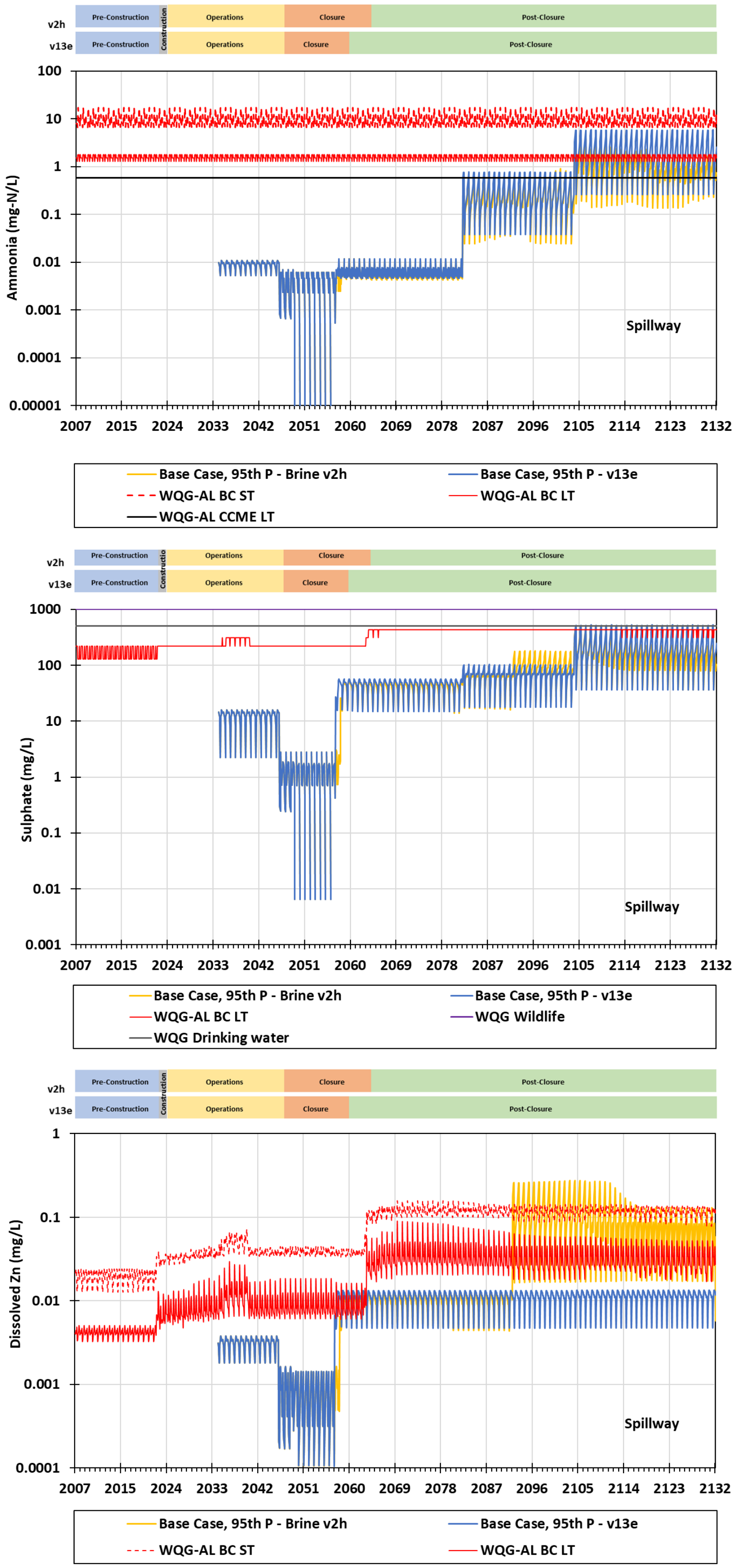

Figure 2-18: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for the TSF Spillway.

With particular respect to Metals WTP and the TSF Spillway as potential discharge locations in the Post-Closure phase, it is acknowledged elevated concentrations of certain parameters are predicted to occur at each node. Site-wide water and discharge management for Post-Closure will be subject to ongoing updates through the Operations and Closure phases, and will serve to address areas of model uncertainty, such as seepage pathways and travel times. These updates will refine BW Gold's understanding of loading sources and pathways that report to the TSF Spillway and support the development of mitigation options. It is further emphasized that the focus of the v2h WBM/WQM update and optimizations was to demonstrate the feasibility of the proposed water management regime with the objective of achieving BC WQGs in the receiving environment. Such refinements may include optimizing water and discharge management under specific climate scenarios, which has not been considered in the water balance model at this time. Discharge from the ECD and Pit Lake is calculated in the water balance model to match the hydrograph using water quality inputs developed under average climate conditions. These assumptions may be too coarse to apply broadly to all climate conditions. Discharge quality and potential discharges limits that could apply to Mine discharges during the Post-Closure phase will be subject to ongoing review and will be considered as part of a future effluent permit amendment.

At present, several options have been identified that may support the refinement and/or mitigation of predicted quality of discharge to Davidson Creek in Post-Closure. These options include:

- Evaluating individual climate cases within the water balance that are driving elevated predicted concentrations for key parameters and develop case-specific water management regimes within the model to mitigate predicted exceedances.
- Refine seepage pathway assumptions as the Mine progresses through Operations
- Evaluate benefit of implementing gypsum-precipitation options in Operations-phase Membrane WTP based on results presented in Section 2.3.
- In Post-Closure, temporarily redirect TSF spillway water to pit for gradual treatment and/or metered discharge.
- In Post-Closure, lower the target elevation for the Pit Lake to allow it to act as a groundwater sink (similar to the model update implemented in the v13e update (KP 2022a; Lorax 2022e)).

Other options identified in ERM (2017) as part of the EA Certificate/EIS application review include:

- In-pit treatment (e.g., nutrient or carbon amendment) applied either to the pit during Closure or to the pit directly in Closure and/or Post-Closure;
- Addition of a sulphide precipitation train to the Metals WTP;
- Construction of a permeable reactive barrier to treat seepage from Pit Lake or TSF;
- Re-evaluation of benefit of passive treatment systems (e.g., wetlands).

DC-05 (WQ28)

Similar to results described for mine site facilities, water quality predictions for mine receiving environment nodes in Davidson Creek show notable differences between the v13e and v2h WBM/WQMs in the Closure and Post-Closure phases. Results are illustrated for model node and monitoring station DC-05 (formerly WQ28) in Figure 2-19. DC-05 is the upstream-most location in Davidson Creek and will incur the highest relative proportion of surface contact water discharged from the mine site compared to other stations further downstream in Davidson Creek. Results for other Davison Creek nodes and Chedakuz Creek are presented in Appendix C. Negligible water quality differences are realized for Creek 661 catchment nodes between the v13e and v2h model updates and Creek 661 results are therefore not discussed in this document.

To evaluate model feasibility and to allow for a more accurate assessment of potential effects, predicted concentrations were compared against BC WQGs calculated using corresponding predicted v2h model hardness for DC-05, and baseline monthly pH, DOC, and temperature. Predicted hardness was higher than upper limits established for certain guidelines for DC-05 (e.g., 250 mg/L hardness cap for the sulfate BC long-term WQG; 399 mg/L hardness cap for the D-Zn BC long-term WQG). In such circumstances, BC ENV suggests the applicability of guidelines may require a site-specific assessment (BC ENV 2023). For the purpose of this assessment, the upper limit of the calculated guideline (based on the hardness upper limit established for each guideline) was used for screening.

In general, Closure and Post-Closure modelling for Davidson Creek, including DC-05, predicts WQGs are met under wide range of conditions under both mean and 95th percentile Variable Climate Case output (Figure 2-19; Appendix C). For the Closure phase, predicted parameter concentrations are similar between the v13e and v2h model. The extension of the Closure phase in the v2h model results in a small offset in predicted concentration trends compared to the v13e, but the relative concentration magnitude and seasonal concentration trends are similar between models.

In the late Closure phase and through the Post-Closure phase, predicted concentrations of major ions and certain metals (most notably sulphate, ammonia and nitrate) at DC-05 (Figure 2-19) and other Davidson Creek nodes (Appendix C) are measurably higher in the v2h model compared to v13e but remain below BC WQGs. This result is largely driven by the controlled management of ECD water without the benefit of membrane treatment in the v2h model. Predicted concentrations of other metals in the v2h model, such as Cd and Zn, are similar to or lower than corresponding predictions from the v13e model during Closure and the first half of the modelled Post-Closure period, in part due to the benefit of the Metals WTP for ECD, Pit Lake, and Upper Waste Stockpile water prior to discharge. In the latter part of the modelled Post-Closure period in approximately 2093, concentrations of Cd, Zn, and select metals in the v2h model increase above the corresponding v13e predictions. This increase reflects the onset of seepages from the Pit Lake, and subsequently the TSF C, assumed to report to the TSF Spillway, which discharges to Davidson Creek. Model predictions for the v2h output were also quantitatively screened against BC WQGs and are discussed further in the following section.

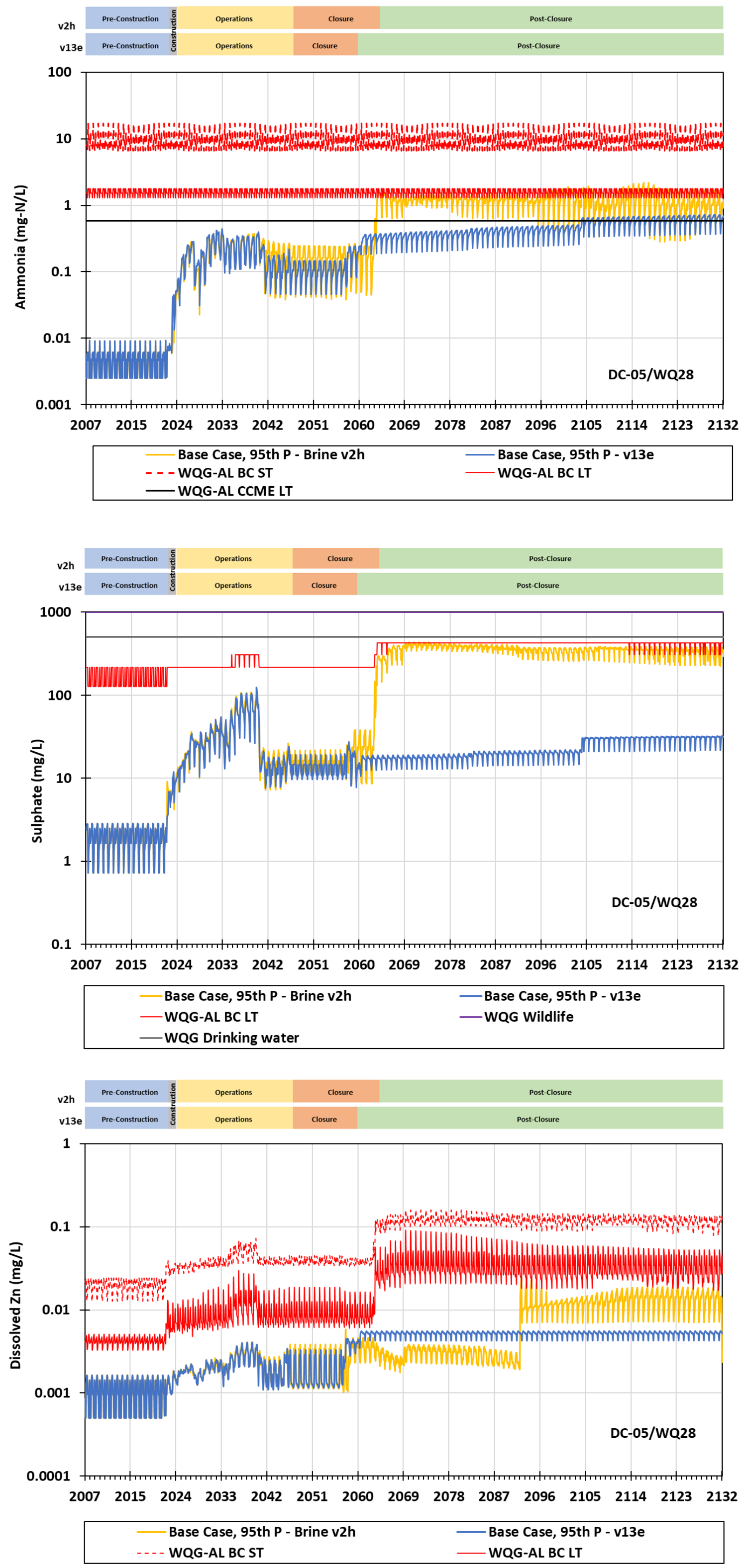

Figure 2-19: Ammonia (upper), sulphate (middle), and dissolved zinc (lower) predictions compared for the v13e and brine v2h 95th percentile Variable Climate Case simulations for Davidson Creek node DC-05 (formerly WQ28). British Columbia water quality guidelines for aquatic life are calculated using corresponding predicted v2h model hardness for DC-05, and baseline monthly pH, DOC, and temperature.

Guideline Screening

This section summarizes the comparison of the v2h model predictions for mine site facilities that may represent discharge points to the environment in the Closure and Post-Closure phases (i.e., FWR, Metals WTP, and TSF Spillway) and receiving stream stations where BC WQGs for the protection of aquatic life may apply. Water quality predictions for the mean of the VCC water balance are emphasized, given the model timeline in focus for Closure/Post-Closure water management and inherent model uncertainty under extended time frames. However, 95th percentile output from the WBM VCC was extensively considered as part of model and water management development to demonstrate the feasibility of the proposed water management scenario (i.e., to meet WQGs in the receiving environment) under a range of climate conditions.

Base Case mean predictions (from the VCC water balance) are screened to evaluate guideline exceedance frequency and maximum magnitude of guideline exceedance for the Closure and Post-Closure modelled phases. The exceedance frequency is presented as a percentage calculated as the number of months in which a guideline is exceeded divided by the total number of months for the modelled mine phase. The phases included in the table reflect the timing of the Closure to Post-Closure transition based on the Average Climate Case water balance. There is variability in the transition between Closure and Post-Closure in the VCC model depending on how rapidly the Pit Lake fills to the final elevation; as such, the beginning of Post-Closure in certain climate realizations occurs earlier than the year in which this transition happens in the Average Climate Case (Year +47).

As noted above, predicted concentrations were compared against BC WQGs calculated using corresponding predicted v2h model hardness to evaluate model feasibility and to allow for a more accurate assessment of potential effects. Predicted hardness was higher than upper limits established for certain guidelines (e.g., 250 mg/L hardness cap for the sulfate BC long-term WQG; 399 mg/L hardness cap for the D-Zn BC long-term WQG) and n such circumstances, BC ENV suggests the applicability of guidelines may require a site-specific assessment (BC ENV 2023). For the purpose of this assessment, the upper limit of the calculated guideline (based on the hardness upper limit established for each guideline) was used for screening purposes.

All parameters predicted to exceed their respective WQG in at least one model time step (i.e., one month) at FWR, Metals WTP, and TSF Spillway are presented in Table 2-11 (exceedance frequency) for the mean model output of the VCC. The corresponding 95th percentile model output is presented in Table 2-12. All parameters predicted to exceed their respective WQG in at least one model time step (i.e., one month) at Davidson Creek stations are presented in Table 2-13 for the mean and 95th percentile model output of the VCC. No exceedances are predicted for Chedakuz Creek stations (Appendix C).

Table 2-11: Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for the FWR, Metals WTP, and TSF Spillway in Closure and Post-Closure (mean output of Variable Climate Case Base Case water quality model)

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	**Units**	**CI**	**PC**	**CI**	**PC**	**Parameter**	**CI**	**PC**	**CI**	**PC**
FWR						**FWR**				
None	%	0	N/A	0	N/A	None	-	N/A	-	N/A
Metal Removal WTP						**Metal Removal WTP**				
NH_3_N	%	N/A	0	N/A	34	NH_3_N	N/A	-	N/A	3.6
NO_3_N	%	N/A	0	N/A	0.1	NO_3_N	N/A	-	N/A	1.1
SO_4	%	N/A	0	N/A	87	SO_4	N/A	-	N/A	4.1
TSF Spillway						**TSF Spillway**				
NH_3_N	%	0	0	0	0.1	NH_3_N	-	-	-	1.0
T_Be	%	0	0	8	31	T_Be	-	-	1.1	1.5
T_Co	%	0	0	0	4	T_Co	-	-	-	1.6
T_Hg	%	0	0	17	77	T_Hg	-	-	1.8	1.9
D_Cd	%	0	4	15	48	D_Cd	-	1.4	1.4	5.0
D_Cu	%	0	0	0	5	D_Cu	-	-	-	1.6
D_Zn	%	0	4	13	44	D_Zn	-	1.5	1.5	6.8

Notes:
FWR = Freshwater Reservoir, TSF = Tailings Storage Facility, WTP = Water Treatment Plant
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; CI = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding **predicted** hardness, DC-05/WQ28 **baseline** monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.
N/A = Not evaluated as location does not discharge directly to receiving environment in that phase.

Table 2-12: Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for the FWR, Metals WTP, and TSF Spillway in Closure and Post-Closure (95th percentile output of Variable Climate Case Base Case water quality model)

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	Units	CI	PC	CI	PC	Parameter	CI	PC	CI	PC
FWR						**FWR**				
T_Al	%	0	N/A	8	N/A	T_Al	-	N/A	1.2	N/A
T_Hg	%	0	N/A	6	N/A	T_Hg	-	N/A	1.6	N/A
Metal Removal WTP						**Metal Removal WTP**				
NH_3_N	%	N/A	0.1	N/A	71	NH_3_N	N/A	1.0	N/A	5.3
NO_3_N	%	N/A	0	N/A	14	NO_3_N	N/A	-	N/A	1.6
SO_4	%	N/A	0	N/A	95	SO_4	N/A	-	N/A	4.3
TSF Spillway						**TSF Spillway**				
NH_3_N	%	0	0	0	6	NH_3_N	-	-	-	3.3
SO_4	%	0	0	0	1	SO_4	-	-	-	1.1
T_Ag	%	0	0	15	0.1	T_Ag	-	-	1.2	1.0
T_As	%	0	0	0	1	T_As	-	-	-	1.2
T_Be	%	0	0	17	80	T_Be	-	-	1.4	2.1
T_Co	%	0	0	0	31	T_Co	-	-	-	3.3
T_Hg	%	0	0	23	100	T_Hg	-	-	2.3	2.7
D_Cd	%	0	16	19	49	D_Cd	-	2.9	1.7	10
D_Cu	%	0	0	0	13	D_Cu	-	-	-	2.4
D_Zn	%	0	16	19	48	D_Zn	-	3.1	1.9	15

Notes:
FWR = Freshwater Reservoir, TSF = Tailings Storage Facility, WTP = Water Treatment Plant
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; CI = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding predicted hardness, WQ28 baseline monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.
N/A = Not evaluated as location does not discharge directly to receiving environment in that phase.

Table 2-13: Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for Davidson model nodes in Closure and Post-Closure

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
Mean output of Variable Climate Case Base Case water quality model										
		BC short-term WQG		**BC long-term WQG**			**BC short-term WQG**		**BC longterm WQG**	
Parameter	**Units**	**CI**	**PC**	**CI**	**PC**	**Parameter**	**CI**	**PC**	**CI**	**PC**
DC-05 (WQ28)						**DC-05 (WQ28)**				
None	%	-	-	-	-	None	-	-	-	-
DC-10 (WQ27)						**DC-10 (WQ27)**				
None	%	-	-	-	-	*None*	-	-	-	-
DC-15 (WQ26)						**DC-15 (WQ26)**				
D_Zn	%	0	0	0	0.2	D_Zn	-	-	-	1.0
DC-20 (WQ7)						**DC-20 (WQ7)**				
D_Zn	%	0	0	0	0.4	D_Zn	-	-	-	1.0
95th Percentile output of Variable Climate Case Base Case water quality model										
DC-05 (WQ28)						**DC-05 (WQ28)**				
NH_3_N	%	0	0	0	14	NH_3_N	-	-	-	1.5
SO_4	%	0	0	0	1	SO_4	-	-	-	1.0
T_Al	%	0	0	6	0	T_Al	-	-	1.2	-
T_Hg	%	0	0	1	2	T_Hg	-	-	1.1	1.1
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.3
DC-10 (WQ27)						**DC-10 (WQ27)**				
NH_3_N	%	0	0	0	4	NH_3_N	-	-	-	1.3
T_Al	%	0	0	6	0	T_Al	-	-	1.1	-
T_Hg	%	0	0	1	0.5	T_Hg	-	-	1.1	1.0
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.1
DC-15 (WQ26)						**DC-15 (WQ26)**				
NH_3_N	%	0	0	0	4	NH_3_N	-	-	-	1.4
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.2
DC-20 (WQ7)						**DC-20 (WQ7)**				
NH_3_N	%	0	0	0	4	NH_3_N	-	-	-	1.5
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.2

Notes:
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; CI = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding **predicted** hardness, **baseline** monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.

2.5 Source Documents

The information presented in this report has been compiled from and is founded on several technical documents that were prepared, signed, and sealed by Qualified Professionals:

- Blackwater Gold Project – 2013 Geochemical Characterization Report. Technical Report prepared for New Gold Inc. in September 2014. AMEC. 2014.
- Blackwater Gold Project Mine Site Water and Discharge Monitoring and Management Plan. March 2022. BW Gold. 2022a.
- Chapter 3: Mine Plan, Blackwater Gold Project Joint Mines Act / Environmental Management Act Permits Application. April 2022. BW Gold. 2022b.
- Chapter 4: Reclamation and Closure Plan, Blackwater Gold Project Joint Mines Act / Environmental Management Act Permits Application. April 2022. BW Gold. 2022c.
- Water Treatment Plant (WTP) for Sulphate Control at Blackwater during Operation and Post-Closure. Preliminary Design Report – Rev B. Prepared for Artemis Gold Inc. by BQE Water. August 2021. BQE. 2021.
- Blackwater Gold Project TSF Stage 1 Detailed Design Report. Rev 1. VA101-457/33-6. Prepared for BW Gold by Knight Piésold Ltd. KP. 2021a.
- Blackwater Gold Project Life of Mine Water Balance Model Report. Rev 1. VA101-457/33-1. Prepared for BW Gold by Knight Piésold Ltd. KP. 2021b.
- Blackwater Gold Project – Updated Water Balance Modelling in Support of Closure/Post Closure Water Quality Optimization. File No.: VA101-00457/37-A.01. Cont. No.: VA22-01082. Prepared for BW Gold by Knight Piésold Ltd. KP. 2022a.
- Blackwater Gold Project Tailings Storage Facility – Life of Mine Design Report. Rev 1. VA101-457/33-5. Prepared for BW Gold by Knight Piésold Ltd. KP. 2022b.
- Blackwater Gold Project Stockpiles Geotechnical and Water Management Design Report. Rev 1. VA101-457/33-22. Prepared for BW Gold by Knight Piésold Ltd. KP. 2022c.
- Upper Waste Stockpile – Geotechnical and Water Management Design. File No.: VA101-00457/37-A.01. Cont. No.: VA22-00305. Prepared for BW Gold by Knight Piésold Ltd. KP. 2022d.
- Response for EMLI Geotechnical Screening Comment 11 – TSF Water Balance. File No.: VA101-00457/37-A.01. Cont. No.: VA22-00192. KP. 2022e.
- Response for EMLI Geotechnical Screening Comment 12 – Monitoring Threshold Conditions. File No.: VA101-00457/37-A.01. Cont. No.: VA22-00219. KP. 2022f.
- Issue Tracking Table IDs 531 to 536, 538, 539, 543 & 559– Accounting for Extreme Wet and Dry Events. File No.: VA101-00457/37-A.01. Cont. No.: VA22-01152. KP. 2022g.
- Issue Tracking Table IDs 338 and 339 – Stockpiles Geotechnical Clarifications. File No.: VA101 00457/37-A.01. Cont. No.: VA22-01571. September 1, 2022. KP. 2022h.
- Blackwater Gold Project Water Balance and Water Quality Model Report. Prepared for Artemis Gold Inc. by Lorax Environmental Services Ltd. (Lorax 2021).
- Water Balance/Water Quality Model Update. Prepared for BW Gold by Lorax Environmental Services Ltd. (Lorax 2022d).
- Blackwater Gold Project ML/ARD Management Plan. Prepared for BW Gold by Lorax Environmental Services Ltd. Lorax. 2022a.

- Detailed Design for the Blackwater Gold Water Treatment Plant. Prepared for BW Gold by McCue Engineering Contractors. McCue. 2021.
- Blackwater – Open Pit Mining Schedule. Moose Mountain Technical Services (MMTS). 2020.
- Blackwater Gold Project – Open Pit and Stockpile Design Report, prepared for Artemis Gold Inc. Moose Mountain Technical Services (MMTS). 2021.

Implementation of an oxygen-preventing barrier to cover waste rock and tailings to prevent adverse effects from rock that is currently or potentially acid-generating or ML are addressed in the following documents:

- Sections 1.3.2 and 5.6.2 in Blackwater Gold Project TSF Stage 1 Detailed Design Report (KP 2021a)
- Sections 3.2.1, 4.4, and 6.3.3 of Blackwater Gold Project Life of Mine Water Balance Model Report (KP 2021b)
- Sections 3.2, 4.1, 5.2.3, 6.2.3, and 10.2 in Blackwater Gold Project Tailings Storage Facility – Life of Mine Design Report (KP 2022b)
- Section 3.2.6 in Blackwater Gold Project: Water Balance and Water Quality Model (Lorax 2021)
- Blackwater Gold Project ML/ARD Management Plan (Lorax 2022a)
- Blackwater Mine Research and Development Plan for a TSF Closure Cover (WSP 2024)

Information related to covers in this report has been based on planned coverage of PAG/NAG3 waste rock and tailings with fresh tailings in the TSFs, and soil covers on the waste stockpiles, during the Operations phase as described in Plan 33 (BW Gold's Mine Waste and Water Management Plan). The means by which BW Gold will limit the year-over-year accumulation of water stored in the TSF is addressed in the following documents:

- Sections 5.6 and 9 in Blackwater Gold Project TSF Stage 1 Detailed Design Report (KP 2021a):
- Section 6.3 in Blackwater Gold Project Life of Mine Water Balance Model Report (KP 2021b):
- Section 3.1 in Response for EMLI Geotechnical Screening Comment 11 – TSF Water Balance (KP 2022e):
- Section 3.3 in Response for EMLI Geotechnical Screening Comment 12 – Monitoring Threshold Conditions (KP 2022f):

3.0 Recommendations for Further Evaluations

This section presents recommendations for further evaluations to address gaps and uncertainties related to water management in the Closure and Post-Closure phases. These evaluations are recommended to occur in addition to routine monitoring prescribed in Permit M-246 and PE-110652. Evaluations that are anticipated or recommended to be initiated within the next five years are described below as "Near-term Evaluations", while programs anticipated to be initiated beyond the next five years are described under "Long-term Evaluations".

3.1 Near-term Evaluations

The following evaluations are recommended to be initiated within the next five years.

- Pit lake modelling to characterize lake behavior in absence stratification previously afforded by brine input.

- Previous modelling efforts predicted the introduction of brine to the pit bottom fosters the development of permanent stratification (i.e., meromixis) in the water column, in which lower salinity (less dense) surface waters overlie higher salinity (more dense) deep waters. This transition to a stratified water column serves to physically isolate brine waters at depth. An updated Pit Lake model in which no brine is introduced may yield weak or no stratification within the water column, and may have implications for surface Pit Lake water quality directed to the Metals WTP, wildlife exposure, or in-pit treatment research.

- Ongoing characterization of Metals WTP waste through Operations per Condition C.3(d)(v) of permit M-246 to support solid waste management plan for MR sludge for Post-Closure.
  - During the Operations phase, sludge from the Metals WTP will be directed to the TSF for storage. Sludge mass from the Metals WTP will represent a small proportion of the total waste mass within the TSF (< 0.05%) and is unlikely that the leaching of such by-products will contribute significantly to the contaminant load balance for the TSF. To confirm the assumptions, treatment sludge from the Metals WTP is proposed to undergo detailed characterization, including detailed solid-phase characterization (grain size, elemental abundance, sequential extractions, and high resolution microscopy) and kinetic test work (saturated columns). Condition C.3(d)(v) of permit M-246 requires a WTP by-product detailed characterization conducted within the first two years of WTP operations. The results of this program may inform updates to geochemical source terms in the water quality model, and depending on the outcome of this program, additional or ongoing sludge characterization studies may be warranted.
- Ongoing geochemical investigations to support source term refinement. In 2022, Lorax concluded kinetic tests on two saturated columns using composite volcanic and andesite waste rock samples collected from 2019 drill core from the Blackwater site. The results of this work showed that trace metal concentrations can remain elevated under saturated conditions as long as mildly acidic pH conditions persist (Lorax 2024). The persistence of mildly acidic conditions will depend on the quantity of water-soluble AP present in saturated mine waste, emphasizing the importance of maintaining neutral pH porewater conditions in the Blackwater TSF (Lorax 2024). Recommendations from this work include:
  - Quantitative evaluation of materials by scanning electron microscopy (QEMSCAN): Conduct QEMSCAN or similar technique on 10-12 composite samples to identify the host phases of sulphate minerals present in trace quantities that may be a potential source of AP release under saturated conditions.
  - Cation exchange capacity testing: Perform cation exchange capacity testing and analyze leachate to estimate the amount of surface bound H^+, Al^{3+}, Fe^{3+} and other parameters that may hydrolyze once in solution. This will provide information on the potential contribution of cation exchange to alkalinity consumption when waste rock surfaces are exposed to the high Na and Ca concentrations present in process water.
  - Batch Reactors: Carry out batch reactor tests to measure the pH response of waste rock when exposed to increasing aliquots of mill process water. These tests can provide insight into the amount of supernatant alkalinity required to neutralize mildly acidic waste rock to achieve predetermined alkaline pH endpoints.
  - Field trials: Conduct field trials where weathered waste rock (approx. 1-5 m^3) is flooded directly with mill supernatant or TSF pond water and instrumented with piezometers. These experiments would yield field-scale results, regarding water quality produced from flooding waste rock, and offer field data to improve mine waste management and water quality predictions. The trial could be initiated once both waste rock and mill process water

become available. Ideally, the experiment would occur within the saturated TSF in an area where access to piezometers could be maintained for several years. Alternatively, an experimental test cell could be constructed. It is anticipated that this experiment would be initiated within the first year that the mill is operational so that site process water can be used to flood waste rock.

- The design of water treatment is based on water quality predictions which are based on assumptions. One of these is the performance of the cyanide destruction process which will greatly affect the TSF water quality in the short term and long term. Furthermore, the chemistry of the process leach solution during actual operation is likely to vary depending on the ore, and the cyanide destruction process must be able to respond to these changes. Understanding this and having expertise in CN destruction, BQE recommends the following action items to ensure that contaminants contained in process water and TSF are managed and controlled successfully as planned (as described further in Appendix E):
    - Review design of the cyanide destruction circuit from the controls and operational perspective to avoid process upsets that would impact TSF water quality.
    - Review specifications used for procurement of all CN destruction reagents to check for impurities unaccounted for in the water quality predictions.
    - Implement water quality monitoring program for the TSF and mill process water to provide early warning for any deviations or trends that would impact water treatment if/when implemented.
    - Periodically review the performance of the cyanide destruction system.
    - Bench scale testing program to determine the degree of sodium sulphate removal that can be achieved with the following currently proposed treatment technologies is recommended:
    - The Membrane WTP uses reverse osmosis (RO) membranes that achieves high rejection efficiency for all parameters. Alternatively, implementation of a nanofiltration (NF) membrane that achieves lower rejection efficiencies may be useful for bleeding sodium sulphate from site over time, and ultimately has the potential of reducing the total sodium sulphate inventory at Closure. The test program will evaluate methods of increasing sodium passage through the NF membrane and replacing sodium sulphate inventory with calcium sulphate which has a substantially lower solubility.
    - Bench testing of Sulf-IXC in near-term evaluation 6 demonstrated an ability to partially remove sodium sulphate as gypsum. Overall sodium sulphate removal depends on the solubility of CO_2 which is temperature and pressure dependent – CO_2 solubility is maximized at low temperature and high pressure. Bench testing to date was executed at room temperature and under atmospheric conditions. The test program will evaluate improvements in the ability to remove sodium sulphate by optimizing operating temperature and pressure.
- Long-term evaluations presented in the Brine Management Work Plan (Table 3-1; Lorax 2022d).
    - Four long-term evaluation tasks presented in the Brine Management Work Plan will be conducted once the Operations phase has been initiated and the commissioning of Mine facilities (e.g., mill, WTPs) in Mine phase 1 has been completed. These investigations include mill optimizations for mill reagent use and waste processing, gypsum precipitation, and pilot tests for WTP optimizations. If applicable, the site-specific sensitivity of aquatic receptors to sulfate (and other parameters of interest, as relevant) will be investigated with consideration of Mine-induced hardness and other factors that may result in the BC WQG being overly-conservative for the Mine receiving environment. This information will be used

to evaluate whether higher loads of Mine discharges can be released to the receiving environment within applicable water quality guidelines or scientifically-defensible, site-specific limits, in order to mitigate long-term treatment requirements. Per Condition C.5.(g)(ii)(a) of *Mines Act* Permit M-246, the outcomes of these evaluations will be reported as part of the updated Post-Closure Water Management Plan six months prior to the Phase 2 commissioning of the Processing Plant.

In addition to the above evaluations, mine monitoring conducted through the Operations phase will inform the refinement of planning and management strategies for the Closure and Post-Closure phases. Relevant Operations-phase monitoring will include sampling and investigations conducted as part of the ML/ARD Management Plan, process and optimization monitoring of the mill and Metals WTP, and mine site wide water quantity and water quality monitoring under permit M-246 and PE-110652. Operations-phase monitoring data will be presented and evaluated as part of the following deliverables:

- Annual Report and Evaluation, conducted annually per Condition 5.3 of PE-110652.
- Trigger Response Plan Review Report, conducted every three years and submitted as part of the Annual Report per Condition 3.4.6 (surface water) and Condition 3.5.6 (groundwater) of PE-110652.
- Water Treatment Performance Report, submitted as part of the Annual Report per Condition 3.12 of PE-110652.
- Aquatic Effects Monitoring Program interpretive report, submitted as part of the Annual Report per Condition 4.6.5 of PE-110652.
- Annual Reclamation Report, including a materials inventory and a summary of any geochemical analysis conducted per Conditions C.3(e)(i) and C.3(e)(ii), a quantitative comparison of relevant surface water, groundwater, and ML/ARD monitoring data to source terms used in water quality predictions and results of surface water and groundwater models per Condition C.4(d)(ii), and treatment reporting per Condition C.5(e) of permit M-246.
- ML/ARD Management Plan review and update, conducted annually and submitted as part of the Annual Reclamation Report per Condition C.3(c) of permit M-246.
- WTP by-product detailed characterization, conducted within the first two years of WTP operations and reported as part of the Annual Reclamation Report per Condition C.3(d)(v) of permit M-246.
- Tailings detailed characterization program, reported annually as part of the Annual Reclamation Report per Condition C.3(d)(vi) of permit M-246.
- Operational ML/ARD Characterization report, submitted 18 months after the commencement of blasting in the Open Pit per Condition C.3(e)(iv) of permit M-246.
- Surface Water and Groundwater Management Plan review and update, conducted annually and submitted as part of the Annual Reclamation Report per Conditions C.4(a)(c) and C.4(a)(d) of permit M-246.
- Site-wide water balance updates and reconciliation, conducted annually and documented as part of the Annual Reclamation Report per Condition C.4(c)(i) of permit M-246.

Information reported as part of the above deliverables will ultimately inform geochemical source term updates, water balance updates, groundwater model updates, and water quality model updates every five years (or more frequently) and submitted as part of the Mine Plan and Reclamation Report Update, per Condition C.4(c)(ii) of M-246. This work will refine model predictions on a routine basis and may identify necessary updates to source controls or mitigation measures for both the Operations and Closure/Post-Closure phases.

Table 3-1: Long-term evaluations to investigate Post-Closure membrane treatment and brine management alternatives, presented in Lorax (2022d; "Document 2.38")

No.	Task	Description	Future Key Deliverables and Outcomes
1	Investigate mill optimizations	Metallurgy and CN and water use optimizations in the mill will be fine-tuned once processing stabilizes at approximately 6 Mtpa (i.e., phase 1). Optimization studies will evaluate: a. Nan Concentration in the process facility versus oxygen volume injected into the process b. The residence time of the overall circuit (i.e., how optimal can the recovery chemical reaction, or "leach process" be performed). c. The optimal balance of reclaim water to make up water percentages, as the quality of the overall stream that combines in the process plant contributes to a more efficient elution process. d. Real time NaCN dosing/concentration management in the pre-leach and carbon in leach trains, coupled with an upstream and downstream test analysis controller Analyzer and real time probe monitoring. e. The blending of ore types and grades prior to processing as Blackwater has a high silver-to-gold ratio. This information will inform the best blend as a function of NaCN addition and ultimately NaCN destruction.	Metallurgical evaluation report
		Review of other CN destruction methods that do not contribute SO_4 (e.g., microbial, alkaline chlorination, oxidation with ozonation and peroxide (H_2O_2), photo catalytic oxidation) for consideration in Phase 2 and 3 mill expansions.	Engineering and metallurgical evaluation report
		Evaluation of additional waste processing optimizations, such as use of a pre-detox thickener and peroxide treatment to destroy some cyanide and reduce reliance on SO_2/air cyanide destruct and reduce SO_4 production.	Engineering and metallurgical evaluation report
2	Investigate treatment optimizations and alternatives	During Operations, pilot scale tests in the treatment systems will be used to establish the limit to which brine can be concentrated to minimize the volume of brine ultimately requiring management in the pit in Post-Closure.	Treatment efficiency pilot scale report
3	Investigate receiving environment SO_4 (and other parameter of interest) sensitivity	Evaluate site-specific sensitivity of aquatic receptors to concentrations of SO_4 (and other parameters of interest as appropriate) above BC WQGs to allow optimized contact water/mill effluent discharge. If concentrations above BC WQGs are demonstrated to be safe to discharge, updates to discharges limits and the EA Certificate would be subsequently investigated.	Proposal for planned toxicity tests and literature reviews
4	Crystallization of brine sulphate with gypsum	Evaluate removal of some SO_4 via crystallization and managing as a solid waste (i.e., in a lined pond) by contacting brine solution with precipitated gypsum.	Proposal for bench scale testing

3.2 Long-term Evaluations

Per the RCP, several long-term evaluations have been identified to address uncertainty and refine planning for Closure and Post-Closure water quality management. These evaluations include:

- Use of wetlands to treat water, as described in Section 4.2.5.3 of the RCP.
- A more passive system in the Post-Closure phase (as compared to currently-planned active treatment) is more desirable to support end land use objectives and has potential to reduce mine-related loadings that report to the WTP or seepage pathways. Passive or semi-passive treatment approaches using wetlands may be investigated. Wetland trials would be conducted within TSF C and upstream of the ECD during Operations to assess:
    - The ability of wetland systems to remove parameters of concern;
    - The uptake of mine-related parameters by wetland vegetation;
    - Operational costs for managing wetlands; and
    - Hydrologic and hydraulic limitations for wetland treatments.
- Pit Lake water treatment pilots, as described in Section 4.2.5.4 of the RCP.
    - Treatment of Pit Lake water *in situ* offers a potentially effective means to reduce soluble metal concentrations, thereby reducing loadings to the WTP and local groundwater system through seepage pathways. In-pit treatment may be conducted during the filling period and/or in the long term (when the pit is at maximum operating water level). The objective of this research will be to demonstrate if and how amendments can be added to the Pit Lake to reduce concentrations of contaminants of concern from the surface layer of the Pit Lake.
    - In-pit treatment options include both biological and chemical methods. The *in situ* bioremediation of mine site pit lakes typically involves the addition of organic matter and/or nutrients to create conditions conducive to contaminant removal. Chemical methods involve the addition of inorganic reagents to promote metal removal through adsorption and/or precipitation.
    - The time scales of pit filling offer the ability to conduct field trials during the filling period. Specifically, whole-lake experiments and/or discrete manipulations of the water column using mesocosms could be used to address the following:
        - The ability of algae to proliferate in response to nutrient addition;
        - The magnitude of metal removal in response to biological and chemical amendments;
        - The best means to distribute the amendment to the Pit Lake; and
        - The potential for generation of harmful by-products in response to in situ treatment.
- Water balance updates to evaluate relationship of Pit Lake elevation and seepage, as described in Appendix B (Water Balance Update Report).
    - The water management strategy in the Joint Permit Application was to maintain the Pit Lake as a groundwater sink at a water elevation at or below 1,440 masl. Given the anticipated improvement in water quality in the Pit Lake in Post-Closure, the target elevation of the Pit Lake was specified in the modelling for this plan to be a few meters below the pit rim and includes seepage from the Pit Lake to the receiving environment. The water quality in the Pit Lake and the requirement to operate the Pit Lake as a groundwater

sink that prevents seepage from the lake will be evaluated in future studies. The studies will incorporate learnings from evaluations described above such as the near-term Pit Lake modelling exercise and long-term Pit Lake water treatment pilots as well as any updates to the understanding of deposit area hydrogeology as the Open Pit is dewatered.

- The priority between accelerated Pit Lake filling and maintaining storage volume in the Pit Lake to direct water from the ECD to the Pit Lake for storage, if required, will be assessed. The scenario represented with the WBM presented in this plan prioritizes filling of the Pit Lake and all water from the TSF, including water that flows onto the facility from the upslope diverted area, is directed to the Pit Lake until the lake level is approximately 15 m below the pit rim. The elevations assigned in the WBM that trigger when mine site water is no longer directed to the Pit Lake and Pit Lake treatment starts were selected as a starting basis to allow the feasibility of the Closure/Post-Closure water management strategy to be assessed. These water levels will be evaluated along with the final target Pit Lake Post-Closure water level.

4.0 Authorship

The main body of this Technical Report has been prepared and/or reviewed by John Dockery (P.Geo.; Lorax Environmental Services Ltd.), Meghan Goertzen (RPBio; Lorax Environmental Services Ltd.), HC Liang (P.Chem.; BQE Water), Cindy Starzyk (P.Eng., Knight Piésold Ltd.), and Veneil Sundar (P.Eng.; BQE Water). Information presented in this document is consolidated from QP-authored technical documents, including Appendix B (Water Balance Update Report), Appendix C (Water Quality Model Update Report), and Appendix E (Treatment Efficiency Investigations). Additionally, multiple authors and QPs contributed to information that further underlies this document and its appendices, and which forms the basis for professional opinions presented herein, as identified in Section 2.5 (Source Documents).

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Appendix A: Comments that Contributed to the Development of the Post-Closure Water Management Plan

A-1: Joint Permit Application Comments and Responses on Post-Closure Brine Management

A-2: ELoMC comments on the August 2023 updated Water Balance/water Quality Model

COMMENT ID	SECTION	COMMENT AUTHOR	COMMENT RESPONSE AUTHOR	DATE COMMENT RECEIVED	REVIEW PHASE	REVIEWER COMMENT	PROPONENT RESPONSE
411	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Jun 01, 2022	1	The Pit Lake is expected to develop into a density stratified system, but was modelled as one fully- mixed reservoir. Due to the deposition of brine at depth in the Pit Lake, and the influences of pit seepage on zinc concentrations in the TSF C Pond and the TSF spillway in post-closure, pit stratification has the potential to significantly influence post-closure water quality, long term mitigation requirements, and the assessment of the reclamation liability. Please complete a WQM sensitivity incorporating Pit Lake stratification in post-closure. Please include an assessment of any proposed changes to post-closure water quality mitigation and/or management actions under this scenario. Please provide updated cost estimates for the Year +3 and LoM cost estimate as a result of this assessment. Please provide a determination on any recommended updates to the Base Case water quality model following that assessment.	A simplified two-cell pit lake model has been developed and results of that model can be provided to the MRC the week of July 10th. This model will be validated through a more robust quantitative pit lake dynamic model under development by Lorax. The results of this model will be integrated with the Application water quality model to evaluate the effects of predicted pit lake stratification on predicted mine and receiving environment water quality. The results of this model exercise will be presented in a memorandum provided to MRC on or before August 15, 2022. BW Gold will update the closure cost estimate for the Year +3 and LoM cost estimate if needed as part of its round 2 responses. This update would build upon the update being completed for round 1 responses and any other comments received during round 2.
411	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Jul 22, 2022	2	Partial response received July 18th. Comments will be provided at a later date.	BW Gold acknowledges this comment and looks forward to discussing further in future Review rounds.
411	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Sep 02, 2022	3	a) The pit lake surface receives acidic pit wall inputs and elevated loadings of several parameters, including zinc. Mineral solubility controls were applied to pit wall loading source terms but no additional geochemical modelling has been conducted for the pit lake. Please provide an estimate of water quality in the pit lake surface layer in post-closure that incorporates solubility controls as well as an estimation of pH levels. [QP Response Required] b) Zinc and cadmium concentrations were predicted to increase above the "one cell" predictions in the surface layer in the Round 1 two-cell pit lake predictions, whereas concentrations of these parameters were predicted to be below the "one cell" predictions in the updated PitMod model. The dominant loading source of these parameters was stated in the Round 1 memo to be pit wall runoff. Please indicate the dominant source of zinc and cadmium loadings to the pit lake in the PitMod model and explain the cause of the observed reduction in predicted concentrations. [QP Response Required] c) The response notes that the pit is predicted to provide approximately 70-80 years of brine storage, and states that "given the time scales of brine storage, there is considerable time to modify water management strategies and re-evaluate the need for long-term treatment and alternative strategies for brine treatment and or disposal". Please provide a detailed plan for development of alternate long-term mitigation strategies for pit lake water quality. The plan must include specific research areas that will be addressed during the development of these mitigations and/or contingencies, timelines associated with each task within the plan, and must include a detailed cost estimate for the execution of the plan. [QP Response Required]	Please see Response ID 487 and 490. Please see attachment "R3_EMLI Comment ID 411_Part_a_and_b.pdf" Please see attachment "R3_EMLI Comment ID 411c..pdf"
411	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Oct 11, 2022	4	a) Closed b) Closed c) Response Pending	"R3_EMLI Comment ID 411c..pdf" was submitted on October 10, 2022
411c	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Nov 01, 2022	5	a. EMLI acknowledges the suggested permit conditions, which will be considered during the reclamation liability cost estimate review. [Comment] b. The post-closure Membrane WTP is referred to as a nanofiltration (NF) system throughout the document. BW Gold had previously indicated that post-closure water treatment would use a reverse osmosis (RO) system, as part of the v13e water balance and water quality modelling updates discussed in the memorandum from Lorax dated June 29, 2022. Please clarify the system that BW Gold is applying to permit. [Clarification] c. EMLI requires the Near-term evaluations #1-3 listed in Appendix A to be provided during the Application Review stage. EMLI understands that the deliverables associated with these tasks are scheduled to be provided on November 15th, and will review the information when received. [Information Requirement] d. For each listed deliverable in the "Key Deliverables and Outcome" column of Appendix A, please indicate if the deliverable is intended to be internal or external (*i.e.*, submitted to ENV/EMLI). Tasks #5 and 6 include delivery of interim modelling updates--please note that EMLI does not typically review interim or draft reporting. [Clarification] e. For Long-term task #2, please clarify if the cost estimate is intended to represent the pilot testing of the treatment system(s) in addition to the development of the report; if not, please indicate where these costs have been included. [Clarification] f. Long-term tasks #3 and 4 include deliverables that are listed as proposals. Is the cost assigned to these tasks the estimated cost to complete the proposals, or also to complete the testing and literature reviews? [Clarification]	a) BWG acknowledges the comment b) BWG would use a reverse osmosis (RO) system at post-closure c) The deliverable associated with these tasks are scheduled for Nov 22. Please see "R5_EMLI Comment 411c_Near Term Evaluations_Final.pdf" and "R5_EMLI Comment 411c_Near Term Evaluations_Responses.pdf" d) The deliverable would be external. e) Cost estimate is intended to represent the development of the report only because it should not incur additional capital or operating expenses to run the already deployed full-scale membrane system f) This cost relates to the completion of the proposal and excludes the toxicity tests.
411c	Source Terms and Water Quality Prediction	EMLI (G.Wolff)		Dec 14, 2022	6	EMLI Geoscience has reviewed the updated submission from BQE Water regarding long-term water treatment at the Blackwater Project in response to EMLI Geoscience Comment 411(c), titled "Post-Closure Water Treatment at Blackwater: Responses to ENV Information Requests", dated November 22, 2022. This report is intended to include near-term evaluations 1-3 from the work plan submitted by Lorax Environmental on October 10, 2022, as follows: 1. Identify if there is a preferred alternative treatment option for post-closure (excluding reverse osmosis or nanofiltration). 2. Report on alternative treatment option (if one is identified through the risk assessment). 3. Evaluate Parameters of Concern in post-closure. EMLI Geoscience has the following comment on the submission: The assumptions regarding the use of dilution to treat sulphate in pit lake discharge once the membrane system has been discontinued rely on potential maximum dilution factors and do not appear to have been modelled. The report includes a recommendation to investigate the feasibility of this option. EMLI expects that this investigation will be explicitly included in the near-term evaluation #5 from the long-term water treatment work plan submitted October 10, 2022, and will include the following: a. Updated water balance and water quality modelling, incorporating updated geochemical source terms and consideration of alternate sources of sulphate and metals (e.g., ARD from pit walls); and b. Management of solid by-products generated by ongoing treatment of metals and oxyanions following discontinuation of membrane treatment and brine production.	BW Gold acknowledges the reviewer's comments. Near-term evaluation #5 from the long-term water treatment work plan submitted October 10, 2022, will include the following: a. Updated water balance and water quality modelling, incorporating updated geochemical source terms and consideration of alternate sources of sulphate and metals (e.g., ARD from pit walls); and b. Management of solid by-products generated by ongoing treatment of metals and oxyanions following discontinuation of membrane treatment and brine production.

COMMENT ID	SECTION	COMMENT AUTHOR	COMMENT RESPONSE AUTHOR	DATE COMMENT RECEIVED	REVIEW PHASE	REVIEWER COMMENT	PROPONENT RESPONSE
411c	Source Terms and Water Quality Prediction	BC ENV		Dec 14, 2022	6	Below are ENV's comments based on our review of the response memos for R5_EMLI Comment ID 411c. To note, ENV is not expecting specific comment responses at this time, but rather is providing the below comments for consideration by BWG:1. ENV is considering a condition in the Environmental Management Act (EMA) effluent permit that would require the development and submission of an updated water balance/water quality model to demonstrate the feasibility of the post-closure discharge scenario that involves mixing the pit supernatant with other lower sulphate water collected on the mine site, as well as treatment of metals to make the effluent suitable for discharge to Davidson Creek. The proposal of this requirement aligns with the R3 Comment 411c workplan tasks 5 and 6, which proposes an interim modelling update by June 1, 2023. Requirements of this condition could include: o A comprehensive model report, which would include all the model assumptions and results. o The authorization of tailings discharge to the tailing storage facility may be contingent on submission of the model report, which is subject to approval by the director. o The required timeline for submission of the updated model report is proposed to be June 2023 to allow for sufficient review and discussion by ENV and First Nations prior to referral to the director for decision, and assumes commencement of tailing deposition August 1, 2024 2. This comment is not specific to the information provided in the above-mentioned memos, however important for consideration in post-closure water treatment and discharge planning. ENV notes that the water quality predictions for post-closure from the TSF spillway (WB/WQM v13e), which is assumed to be the end-of-pipe, are shown to be above the proposed permit limits in the current Major Works application (i.e., BC WQGs and proposed SBEBs) - reference Lorax memo "Water Balance/Water Quality Model Update" dated June 29, 2022. Whereas, the water quality predictions in Davidson Creek, immediately downstream of the discharge at WQ28 are shown to meet BC WQGs. Hence: o It is assumed that a certain amount of dilution is being relied upon to achieve BC WQGs in the receiving environment downstream of the project during the post-closure phase. o Proposal of an initial dilution zone (IDZ) is not considered to be part of the current application.o In the event that BWG proposes this discharge scenario for authorization in future permit amendments for the closure/post-closure water management, then proposal and acceptance of an IDZ will be required. Refer to the ENV IDZ guidance document. o The proposed permit limits in the current application are at or below BC WQGs or proposed SBEBs to Davidson Creek. Given that potential changes to the discharge scenario at closure would require authorization, ENV cannot guarantee that BWG will be successful in receiving authorization for an IDZ or any associated changes to the proposed discharge limits. o Therefore, ENV recommends that BWG consider the possibility of implementation of additional mitigation measures to achieve BC WQGs or proposed SBEBs at end-of-pipe in post-closure. o This is the inherent risk taken on by BWG when opting to take a phased approach to EMA effluent permitting.	BW Gold acknowledges the reviewer's comments. BW Gold looks forward to reviewing the draft EMA permit and to discussing the proposed condition with ENV. BW Gold would like ENV to consider the proposed permit condition consider the final water balance/water quality model scenario (Task #7), which has a deliverable date of May 2024 - that culminates with a model report that summarizes key outcomes, recommendations, and updated Post Closure water management plan (if applicable) as opposed to Task #5, which would be an interim modelling update.BW Gold acknowledges the reviewers comments on water quality predictions for post-closure from the TSF spillway (WB/WQM v13e) and understands the inherent risk taken on by BWG when opting to take a phased approach to EMA effluent permitting.
487	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm	Lorax Environmental Services Ltd.	Aug 22, 2022	2	The two-cell pit lake water balance/water quality model update memo dated July 14, 2022 describes how permanent water column stratification (meromixis) is anticipated to occur within the pit lake during the Project post closure phase. However, as depicted in Figures 1 and 2 of the update memo, the pit lake will only contain brine after recycling it from the membrane water treatment plant after ~100 years of post closure. Yet, water treatment from all the contributing sources must continue, except the brine reporting back to the WTP from the pit lake will be of significantly worse quality. It is unclear what the plan is afterwards and whether managing the water in the proposed fashion for almost a century will leave options for management and treatment required in perpetuity. Beyond stating that 100 years is a long time and plans can be made, no other plans are provided for water management. This makes it impossible to define the appropriate and necessary Closure and Post Closure commitments. Information Request: Please describe what, if any, plans exist that ensure negative environmental impacts of the storing water in the pit are mitigated and monitored effectively throughout the entire LOM. After 100 years, the pit lake will be full of brine with no room for storage. It is not clear what plans BW Gold is referring to that can be developed in 100 years, but not now, such that the management of water is clear and there are minimum uncertainties for how the contaminated water will be managed in perpetuity to minimize environmental impact. See comment #57 (ITT ID 490) for more commentary on this topic.	In response to Round 3 Comment 411(c), a work plan is under development that will support alternate long-term mitigation strategies for pit lake water quality. This plan will be provided to reviewers once available and is anticipated to address the information request by the reviewer in this comment. In the interim, the membrane WTP vendor has conducted additional work to evaluate treatment capacity for sulfate in the Post-Closure phase after the entire pit volume is composed of brine. The preliminary results of this work suggest the treatment plant could continue to treat sulfate in the "brine lake" for an additional 300 years until the treatment efficiency is no longer feasible. Sulfate was selected for this analysis as a key limiting parameter This analysis will be considered within the plan submitted in response to Round 3 Comment 411(c) amongst other mitigation strategies identified by BW Gold. For the information Request, BWG acknowledges the Request and will provide a memo addressing the Request. (R3_CSFN_Comment ID 487.pdf)
487	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm	Lorax Environmental Services Ltd.	Dec 12, 2022	4	To be addressed through ITT ID 490	Please refer to the forthcoming response that will be provided for Round 4 Comment 490.
487	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm	Lorax Environmental Services Ltd.	Oct 11, 2022	3	While the work completed by BQE Water demonstrates that the deteriorating water quality in the pit 300 years into the Post Closure phase will not result in exceedances against MDMER/BCWQG, as assumed for the exercise, the water quality in the pit lake keeps getting worse over time and so the treated water quality and the WQG are expected to be exceeded at some point in the future although not clear exactly when. CSFNs communicated previously in comment ITT ID 490 that this approach is unacceptable. MMO Reclamation Security Policy describes the overarching objective of mine reclamation is to return disturbed land to a state that achieves the desired end land use goals and a state of physical and geochemical stability, a self-sustaining state. Moreover, BW Gold committed to equilibrium modelling and stratified pit lake with a freshwater lens during the EA. The expectations are always that a mine design, planning, and reclamation ensure that dependence on active water management and treatment is reduced over time. The proposed water management strategy for the Post Closure phase (V13e) results in progressive deterioration of the pit water quality with ever increasing demand and risk of water treatment in perpetuity.CSFN strongly recommends WB/WQ models are updated to achieve the state of equilibrium and water management strategies are revised to focus on mitigation measures rather than treatment in perpetuity to address the lack of stratification in the pit lake and management of brine to avoid deteriorating pit lake water quality. This is regardless of the timeframe proposed for duration of Post Closure. Although WTP effluent is shown to meet MDMER/BCWQG in the receiving environment, the treatment objectives for the water treatment plant must be set based on the maximum capacity of the downstream receiving environment. Specifically for sulphate, the most stringent treatment targets appear to be required to meet the Class 1 standards in the Nechako Reservoir. As such, it is recommended that these limits are identified and if different from MDMER/BCWQG, considered in WQ models and water treatment requirements. From a fundamental perspective, the accumulation of sulphate in the pit lake is due to the presence of sodium ions because sulphate is balanced by calcium caps at gypsum solubility in the brine and as such can be removed from the overall system as solid gypsum during brine treatment. Considering that the predominant source of sodium at the site is from chemical reagents used during mining and processing, continuing contributions of sodium loading to the water quality are expected to decline over time. It is counterintuitive that the V13e modelling results show continually increasing sulphate and sodium concentrations in the pit lake. As Source communicated to BW Gold during Round 2 detailed review (comment ITT ID 490), the sustaining concentration of ammonia in the pit water seems counterintuitive. Additions of ammonia to the water balance must cease when blasting/cyanide reagents are no longer used and ammonia degradation over time from sunlight and biological activity must be considered in the WQ model. Strategies such as limiting the use of sodium-bearing reagents (or other soluble salts of sulphate) or the use of alternative reagents for mining and processing can help limit the sodium contributions from the tailings in the long run and so limit sulphate concentration in the water. If sodium contributions are finite and limited to the reagents consumed, temporary treatment for the removal of sodium from the brine	The reviewer's comment and recommendations are acknowledged. In response to Round 3 Comment 411(c), a Work Plan has been submitted by BW Gold to reviewers to derive alternate long-term mitigation strategies for pit lake water quality with the overarching goal of ultimately reducing the Project's reliance on long-term active treatment. It is anticipated that analyses proposed as part of the Work Plan will address several of the reviewer's concerns noted in this comment. The request to extend the model timeline to equilibrium (steady-state) conditions is noted and will be incorporated as applicable in Work Plan modelling exercises. The primary source of ammonia release in post closure originates from TSF seepage. This ammonia is sourced primarily from reagent usage, and concentrations will decline in the long term as this load is rinsed out of the TSF. However, significant reductions of ammonia in seepage concentrations due to flushing will require an extended period of time, owing to the modest seepage rates (2 Mm3/year) and large volume (180 Mm3) of pore water contained within the interior of the TSF. Within the saturated pore space of the TSF, ammonia is expected to remain relatively stable. The sub-oxic conditions will promote ammonia stability and biological uptake would be limited to anaerobic bacteria consuming residual organic carbon present in the interior of the TSF. Ammonia released as TSF seepage will be concentrated as brine and discharged to the bottom waters of a meromictic pit lake. Within the pit lake a portion of the ammonia may be oxidized or consumed by biological uptake. The degree of ammonia oxidation and biological uptake within the pit lake bottom waters would depend on the turbidity and depth of the surface water layer which will vary over time, as well as nutrient (i.e., phosphorous) availability. For these reasons, ammonia is assumed to remain stable as a model conservatism. Work Plan reference: Lorax Environmental Services Ltd. (Lorax). 2022. Technical Memorandum: Response to Round 3 Comment 411(c). Prepared for BW Gold Ltd. October 10, 2022. File ID: R3_EMLI Comment ID 411c.pdf

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						can also be considered a viable option instead of deteriorating water quality and may assist in achieving the equilibrium state earlier in the mine life and better overall water quality. Recommendation: BW Gold should revisit the WQ/WBM to: • Identify mitigation strategies that decrease the project's dependence on active water treatment as opposed to increasing it over time • Extend the modelling timeframe to reach equilibrium conditions in the pit lake and the end land use goal of a self-sustaining state • Consider maximum receiving environment concentrations based on all classes of downstream receiving water bodies• Maintain a stratified pit lake with a freshwater lens on top • Verify the sources of sodium and nitrogen and duration of contributions to water quality (Source Comment ID#54)	
490	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm	Lorax Environmental Services Ltd.	Aug 22, 2022	2	See 220822 Source Round 2 Detailed Comments on the Revised Blackwater Major Works Application (Batch 2C) Recommendation: BW Gold should revisit the WQ/WBM and extend the modeling timeframe to the point when equilibrium conditions are reached in the pit lake. If the duration to equilibrium is many decades, it is recommended that additional mitigations or alternative methods of treating/handling brine are integrated into the project so that water treatment demands do not continually escalate over time. Information Request: The updated WQ/WB model indicates that levels of ammonia in the pit are expected to increase significantly over time, reaching >10 mg/L N after 100 years. This seems counterintuitive, as ammonia addition to the water balance should cease when blasting/cyanide is no longer used at site and ammonia degrades over time from sunlight and biological activity. Was ammonia degradation in the pit modeled similar to how it was modeled in the TSF? (Source Comment ID#57)	The comment presents one Recommendation and one Information Request. A response to each is presented below. For the Recommendation: In response to Round 3 Comment 411(c), a work plan is under development that will support alternate long-term mitigation strategies for pit lake water quality. This plan will be provided to reviewers once available and is anticipated to address the recommendation provided in this comment. It is anticipated this plan will identify additional WB/WQM scenarios that will be extended until pit equilibrium conditions are reached, as appropriate. For the Information Request: Ammonia and other nitrogen species were treated conservatively in the model outside of the TSF C and TSF D ponds. The primary source of NH3 in Post Closure originates from TSF seepage, which is then concentrated into the brine being discharged into the mine pit. Ammonia within the interior of the TSF is expected to be relatively stable, with minimal decay over time. This reservoir will gradually be rinsed out of the facility, which is not considered in the tailings seepage source term predictions which use constant ammonia concentrations over time. Ammonia disposed in the pit lake will degrade through oxidation and biological uptake. These reactions were not incorporated into the WQM as a model conservatism.
490	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm	Lorax Environmental Services Ltd.	Oct 10, 2022	3	BW's response to our recommendation for alternate long-term mitigation strategies for management of pit lake water quality is acknowledged. CSFNs look forward to reviewing BW Gold's workplan and expect that the alternate strategies will result in significantly reduced environmental concerns and liabilities and more importantly not in perpetuity. This comment remains open until receiving and reviewing the outcomes of BW Gold's workplan. With respect to modelling assumptions for ammonia sources and sinks and thus concentration in the pit, is there evidence to support ammonia from TSF will last longer than the duration of the modelling work? This same concern must be crucially addressed for sodium and consequently the rising sulphate concentrations in the pit lake. It is understood that conservatism is a necessity for all models, but the assumption of unlimited sources for ammonia and sodium is simply a false assumption rather than a degree of conservatism. Such an assumption may not necessarily result in false predictions in other cases, but could in the case of the Blackwater project where the limited capacity of the receiving environment and the nature of the water treatment process together result in a significant proportion of the contaminants remaining within the battery limits of the mine. Therefore, if contaminants are assumed to be introduced into the balance in perpetuity, the concentrations are naturally expected to rise. It is crucial to CSFNs' rights and interests to understand and evaluate actual concerns rather than artifacts of modeling work. Information request: Please share with CSFNs, for review and comment, the workplan referred to in this response as being in development for alternate long-term mitigation strategies for the management of pit lake water quality. Information Request: All assumptions built into the WQ modelling work must be carefully reviewed and if possible, verified through analogue site information before updating the WQ models, evaluating additional scenarios, and especially devising alternative management strategies. This specifically includes sources and sinks for sodium and nitrogen species. (Source Comment ID#57)	Regarding the first Information Request, BW Gold Ltd. provided the Review Comment 411c Work Plan to MMO on October 10, 2022, for distribution to the Mine Review Committee. For reference, the full Work Plan reference is included at the end of this response. Assumptions built into the model will be routinely updated and evaluated as model updates occur. In general, it is not possible to evaluate all assumptions against an analogue. All source terms, water inputs, and general model assumptions are based on site-specific empirical data where possible, for which analogues may not be available or appropriate. Analogue mine data from a number of mines is incorporated into the geochemical source terms and water quality predictions (Section 2.9 of Geochemical Source Term Report). This data was used to support degradation of nitrogen species in the TSF pond (Section 3.7 of the Geochemical Source Term Report), which included T-CN and WAD-CN losses, cyanate conversion to ammonia, and subsequent ammonia decay. Outside of the TSF pond ammonia was assumed to behave conservatively, the rational for which is described in the R3 Comment 487 response. As noted in the R3 Comment 487 response, the Work Plan submitted in response to Review Comment 411c (Lorax 2022) will evaluate alternative management strategies, particularly in the Post-Closure phase. Lorax Environmental Services Ltd. (Lorax). 2022. Technical Memorandum: Response to Round 3 Comment 411(c). Prepared for BW Gold Ltd. October 10, 2022. File ID: R3_EMLI Comment ID 411c.pdf
490	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm, P.Littlejohn	Lorax Environmental Services Ltd.	Dec 12, 2022	4	The overarching assumption made in the existing Workplan is that it is ok to advance without a reasonable solution at sight. The ever-increasing concentration of contaminants and TDS in the pit is a significant concern to the environment and the Nations and must be resolved through a technically feasible solution, irrespective of costs and implementation/operation challenges before a permit can be issued and a Workplan commenced. Specifically, the first near term activity currently listed in the Workplan must be completed as a pre-requisite to the Workplan, which is to "identify if there is a preferred alternative treatment option for post-closure (excluding reverse osmosis or nano-filtration)". The main concern here is that if the answer to this question is "No" and a technical solution cannot be devised, it is not clear how the long-term risks to the environment and the Nations can be mitigated/managed. Permit conditions and other activities stated in the Workplan can be implemented based on Project requirements and priorities to ensure the best solution can be implemented in a cost-effective manner but a solution to this issue must be identified as early as possible. Considering the water quality predictions, one potentially feasible solution to the long-term concentration of contaminants and TDS in the pit could be to increase water treatment capacity as required and pair with existing metals/gypsum removal to maintain a steady concentration of contaminants in the pit that must be back calculated based on the capacity of the receiving environment. This option along with any other potentially feasible solutions that BW Gold can envisage must be evaluated for technical feasibility irrespective of the costs associated with their implementation before a permit can be issued.Information Request: • Please describe how the risks to the environment and the Nations are mitigated/managed if a technical solution cannot be devised for the issue of the pit water quality in post closure. • Please describe how the reclamation and closure liabilities are estimated without a practical solution to a significant problem. • Based on the maximum capacity of the receiving environment for each COPC and proposed water treatment/management scheme, what are the maximum concentrations that can be tolerated in the pit? • What are the mass loading removal rates required from the pit water for each COPC to maintain the pit at 70% of the maximum allowable concentrations? • What percentage of these removal rates can be achieved for each COPC by treatment of the brine for metals removal and gypsum precipitation? • What other technologies can be applied to achieve these mass loading removal rates either in the brine from the membrane treatment plant or in the pit water directly and what are the associated costs?Recommendation: CSFNs request a meeting with BW Gold and its consultants to discuss the information request above.	BWG has been informed that the comment is being re-written

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490	Chapter 4: Reclamation and Closure Plan	CSFN - F. Mohamm, P.Littlejohn	Lorax Environmental Services Ltd.	Jan 12, 2022	5	Thank you for the additional work and information provided in BQE's memo of Nov 22, 2022 in response to ENV information request and our meeting on December 19, 2022. BQE estimates that if SO4 and N are assumed to have finite quantities, TSF seepage quality will improve, to a degree that membrane treatment for sulphate will no longer be required, at around 176 years in post closure (it is understood, the exact timing of this occurrence is difficult to estimate). The reduced sulphate loads combined with the dilution from the plunge pool are expected to achieve compliance for sulphate. Therefore, it is acknowledged that effluent quality will eventually meet treatment targets, without membrane treatment after an estimated 176-year period. It is also understood that treatment for metals removal will likely continue in perpetuity due to the ongoing pit wall source term., Additionally, pit discharge quality is expected to rely heavily on precipitation regardless of the relative sizes of the catchment areas. This will need to be carefully evaluated by updating the WQM to include best estimate assumptions for sources/sinks a key step in de-risking the project. However, CSFNs remain concerned that the water quality liability has not been adequately addressed. The proposed effluent quality management approach in post-closure still relies on storage of the contaminant salts in the pit for many decades, if not centuries, and requires long term operation of the membrane water treatment plant. Operating the membrane treatment plant for a period of 200 years is a costly and potentially, increasingly complex process. As such, removal of the contaminant salts must be prioritized and evaluated in the near term, for potential implementation early in the project life. Salt precipitation methods that may be perceived unfeasible or costly could become the preferred choice of treatment if applied early in the project life to avoid decades of costly membrane treatment during post-closure. This is in addition to brine volume management activities that although important, are of lower priority in comparison. Early removal of salts may prove to be less costly for BW Gold in the long run and serve to reduce environmental risk for CSFN's rights and interests. Recommended Permit Condition: In addition, and in parallel to the feasibility study of near-term activity 6.b, which is designed to identify the best salt removal option from the membrane retentate brine over and above gypsum desaturation, BW Gold must complete a new activity 6.e that includes comparative assessment and discussion of costs and risks associated with the following two options: 1. Non-compliant pit water storage combined with membrane water treatment plant operation for ~ 176 years 2. 2. Removal of salts from the membrane retentate brine as early as possible in the mine life using the preferred option for additional brine treatment. For clarity, this activity is meant to clarify how much earlier would the mine be independent of the membrane treatment plant if the membrane retentate brine was treated to remove more sulphate over and above that achievable via gypsum desaturation. BW Gold must complete this activity by July 1, 2023. Recommended Permit Condition: BW Gold must complete a new activity 6.f that includes bench-scale testing of the preferred option(s) upon completion of near-term activity 6.b. In addition, BW Gold must prioritize long-term evaluation activity #4, crystallization of brine sulphate with gypsum, and complete it in conjunction with 6.f. This activity must be completed by Sept 1, 2023. Recommended Permit Condition: BW Gold must incorporate the outcomes of activities 6.e and 6.f into near-term activity 7, updating the water balance/water quality model, that is due May 1, 2024. Further to ongoing engagement efforts, BW Gold must provide progress review updates and arrange discussion meetings with first Nations and Regulators on a quarterly basis to discuss the findings and outcomes of the Workplan.	
845	Chapter 4 Reclamation and Closure Plan Section # not provided: Management and Treatment of Water and Tailings	CSFN (Farzad Mohamm, Rina Freed, et al.)	BW Gold Ltd.	Jun 06, 2022	1	The need for long-term complex water treatment is a concern and not ideal for a mine design. This poses a risk as it is difficult to maintain water treatment long-term in a remote location. A robust strategy is required to maintain complex water treatment long-term. Please include proposed methods to reduce this risk. This is especially important because the treatment process selected for long-term operation involves membrane filtration that has a high risk of fouling. Therefore, to ensure compliance, the plant must be operated under optimal conditions and maintained regularly, which necessitates the development of a robust strategy and plan.Recommendation: Please include a strategy and plan that ensures the long-term operation of the membrane treatment plant is successful.	BW Gold will be required to submit updates to the MDSP and RCP plans every five years at a minimum, which will include water quality model updates. Furthermore, Provincial EA condition 34 requires BW Gold to prepare a Closure and Post-Closure Water Quality Management Plan prior to the commencement of Operations. This plan must be developed in consultation with Indigenous Groups, EMLI, and ENV and submit the plan to EAO for review at the time of planned commencement of operations. The plan must be updated at least every five years from the commencement of operations. This plan must consider mitigations and whether and how the water treatment technology differs from the technology proposed in the EA Application/Environmental Impact Statement. Moreover, Part 10, section 10.1.12 of the Health, Safety and Reclamation Code of Mines in BC (EMLI 2021) requires that a TSF has a water balance and water management plan for permitted life of the mine, prepared by a qualified person. After commencement of operations, the water balance and water management plans must be reconciled annually (Part 10, section 10.4.1). These updates may identify the need for science-based environmental benchmarks (SBEB). As required by EAC Condition 26, SBEBs must be developed in consultation with Indigenous Groups. Furthermore, EAC condition 34 requires development of a closure and post-closure phase WQ management plan, which must be updated every 5 years from the commencement of operations, based on the notion that BW Gold's understanding of the site will change over time and good practice suggests that understanding be used to further optimize plans. The mitigations proposed for construction and operations are described in the Mine Site Water and Discharge Monitoring and Management Plan (MSDP; Appendix 9-E). Section 11 of the MSDP includes a groundwater adaptive management plan and contingency measures actions, which include pumping wells. Closure costs will be assessed by EMLI when it determines the closure bond for the Project. BW Gold has proposed additional closure research projects related to water treatment. These include the use of constructed wetlands for treating water and pit lake amendments to improve water quality in the pit lake.

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846	Chapter 4 Reclamation and Closure Plan Section # not provided: Management and Treatment of Water and Tailings	CSFN (Farzad Mohamm, Rina Freed, et al.)	BW Gold Ltd.	Jun 06, 2022	1	Considering that water treatment is required for an extended period post-closure, please include contingency planning for this period to lower the risk of treatment failure/shutdown and non-compliance. These plans and measures can include duplicate installation of critical systems as well as maintaining inventory of spare parts. Recommendation: Develop detailed contingency plans for water treatment post closure. Water treatment is an important aspect of post-closure reclamation and requires contingency planning to ensure success and compliance.	BW Gold will be required to submit updates to the MDSP and RCP plans every five years at a minimum, which will include water quality model updates. Furthermore, Provincial EA condition 34 requires BW Gold to prepare a Closure and Post-Closure Water Quality Management Plan prior to the commencement of Operations. This plan must be developed in consultation with Indigenous Groups, EMLI, and ENV and submit the plan to EAO for review at the time of planned commencement of operations. The plan must be updated at least every five years from the commencement of operations. This plan must consider mitigations and whether and how the water treatment technology differs from the technology proposed in the EA Application/Environmental Impact Statement. Moreover, Part 10, section 10.1.12 of the Health, Safety and Reclamation Code of Mines in BC (EMLI 2021) requires that a TSF has a water balance and water management plan for permitted life of the mine, prepared by a qualified person. After commencement of operations, the water balance and water management plans must be reconciled annually (Part 10, section 10.4.1). These updates may identify the need for science-based environmental benchmarks (SBEB). As required by EAC Condition 26, SBEBs must be developed in consultation with Indigenous Groups. The mitigations proposed for construction and operations are described in the Mine Site Water and Discharge Monitoring and Management Plan (MSDP; Appendix 9-E). Section 11 of the MSDP includes a groundwater adaptive management plan and contingency measures actions, which include pumping wells. Closure costs will be assessed by EMLI when it determines the closure bond for the Project. BW Gold has proposed additional closure research projects related to water treatment. These include the use of constructed wetlands for treating water and pit lake amendments to improve water quality in the pit lake.
1312	Chapter 5 5.4.1.3	LDN/UFN		Jun 11, 2022	1	Table 5.4-1 Mitigation measures - water management strategy states brine from the Membrane WTP will be pumped to pit lake to support meromixis. Given the 25% brine rate, what is the capacity (years) for storing WTP brine, including the other sources of poor quality water that will be placed in the pit lake.	The post-closure water management plan includes active control of the open pit water level for the long-term following closure. Water inflows to the pit lake in Post-Closure, including contributions of brine, will generally be balanced by the rate that water is pumped out of the pit lake. The available storage volume above the target pit lake surface elevation is approximately 58 Mm3, which would take approximately 20 years to fill if the average inflows contributing annually to the pit are 2.8 Mm3, comprising brine, precipitation, runoff and groundwater inputs in Post-Closure.
2311	Reclamation Liability Cost Estimate (RLCE)	CSFN (F. Mohamm)		12-Dec-22	1	As discussed in length in comment ITT ID 490, the long-term status of the pit lake is unclear at this point. The updated water management/treatment scheme (V13e) clearly results in the concentration of contaminants in the open pit up to the point that the proposed infrastructure cannot ensure management/treatment of water and exceedances are eventually expected, regardless of the timeline. The solutions and path forward proposed to this point by BW Gold do not present a meaningful way of addressing this issue in the long run and most likely require additional water treatment capacity and schemes in the long term to ensure the receiving environment targets can be met. These costs and liabilities are significant and must be accounted for in the RLCE, none of which is possible unless the issues discussed in comment ITT ID 490 are addressed and resolved. Recommended Permit Condition: The Reclamation and Closure Plan must be updated upon conclusion of water management/treatment practices for Post-Closure that the pit lake is in a state of equilibrium and concentration of contaminants can be met in the receiving environment regardless of the timespan considered.	BW Gold appreciates the further comment from the reviewer continuing to clarify and explain the concerns with regard to the water management and water treatment of the pit lake water in the Post-closure phase of the mine. BW Gold anticipates that the Mines Act permit will contain conditions related to the Reclamation and Closure plan, including scheduled updates and required content of the plan. The reviewer's recommendation is available for EMLI to consider.
2311	Reclamation Liability Cost Estimate (RLCE)	CSFN (F. Mohamm)		12-Jan-23	2	Status - CSFNs met with Artemis and Lorax on December 19, 2022. Based on this meeting, a follow-up to comment 490 has been provided above. In order for this reclamation and closure comment to be considered resolved, the cost estimate must take into account the recommendations required to resolve comment 490.	

Comment ID	Topic	Comment Author	Comment Response Author	Date Comment Received	New or Follow Up to Previous Comment?	Comment	Proponent Response
Unique identifying ID to keep track of comments	*Theme of comment*	*Reviewer's name and/or organization*	*Name and/or organization*	*Date comment provided from reviewer*	*New/Follow Up*	*Reviewer's comment*	*Proponent's response*
1	Brine Management Work Plan	Source	KP	01-Sep-23	New	The statement "water from Pit Lake sent to WTP if capacity remains" on slide 13 prompts the question whether the implication is that water might be transferred without proper treatment in cases where the water treatment plant's capacity is already stretched. Please explain what this statement means.	The statement "if capacity remains" is referring to the likelihood that short periods of time may occur, such as freshets that are wetter than average, when water collected at the ECD will utilize the full capacity of the Metals WTP treatment. During those temporary wet periods, water from the ECD that exceeds the maximum treatment capacity will be directed to the Pit Lake; no additional capacity will remain at the WTP to treat water from the Pit Lake during those temporary conditions. Once the rate of water accumulation at the ECD decreases, capacity to treat water from the Pit Lake will again become available. This condition is only expected to occur during very wet conditions and would not be the case during the majority of the year. The Metals WTP has capacity to treat up to 5.4 Mm^3 each year when operating at the modelled rate of 155 L/s. The volumes of water collected each year from the ECD and Pit Lake and that require treatment are predicted to vary between approximately 3 to 4 Mm^3/yr under average climate conditions (slide 16). Additional treatment capacity on the order of 1.5 to 2 Mm^3 therefore remains at the Metals WTP on an annual basis to treat more water if wet conditions exist. Water would not be transferred downstream without proper treatment in cases where the water treatment plant is at capacity. The pit has an additional 10Mm^3 storage capacity when the Pit Lake level is maintained at 1471 masl. This extra storage volume acts as a contingency for temporary storage of contact water if needed and is equivalent to approximately three times the annual volume of water generated at the ECD and Pit Lake under average climate conditions.
2	Brine Management Work Plan	Source	KP	01-Sep-23	New	Slide 15 introduces an update regarding the modelled target Pit Lake water level, now established at 10 meters below the pit rim (1,471 meters above sea level). This adjustment represents a 30-meter increase from the prior assumed level, effectively altering the pit's status from a groundwater sink. It is imperative to gain a comprehensive understanding of the ramifications this change holds for groundwater quality. Specifically, we request a detailed elucidation on how the upward revision of the Pit Lake water level could impact the surrounding groundwater quality. Are there potential risks of contamination due to increased interaction between the lake and the groundwater system?	The increased Pit Lake elevation was included in the model presented in the September 2023 ELoMC meeting to investigate the predicted water quality in Davison Creek with the inclusion of Pit Lake seepage in the model. The changes incorporated in the Post-Closure Water Management modelling, particularly that brine is no longer generated and directed to the Pit Lake, result in improved Pit Lake water quality in the long-term compared to the pit lake water quality predicted in the Application. As a result, initial modelling suggests the mitigation of maintaining the Pit Lake as a groundwater sink may not be a needed mitigation to meet water quality objectives in the receiving environment. The predicted rates and travel times associated with Pit Lake seepage are presented in the Numerical Groundwater Modelling Report submitted in the Application (Appendix 5-F; KP, 2021). These rates and travel times were included in the water balance and water quality model results presented in the September 2023 ELoMC meeting. The mitigation of maintaining the Pit Lake level at a lower elevation to function as a groundwater sink remains available to be incorporated in the water management strategy if future water quality predictions suggest seepage from the pit lake would result in exceedance of water quality objectives.
3	Brine Management Work Plan	Source	Lorax/BWG	01-Sep-23	New	The latest outcomes from the WBWQ model underscore the necessity for a dynamic approach to water management, contingent upon water quality considerations stemming from diverse sources. Considering these findings, it becomes imperative to formulate a comprehensive water management plan for Post Closure, encompassing specifics for attaining the intended dilution levels. This must include details about the range of water sources to be managed, the methodologies for achieving the desired dilutions, and a comprehensive breakdown of potential additional costs linked to this evolved water management approach. These insights will be instrumental in guiding the decision-making process and facilitating a comprehensive understanding of the project's financial and operational landscape.	Thank you for this comment. We appreciate the importance of developing a comprehensive, robust water management plan for Post-Closure that includes a high level of operational resolution. As the mine plan progresses and the model is regularly updated through project life, these details will certainly be developed and refined well before the Post-Closure period.
4	Brine Management Work Plan	Source	Lorax/BWG	01-Sep-23	New	A key aspect that appears absent from the presented slides (17, 19, etc.) is a comprehensive explanation concerning the exclusion of membranes from the revised water treatment scheme, and its subsequent connection to the newfound availability of dilution capacity for sulphate management. Membranes, operating under purely physical principles, should theoretically have little bearing on dilution potential – a point that warrants elucidation. During the presentation, the response provided emphasized the viability of dilution in the updated model due to notable reductions in sulphate loading, achieved through modifications in the cyanide detox reagent and subsequent decreases in reagent consumption. The assertion that alterations in cyanide detoxification reagents can singularly account for a substantial reduction in sulphate concentration is questionable, given that the capacity of reagents to influence dissolved sulphate is limited, resulting in the precipitation of surplus reagents as gypsum or calcium sulphite. The correlation between decreased reagent consumption and a significant reduction in sulphate concentration demands a more detailed justification. This includes any amendments in cyanide dosage, updated SO_2 dosages, and an in-depth clarification on how reduced SO_2 consumption could lead to the observed decline in sulphate concentration. Considering the utilization of acidic and lime-based reagents for detoxification, any excessive reagent should not have been factored into the dissolved species within the water quality models. Given the complexity of these factors, we look forward to receiving a detailed account that will help us establish a comprehensive understanding of how these variables collectively contribute to the alteration in sulphate concentration, as observed in the updated model.	Thank you for your comment. A key objective in the Post-Closure Water Management Plan modelling exercise was to develop a Post-Closure scenario that allows the project to meet water quality guidelines in Davidson Creek without invoking membrane treatment. This was accomplished in the updated model through: 1) optimizations in water and discharge management in the Post-Closure model period, 2) consideration of long-term decay in major ion concentrations in closure source terms, and 3) modifications in the cyanide detox reagents and subsequent decreases in reagent consumption during the Operations model period. These three factors were not explicitly included in the Joint Application model, and they collectively contribute to the updated model's ability to meet water quality guideline in Davidson Creek without invoking membrane treatment. Of note, reduction of sulphate concentrations in TSF seepage was accomplished by modifying closure source term assumptions (item 2) above). The Joint Application model calculated annual sulphate concentrations in the TSF seepage throughout Operations. The concentration calculated for the final year of Operations was then applied for the duration of the Closure and Post-Closure period. This was a simplifying and conservative approach, as sulphate would be expected to decline over time as it was rinsed from the TMF pore water. This Closure assumption was revisited in the updated model version presented in the September ELoMC meeting. The updated model tracks sulphate additions to the TSF, partitioning sulphate between aqueous and solid (gypsum) phases. The model results show that sulphate will begin precipitating as gypsum within the first year of mine Operations. Thus, the concentration of sulphate in TSF seepage will be controlled by gypsum solubility for most of Operations. Following mine Operations, the gypsum reservoir within the TSF will eventually be exhausted. The gypsum reservoir is exhausted in TSF D by year 2055, while gypsum persists in TSF C for the duration of the model horizon (note these results were originally shown in the September ELoMC meeting Slide 24, and erroneously stated the year 2047). This results in a rapid decline in sulphate concentrations from TSF D after year 2055 while sulphate concentrations in TSF C remain elevated for the duration of the model. Usage of SO_2 air for CN destruction within the mill is a major contributor of sulphate loading to the TSF. Under aerobic conditions, any unreacted sulfur dioxide (SO_2) or sulfite (SO_3) would rapidly oxidize to sulphate within the mill or when spigotted as slurry to the TSF. If oxidation does not occur, then these parameters will likely precipitate as calcium sulfite which is relatively insoluble. Persistence of calcium sulfite within the tailings would have two notable effects on tailings chemistry: • Inhibition of ARD in exposed tailings beach. Calcium sulfite is highly reactive in the presence of oxygen and could inhibit sulphide oxidation in the tailings beach by scavenging any oxygen ingress. This approach to ARD mitigation has been studied at the American Electric Power Plant (Coshocton, OH), where calcium sulfite recovered from flue gas desulfurization was applied to pyrite-bearing coal ash. • Reduction in sulphate accumulation within the TSF. Calcium sulfite is orders of magnitude less soluble than gypsum and would remain stable under anoxic conditions in the interior of the TSF. Precipitation of sulphur as calcium sulfite rather than gypsum would reduce the mass of available sulphate within the TSF, resulting in a more rapid decline in sulphate concentrations from TSF seepage. Both impacts would be broadly positive for water quality. However, to the author's knowledge formation and persistence of calcium sulfite has not been conclusively documented in mine tailings. Therefore, excluding this process from water quality predictions represents a model conservativism. Mill reagent usage has been updated within the model to reflect current metallurgical assessments (item 3) above). The current estimates show a substantial reduction in SO_2 air usage compared to the Joint Application model (0.9 kg/t vs 1.9 kg/t). This change has limited impact on TSF seepage in Operations and early Closure/Post-Closure when sulphate concentrations are controlled by gypsum solubility. The primary influence this assumption has on model results relates to the mass of gypsum that accumulates in the TSF during Operations (i.e., the reduced SO_2 air addition results in reduced gypsum accumulation within the TSF). Hence, less time is required for gypsum to be rinsed from the system following the Operations phase.
5	Brine Management Work Plan	Source	Lorax	01-Sep-23	New	The statement on Slide 19 that the "Updated model assumes a degree of microbially-mediated conversion of ammonia to nitrate" necessitates a clarification on the derivation of the associated rates. This requires a detailed explanation of the methods utilized to arrive at these rates. It is important that this assumption undergoes a rigorous assessment, supplied with clear justifications that include a direct comparative analysis of factors such as temperatures, solar exposure duration, pond depths, and ice coverage span with multiple relevant reference sites to substantiate the validity of the assumption. The significance of this exercise becomes even more pronounced considering the updated WBWQ scenario indicates a 14% frequency of exceedances for ammonia levels. The potential for exacerbating this percentage if the assumptions remain unverified underscores the importance of their accuracy. Considering this, we propose the implementation of pilot trials during the operational phase. This measure will serve to validate the feasibility of the approach and provide empirical confirmation of the assumption's validity. This approach aligns with the principles of robust decision-making and ensures that our strategies are underpinned by sound scientific data.	A nitrification rate of 0.005 mg/L/day was adopted from Chlot et al., (2011), who modelled nitrogen transformations in waters receiving mine effluents. Their model was developed using site-specific data collected from a clarification pond, which received ammonia-enriched process water from a tailings impoundment. The clarification pond is considered an analogue site with similar water quality as predicted in the Blackwater pit lake. The analogue site is a northern hemisphere, high-latitude mine that would be expected to undergo similar seasonal cycling as the Blackwater site. The measured range of relevant water quality parameters in the clarification pond (Chlot et al., 2011) are provided below: - pH (7.86 - 11.7) - Water Temperature (0-20 °C) - Dissolved Oxygen (2.1 - 10.2 mg/L) - Ammonia-N (0.1 - 5.5 mg/L) - Nitrate-N (0.4 - 1.3 mg/L) The biogeochemical model develped by Chlot et al., (2011) assumed fully mixed conditions and used a series of differential equations for derivation of model parameters. For nitrification, the model accounted for pH, temperature, ammonia concentration, dissolved oxygen, as well as the growth rate of nitrifying bacteria. As such, the nitrification rate derived by Chlot et al. (approximately 0.005 mg/L/d during the summer months) is considered a suitable input for pit lake modelling at Blackwater based on available literture on nitrogen modelling in mine-influenced systems. 95th percentile model predictions for ammonia with (yellow) and without (blue) the benefit of pit lake nitrification are shown for WQ28 (figure right). Relatively speaking, pit lake nitrificaiton assumption offers a small benefit within the context of overall ammonia management and predictions. With pit lake nitrification, the highest-predicted ammonia concentration in the Post-Closure phase is 1.5x higher than the long-term BC water quality guideline (WQG; upper and lower bounds of the long-term WQG are shown as red lines, calcualted based on monthly baseline ambient conditions at WQ28). Without pit lake nitrification, the highest predicted concentration is a small degree higher (1.7x) than the long-term BC WQG, although predicted concentrations are above their corresponding long-term WQG in more months of the year compared to the scenario with nitrification. With respect to pilot trails during the operational phase, we note there will not be a pit lake during operations so the ability to conduct appropriate pilot-scale tests on site will be limited. An alternative option may be to draw upon ongoing research at analogue sites.

Comment ID	Topic	Comment Author	Comment Response Author	Date Comment Received	New or Follow Up to Previous Comment?	Comment	Proponent Response
Unique identifying ID to keep track of comments	*Theme of comment*	*Reviewer's name and/or organization*	*Name and/or organization*	*Date comment provided from reviewer*	*New/Follow Up*	*Reviewer's comment*	*Proponent's response*
6	Brine Management Work Plan	Source	Lorax	01-Sep-23	New	The predicted concentrations on Slide 44 that show how frequently ammonia (14%) and antimony (39%) are exceeding the BC WQGs at WQ28. There is not sufficient information in the presentation to understand whether ammonia and antimony are predicted to exceed the Yinka Dene Water Law (YDWL) standards at WQ7 on Davidson Creek. This uncertainty gains greater significance when viewed through the lens of the inherent uncertainty in modeling outcomes and the assumptions underpinning both water treatment processes and the rates of natural attenuation for substances. It is recommended that predictions are provided for WQ7 and if needed (i.e., if exceedances are predicted), a thorough reassessment of the current water management practices and treatment strategies be conducted, with a focus on curbing the prevalence of such exceedances to achieve the YDWL standards and safeguard the integrity of water resources as mandated by the YDWL.	Thank you for this comment. As emphasized during the August presentation, the exceedance frequencies shown in the table on Slide 44 (including those for ammonia [14%] and antimony [39%]) conservatively reflect screening results for the 95th percentile concentration model output; these percentages were included in order to provide a general indication of the relative frequency of exceedances of different parameters. However, 95th percentile concentrations will not be realized on a regular basis and the exceedance frequencies noted for ammonia and antimony should not be considered to reflect routinely expected or average conditions. With respect to compliance with the YDWL, BW notes that it was not the intent of this work to provide information to predict whether there may be ammonia or antimony exceedances of the YDWL, nor is this a requirement of Mines Act Permit Condition C. 5. (g) (which prescribes the present Post-Closure Water Management Plan and the brine management work plan/modelling). As you know, the compliance framework for the YDWL sits within the draft participation agreement which remains unsigned. That said, even if the participation agreement was signed there are no provisions within the YDWL framework in the draft participation agreement that would require BW Gold to predict future compliance with the YDWL, nor are there any requirements to do the same within any of BW Gold's regulatory requirements. While we appreciate your interest in compliance with the YDWL, BW Gold understands that the parties (BW Gold and the NFNs) have agreed that compliance with the YDWL is a matter to be addressed in our participation agreement and not as a regulatory matter. BW Gold has been consistent in its responses to comments related to YDWL compliance and will continue to respond in the same manner. With particular respect to antimony, the table on Slide 44 of the ELoMC presentation conservatively compares predicted total Sb concentrations relative to the working BC guideline for aquatic life, which applies only to the Sb III fraction. Sb VI (for which an approved guideline has not been developed) will represent the majority of Sb in oxic stream environments, however; as such, we reiterate that screening total Sb against the Sb III working guideline is a very conservative approach and Sb III concentrations realized at WQ28 (and downstream, like at WQ7) will likely represent a small fraction of the total Sb concentration predicted. For context, the highest predicted total Sb concentration predicted for WQ28 in the Post Closure evaluation (0.012 mg/L) is 1.3x higher than the working guideline for Sb III (0.009 mg/L). We further note an updated draft BC guideline (aquatic life) for total Sb has been recently circulated for public review. While this draft guideline is not approved, the long-term guideline for total Sb proposed therein (0.074 mg/L) is substantially higher than predicted total Sb concentrations in our model, and considers a recent toxicological dataset that indicates the current working Sb III guideline is highly conservative. With respect to ammonia, the primary source of ammonia release to the receiving environment in Post Closure originates from TSF seepage. This ammonia is sourced primarily from reagent usage in the milling process, and concentrations in TSF seepage to the environment will decline in the long term as this load is rinsed out of the TSF. We acknowledge uncertainties exist with respect to long-term model predictions for ammonia concentrations as is the case for all model scenarios, notably those that extend to the far future; however, model and source term assumptions for ammonia have been made based on conservative and professional best estimates based on information available at this time. The following represent key areas of uncertainty with respect to long-term ammonia predictions that will undergo ongoing refinement as the project develops: 1. The amount of ammonia ultimately deposited in the TSF, which is dependent on mill reagent usage. These estimates will be refined as mill operations progress. 2. TSF pore volume flushing rates in Post-Closure. These estimates are based on the water balance, and may be refined as the TSF is developed. 3. Ammonia attenuation. Currently no attenuation is assumed for ammonia (or any other parameter) within sub-surface flow paths beyond the TSF area. This is a conservative assumption that may be refined as the Project footprint is developed.

Appendix B: Water Balance Update Report

Knight Piésold CONSULTING

Management System Certified By: bsi ISO 9001 Quality Management Systems CERTIFIED; ISO 14001 Environmental Management CERTIFIED; ISO 45001 Occupational Health and Safety Management CERTIFIED

September 4, 2024

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Dear Alastair,

RE: Water Balance Modelling with Updated Post-Closure Water Management

1.0 INTRODUCTION

This letter presents a Life of Mine (LOM) Water Balance Model (WBM) scenario completed by Knight Piésold Ltd. (KP) for the Blackwater Mine (the Mine) to support development of a Closure and Post-Closure Water Management Plan. A Joint Mines Act and Environmental Management Act Permits Application (the Application) was submitted in November 2021 seeking approval to construct the Mine. BW Gold Ltd. (BW Gold) received a *Mines Act* permit (M-246) for the Mine on March 8, 2023 and an *Environmental Management Act* permit (PE-110652) on May 2, 2023. Since approval of M-246 and PE-110652, BW Gold and its consultants have conducted optimization exercises to update the approach to Closure and Post-Closure water management to satisfy several permit conditions.

The LOM WBM originally submitted with the Application is documented in the *Life of Mine Water Balance Model Report* (KP, 2021a) submitted as Appendix 5-B of the Application. That report includes a detailed discussion on the baseline watershed model and water balance model methodology. The modelling was subsequently updated during the Application technical review phase to optimize water management practices in Closure and Post-Closure (KP, 2022a). The water balance model presented in this letter builds upon the optimized Closure and Post-Closure model presented in KP (2022a) prepared during the Application technical review phase. The water balance model and water management strategy represented in the model during Baseline, Construction, and Operations phases of the mine life are unchanged from what is presented in KP (2021a).

Flows generated with the LOM WBM were provided to Lorax Environmental Services Ltd. (Lorax) as inputs to the Water Quality Model to develop water quality predictions (Lorax, 2024).

2.0 REGULATORY CONTEXT AND OBJECTIVES

2.1 CONTEXT

The water balance model scenario presented in this letter was completed to satisfy part of Condition C.5.(g).(i).(b) of permit M-246 and Comment 411c submitted by the BC Ministry of Energy, Mines, and Low Carbon Innovation (EMLI) during the Mines Review Committee. Permit Condition C.5.(g).(i).(b) is as follows:

> *(i)* *Six months prior to commencing construction of the TSF-C dams above 1283 masl, the Permittee must submit a Post-Closure Water Management Plan to the Chief Permitting Officer*

for approval. The Permittee must ensure that the plan is prepared by a Qualified Professional and includes, but is not limited to, the following:

a. *A demonstration of completion of near-term evaluations as listed in Document 2.38;*
b. *An updated surface water and groundwater model, including a modelling scenario demonstrating the feasibility of using dilution to treat sulphate in pit lake discharge after discontinuing membrane treatment, as described in Document 2.39;*

Document 2.38 (Lorax, 2022) presents a Work Plan, also referred to as the Brine Management Work Plan, developed to address Comment 411(c) submitted by EMLI during the Mines Review Committee review. The Work Plan details investigations proposed by BW Gold to prevent brine accumulating in the long-term in the pit lake following mine closure. Item 7 of the Work Plan includes developing a water balance and water quality model sensitivity analysis to identify and evaluate alternative water management and water treatment options to prevent long-term brine accumulation in the pit lake.

Document 2.39 (BQE Water, 2022) presents alternative Post-Closure water treatment technologies to prevent permanent storage of sodium sulphate in the pit lake and/or sulphate treatment into perpetuity. The report recommends blending water from the Tailings Storage Facility (TSF) Pond with mine site water to discharge sulphate from the mine site (the pit lake).

The LOM WBM scenario presented herein was completed to meet Item 7 of Document 2.38 and incorporates the recommendations proposed in Document 2.39 as indicated in Condition C.5.(g).(i).(b) of permit M-246.

2.2 OBJECTIVE

The objective of this water balance model update is to demonstrate "…*the feasibility of using dilution to treat sulphate in pit lake discharge after discontinuing membrane treatment*" as required by Condition C.5.(g).(i).(b). The feasibility of the water management strategy is evaluated through modelled attainment of water quality objectives in the receiving environment at model node WQ28 on Davidson Creek and is documented in the Water Quality Model report (Lorax, 2024). The results of this water balance model scenario form the basis for the water management strategy presented in the *Closure and Post-Closure Water Management Plan* (BW Gold, 2024).

3.0 WATER MANAGEMENT AND MODELLING BACKGROUND

3.1 WATER BALANCE MODEL METHODS

The LOM WBM simulates water management flows, surface water, and groundwater flows using one continuous model that is built out through the entire life cycle of the proposed Mine, from pre-mining (Baseline) through Post-Closure. The LOM WBM is based on the Baseline Watershed Model developed for the Mine (KP, 2021b). The Baseline Watershed Model framework is a semi-distributed parameter model developed as a spreadsheet-based model using Microsoft Excel. Climate input to the model is varied spatially based on elevation, and the study area is divided into sub-catchments within which groundwater and surface water flows are modelled.

Development of the proposed mine is simulated in the LOM WBM by modifying hydrologic flows in sub-catchment areas to represent mine infrastructure and surface water diversions in the model. Key mine site infrastructure is explicitly represented in the LOM WBM to develop predictions of mine site flows, volumes of water stored, and downstream flows in the receiving environment.

The water balance model and water management strategy during Baseline, Construction, and Operations phases of the mine life are unchanged from what is presented in KP (2021a; 2022a). Additional detail on the LOM WBM methodology and representation of mine facilities in the model is provided in Sections 2 through 4 of KP (2021a).

3.2 CLIMATE INPUTS

Climate inputs to the LOM WBM to assess the Closure/Post-Closure water management strategy are unchanged from earlier versions of the water balance modelling (KP, 2021a; 2022a). Evaluation of the water management strategy was conducted using average climate inputs as well as the long-term historical (variable) climate record as described below. A detailed description of the Mine climate record and methodology for including it in the LOM WBM is provided in KP (2021a). The monthly long-term temperature and precipitation synthetic climate record are provided in Table A.1 and Table A.2, respectively, in the Baseline Watershed Model report in Appendix A of KP (2021a).

The updated Closure/Post-Closure water management strategy was initially developed using average climate inputs to the LOM WBM. Average climate inputs to the LOM WBM consist of mean monthly temperature and precipitation values averaged from the 40-year long-term synthetic climate record extending from November 1980 through October 2020.

The performance of the proposed Closure/Post-Closure water management strategy was evaluated against a range of wet and dry periods by inputting the 40-year historical climate record into the LOM WBM. A variable climate case model (VCC Model) scenario was developed to assess potential influence of climate variability on surface and groundwater flows and mine water management. The VCC Model comprises 40 separate model iterations that are generated by iteratively stepping the long-term climate record through the LOM WBM, consistent with the model methodology conducted in KP (2021a; 2022a). Each of the 40 iterations of the VCC Model represents the positioning of a different historical climate year in the first year of the model. The remaining historical climate data is input to the water balance model in the same order that it occurred in the historical record and is repeated end on end throughout the modelled period.

4.0 REVISIONS TO THE WATER MANAGEMENT STRATEGY AND MODELLING

4.1 REVISED CLOSURE/POST-CLOSURE WATER MANAGEMENT STRATEGY

The water management strategy was revised as part of this update to remove reliance on treatment of mine contact water at the Membrane Water Treatment Plant (WTP) during Post-Closure by discharging water from the mine at rates that vary with the natural hydrograph to meet water quality objectives in the receiving environment. To accomplish this objective, the water management strategy was modified during Late Closure and Post-Closure and represented in the LOM WBM as outlined below. The water management strategy during Early Closure is unchanged from that presented in KP (2022a).

Late Closure:

- Mine site water from the TSF, Environmental Control Dam (ECD), and Upper Waste Stockpile (UWS) stops being directed to the pit lake in Late Closure a few years prior to the pit lake filling to the level that initiates treatment of pit lake water at the Metals WTP. In the previous water management strategy, water was directed for treatment at a Membrane WTP prior to release in Post-Closure. The pit lake continues to fill at a slower rate during the next few years with groundwater inflows and surface water runoff and water directed from the ECD.

- Water collected at the ECD and UWS is directed to the Metals WTP for treatment prior to release downstream at rates that meet water quality objectives. Rates of treatment and release vary with the natural hydrograph. The WTP is specified in the model to have a maximum treatment rate of 155 L/s (up to 5 Mm^3/yr). Water in excess of what can be released downstream during a given month considering the treatment capacity and water quality objectives, is directed to the pit lake to assist in pit lake filling.
- Water discharges from TSF C and TSF D via the closure spillway to the plunge pool. Water from the TSF is also actively managed and directed to the TSF closure spillway to increase streamflow and facilitate discharge of water collected at the ECD.
- The Water Management Pond (WMP) is decommissioned in Late Closure.
- Non-contact water is directed around TSF C and TSF D to the Fresh Water Reservoir (FWR) to the extent possible via the Central Diversion System (CDS) and Northern Diversion System (NDS).
- The FWR and Fresh Water Supply System (FWSS) continue to operate to meet the instream flow needs (IFN) in Davidson Creek. Effluent from the Metals WTP is sent to the FWR along with flows diverted around TSF C and TSF D.

Post-Closure:

- Withdrawal of water from the pit lake for treatment at the Metals WTP maintains the surface water elevation of the lake below the spillway elevation and no discharge from the pit lake occurs. Seepage from the pit lake is assumed to discharge to downstream locations.
- Water collected at the ECD and UWS continues to be treated at the Metals WTP prior to release. Water in excess of the treatment rate during a given month is directed to the pit lake for discharge during a later month and the pit lake water elevation is managed to accept inputs from the ECD as needed.
- Water continues to discharge from TSF C and TSF D via the closure spillway and is actively managed as required to facilitate discharge of water collected at the ECD.
- The FWR and FWSS are decommissioned once IFN and water quality objectives can be met in Post-Closure. Once decommissioned, effluent from the Metals WTP is sent to the plunge pool on Davidson Creek along with flows from the CDS and NDS.

In the version of the model presented herein, the pit lake is not maintained as a groundwater sink during Post-Closure. The strategy for managing the pit lake in Post-Closure in the Application was to manage the pit lake as a groundwater sink by keeping the pit lake water level at or below an elevation of 1,440 masl to prevent seepage from the lake (KP 2022a). The pit lake water quality in Post-Closure is anticipated to be improved without the addition of brine and the target elevation of the pit lake in the LOM WBM was instead specified to be several meters below the pit rim and the model includes pit lake seepage to the receiving environment. The water quality in the pit lake and the requirement to operate the pit lake as a groundwater sink that prevents seepage from the pit lake to the receiving environment can be evaluated in future studies.

In the Application, water from the ECD, pit lake, and UWS was directed in the long-term to the Membrane WTP for treatment prior to release. Make-up water was obtained from the TSF to meet a constant influent rate to the WTP as required (190 L/s; 6 Mm^3/yr). Brine from the Membrane WTP was generated at 25% of the influent rate and sent to the pit lake (1.5 Mm^3).

Updated water management plans for Closure and Post-Closure are presented on the figures in Appendix A. A timeline of water management in Closure and Post-Closure is provided in Table 4.1. Updated flow schematics showing water management in Closure and Post-Closure are presented on Figures 4.1 to 4.3 and flow schematics for all phases of the Mine are provided in Appendix B.

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TABLE 4.1

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LOM WATER BALANCE MODEL
TIMELINE OF WATER MANAGEMENT PLAN IN CLOSURE/POST-CLOSURE MODEL

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Facility	Mine Process and Water Management Activity		Early Closure																				Late Closure			Post-Closure																					
		Mine Year	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
		Year[3]	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091
TSF C	TSF C Pond pumped to Pit Lake																																														
	TSF C Pond pumped to Plunge Pool (for ECD discharge)																																														to Year 89->
	TSF C Pond discharges via Closure Spillway																																														
TSF D	TSF D Pond pumped to TSF C																																														
	TSF D Pond discharges via Closure Spillway																																														
Open Pit	Pit Lake filling to target elevation																																														
	Pit Lake pumped to Metals WTP																																														
Upper Waste Stockpile	Water collected from Stockpile to Open Pit																																														
	Water collected from Stockpile to Metals WTP																																														
ECD	ECD pumped to Pit Lake																																														
	ECD pumped to Metals WTP																																														
WMP	Water Management Pond surplus pumped to FWR																																														
	Water Management Pond To Pit Lake in Winter Months																																														
FWR	Fresh Water Reservoir discharges to Davidson Creek																																														
FWSS	Pumps water from Tatelkuz Lake																																														
Metals WTP	Treat water from ECD and Upper Waste Stockpile																																														
	Treat water from ECD, Upper Waste Stockpile, and Pit Lake																																														
Diversions	Central Diversion System directed to WMP																																														
	Central Diversion System directed to TSF Spillway/Plunge Pool																																														
	Northern Diversion Area directed to Davidson Creek (and TSF as required)																																														

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\2-Tables\[Table - Closure Timeline_model v2h_r0.xlsm]Closure Timeline-Avg

NOTES:

1. THE TIMELINE PRESENTED IS BASED ON THE RESULTS OF AVERAGE CLIMATE INPUTS TO THE LOM WBM.
2. POST CLOSURE BEGINS WHEN THE PIT LAKE REACHES ITS TARGET ELEVATION AND TREATMENT OF PIT LAKE WATER AT THE METALS WTP BEGINS. WATER DISCHARGES FROM THE TSF VIA THE CLOSURE SPILLWAY.
3. MINE YEAR 24 IS EQUAL TO CALENDAR YEAR 2047. CALENDAR YEARS REFLECT ESTIMATES BASED ON THE SCENARIO MODELLED AND MAY VARY DEPENDING ON THE MINE DEVELOPMENT AND WATER MANAGEMENT STRATEGY.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS

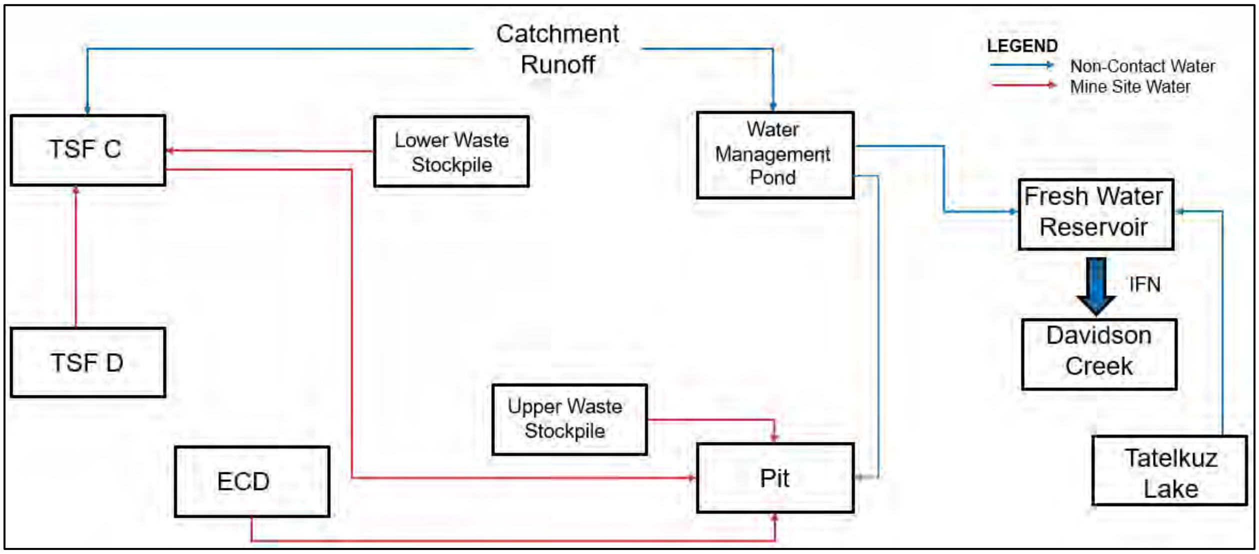


Figure 4.1 Flow Schematic – Early Closure Phase

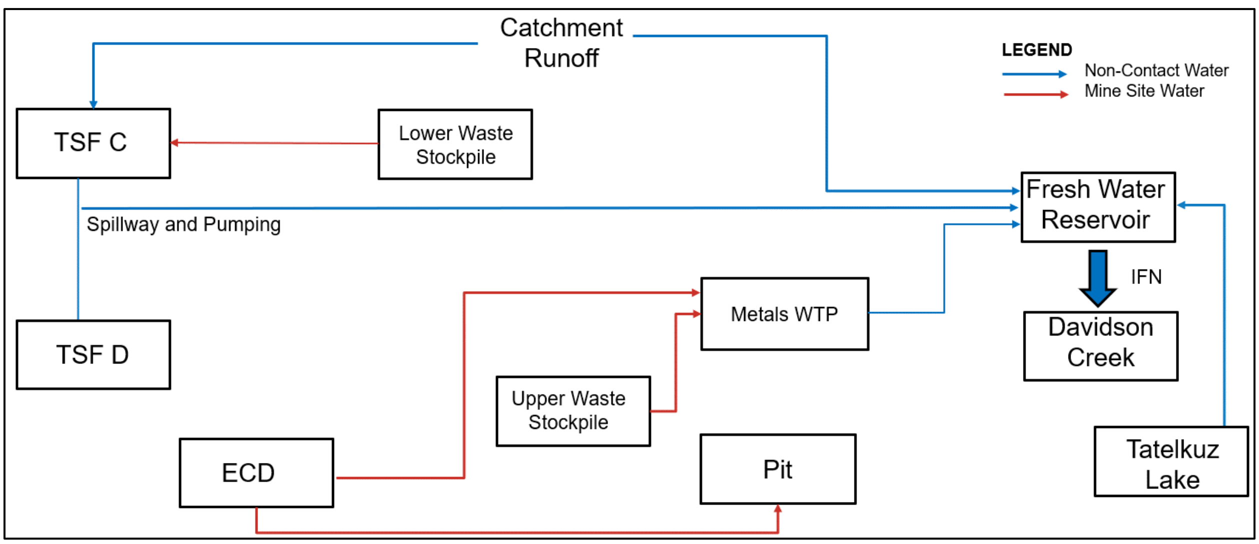
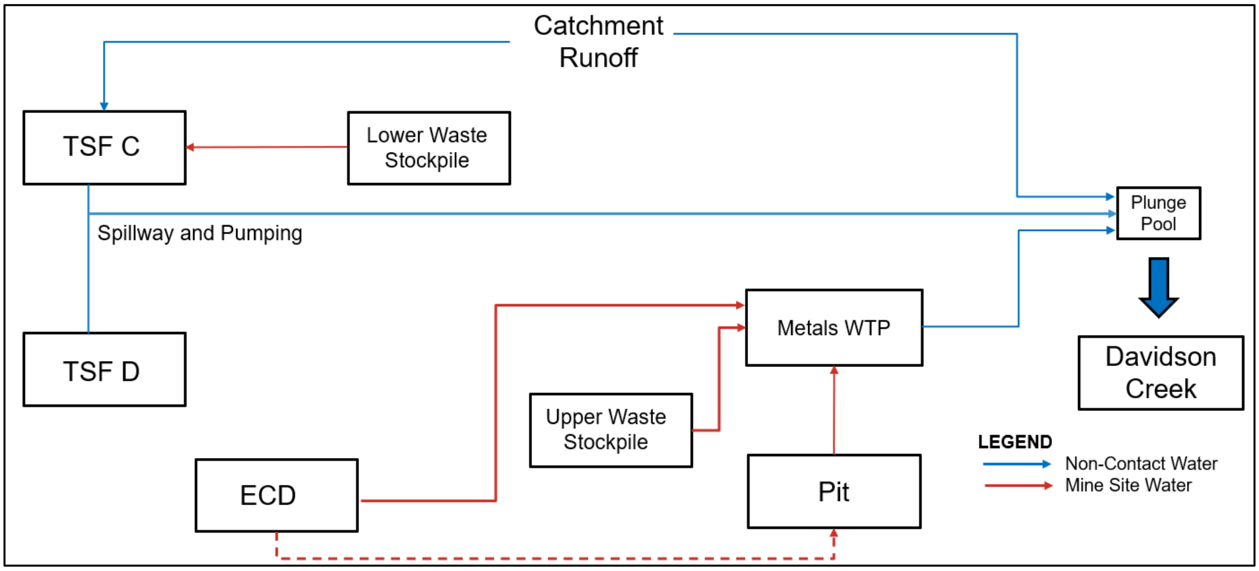


Figure 4.2 Flow Schematic – Late Closure Phase



Note(s):

1. A dashed line indicates the flow path exists intermittently.

Figure 4.3 Flow Schematic – Post-Closure Phase

4.2 WATER BALANCE MODEL REVISIONS

4.2.1 MODELLED SULPHATE CONCENTRATIONS

Predicted concentrations of sulphate in TSF C Pond, ECD, and pit lake water were included in the LOM WBM to allow the monthly volume of mine site water discharge to be estimated in the water balance. The inclusion of sulphate concentrations in the water balance was an iterative process whereby initial flows generated using average climate inputs to the water balance model were provided to Lorax as inputs for developing water quality predictions for a model simulation. The sulphate predictions were then fed back into the LOM WBM to refine the allowable mine site discharge predictions.

The predicted sulphate concentrations incorporated in the water balance model were developed using flows representing average climate inputs. As a result, the representative sulphate concentrations entered into the water balance for each mine facility do not change during wet and dry conditions. This means that the dilution associated with additional runoff generated during wetter conditions is not accounted for in the LOM WBM and the volume of water that can be discharged during wetter conditions is likely underestimated. Sulphate concentrations were incorporated into the water balance model for the purpose of estimating the allowable volume of monthly discharge. The water quality predictions for the modelled scenarios are based on results from the Water Quality Model (Lorax, 2024).

Sulphate concentrations in the TSF C Pond, TSF seepage, and pit lake will decrease as sulphate is discharged from the mine during Closure and Post-Closure. Sulphate concentrations in the TSF C Pond are predicted to decrease rapidly following the end of Operations and are predicted to be less than water quality objectives in all months by mine Year 27. Sulphate concentrations in water collected at the ECD are predicted to be less than water quality objectives in freshet months by Year 67 and in all months by mine Year 108. Sulphate concentrations in the pit lake are predicted to remain above water quality objectives during the period modelled with the LOM WBM. Predicted sulphate concentrations in water at the facilities along with concentrations of other parameters are discussed in the Water Quality Model reporting by Lorax (2024).

4.2.2 REVISIONS TO MODELLED MINE FACILITIES

Additional detail on representing the updated water management strategy at select mine facilities in the LOM WBM is provided below.

Pit Lake

The pit lake receives water from the TSF, ECD, WMP, and UWS during Closure as described in Section 4.1. Water from the TSF, WMP, and UWS is no longer directed to the pit lake starting a few years before the pit lake level reaches the target closure level, which signals the start of Late Closure. Water from the pit lake is then directed to the Metals WTP and Post-Closure starts once the lake level reaches the closure water level.

For modelling purposes, water from the TSF, WMP, and UWS is no longer directed to the pit lake when the pit lake level is 15 m below the pit rim (1,467 masl), and water from the pit lake is directed to the Metals WTP once the modelled pit lake is 10 m below the pit rim (1,472 masl). These elevations assigned in the LOM WBM were selected as a starting basis to allow the feasibility of the Closure/Post Closure water management strategy to be assessed. These water levels will be evaluated in future updates to the water management strategy as discussed in Section 8. The long-term Post-Closure pit lake elevation assigned in the LOM WBM is approximately 30 m higher than the target pit lake elevation specified in the previous water balance model in KP (2022a) that maintains the pit lake as a groundwater sink during Post-Closure.

Seepage from the pit lake to the receiving environment is modelled to start when the pit lake reaches an elevation of 1,467 masl. Consistent with KP (2021a), seepage from the pit lake to the receiving environment is modelled at a rate of 1.2 L/s and is included in the water balance when the Pit Lake reaches an elevation of 1,467 masl. Seepage from the pit lake is predicted to report to TSF C, Creek 505659 (a tributary of Creek 661), the TSF Closure Spillway channel, and Davidson Creek. An engineered french drain (referred to as the Pit Lake Seepage Collection System) could be constructed along the southern tributary of Creek 505659 to capture seepage that discharges toward that tributary and direct it back to the pit lake. Details of how pit lake seepage is incorporated into the LOM WBM are described in Section 4.5 of KP (2021a).

Environmental Control Dam

Water from the ECD is directed to the pit lake during early Closure. Once the pit lake approaches the target lake Closure elevation, water from the ECD is directed to the Metals WTP at rates that allow downstream water quality objectives to be met. Water collected at the ECD in excess of the Metals WTP treatment rate is directed to the pit lake. As described in Section 4.2.1, the volume of water that can be discharged each month is calculated in the LOM WBM using predicted concentrations of sulphate in water collected at the ECD. The volume of water collected at the ECD that can be discharged via the Metal WTP each month increases over time as sulphate concentrations in TSF seepage reporting to the ECD decrease.

The ECD Pond design can hold a water volume of approximately 194,000 m^3. The ECD pond is represented in the LOM WBM with a minimum volume of water and does not temporarily store water from one month to the next.

<u>**Tailings Storage Facility**</u>

Water from the TSF is directed to the pit lake during early Closure. In Late Closure, water from the TSF C Pond is no longer directed to the pit lake and discharges passively via the closure spillway. Water from the TSF C Pond is also actively managed (discharged) as required to increase downstream flows during low flow periods in Late Closure and early Post-Closure to facilitate discharge of water collected at the ECD.

The following logic is incorporated in the LOM WBM to define the strategy for actively discharging water from TSF C Pond:

- Active discharge of water from TSF C Pond can occur if the monthly volume of water collected at the ECD exceeds what can be discharged based on naturally occurring flows downstream and capacity remains at the Metals WTP to treat additional water.
- Water from the TSF C Pond can be actively discharged when the pond volume is greater than 1.5 Mm^3.
- Active discharge of water from TSF C Pond occurs up to an assumed maximum rate of 270 m^3/hr (75 L/s).

The ability to actively discharge water from TSF C Pond is incorporated into the LOM WBM when the above criteria are met during Late Closure through the full duration of the modelled Post-Closure period.

Design criteria for the discharge strategy and infrastructure, such as pump and pipeline capacity, will be refined as the Closure/Post-Closure water management strategy is further developed.

The water management strategy for TSF D is unchanged from KP (2021a).

5.0 SIMULATED MINE SITE WATER MANAGEMENT

5.1 OVERVIEW

The modelling results indicate that water contained or collected at facilities across the site can be managed effectively with the evaluated water management strategy using treatment and discharge of water from a Metals WTP. The water management strategy continues to prioritize directing mine site water to the pit lake for accelerated pit lake filling during Closure. Once the pit lake is near full, mine site water is modelled to discharge to the receiving environment at rates that the modelling indicates will be suitable to meet downstream water quality objectives. Water collected at the ECD that cannot be discharged during a given month is directed to the pit lake for storage and discharge during a later month. The Late Closure and Post-Closure water management strategy prioritizes the following:

- Accelerating pit lake filling by directing contact water from the mine site (collected from the ECD, TSF C, and UWS) to the pit lake once open pit mining ceases.
- Treating water from the ECD, UWS, and pit lake in Late Closure and Post-Closure at a Metals WTP to meet water quality objectives in the downstream receiving environment.
- Diverting non-contact water around the TSF in Post-Closure to Davidson Creek to support IFN.
- Discharging water from TSF C to facilitate discharge from the ECD.

Key results of the water management strategy are discussed below for average and variable climate conditions assessed with the LOM WBM. Tables presenting annual water balances at key mine facilities based on average climate inputs to the LOM WBM are provided in Appendix C. A timeline of the modelled Closure/Post-Closure water management strategy is presented in Table 4.1.

5.2 ENVIRONMENTAL CONTROL DAM (ECD)

The simulated volume of water directed from the ECD to the pit lake and the Metals WTP is shown on Figure 5.1 for average climate inputs to the model. Slightly more than half of the water collected annually at the ECD starts to be directed to the Metals WTP and discharged to the receiving environment in Year 45. Sulphate concentrations in water collected at the ECD are projected to decrease over time (Lorax, 2024), which allows increasingly more water from the ECD to be directed to the Metals WTP during Post-Closure. All water collected at the ECD each year (2.7 Mm^3) is directed to the Metals WTP for discharge in the long-term in the water balance starting in Year 63 with average climate inputs to the model. Months when water continues to be directed from the ECD to the pit lake in the average climate LOM WBM after approximately Year 55 are the lower flow months (i.e., winter and late summer) when active discharge from the TSF is restricted by logic specified in the model. This typically occurs in the model when the TSF C Pond volume is less than the minimum volume specified for discharge (i.e., 1.5 Mm^3) or the maximum rate of discharge from TSF C Pond has already been reached (270 m^3/hr).

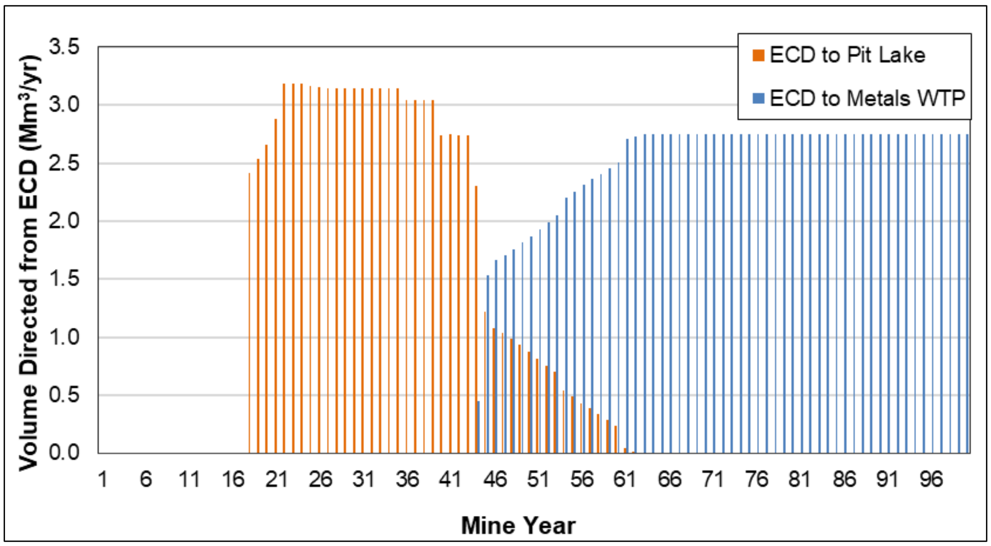
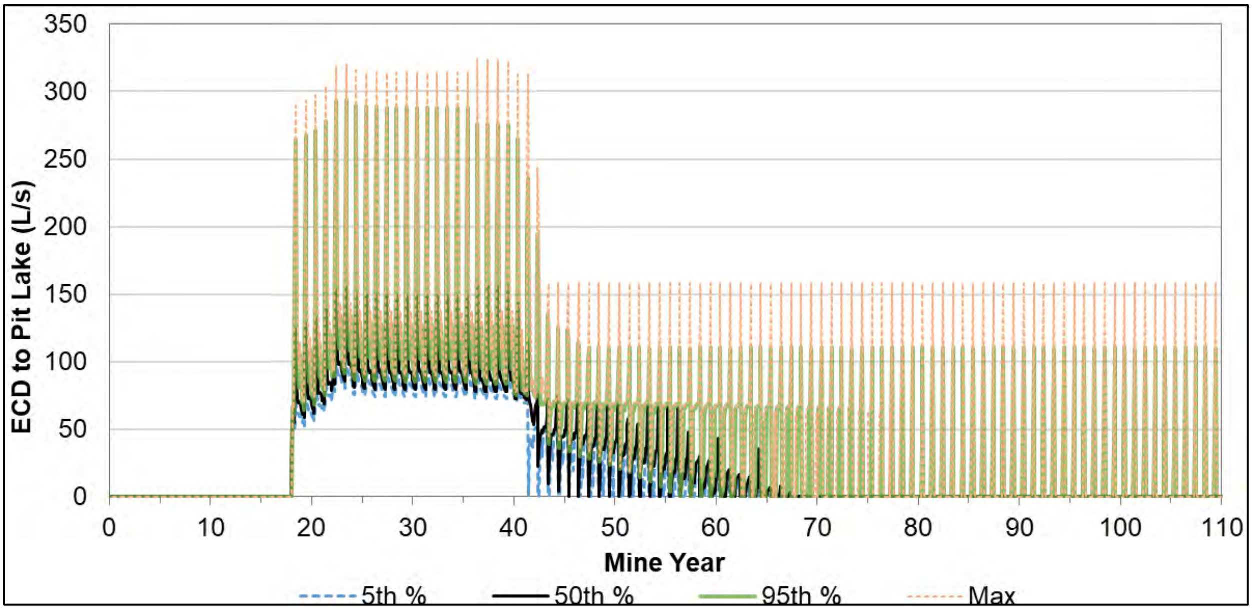


Figure 5.1 Modelled Discharge from ECD (Average Climate)

With variable climate inputs to the LOM WBM, the monthly volume of water collected at the ECD is predicted to exceed the modelled rate of treatment at the Metals WTP during the wetter months. Water in excess of the modelled treatment capacity is directed to the pit lake for storage during those months and is discharged during a later month. The simulated rates that water is directed to the pit lake using variable climate inputs to the water balance are shown on Figure 5.2. The predicted rates are shown for various percentiles and the maximum rate of all 40 iterations of the variable climate model. The maximum modelled flow of 158 L/s in the long-term predictions is generated by one month in the historical climate associated with the highest simulated streamflow (May 2018) as it iteratively cycles through each mine year in the VCC Model.

The ECD Pond can hold a volume of approximately 194,000 m^3; this storage capacity is not currently considered in the model and the ECD is maintained empty each month. If this temporary storage capacity were considered, more than half of the months where water is modelled to go to the pit lake during Post-Closure would instead be expected to be held at the ECD and directed to the Metals WTP in the next month.



Note(s):

1. Water is directed in the WBM from the ECD to the Pit Lake in long-term Post-Closure (later than approximately Year 70) during wetter months when the volume of water collected at the ECD exceeds the modelled maximum treatment rate at the Metals WTP of 155 L/s.

Figure 5.2 Modelled Flows Directed from ECD to Pit Lake (Variable Climate)

5.3 METALS WTP

The Metals WTP is specified to have a treatment rate of up to 155 L/s in the LOM WBM, which is equivalent to an annual treatment capacity of up to approximately 4.9 Mm^3.

Treatment at the Metals WTP is modelled to begin in Late Closure in Year 44 using average climate inputs to the model or between Years 40 and 42 using variable climate inputs to the model. Water from the pit lake begins to be treated at the Metals WTP by Year 47 for all climate scenarios assessed.

The modelled sources of influent to the Metals WTP under average climate inputs to the model are shown on Figure 5.3. The total annual influent volume to the Metals WTP is modelled to be up to approximately 3.9 Mm^3 for average climate conditions when water from the ECD is still being directed to the pit lake. The simulated range in the volume of water treated annually at the Metals WTP with variable climate inputs to the LOM WBM is shown on Figure 5.4. The highest modelled treatment rates at the Metals WTP (4.8 Mm^3) using variable climate inputs occur during years following the two wettest years in the historical climate record (1996 and 2007). During those wetter years, a greater volume of water is directed to the pit lake from the ECD and is subsequently treated and discharged as treatment capacity is available in later months. In the long-term, the average annual volume requiring treatment is predicted to be approximately 3.4 Mm^3 (Figures 5.3 and 5.4).

The predicted range of treatment rates at the Metals WTP using variable climate inputs are shown on Figure 5.5. In the long-term, monthly treatment rates varying between 80 to 155 L/s are predicted to be sufficient to treat water from the ECD and keep the pit lake water level within the target range. The predicted volume of water treated annually for one variable climate iteration developed with climate year 1981 placed in the first year of the model (“Iteration 1981”) is shown on Figure 5.4. As demonstrated by Iteration 1981, the annual volume of water treated at the Metals WTP displays year to year variability, and the Metals WTP is not required to consistently operate at the maximum specified treatment capacity.

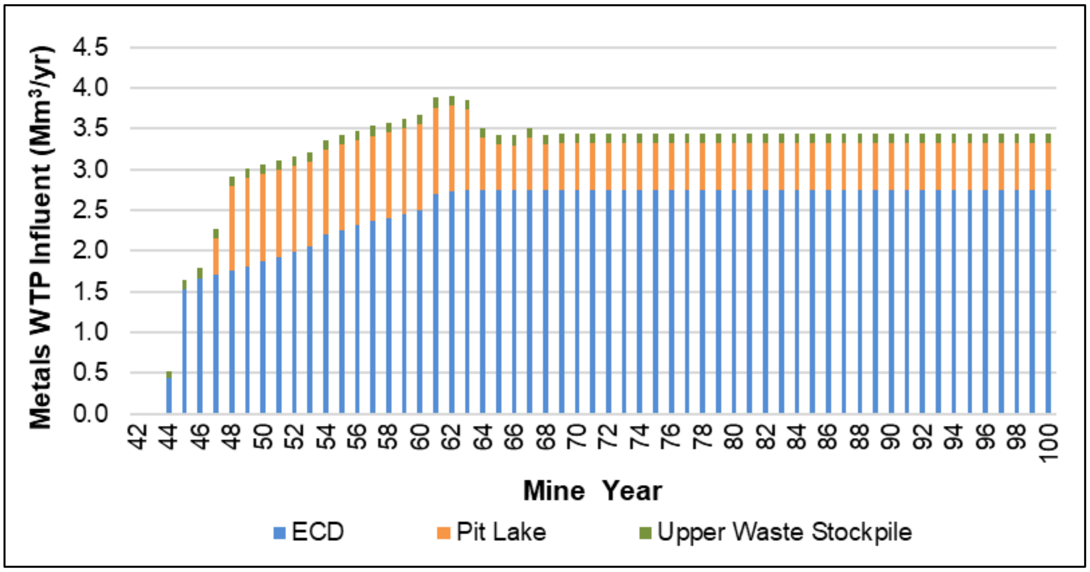
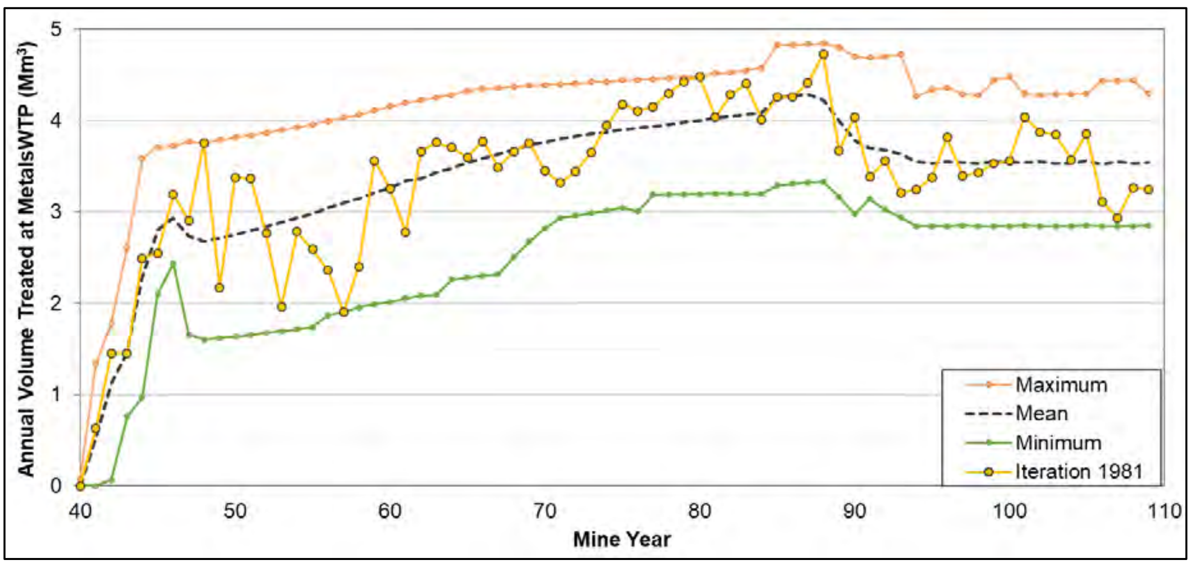


Figure 5.3 Annual Metals WTP Influent Water Sources (Average Climate)



Note(s):

1. Maximum, Mean, and Minimum, values are calculated from annual volumes of water treated at the Metals WTP in the 40 iterations of the VCC Model.
2. "Iteration 1981" represents the predicted annual treatment rates for the single isolated iteration of the VCC Model that assigns climate year 1981 in the first year of the water balance.

Figure 5.4 Metals WTP Annual Influent Volumes (Variable Climate)

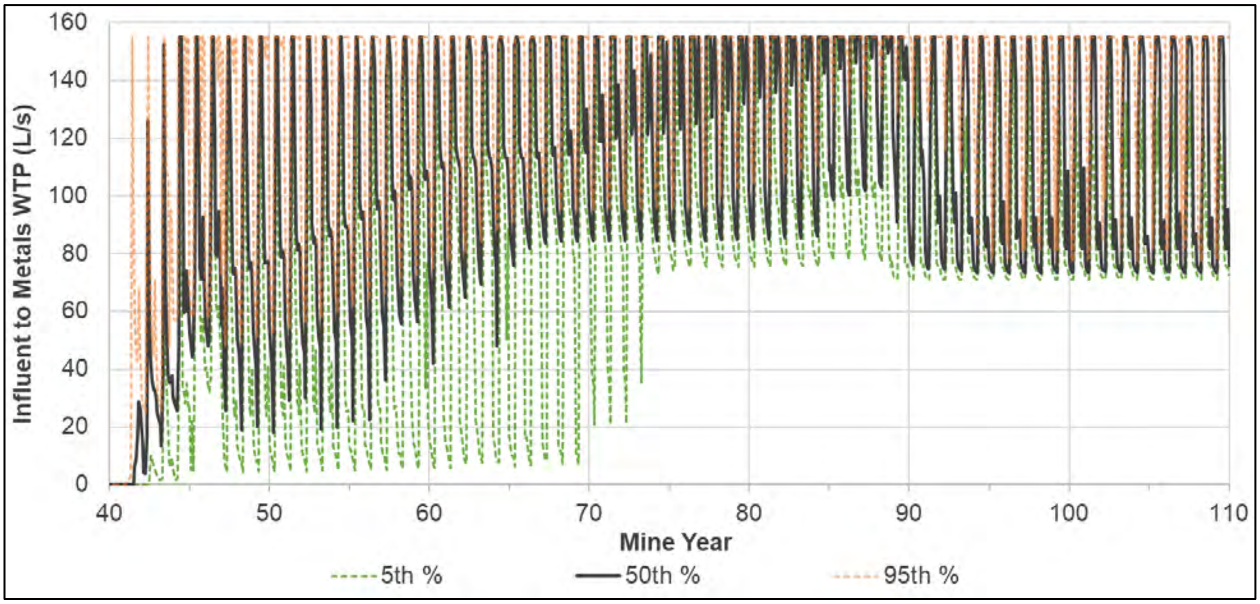
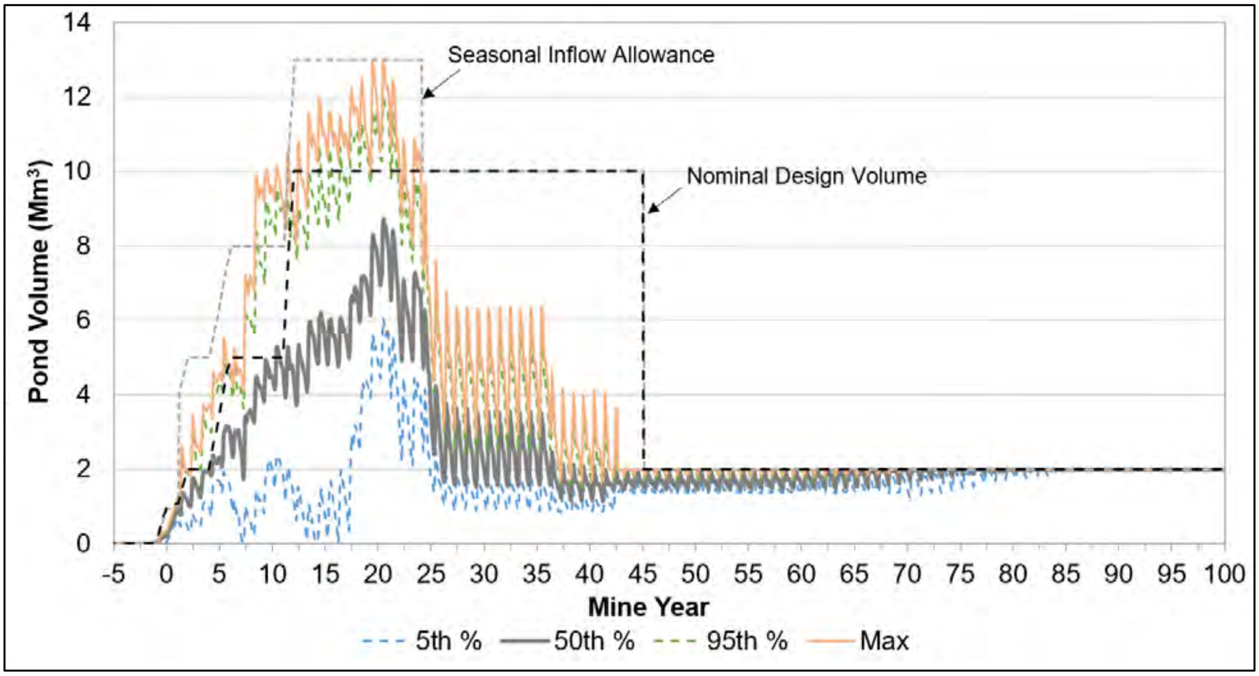


Figure 5.5 Metals WTP Influent Rates (Variable Climate)

5.4 TAILINGS STORAGE FACILITY

The predicted TSF C Pond volume using variable climate inputs to the model is presented on Figure 5.6. The simulated TSF C Pond during Operations through approximately Year 37 is unchanged from earlier modelling (KP, 2021a; 2022a). Water begins to discharge from TSF C via the closure spillway in Year 45 with average climate inputs to the model and as early as Year 41 with variable climate inputs to the model. The TSF C Pond volume is drawn down below the 2 Mm^3 nominal Post-Closure design volume by the active discharge (pumping) of water from the pond to the closure spillway to facilitate discharge of water collected at the ECD. This period of active management of water discharge from the TSF is modelled to continue until Year 90 using average climate inputs and continues until between Year 85 and Year 97 using variable climate inputs.

The predicted TSF D volume is unchanged from KP (2021a).



Note(s):

1. The simulated TSF C Pond volumes in Operations and early Closure are unchanged from earlier modelling (KP, 2021a; 2022a).

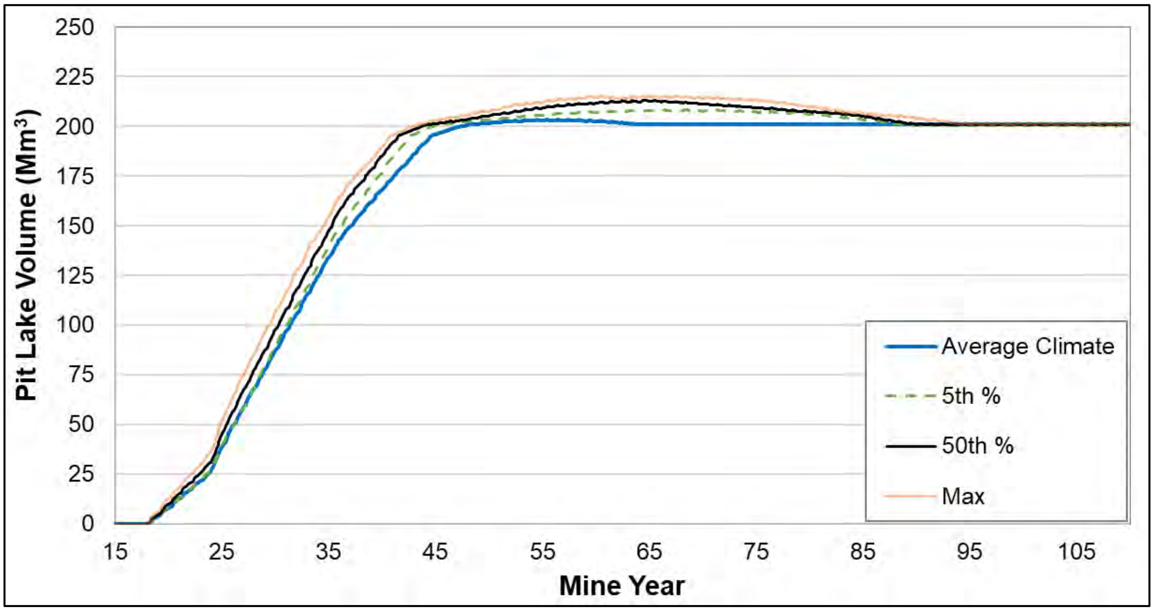
Figure 5.6 TSF C Pond Volume (Variable Climate)

5.5 PIT LAKE

The simulated pit lake volumes using average and variable climate inputs to the LOM WBM are presented on Figure 5.7. The simulated pit lake volume with variable climate inputs is larger than the simulated volume with average climate inputs, which is attributed to the increased volume of water directed to the pit lake during wet conditions. The simulated pit lake volume remains below the pit rim (maximum pit volume is 216 Mm^3) for all model iterations.

As mentioned in Section 4.2.2, the pit lake is not maintained as a groundwater sink in this model version to investigate the predicted water quality in Davison Creek with the inclusion of pit lake seepage in the model. The changes incorporated in the updated Closure and Post-Closure water management strategy, particularly that brine is no longer generated and directed to the pit lake, result in improved pit lake water quality in the long-term compared to the pit lake water quality predictions presented in the Application. As a result, initial modelling suggests the mitigation of maintaining the pit lake as a groundwater sink may not be a needed mitigation to meet water quality objectives in the receiving environment. The actual target level for the pit lake will be designed based on site specific factors and water management considerations as part of detailed Closure planning. Maintaining a lower pit lake water level could be accommodated by discontinuing pumping of water from TSF C to the open pit earlier than modelled.

The pit lake is predicted to reach the specified target elevation that initiates treatment at the Metals WTP in Year 47 under average climate inputs and between Years 42 to 45 with variable climate inputs. The modelled treatment rate is sufficient to maintain the pit lake level below the lowest point of the pit rim in all variable climate model iterations.



Note(s):

1. The maximum Open Pit volume at the pit crest (1,481 masl) is 216 Mm^3.
2. 5th, 50th and Max represent the predicted percentiles and maximum pit lake volume of all 40 iterations of the VCC Model.

Figure 5.7 Pit Lake Volume (Average and Variable Climate)

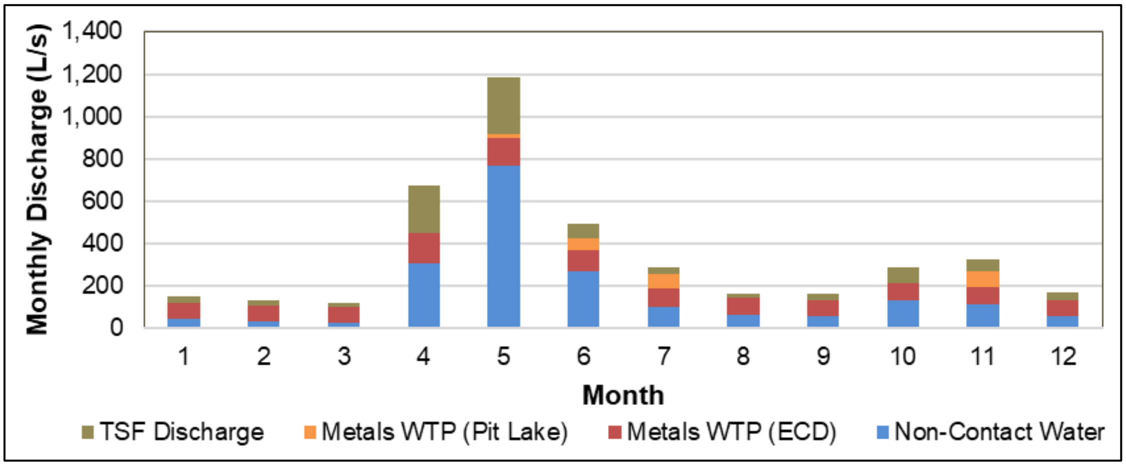
Long-term average annual water contributions to the pit lake total approximately 1.3 Mm^3 in Post-Closure when water from the ECD is no longer directed to the Open Pit. Contributions to the pit lake comprise direct precipitation, runoff from the upgradient catchment, and groundwater inflows at the approximate distribution shown in Table 5.1. The pit lake volume is maintained in equilibrium in the long-term under average climate conditions by pumping 0.6 Mm^3 water annually to the Metals WTP (equivalent to an average annual rate of 20 L/s). A little over half of the water contributing to the pit lake is lost to evaporation annually.

Table 5.1 Long-Term Annual Pit Lake Water Balance (Average Climate)

	Inputs (Mm^3)				Losses (Mm^3)			
Post-Closure	**Pit Wall Runoff**	**Groundwater Inflow**	**Precipitation on Pit Lake**	**Total Inputs**	**Evaporation from Pit Lake**	**To Metals WTP**	**Seepage**	**Total Losses**
Mm^3/yr	0.3	0.2	0.7	1.3	0.7	0.6	0.03	1.3
Percent	24%	18%	57%	-	52%	45%	3%	-

5.6 MINE SITE DISCHARGE

The simulated discharge hydrograph at the plunge pool located at the downstream extent of the mine site is shown on Figure 5.8 for average climate conditions in long-term (steady state) Post-Closure when water collected at the ECD is no longer directed to the pit lake. The sources of water comprising the monthly mine site discharge are shown on Figure 5.8 and summarized on an annual basis in Table 5.2.



Note(s):
1. Monthly results shown for mine Year 100 using average climate inputs to the LOM WBM.

Figure 5.8 Post-Closure Plunge Pool Hydrograph and Water Sources (Average Climate)

Table 5.2 Long-Term Annual Water Balance of Predicted Mine Site Discharge

	Flows Leaving Downstream Extent of Mine (Mm^3)					
Post-Closure	**Non-Contact Water**	**ECD and UWS via Metals WTP**	**Pit Lake via Metals WTP**	**Seepage Contact Water**	**TSF Pond Discharge**	**Total Discharge**
Mm^3/yr	5.2	2.9	0.6	0.1	2.3	11.0
Percent	47%	26%	5%	1%	21%	-

Note(s):
1. The total water treated at the Metals WTP from the ECD and pit lake sums to 3.4 Mm^3.

5.7 RECEIVING ENVIRONMENT STREAMFLOWS

Tables presenting the predicted mean monthly streamflow and predicted percent change in streamflow for each mine phase with average climate inputs are provided in Appendix D. Monthly streamflows in Closure and Post-Closure are unchanged at all nodes along Creek 705 from those presented in previous model iteration KP (2021; 2022a). The predicted average annual change in streamflow is the same as previous estimates presented in KP (2022a) in all phases of mining along Davidson Creek, Creek 661, and Chedakuz Creek, with the exception of Post-Closure flows in Creek 661, where a predicted annual reduction in flow differs by 4% or less than in KP (2022a), and at the upstream most location on Davidson Creek (node H2B), where predicted annual streamflows are consistent with baseline flows and 1% higher than in KP (2022a).

IFN in Davidson Creek are met in Closure by directing non-contact water around the mine site to the downstream environment to the extent practical. Supplemental water is pumped from the FWSS from

Tatelkuz Lake to the FWR as required to maintain a suitable source of freshwater to provide IFN. The FWR and FWSS are decommissioned when water quality and downstream flow criteria (i.e. IFN) can be met.

IFN reported by Palmer Environmental Consulting Group (2021) are summarized on a monthly basis in Table 5.3. The IFN values are to be met in Davidson Creek at the downstream extent of the FWR or the plunge pool; these locations are generally consistent with model node/hydrology station H2B. Flow predictions at model node H2B in baseline conditions are also presented in Table 5.3 as minimum, maximum, and percentile (5th, 50th, 95th) flows calculated from the 40 model iterations of the VCC Model.

The FWSS and FWR are assumed to be decommissioned in the LOM WBM in Year 47 (the start of Post-Closure). Modelled streamflows at that time at model node H2B are less than IFN during late winter months (February and March) and in June when average climate is input to the model; average monthly streamflows during those three months in baseline conditions are also less than IFN (Table 5.3). Sulphate concentrations in water collected at the ECD decrease over time allowing increased water to be discharged from the ECD. Starting in Year 60, June is the only month that IFN is not met at model node H2B in Post-Closure in the long-term under average climate conditions. Predicted June Post-Closure streamflows (491 L/s) are higher than average June baseline flows (472 L/s) but lower than the specified IFN (560 L/s).

Flow predictions at model node H2B for long-term Post-Closure (Year 100) are presented in Table 5.4 for average and variable climate model results. With variable climate inputs to the model, model results suggest the lower range (i.e., 5th percentile) of predicted Post-Closure streamflows at H2B in the months of May though July could be less than IFN, which is consistent with results presented during the Application review phase (KP, 2022b). These simulated Post-Closure flows are similar to or slightly higher than the predicted lower range of flows during the baseline period, which indicates the Post-Closure flows are representative of the range of flows expected in the natural environment during existing (pre-mining) conditions. Modifications to the Post-Closure water management strategy or implementation of mitigations could be considered, if required, if results of ongoing monitoring suggest that Post-Closure streamflows need to be augmented above the natural range of flows observed during the baseline period.

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Table 5.3 Predicted Streamflow at Model Node H2B during Baseline

Month	IFN	Average Climate	Variable Climate				
			Minimum	5th	50th	95th	Maximum
1	80	96	31	35	84	150	167
2	80	78	25	28	68	120	133
3	80	63	19	24	60	100	106
4	115	763	21	27	623	1,376	1,989
5	458	1,476	273	305	1,579	2,782	3,248
6	560	472	135	159	539	1,237	1,879
7	225	209	107	131	248	852	1,614
8	150	143	89	96	158	452	1,039
9	120	118	72	83	139	354	525
10	120	300	59	70	147	867	1,038
11	120	266	47	57	145	377	409
12	80	126	38	45	107	194	215

Note(s):

1. Average Climate flows calculated using average climate inputs to the LOM WBM.
2. Minimum, maximum and percentile flows calculated using the 40 iterations of the VCC Model during Baseline conditions.
3. Simulated flows highlighted red are less than the monthly IFN.

Table 5.4 Predicted Streamflow at Model Node H2B during Post-Closure Year 100

Month	IFN	Average Climate	Variable Climate				
			Minimum	5th	50th	95th	Maximum
1	80	144	92	97	131	204	237
2	80	128	87	92	117	166	233
3	80	117	87	87	114	146	159
4	115	675	116	119	528	1,137	1,617
5	458	1,184	299	344	1,292	2,392	2,846
6	560	491	209	253	530	1,100	1,479
7	225	284	185	207	287	723	1,286
8	150	161	152	159	220	400	841
9	120	160	122	127	205	342	433
10	120	362	125	132	215	716	850
11	120	246	110	143	226	410	441
12	80	168	98	104	157	285	312

Note(s):

1. Average Climate flows calculated using average climate inputs to the LOM WBM.
2. Minimum, maximum and percentile flows calculated using the 40 iterations of the VCC Model during Year 100 (Post-Closure).
3. Simulated flows highlighted red are less than the monthly IFN.

6.0 CLIMATE CHANGE

The objective of this water balance model scenario was to assess the feasibility of the Closure and Post-Closure water management strategy. Developing a water balance model sensitivity to assess the influence of climate change was outside the scope of the work.

Predicted future climate conditions for the Mine were assessed in the *2020 Hydrometeorology Report* (KP, 2021c). For a climate change scenario that represents greenhouse gas emissions scenario RCP 4.5, mean temperature at the Mine was predicted to increase by up to 1.8°C seasonally by the 2050s and mean seasonal precipitation was predicted to increase by 0.7% in the summer and up to 9.2% in the fall. By the 2080s, seasonal temperatures could increase up to 2.8°C and seasonal precipitation could increase by 0.7% in the summer and up to 13% in the fall.

Monthly flows for a climate change scenario were assessed using the LOM WBM submitted in the Application (KP, 2021a). The future predicted climate using RCP4.5 for the 2050s resulted in a net increase in annual streamflows of 6 to 10% in Davidson Creek relative to the base case simulation and predicted changes to the hydrograph as follows:

- Freshet was predicted to occur one month earlier in the modelled climate change scenario compared to the base case and was associated with higher streamflows in the future relative to current conditions. Increased fall rains were predicted to result in increased fall flows. Winter low flows were generally predicted to be the same as the base case or decrease slightly in higher elevation sub-catchments and were predicted to increase in lower elevation sub-catchments. Late summer streamflows were generally predicted to decrease.
- The pit lake water level was predicted to reach its target elevation and initiate Post-Closure approximately two years earlier in the climate change scenario than in the base case LOM WBM.

Climate change is anticipated to have a similar influence on the updated Closure/Post-Closure water management strategy as the changes described above by shortening the time it takes for the pit lake to fill to the target water level if water continues to be managed as modelled. Discontinuing the pumping of TSF water to the pit lake sooner than modelled or decreasing the amount of non-contact runoff that is directed to the pit lake in Closure would decrease the volume of water sent to the pit lake and slow the filling time if warranted. Higher flows during freshet could result in a greater volume of water reporting to the ECD over a shorter period of time. The maximum treatment rate of the Metals WTP in Closure should be evaluated as the water management strategy is further developed to confirm the rate is suitable for long-term management of the expected range of flows.

The Closure/Post-Closure water management strategy presented herein is anticipated to be feasible when considering the influence of a future climate.

7.0 SUMMARY

The water balance model scenario presented in this letter was completed to meet requirements specified in the Mines Act permit (M-246) in Condition C.5.(g).(i).(b), which include demonstrating the feasibility of the Closure and Post-Closure water management approach using dilution to treat sulphate in discharge from the mine site. The water management strategy developed as part of this work demonstrates that water contained or collected at facilities across the mine site in Closure and Post-Closure can be effectively managed and discharged using treatment at a Metals WTP. The water management strategy no longer relies on a Membrane WTP in Post-Closure to manage discharge of mine site water and therefore no brine (retentate) would be generated that requires long-term management.

Key changes to water management that are incorporated in this Closure and Post-Closure water management strategy include:

- Water from the ECD, pit lake, and UWS is treated at a Metals WTP prior to discharge. Water is directed downstream at rates that meet water quality objectives in the downstream environment. Water is actively discharged from the TSF to facilitate discharge of water from the ECD.
- Water collected at the ECD in excess of what can be discharged during the month is directed to the pit lake for discharge in a later month. Water in the pit lake is treated as capacity remains at the Metals WTP.
- A Membrane WTP is no longer required and brine (retentate) is not generated.

The water management strategy was assessed using average climate inputs and variable climate inputs from a 40-year historical climate record. The modelled rate of treatment at the Metals WTP of 155 L/s provided sufficient capacity to manage the mine site water through Closure and Post-Closure and maintain the pit volume below the pit rim elevation under all climate scenarios assessed. Based on the water management scenario modelled, and depending on the climate inputs to the model, water from the ECD, TSF C, and UWS are directed to the pit lake until between Year 40 to 44 and treated water from the mine site begins to be discharged via a Metals WTP. The pit lake continues to fill and treatment of water at the pit lake begins, initiating Post-Closure, in approximately Year 41 to 47 depending on the climate inputs to the model. The period of active management of water discharge from the TSF is modelled to continue until between Year 85 and 97.

The results of this water balance model scenario form the basis for the water management strategy presented in the *Closure and Post-Closure Water Management Plan* (BW Gold, 2024). Flows generated with the LOM WBM were provided to Lorax to input to the Water Quality Model to develop water quality predictions (Lorax, 2024). Modelled attainment of water quality objectives in the receiving environment demonstrates the feasibility of the water management strategy developed herein (Lorax, 2024).

8.0 RECOMMENDATIONS

Recommendations for future work to advance the Closure and Post-Closure water management strategy include:

- Evaluate priority between accelerated pit lake filling and maintaining storage volume in the pit lake to direct water from the ECD to the pit lake for storage, if required. The model scenario represented herein prioritizes pit lake filling and all water from the TSF, including water that flows onto the facility from the upslope diverted area, is directed to the pit lake up to a few years before the lake level reaches the target closure water elevation.
- Evaluate the quality of pit lake seepage and reassess the final target pit lake water level in Post-Closure to determine if the pit lake should be managed as a groundwater sink to prevent seepage.
- Conduct a climate change sensitivity to confirm the Closure/Post-Closure water management strategy is robust under the influence of potential future changes.
- Future refinements to the LOM WBM:
    - Calculate the monthly sulphate concentration in water collected at the ECD using separate concentrations for non-contact runoff and TSF seepage entered into the LOM WBM. Monthly sulphate concentrations in water collected at the ECD are input to the model based on average

climate conditions and do not vary during wet or dry conditions. As a result, the volume of water that is directed from the ECD to the pit lake is likely overestimated.

- The ECD pond can hold a volume of approximately 194,000 m^3; this storage capacity is not currently considered in the variable climate water balance model and the ECD is instead maintained empty each month. When this temporary storage capacity is considered, water that is modelled to go to the pit lake in Post-Closure could instead be held in the ECD and directed to the Metals WTP during the next month.

9.0 CLOSING

We trust that the information in this letter satisfies your requirements at this time. Please do not hesitate to contact the undersigned should you have any questions or require any clarification.

Yours truly,
Knight Piésold Ltd.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA Dr. C. A. STARZYK # 39753 2024-09-04

Prepared: Cindy Starzyk, Ph.D., P.Eng.
Specialist Hydrogeological Engineer
Associate

Reviewed: Daniel Fontaine, P.Eng.
Specialist Engineer | Associate

KNIGHT PIÉSOLD LTD.
PERMIT NUMBER
1001011
EGBC PERMIT TO PRACTICE

Approval that this document adheres to the Knight Piésold Quality System: CAS

Attachments:

Appendix A	Water Management Plans (Closure and Post-Closure)
Appendix B	Water Management Flow Schematics
Appendix C	Estimated Annual Water Balances
Appendix D	Estimated Average Monthly Streamflows and Change in Flow During Life of Mine

References:

BQE Water, 2022. Memorandum: Blackwater Pit Lake Long Term Brine Management. Prepared for BW Gold. Ltd. September 15, 2022. Document 2.39 of the Joint Application Technical Review.

BW Gold Ltd., 2024. Closure and Post-Closure Water Management Plan. Dated September 2024.

Knight Piésold Ltd. (KP), 2021a. Blackwater Gold Project – Life of Mine Water Balance Model Report. Vancouver, BC. Ref. No. VA101-457/33-1, Rev 1. November 24, 2021. Appendix 5-B of the Joint Mines Act/Environmental Management Act Permits Application.

Knight Piésold Ltd. (KP), 2021b. Blackwater Gold Project – 2020 Hydrometeorology Report. Vancouver, BC. Ref. No. VA101-457/33-8, Rev 1. May 17, 2021. Appendix 2-B of the Joint Mines Act/Environmental Management Act Permits Application.

Knight Piésold Ltd. (KP), 2021c. Re: Blackwater Gold Project – 2020 Baseline Watershed Model Report. Vancouver, BC. Ref. No VA21-00074. September 7, 2021.

Knight Piésold Ltd. (KP), 2022a. Re: Blackwater Gold Project – Updated Water Balance Modelling in Support of Closure/Post-Closure Water Quality Optimization Ref. No. VA22-01082. June 29, 2022.

Knight Piésold Ltd. (KP), 2022b. Re: Issue Tracking Table IDs 498, 506 & 583 – IFN at Water Balance Model nodes H2B and 15-CC. Ref. No. VA22-01184. June 30, 2022.

Lorax Environmental Services Ltd. (Lorax), 2022. Technical Memorandum: Response to Round 3 Comment 411(c). Prepared for BW Gold Ltd. October 10, 2022. Document 2.38 of the Joint Application Technical Review.

Lorax Environmental Services Ltd. (Lorax), 2024. Water Balance/Water Quality Model Update for Blackwater Gold Mine Brine Management Work Plan. Dated September 2024.

Palmer Environmental Consulting Group (Palmer), 2021. Re: Blackwater Fisheries Offsetting Plan: Instream flow needs for Davidson Creek. Vancouver, BC. Project # 2006501, dated August 18, 2021.

Copy To: Ryan Todd, Alexandra Gresiuk, Karen Halwas

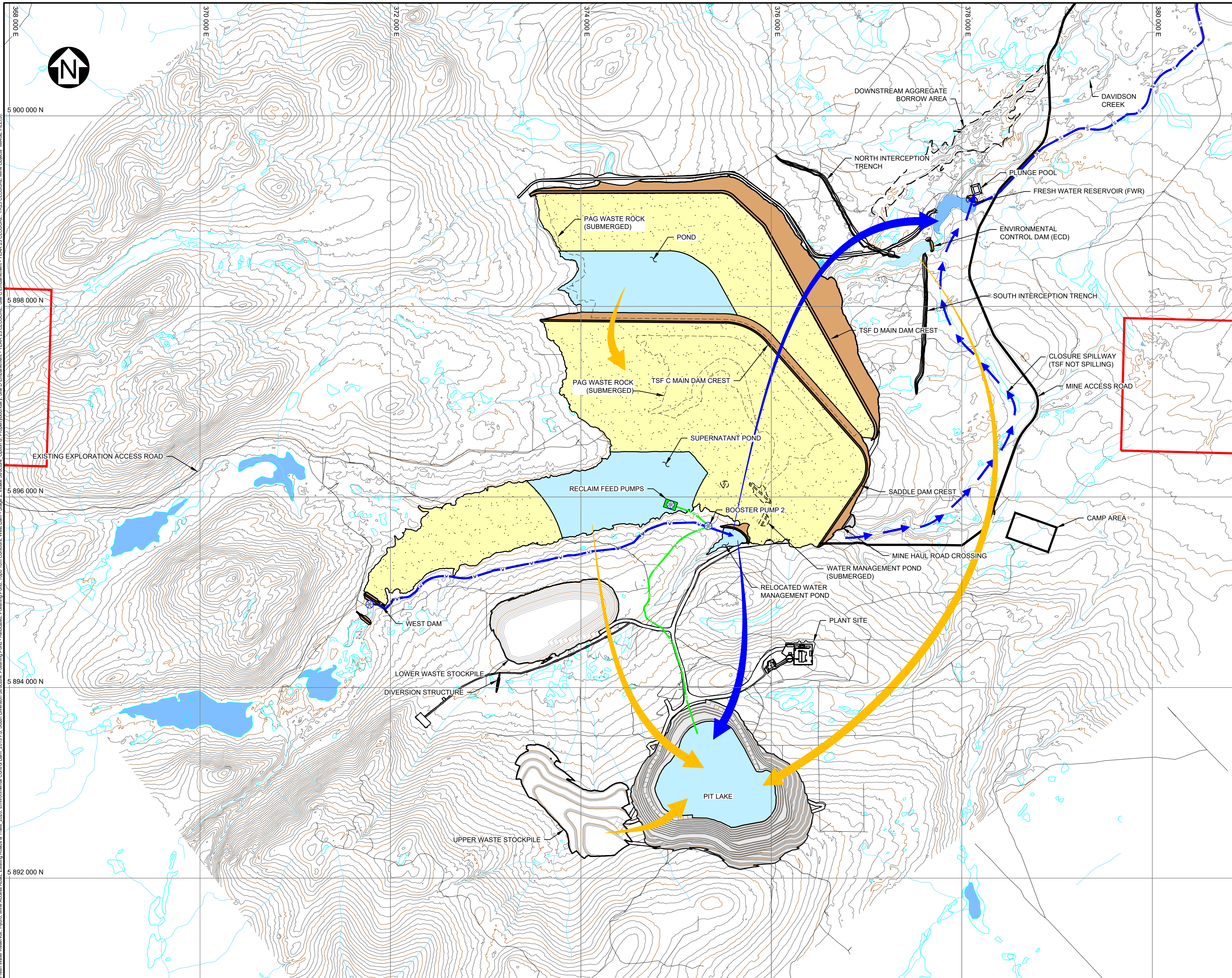
/cas

Knight Piésold CONSULTING

APPENDIX A

Water Management Plans (Closure and Post-Closure)

(Figures A.1 to A.3)



PLAN
SCALE A

LEGEND:

- TAILINGS BEACH
- MINE WATER
- FRESH WATER
- EMBANKMENT FILL
- PUMP STATION
- MINE ACCESS ROAD
- EXISTING ACCESS TRAILS
- PROPERTY BOUNDARY
- FRESH WATER SUPPLY SYSTEM PIPELINE
- WATER DIVERSION PIPELINE
- TSF C RECLAIM PIPELINE
- SPILLWAY
- FRESH WATER
- SITE WATER

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10U.
2. CONTOUR INTERVAL IS 10 METRES.
3. ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. WATER PUMPED FROM THE WATER MANAGEMENT POND TO THE PIT LAKE FROM AUGUST THROUGH MARCH AND TO THE FRESH WATER RESERVOIR IN REMAINING MONTHS.

FOR INFORMATION ONLY

SCALE A: 400 200 0 400 800 1200 1600 2000 m

BW GOLD LTD.

BLACKWATER MINE

WATER MANAGEMENT PLAN EARLY CLOSURE

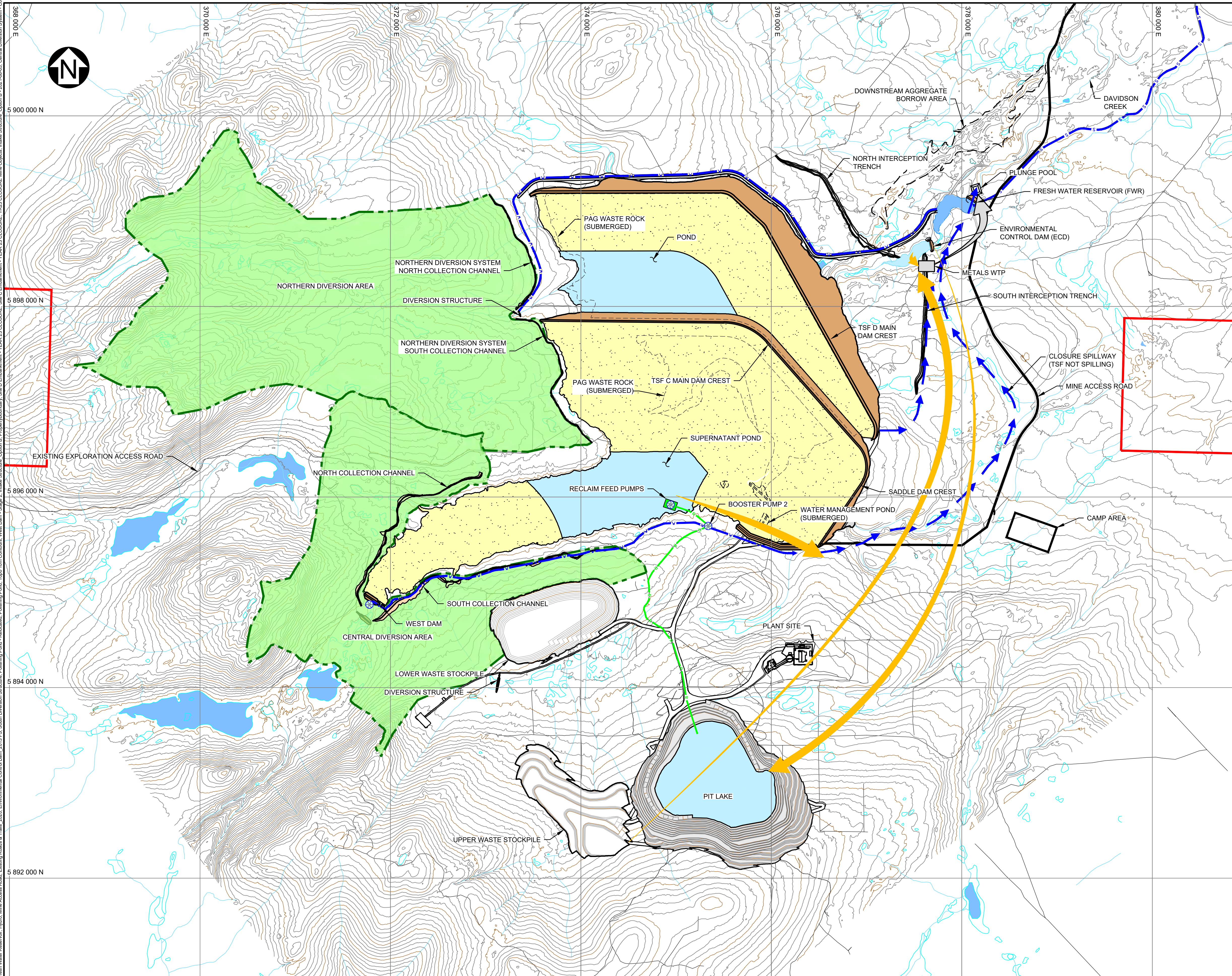
Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/39	VA23-01383

FIGURE A.1 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04SEP'24	ISSUED WITH LETTER	CAS	EL	CAS

SAVED: \\KPL\VA-Prj$\1\01\00457\39\A\Acad\FIGS\B18, 9/4/2024 8:08:58 AM , ELEE PRINTED: 9/4/2024 8:09:06 AM, FIG A.1, ELEE ACAD VERSION: 24.1S (LMS TECH)



PLAN
SCALE A

LEGEND:

- TAILINGS BEACH
- MINE WATER
- FRESH WATER
- EMBANKMENT FILL
- DIVERSION AREA
- PUMP STATION
- MINE ACCESS ROAD
- EXISTING ACCESS TRAILS
- PROPERTY BOUNDARY
- FRESH WATER SUPPLY SYSTEM PIPELINE
- WATER DIVERSION PIPELINE
- TSF C RECLAIM PIPELINE
- SPILLWAY
- SITE WATER
- TREATED WATER

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10U.
2. CONTOUR INTERVAL IS 10 METRES.
3. ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. WATER FROM THE ENVIRONMENTAL CONTROL DAM DIRECTED TO THE METALS WATER TREATMENT PLANT PRIOR TO DISCHARGE OR PUMPED TO THE PIT LAKE AS REQUIRED.

FOR INFORMATION ONLY

400 200 0 400 800 1200 1600 2000 m
SCALE A

BW GOLD LTD.

BLACKWATER MINE

WATER MANAGEMENT PLAN
LATE CLOSURE

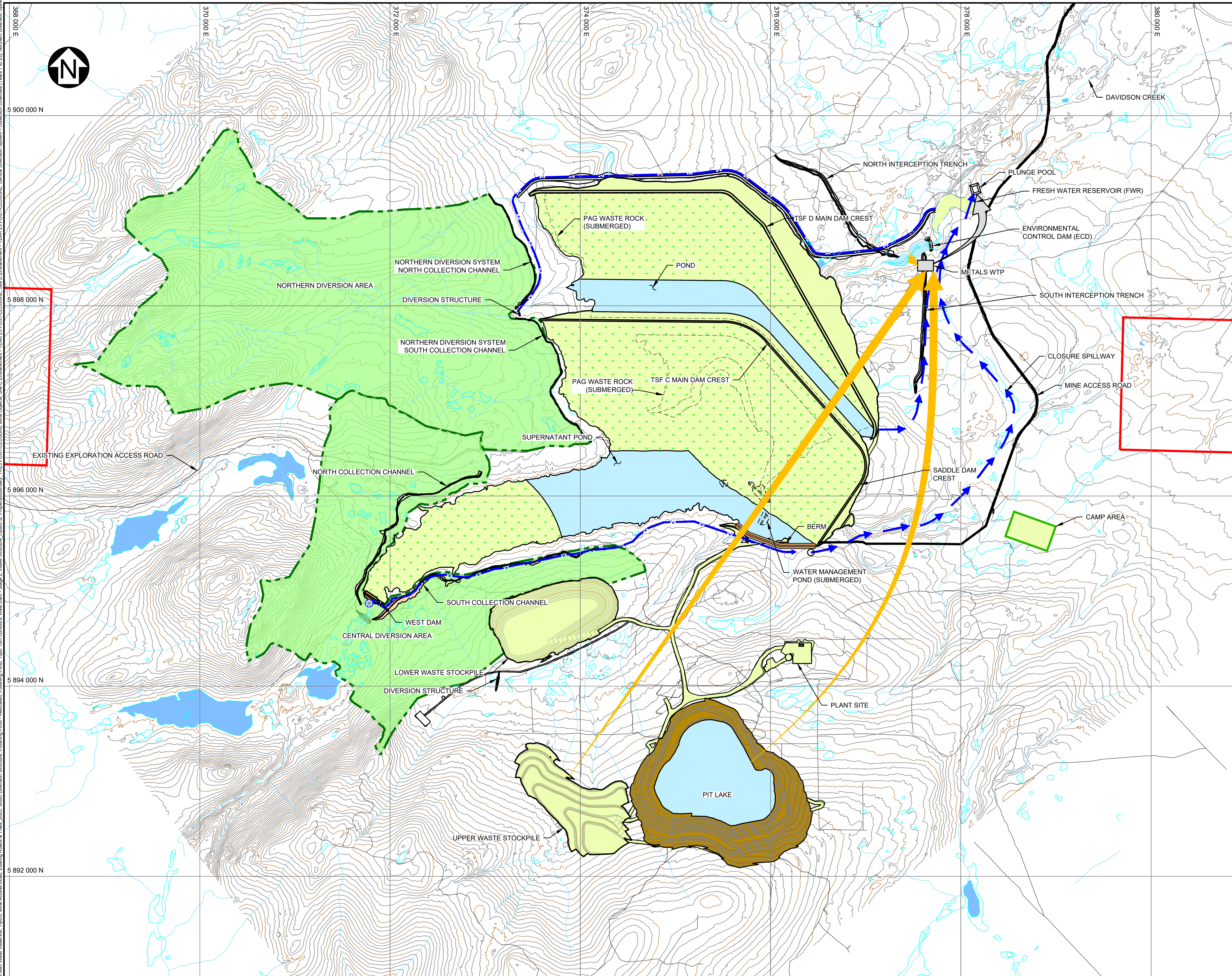
Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/39	VA23-01383

FIGURE A.2 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04SEP'24	ISSUED WITH LETTER	CAS	EL	CAS

SAVED: \\KPL\VA-Prj$\1\01\00457\39\A\Acad\FIGS\B20, 9/3/2024 4:40:18 PM, ELEE PRINTED: 9/4/2024 7:27:04 AM, FIG A.2, ELEE ACAD VERSION: 24.1S (LMS TECH)



LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- MINE WATER
- FRESH WATER
- ROCK SLOPES
- DIVERSION AREA
- PUMP STATION
- MINE ACCESS ROAD
- EXISTING ACCESS TRAILS
- PROPERTY BOUNDARY
- WATER DIVERSION PIPELINE
- SPILLWAY
- SITE WATER
- TREATED WATER

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10U.
2. CONTOUR INTERVAL IS 10 METRES.
3. ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. LOCATION OF WATER TREATMENT PLANT (WTP) IS APPROXIMATE.

FOR INFORMATION ONLY

SCALE A 400 200 0 400 800 1200 1600 2000 m

PLAN
SCALE A

BW GOLD LTD.

BLACKWATER MINE

WATER MANAGEMENT PLAN
POST-CLOSURE

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/39	VA23-01383

FIGURE A.3 REV 0

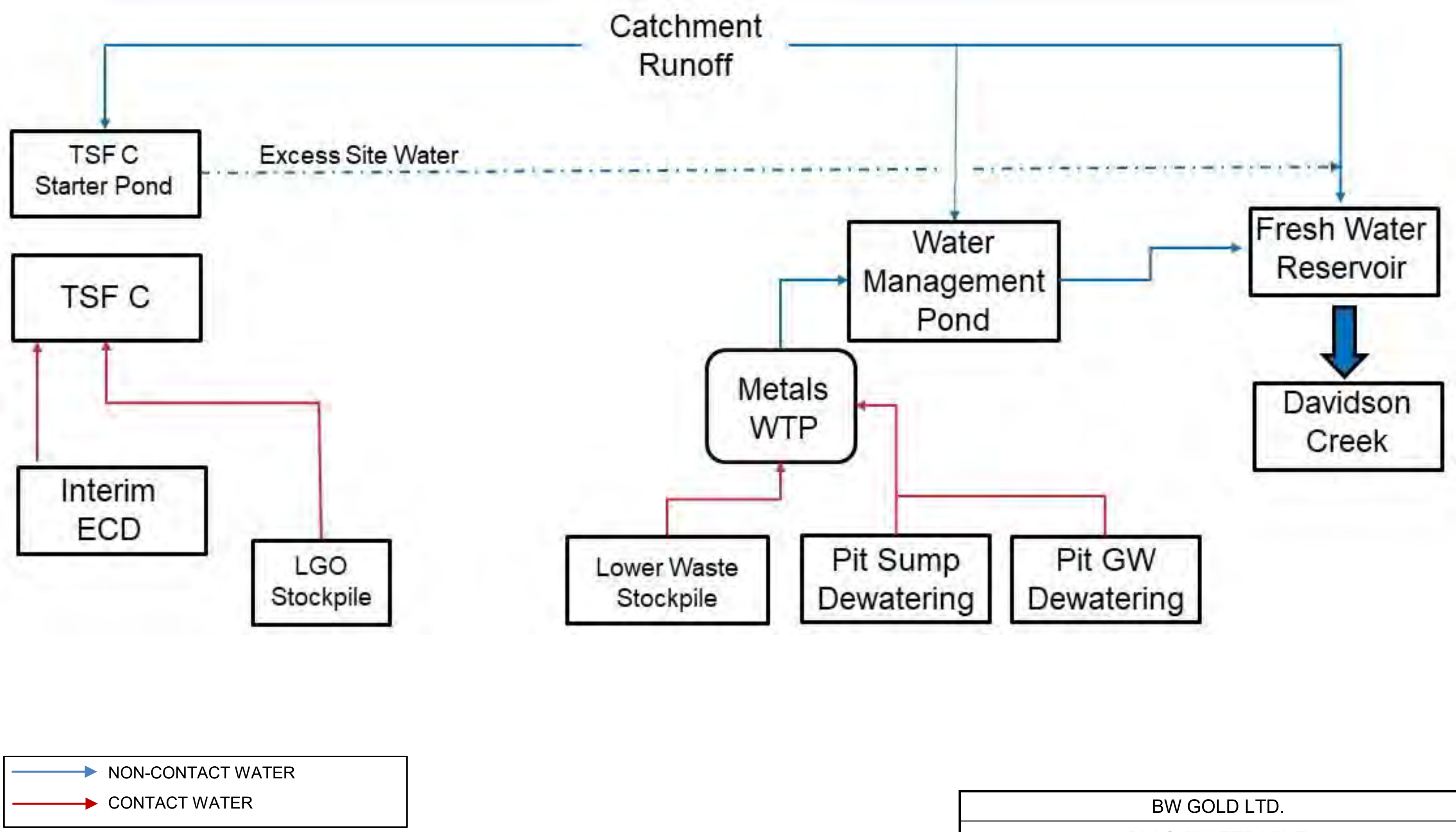
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04SEP'24	ISSUED WITH LETTER	CAS	EL	CAS

SAVED: \\KPL\VA-Prj$\1\01\00457\39\A\Acad\FIGS\B19, 9/3/2024 4:39:12 PM , ELEE PRINTED: 9/4/2024 7:25:08 AM, FIG A.3, ELEE ACAD VERSION: 24.1S (LMS TECH)

APPENDIX B

Water Management Flow Schematics

(Figures B1 to B8)



BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
CONSTRUCTION YEAR -1

Knight Piésold CONSULTING

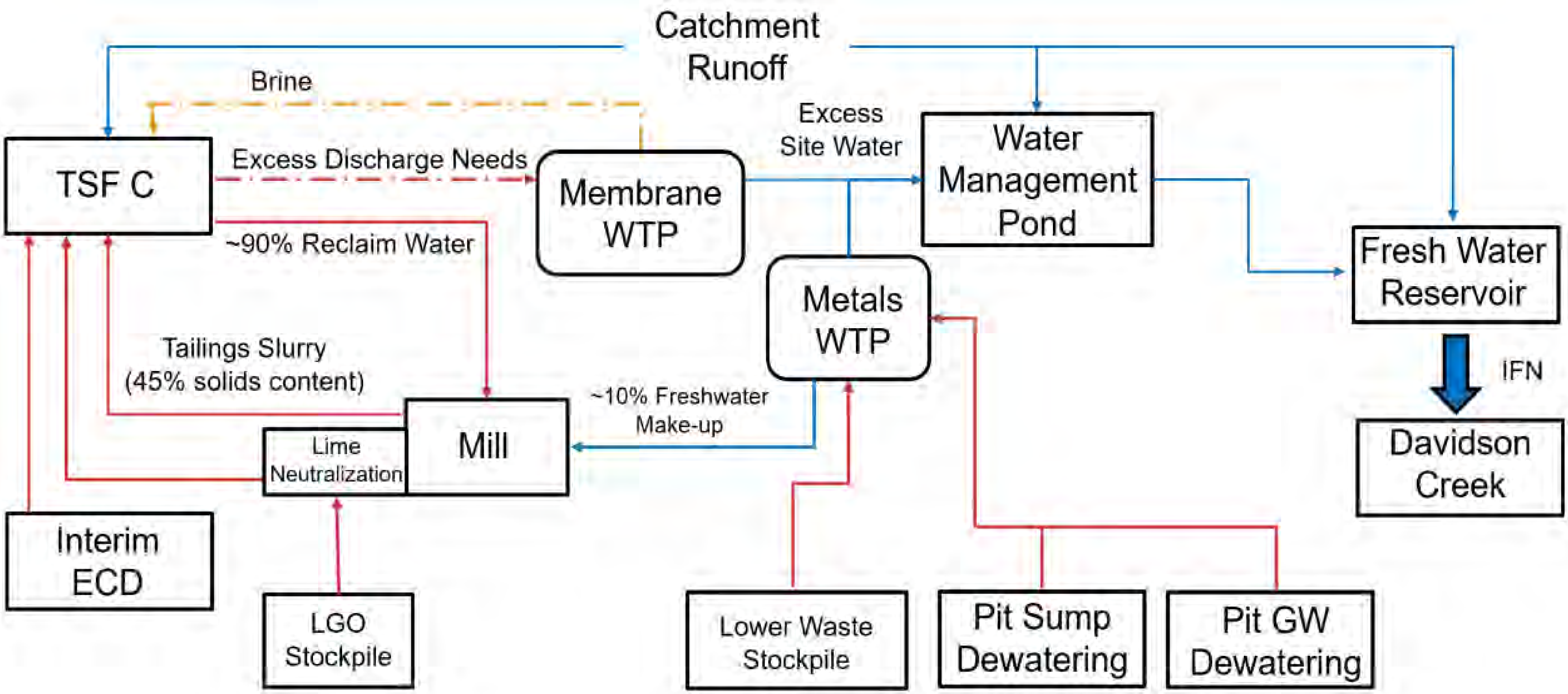
P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B1

REV 0

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	11JAN'24	ISSUED WITH LETTER	MCW	CAS



NON-CONTACT WATER
CONTACT WATER
BRINE FROM MEMBRANE WTP

BW GOLD LTD.

BLACKWATER MINE

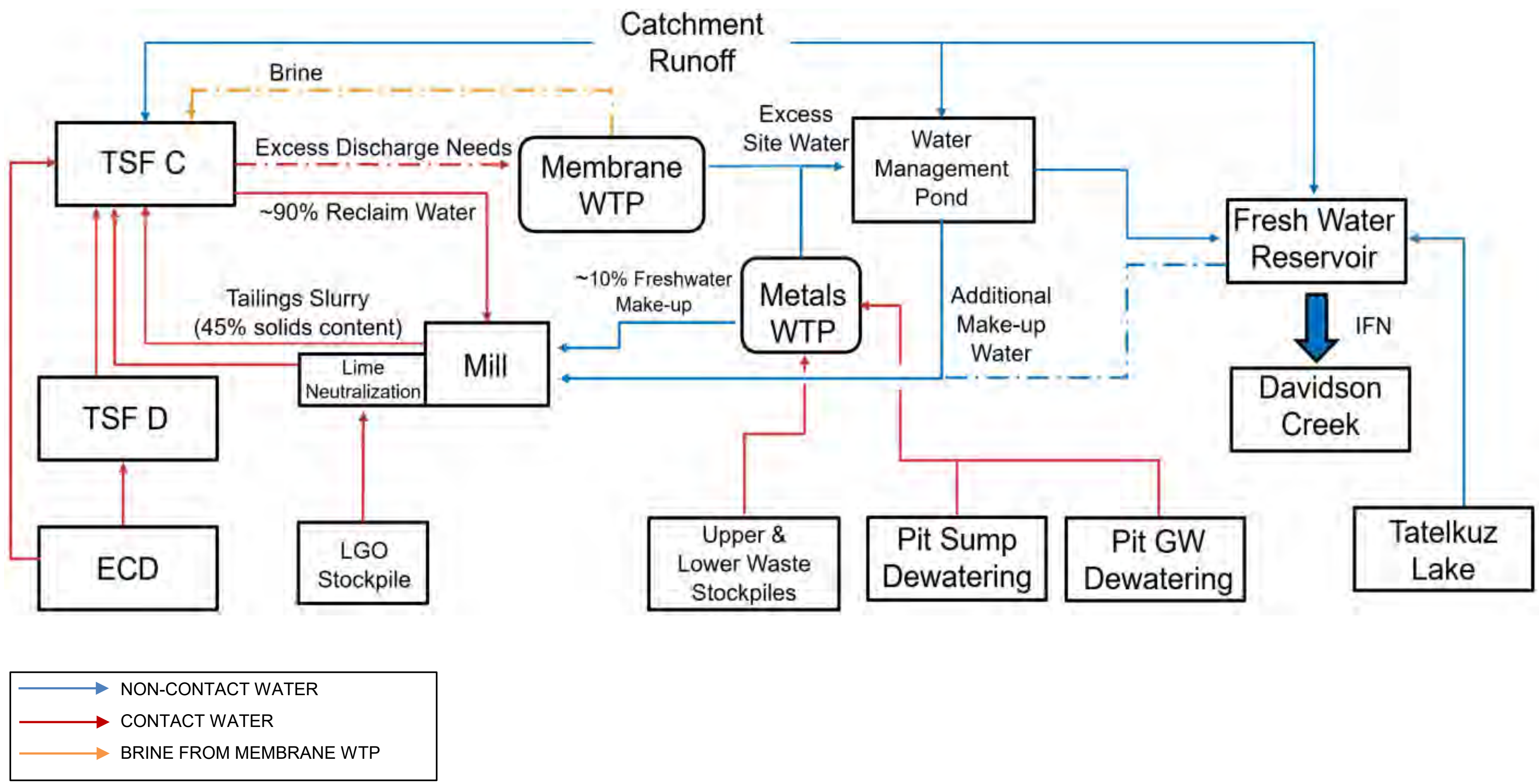
SIMPLIFIED FLOW SCHEMATIC
OPERATIONS YEAR 1 TO 6

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA/101-457/39	VA23-01383

FIGURE B2 REV 0

0	11JAN'24	ISSUED WITH LETTER	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D



NOTES:

1. MATERIAL STARTS TO BE PLACED IN THE UPPER WASTE STOCKPILE IN YEAR 11.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	11JAN'24	ISSUED WITH LETTER	MCW	CAS

BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
OPERATIONS YEAR 7 TO 17

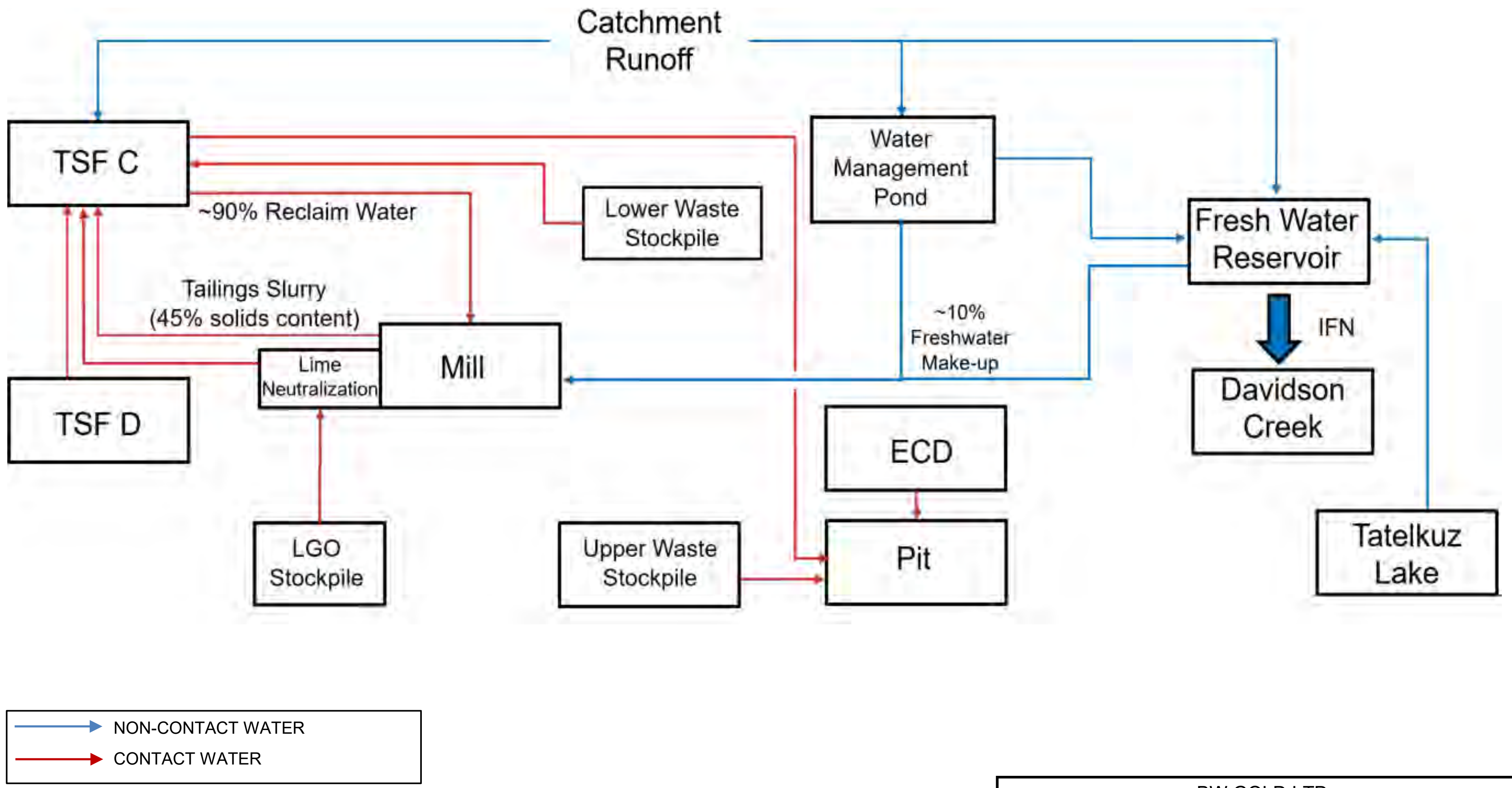
Knight Piésold CONSULTING

P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B3

REV 0



BW GOLD LTD.

BLACKWATER MINE

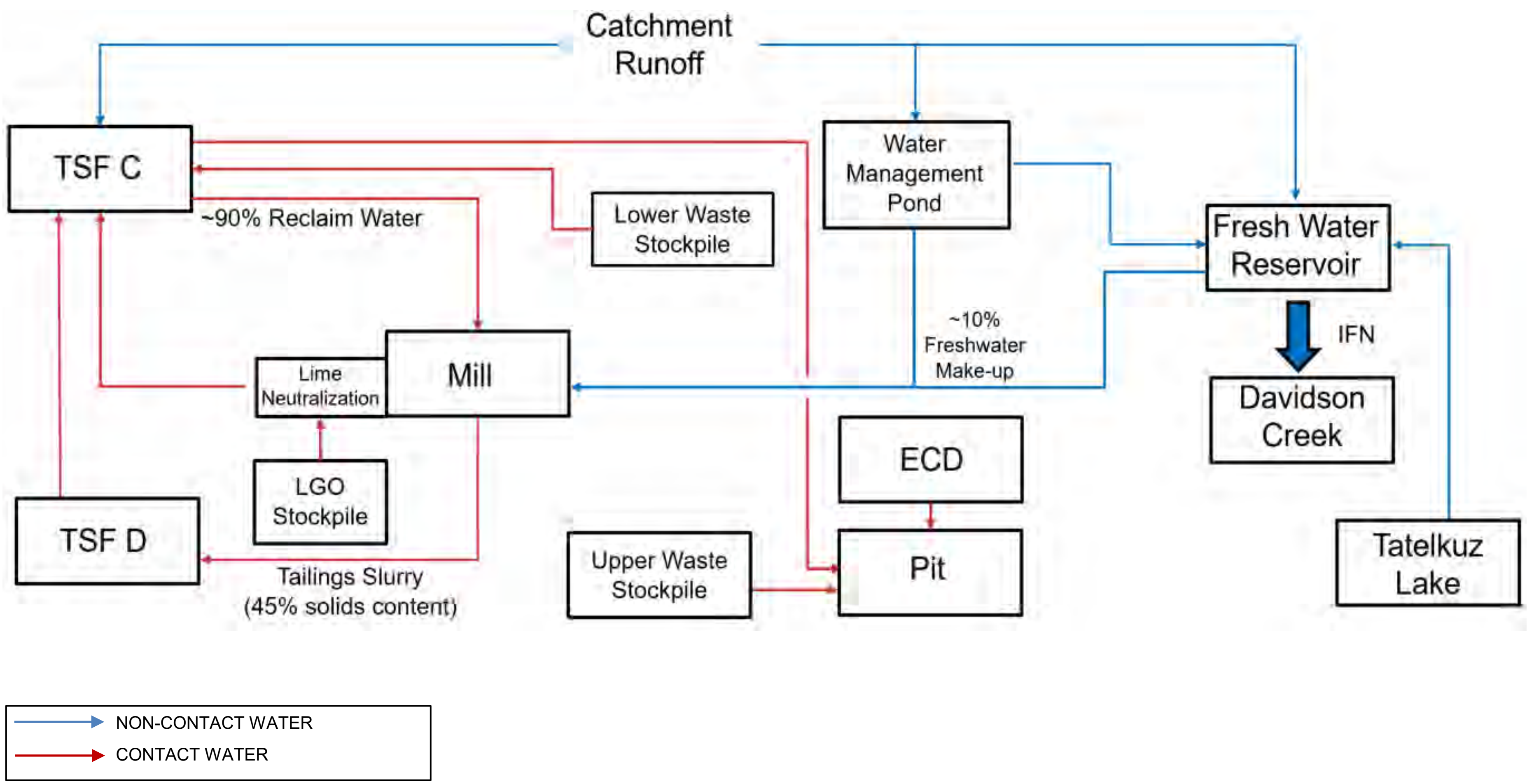
SIMPLIFIED FLOW SCHEMATIC
OPERATIONS YEAR 18 TO 20

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA/101-457/39	VA23-01383

FIGURE B4 REV 0

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	11JAN'24	ISSUED WITH LETTER	MCW	CAS



REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	11JAN'24	ISSUED WITH LETTER	MCW	CAS

BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
OPERATIONS YEAR 21 TO 23

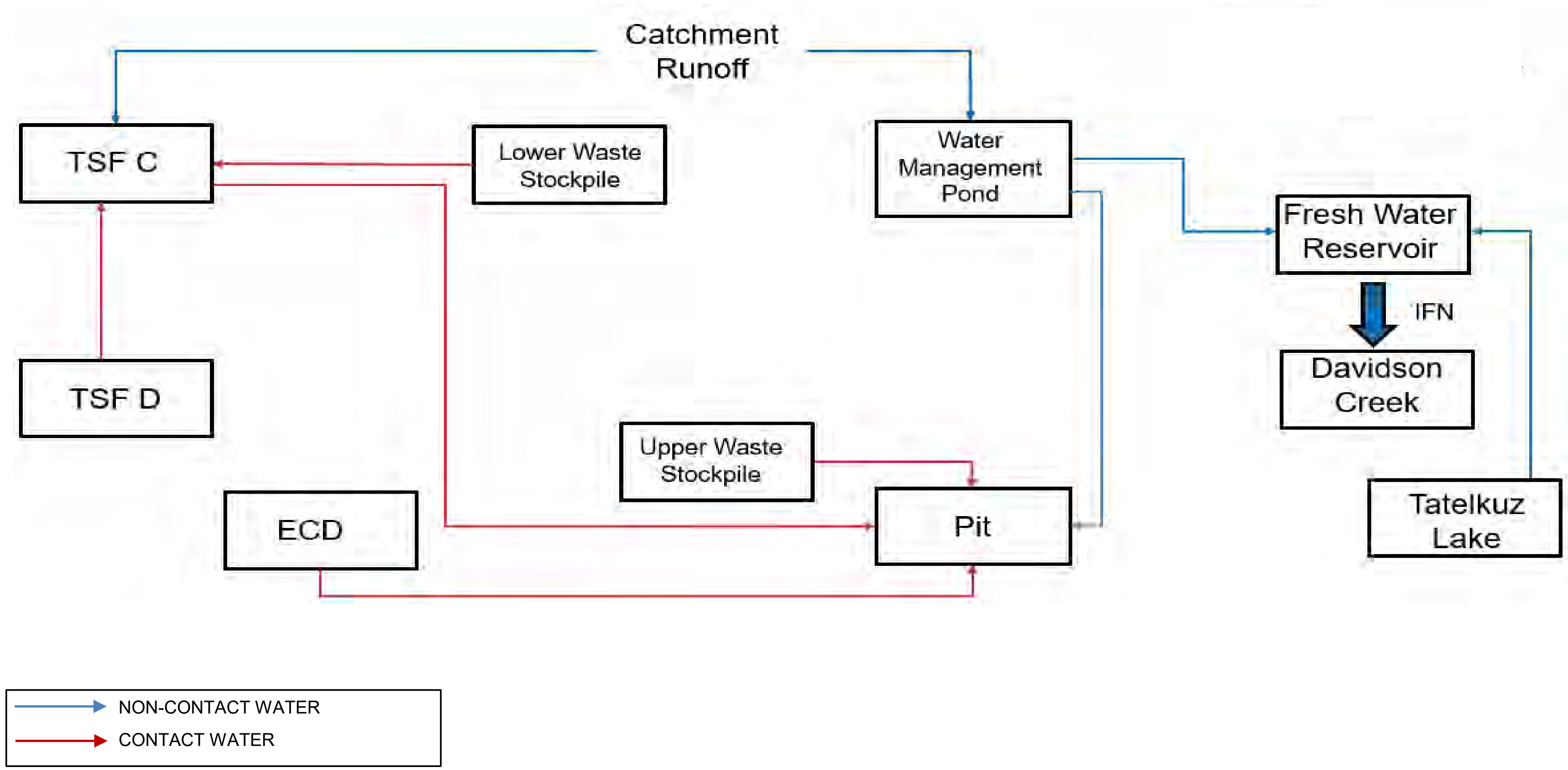
Knight Piésold CONSULTING

P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B5

REV 0



0	11JAN'24	ISSUED WITH LETTER	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
EARLY CLOSURE (YEAR 24 TO 44)

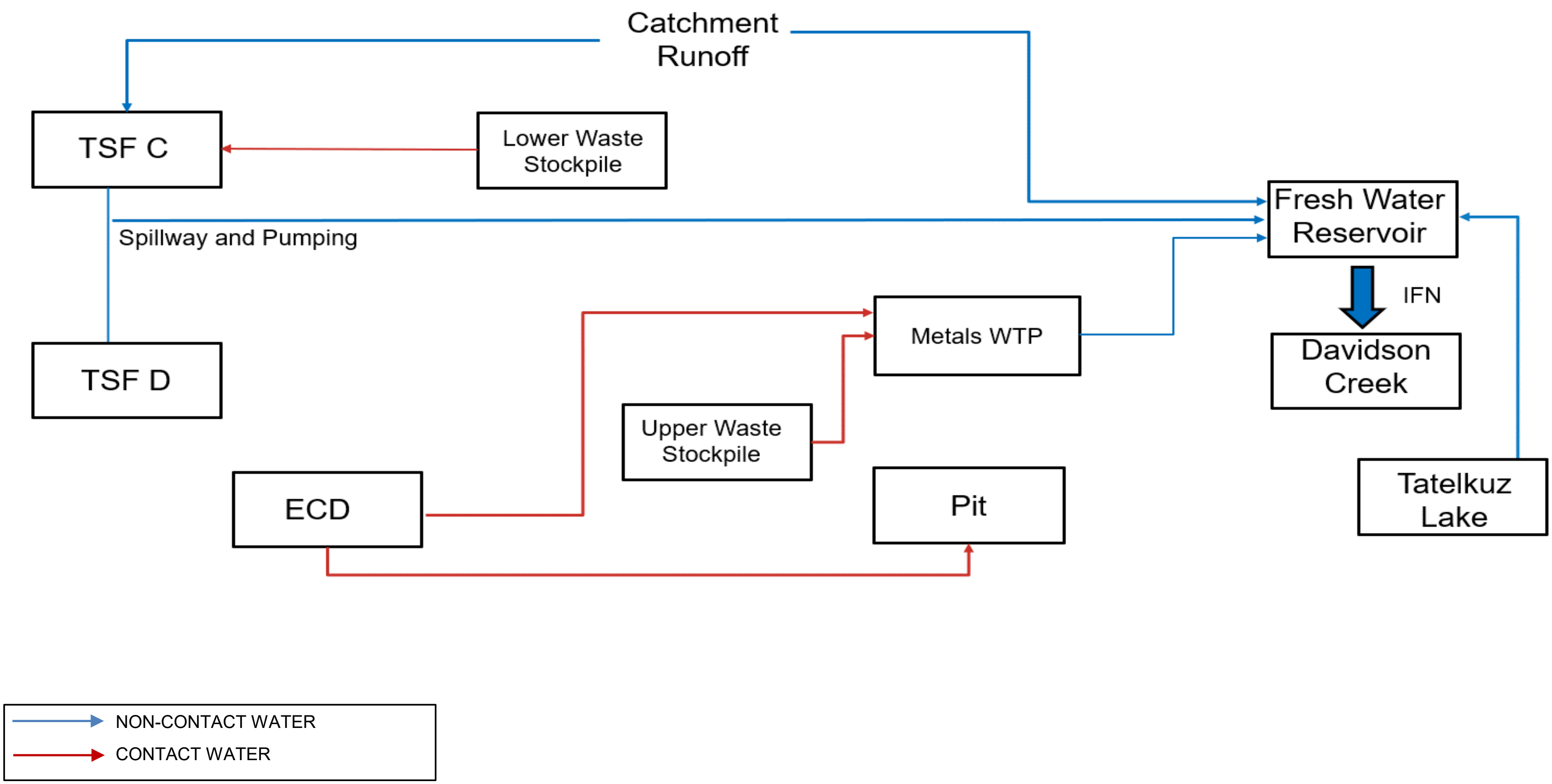
Knight Piésold CONSULTING

P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B6

REV 0



BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
LATE CLOSURE (YEAR 45 TO 47)

Knight Piésold CONSULTING

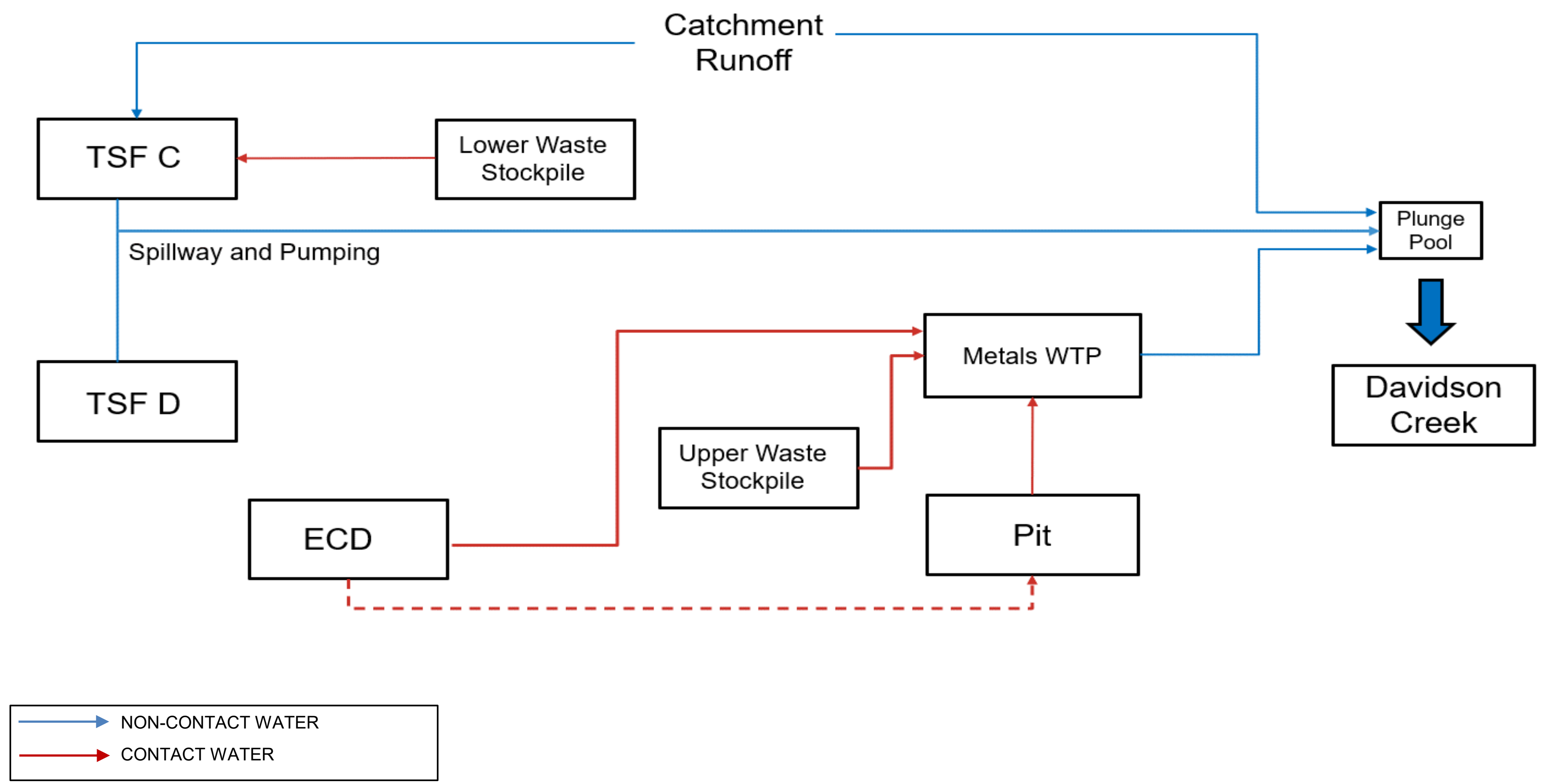
P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B7

REV 0

0	11JAN'24	ISSUED WITH LETTER	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D



NOTES:

1. WATER COLLECTED AT THE ENVIRONMENTAL CONTROL DAM (ECD) IN EXCESS OF DISCHARGE CRITERIA IS DIRECTED TO THE PIT LAKE AS REQUIRED.
2. WATER FROM TSF C POND IS ACTIVELY DISCHARGED (PUMPED) TO THE TSF SPILLWAY TO FACILITATE DISCHARGE OF WATER FROM THE ECD AS REQUIRED.
3. A DASHED LINE INDICATES THE FLOW PATH IS INTERMITTENT.

0	11JAN'24	ISSUED WITH LETTER	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

BW GOLD LTD.

BLACKWATER MINE

SIMPLIFIED FLOW SCHEMATIC
POST-CLOSURE

Knight Piésold CONSULTING

P/A NO. VA/101-457/39

REF. NO. VA23-01383

FIGURE B8

REV 0

APPENDIX C

Estimated Annual Water Balances

(Tables C.1 to C.9)

TABLE C.1

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO

ANNUAL WATER BALANCE - MILL (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)								Losses (Mm^3)		
	Site C Pond (Reclaim)	Pit Dewatering - SW Sump (Freshwater)	Pit Dewatering - GW Wells (Freshwater)	Water Management Pond (Freshwater)	Plant Site Runoff	Fresh Water Reservoir (Freshwater)	Water in Ore	Total Inputs	Slurry Water Out with Tailings (to Site D)	Slurry Water out with Tailings (to Site C)	Total Losses
-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	**0.0**
-1	0.0	0.0	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	**0.0**
1	4.8	0.1	0.4	0.0	0.01	0.0	0.1	**5.5**	0.0	5.5	**5.5**
2	5.9	0.2	0.5	0.0	0.01	0.0	0.2	**6.7**	0.0	6.7	**6.7**
3	5.9	0.2	0.4	0.0	0.01	0.0	0.2	**6.7**	0.0	6.7	**6.7**
4	5.9	0.2	0.4	0.0	0.01	0.0	0.2	**6.7**	0.0	6.7	**6.7**
5	5.9	0.3	0.4	0.0	0.01	0.0	0.2	**6.7**	0.0	6.7	**6.7**
6	12.9	0.3	1.1	0.0	0.01	0.0	0.4	**14.7**	0.0	14.7	**14.7**
7	12.9	0.4	1.0	0.0	0.01	0.0	0.4	**14.7**	0.0	14.7	**14.7**
8	12.9	0.4	1.0	0.0	0.01	0.0	0.4	**14.7**	0.0	14.7	**14.7**
9	12.9	0.5	1.0	0.0	0.01	0.0	0.4	**14.7**	0.0	14.7	**14.7**
10	12.9	0.5	0.9	0.0	0.01	0.0	0.4	**14.7**	0.0	14.7	**14.7**
11	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
12	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
13	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
14	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
15	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
16	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
17	21.5	0.6	1.6	0.1	0.01	0.0	0.6	**24.4**	0.0	24.4	**24.4**
18	21.5	0.0	0.0	1.7	0.00	0.7	0.6	**24.4**	0.0	24.4	**24.4**
19	21.5	0.0	0.0	1.5	0.00	0.8	0.6	**24.4**	0.0	24.4	**24.4**
20	21.5	0.0	0.0	1.6	0.00	0.8	0.6	**24.4**	0.0	24.4	**24.4**
21	21.5	0.0	0.0	1.6	0.00	0.8	0.6	**24.4**	6.5	18.0	**24.4**
22	21.5	0.0	0.0	1.6	0.00	0.8	0.6	**24.4**	24.4	0.0	**24.4**
23	8.1	0.0	0.0	0.8	0.00	0.1	0.2	**9.2**	9.2	0.0	**9.2**
Total	358	7.5	18	10	0.1	4.0	10	408	40	368	408

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.1 Mill_WB

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

Knight Piésold CONSULTING

TABLE C.2

BW GOLD LTD
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - TSF C POND (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)																Losses (Mm^3)										Mm^3
	Tailings Slurry	Consolidation Seepage	Precipitation on TSF C Pond	Precipitation on Tailings Beach, Waste Rock, and Upstream Embankments	Starter Pond Volume	SW & GW from Upgradient Catchment[1]	Pumped from TSF D Pond	Runoff from Upper and Lower Waste Stockpiles	LGO from Lime Neutralization	Pumpback from Interim ECD	GW Seepage from Contact Source[2]	West Dam Seepage Sump Pumpback	WMP[3]	Runoff from Plant Site	Plant Site Sewage Effluent	Total Inputs[4]	Reclaim to Mill	Water Retained in Waste Rock Voids[5]	Water Retained in Tailings Voids	Seepage	Pond Evaporation	Pumping to Open Pit	Overflow via Closure Spillway	Pumped to TSF Spillway (Untreated)	Surplus to WTP in Operations	Total Losses[4]	Change in Pond Volume
-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.000	0.04	**0.3**	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**	0.1
1	5.5	0.3	0.1	0.1	0.9	1.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.001	0.04	**8.3**	4.8	0.7	1.8	0.1	0.1	0.0	0.0	0.0	0.0	**7.6**	0.7
2	6.7	0.5	0.1	0.2	0.0	0.9	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.001	0.04	**9.1**	5.9	0.7	2.3	0.2	0.1	0.0	0.0	0.0	0.0	**9.1**	0.0
3	6.7	0.6	0.1	0.2	0.0	1.2	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.001	0.04	**9.7**	5.9	0.5	2.3	0.2	0.1	0.0	0.0	0.0	0.0	**9.0**	0.7
4	6.7	0.5	0.2	0.3	0.0	1.1	0.0	0.0	0.2	0.6	0.0	0.0	0.0	0.001	0.04	**9.7**	5.9	0.4	2.3	0.2	0.1	0.0	0.0	0.0	0.0	**8.9**	0.8
5	6.7	0.6	0.2	0.4	0.0	1.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0	0.001	0.04	**9.9**	5.9	1.2	2.3	0.3	0.2	0.0	0.0	0.0	0.0	**9.8**	0.1
6	14.7	1.2	0.3	0.5	0.0	0.9	0.2	0.0	0.3	0.7	0.0	0.0	0.0	0.001	0.04	**18.8**	12.9	1.4	4.9	0.3	0.2	0.0	0.0	0.0	0.0	**19.7**	-0.9
7	14.7	1.2	0.3	0.4	0.0	1.7	1.5	0.0	0.3	0.0	0.0	0.0	0.0	0.001	0.04	**20.2**	12.9	1.1	4.9	0.3	0.3	0.0	0.0	0.0	0.0	**19.5**	0.7
8	14.7	1.2	0.4	0.4	0.0	1.7	0.8	0.0	0.4	0.0	0.0	0.0	0.0	0.001	0.04	**19.6**	12.9	0.0	4.9	0.4	0.4	0.0	0.0	0.0	0.0	**18.5**	1.1
9	14.7	1.3	0.4	0.5	0.0	1.6	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.001	0.04	**19.1**	12.9	0.0	4.9	0.4	0.4	0.0	0.0	0.0	0.0	**18.6**	0.5
10	14.7	1.3	0.4	0.6	0.0	1.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.001	0.04	**19.0**	12.9	0.0	4.9	0.5	0.4	0.0	0.0	0.0	0.0	**18.7**	0.3
11	24.4	2.1	0.8	0.6	0.0	1.5	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.001	0.04	**29.8**	21.5	0.0	8.2	0.5	0.7	0.0	0.0	0.0	0.0	**30.9**	-1.1
12	24.4	2.2	0.9	0.6	0.0	1.4	0.6	0.0	0.4	0.0	0.0	0.1	0.0	0.005	0.04	**30.7**	21.5	0.0	8.2	0.6	0.8	0.0	0.0	0.0	0.0	**31.1**	-0.4
13	24.4	2.2	0.8	0.7	0.0	1.4	1.2	0.0	0.4	0.0	0.0	0.1	0.0	0.005	0.04	**31.2**	21.5	0.0	8.2	0.6	0.7	0.0	0.0	0.0	0.0	**31.0**	0.3
14	24.4	2.3	0.7	0.8	0.0	1.4	0.5	0.0	0.4	0.0	0.0	0.1	0.0	0.005	0.04	**30.7**	21.5	0.0	8.2	0.6	0.7	0.0	0.0	0.0	0.0	**31.0**	-0.3
15	24.4	2.3	0.7	0.9	0.0	1.3	0.4	0.0	0.4	0.0	0.0	0.1	0.0	0.005	0.04	**30.6**	21.5	0.0	8.2	0.7	0.6	0.0	0.0	0.0	0.0	**31.0**	-0.4
16	24.4	2.4	0.7	0.9	0.0	1.1	0.7	0.0	0.4	0.0	0.0	0.2	0.0	0.005	0.04	**30.9**	21.5	0.0	8.2	0.7	0.6	0.0	0.0	0.0	0.0	**31.0**	0.0
17	24.4	2.4	0.7	1.0	0.0	1.0	1.6	0.0	0.4	0.0	0.0	0.2	0.0	0.005	0.04	**31.9**	21.5	0.0	8.2	0.6	0.6	0.0	0.0	0.0	0.0	**30.9**	1.0
18	24.4	2.7	0.7	1.1	0.0	1.8	0.4	0.2	0.4	0.0	0.0	0.3	0.0	0.012	0.04	**32.0**	21.5	0.0	8.2	0.5	0.6	0.0	0.0	0.0	0.0	**30.8**	1.3
19	24.4	2.6	0.7	1.1	0.0	1.8	0.5	0.2	0.4	0.0	0.0	0.3	0.0	0.012	0.04	**32.0**	21.5	0.0	8.2	0.4	0.6	0.6	0.0	0.0	0.0	**31.3**	0.7
20	24.4	2.6	0.8	1.1	0.0	1.7	0.3	0.2	0.3	0.0	0.0	0.3	0.0	0.012	0.04	**31.7**	21.5	0.0	8.2	0.3	0.7	0.7	0.0	0.0	0.0	**31.4**	0.4
21	18.0	1.9	0.8	1.1	0.0	1.7	3.1	0.2	0.2	0.0	0.0	0.2	0.0	0.012	0.04	**27.3**	21.5	0.0	6.0	0.2	0.7	0.4	0.0	0.0	0.0	**28.8**	-1.5
22	0.0	0.2	0.8	1.1	0.0	1.7	17.3	0.2	0.1	0.0	0.0	0.2	0.0	0.012	0.04	**21.8**	21.5	0.0	0.0	0.1	0.8	0.0	0.0	0.0	0.0	**22.4**	-0.6
23	0.0	0.1	0.8	1.1	0.0	1.7	6.2	0.2	0.1	0.0	0.0	0.2	0.0	0.012	0.04	**10.5**	8.1	0.0	0.0	0.1	0.8	0.1	0.0	0.0	0.0	**9.1**	1.4
24	0.0	0.1	0.8	1.1	0.0	1.8	1.2	0.2	0.0	0.0	0.0	0.2	0.0	0.012	0.00	**5.5**	0.0	0.0	0.0	0.1	0.8	7.2	0.0	0.0	0.0	**8.1**	-2.6
25	0.0	0.1	0.8	1.1	0.0	1.8	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.012	0.00	**5.4**	0.0	0.0	0.0	0.1	0.8	4.9	0.0	0.0	0.0	**5.8**	-0.4
26	0.0	0.0	0.8	1.1	0.0	1.8	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.012	0.00	**5.4**	0.0	0.0	0.0	0.1	0.8	4.7	0.0	0.0	0.0	**5.6**	-0.2
27	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.4**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	0.0
28	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
29	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.3	0.0	0.0	0.0	**5.2**	0.1
30	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
31	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
32	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
33	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.3	0.0	0.0	0.0	**5.2**	0.1
34	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
35	0.0	0.0	0.8	1.1	0.0	1.9	1.1	0.2	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**5.3**	0.0	0.0	0.0	0.1	0.8	4.5	0.0	0.0	0.0	**5.4**	-0.1
36	0.0	0.0	0.8	1.0	0.0	1.1	0.3	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.6**	0.0	0.0	0.0	0.1	0.8	2.7	0.0	0.0	0.0	**3.6**	0.0
37	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.3**	0.0	0.0	0.0	0.1	0.8	2.6	0.0	0.0	0.0	**3.5**	-0.1
38	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.6	0.0	0.0	0.0	**3.5**	-0.1
39	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.6	0.0	0.0	0.0	**3.5**	-0.1
40	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.4	0.0	0.0	0.0	**3.3**	0.1
41	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.6	0.0	0.0	0.0	**3.5**	-0.1
42	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.4	0.0	0.0	0.0	**3.3**	0.1
43	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	2.6	0.0	0.0	0.0	**3.5**	-0.1
44	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	1.3	0.0	1.0	0.0	**3.2**	0.2
45	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	0.8	1.6	0.0	**3.3**	0.1
50	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	0.9	1.6	0.0	**3.4**	0.0
55	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	0.7	1.7	0.0	**3.3**	0.0
60	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	1.0	1.4	0.0	**3.3**	0.0
65	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	1.3	1.1	0.0	**3.3**	0.0
70	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	1.8	0.7	0.0	**3.4**	0.0
75	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.1	0.4	0.0	**3.4**	0.0
80	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.3	0.2	0.0	**3.4**	0.0
85	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.4	0.0	0.0	**3.4**	0.0
90	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.5	0.0	0.0	**3.4**	0.0
95	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.5	0.0	0.0	**3.4**	0.0
100	0.0	0.0	0.8	1.1	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.000	0.00	**3.4**	0.0	0.0	0.0	0.1	0.8	0.0	2.5	0.0	0.0	**3.4**	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.2 TSF C_WB

NOTES:

1. UPGRADIENT FLOWS ALSO INCLUDE FLOWS FROM SEDIMENT CONTROL PONDS FOR TRUCK SHOP AND AGGREGATE BORROW AREAS.
2. INCLUDES GROUNDWATER SEEPAGE FROM STOCKPILES AND TSF SITE C SEEPAGE RECOVERED IN SOUTH ABUTMENT DRAINS.
3. FLOW FROM WMP INCLUDES WATER DIVERTED TO MAINTAIN A MINIMUM POND VOLUME IN THE TSF AND WATER OVERFLOWING THE WMP SPILLWAY WHEN FLOWS ARE GREATER THAN THE CAPACITY OF THE FWR PIPELINE. NO WATER OVERFLOWS THE WMP SPILLWAY IN THE BASE CASE LOM MODEL USING AVERAGE CLIMATE CONDITIONS.
4. DIFFERENCE BETWEEN INPUTS AND LOSSES EQUALS THE CHANGE IN POND VOLUME OVER THE YEAR.
5. MODEL ASSUMES WASTE ROCK VOIDS BECOME SATURATED BETWEEN ZERO AND 12 MONTHS AFTER THE MATERIAL IS PLACED IN THE FACILITY, DEPENDING ON THE YEAR.

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

TABLE C.3

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - TSF D POND (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)										Losses (Mm^3)							Mm^3
	Tailings Slurry	Consolidation Seepage	Precipitation on TSF D Pond	Precipitation on Waste Rock and Tailings Beach	Pumpback from ECD	Seepage from TSF C (includes C Consolidation)	SW & GW from Upgradient Catchment	GW Seepage from Contact Sources	Runoff from TSF D and C Main Dams	Total Inputs[1]	Water Retained in Waste Rock Voids[2,3]	Water Retained in Tailings Voids	TSF Site D Seepage	Pond Evaporation	Pumped to TSF Site C	Overflow via Closure Spillway	Total Losses[1]	Change in Pond Volume
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.00	0.0	1.1	0.9	0.0	0.0	0.0	0.2	0.0	1.1	0.0
7	0.0	0.0	0.0	0.2	1.1	0.6	1.2	0.00	0.2	3.3	1.7	0.0	0.1	0.0	1.5	0.0	3.3	0.1
8	0.0	0.0	0.0	0.5	1.1	0.7	1.0	0.00	0.2	3.5	2.6	0.0	0.2	0.0	0.8	0.0	3.6	-0.1
9	0.0	0.0	0.0	0.6	1.3	0.7	0.9	0.00	0.2	3.8	3.2	0.0	0.3	0.0	0.2	0.0	3.8	0.0
10	0.0	0.0	0.0	0.8	1.4	0.7	0.8	0.00	0.2	3.9	3.5	0.0	0.4	0.0	0.0	0.0	3.9	0.0
11	0.0	0.0	0.0	0.8	1.5	0.9	0.8	0.00	0.2	4.3	3.8	0.0	0.5	0.0	0.0	0.0	4.3	0.0
12	0.0	0.0	0.0	0.9	1.6	1.0	0.7	0.00	0.3	4.5	3.2	0.0	0.7	0.0	0.6	0.0	4.4	0.1
13	0.0	0.0	0.0	1.0	1.8	1.1	0.7	0.00	0.3	4.7	2.9	0.0	0.8	0.0	1.2	0.0	4.8	-0.1
14	0.0	0.0	0.0	1.0	1.9	1.1	0.6	0.00	0.3	5.0	3.5	0.0	0.9	0.0	0.5	0.0	5.0	0.0
15	0.0	0.0	0.0	1.1	2.0	1.1	0.6	0.00	0.3	5.2	3.7	0.0	1.0	0.0	0.4	0.0	5.2	0.0
16	0.0	0.0	0.0	1.2	2.2	1.1	0.5	0.00	0.3	5.3	3.5	0.0	1.1	0.0	0.7	0.0	5.3	0.0
17	0.0	0.0	0.0	1.2	2.3	1.0	0.5	0.00	0.2	5.3	2.3	0.0	1.3	0.0	1.6	0.0	5.2	0.1
18	0.0	0.0	0.0	1.2	0.0	1.0	0.5	0.00	0.2	3.0	1.1	0.0	1.4	0.0	0.4	0.0	2.9	0.1
19	0.0	0.0	0.0	1.2	0.0	0.9	0.5	0.00	0.2	2.9	0.8	0.0	1.5	0.0	0.5	0.0	2.9	0.0
20	0.0	0.0	0.0	1.2	0.0	0.8	0.5	0.00	0.2	2.8	0.8	0.0	1.6	0.0	0.3	0.0	2.8	0.0
21	6.5	0.4	0.6	0.7	0.0	0.6	0.5	0.00	0.2	9.5	0.0	2.2	1.7	0.6	3.1	0.0	7.7	1.9
22	24.4	1.6	0.6	0.6	0.0	0.0	0.5	0.00	0.2	27.9	0.0	8.2	1.8	0.5	17.3	0.0	27.9	0.0
23	9.2	0.7	0.4	0.7	0.0	0.0	0.4	0.00	0.2	11.7	0.0	3.1	2.0	0.4	6.2	0.0	11.7	0.0
24	0.0	0.1	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.2	0.0	3.5	0.0
25	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
26	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
27	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
28	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
29	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
30	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
31	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
32	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
33	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
34	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
35	0.0	0.0	0.3	0.8	0.0	0.0	2.0	0.00	0.2	3.4	0.0	0.0	2.0	0.2	1.1	0.0	3.4	0.0
36	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.00	0.2	2.2	0.0	0.0	2.0	0.2	0.3	0.0	2.6	-0.4
37	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.00	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
38	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.00	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
39	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.00	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
40	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.00	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
41	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
42	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
43	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
44	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
45	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
50	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
55	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
60	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
65	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
70	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
75	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
80	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
85	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
90	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
95	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.3	0.0
100	0.0	0.0	0.3	0.8	0.0	0.0	1.0	0.0	0.2	2.2	0.0	0.0	2.0	0.2	0.0	0.0	2.2	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.3 TSF D_WB

NOTES:

1. DIFFERENCE BETWEEN INPUTS AND LOSSES EQUALS THE CHANGE IN POND VOLUME OVER THE YEAR.
2. MODEL ASSUMES WASTE ROCK VOIDS BECOME SATURATED THE SAME MONTH THE MATERIAL IS PLACED IN THE FACILITY IN YEAR 6. WASTE ROCK VOIDS BECOME SATURATED 3 MONTHS AFTER BEING PLACED IN YEAR 7 AND THEREAFTER.
3. INCLUDES RE-FILLING OF WASTE ROCK VOIDS IF THE WATER LEVEL IS DRAWNDOWN INTO THE WASTE ROCK.

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

TABLE C.4

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - WATER MANAGEMENT POND (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

	Inputs (Mm^3)							Losses (Mm^3)						Mm^3
Model Year	**Upgradient Catchment Runoff (Non-contact)**	**Central Diversion System[1]**	**Pit Dewatering System after Metals Treatment[2]**	**Upper & Lower OBS Waste Runoff (after Metals Treatment)**	**Seepage from Contact Sources**	**Precipitation on Pond**	**Total Inputs**	**Flow to FWR**	**To Mill (Freshwater)**	**Evaporation**	**Flow to Pit Lake**	**Flow to TSF C[3]**	**Total Losses**	**Change in Pond Volume**
-1	0.9	0.5	0.3	0.0	0.00	0.02	**1.8**	0.9	0.0	0.03	0.0	0.0	**1.0**	0.8
1	3.1	1.8	0.3	0.0	0.01	0.04	**5.3**	5.3	0.0	0.05	0.0	0.0	**5.3**	0.0
2	3.0	1.8	0.2	0.1	0.01	0.04	**5.1**	5.1	0.0	0.05	0.0	0.0	**5.1**	0.0
3	2.9	1.8	0.3	0.1	0.01	0.04	**5.2**	5.3	0.0	0.05	0.0	0.0	**5.3**	-0.1
4	2.8	1.8	0.4	0.2	0.01	0.04	**5.2**	5.1	0.0	0.05	0.0	0.0	**5.2**	0.0
5	2.8	1.8	0.4	0.2	0.01	0.04	**5.2**	5.2	0.0	0.05	0.0	0.0	**5.2**	0.0
6	2.7	1.8	0.2	0.2	0.02	0.04	**4.9**	5.5	0.0	0.05	0.0	0.0	**5.6**	-0.6
7	2.7	1.1	0.2	0.2	0.02	0.04	**4.3**	4.1	0.0	0.05	0.0	0.0	**4.1**	0.1
8	2.7	1.1	0.2	0.2	0.02	0.04	**4.3**	4.3	0.0	0.05	0.0	0.0	**4.3**	0.0
9	2.7	1.1	0.3	0.2	0.02	0.04	**4.3**	4.3	0.0	0.05	0.0	0.0	**4.3**	0.0
10	2.6	1.1	0.3	0.2	0.02	0.04	**4.4**	4.3	0.0	0.05	0.0	0.0	**4.4**	0.0
11	2.6	1.1	0.2	0.2	0.02	0.04	**4.2**	4.0	0.1	0.05	0.0	0.0	**4.2**	-0.1
12	2.6	1.1	0.2	0.3	0.03	0.04	**4.3**	4.1	0.1	0.05	0.0	0.0	**4.3**	0.0
13	2.5	1.1	0.3	0.4	0.04	0.04	**4.3**	4.2	0.1	0.05	0.0	0.0	**4.3**	0.0
14	2.5	1.1	0.3	0.4	0.04	0.04	**4.3**	4.1	0.1	0.05	0.0	0.0	**4.3**	0.0
15	2.5	1.1	0.3	0.4	0.04	0.04	**4.3**	4.1	0.1	0.05	0.0	0.0	**4.3**	0.0
16	2.5	1.1	0.3	0.4	0.04	0.04	**4.3**	4.1	0.1	0.05	0.0	0.0	**4.3**	0.0
17	2.5	1.1	0.3	0.4	0.04	0.04	**4.3**	4.1	0.1	0.05	0.0	0.0	**4.3**	0.0
18	2.5	0.3	0.0	0.0	0.04	0.04	**2.8**	1.2	1.7	0.05	0.0	0.0	**2.9**	-0.1
19	2.5	0.3	0.0	0.0	0.04	0.04	**2.8**	1.2	1.5	0.05	0.0	0.0	**2.8**	0.0
20	2.5	0.3	0.0	0.0	0.04	0.04	**2.9**	1.3	1.6	0.05	0.0	0.0	**2.9**	0.0
21	2.6	0.3	0.0	0.0	0.04	0.04	**2.9**	1.3	1.6	0.05	0.0	0.0	**2.9**	0.0
22	2.6	0.3	0.0	0.0	0.04	0.04	**3.0**	1.4	1.6	0.05	0.0	0.0	**3.0**	0.0
23	2.7	0.3	0.0	0.0	0.04	0.04	**3.1**	2.1	0.8	0.05	0.0	0.0	**3.0**	0.1
24	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
25	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
26	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
27	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
28	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
29	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
30	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
31	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
32	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
33	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
34	2.7	0.3	0.0	0.0	0.05	0.04	**3.1**	2.2	0.0	0.05	0.8	0.0	**3.1**	0.0
35	0.1	0.3	0.0	0.0	0.04	0.04	**0.5**	0.4	0.0	0.05	0.1	0.0	**0.6**	-0.1
36	0.0	0.0	0.0	0.0	0.00	0.00	**0.0**	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0
37	0.0	0.0	0.0	0.0	0.00	0.00	**0.0**	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0
38	0.0	0.0	0.0	0.0	0.00	0.00	**0.0**	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0
39	0.0	0.0	0.0	0.0	0.00	0.00	**0.0**	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0
40	0.0	0.0	0.0	0.0	0.00	0.00	**0.0**	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.4 WMP_WB

NOTES:

1. EXCLUDES FLOW CONVEYED IN CENTRAL DIVERSION FROM LOWER WASTE STOCKPILE.
2. REPRESENTS FLOW FROM PIT DEWATERING SYSTEM IN EXCESS OF MILL FRESHWATER REQUIREMENT.
3. FLOW TO TSF C INCLUDES WATER DIVERTED TO MAINTAIN A MINIMUM POND VOLUME IN THE TSF AND WATER OVERFLOWING THE WMP SPILLWAY WHEN FLOWS ARE GREATER THAN THE CAPACITY OF THE FWR PIPELINE. NO WATER OVERFLOWS THE WMP SPILLWAY IN THE BASE CASE LOM MODEL USING AVERAGE CLIMATE CONDITIONS.
4. WATER MANAGEMENT POND IS DECOMMISSIONED IN YEAR 36 IN THIS MODEL SCENARIO.

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

Knight Piésold CONSULTING

TABLE C.5

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - FRESH WATER RESERVOIR (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)						Losses (Mm^3)				Mm^3
	SW and GW from Upgradient Catchment (Non-contact)	Diversions[1] (Non-contact)	Precipitation on Pond	Flow from Water Management Pond[2,3]	FWSS Pumped from Tatelkuz Lake	Total Inputs	Discharge to Davidson Creek	To Mill (Freshwater)	Evaporation from Pond	Total Losses	Change in Pond Volume
-1	6.8	1.4	0.02	0.9	0.3	**9.5**	9.4	0.0	0.03	**9.4**	0.1
1	4.0	0.0	0.03	5.3	0.0	**9.3**	9.0	0.0	0.04	**9.1**	0.2
2	4.0	0.0	0.03	5.1	0.0	**9.1**	9.1	0.0	0.04	**9.1**	0.0
3	3.7	0.0	0.03	5.3	0.0	**9.0**	8.9	0.0	0.04	**9.0**	0.0
4	3.7	0.0	0.03	5.1	0.0	**8.8**	8.8	0.0	0.04	**8.8**	0.0
5	3.6	0.0	0.03	5.2	0.0	**8.9**	8.8	0.0	0.04	**8.9**	0.0
6	2.8	0.0	0.03	5.5	0.1	**8.5**	8.7	0.0	0.04	**8.8**	-0.3
7	0.1	1.8	0.03	4.1	0.5	**6.5**	6.4	0.0	0.04	**6.5**	0.0
8	0.1	1.8	0.03	4.3	0.3	**6.5**	6.5	0.0	0.04	**6.5**	0.0
9	0.1	1.8	0.03	4.3	0.3	**6.5**	6.5	0.0	0.04	**6.5**	0.0
10	0.1	1.8	0.03	4.3	0.8	**7.1**	7.0	0.0	0.04	**7.1**	0.0
11	0.1	1.8	0.03	4.0	1.0	**6.9**	6.9	0.0	0.04	**6.9**	0.0
12	0.1	1.8	0.03	4.1	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
13	0.1	1.8	0.03	4.2	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
14	0.1	1.8	0.03	4.1	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
15	0.1	1.8	0.03	4.1	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
16	0.1	1.8	0.03	4.1	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
17	0.1	1.8	0.03	4.1	1.0	**7.0**	7.0	0.0	0.04	**7.0**	0.0
18	0.1	1.8	0.03	1.2	3.3	**6.4**	5.6	0.7	0.04	**6.4**	0.0
19	0.1	1.8	0.03	1.2	3.4	**6.5**	5.7	0.8	0.04	**6.5**	0.0
20	0.1	1.8	0.03	1.3	3.3	**6.6**	5.7	0.8	0.04	**6.6**	0.0
21	0.1	1.8	0.03	1.3	3.3	**6.6**	5.7	0.8	0.04	**6.6**	0.0
22	0.1	1.8	0.03	1.4	3.3	**6.6**	5.8	0.8	0.04	**6.6**	0.0
23	0.1	1.8	0.03	2.1	2.1	**6.1**	6.0	0.1	0.04	**6.1**	0.0
24	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
25	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
26	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
27	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
28	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
29	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
30	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
31	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
32	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
33	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
34	0.1	0.0	0.03	2.2	3.2	**5.6**	5.6	0.0	0.04	**5.6**	0.0
35	0.1	0.0	0.03	0.4	2.7	**3.2**	3.2	0.0	0.04	**3.2**	0.0
36	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
37	0.1	1.2	0.03	0.0	1.8	**3.1**	3.1	0.0	0.04	**3.1**	0.0
38	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
39	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
40	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
41	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
42	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
43	0.1	1.2	0.03	0.0	1.7	**3.1**	3.1	0.0	0.04	**3.1**	0.0
44	0.1	1.2	0.03	0.0	1.0	**2.3**	2.1	0.0	0.04	**2.1**	0.2
45	0.1	1.2	0.03	0.0	0.1	**1.4**	1.3	0.0	0.04	**1.4**	0.1
46	0.1	0.0	0.03	0.0	0.2	**0.4**	0.6	0.0	0.04	**0.7**	-0.3
47	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.00	**0.0**	0.0
48	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.00	**0.0**	0.0
49	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.00	**0.0**	0.0
50	0.0	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.00	**0.0**	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.5 FWR_WB

NOTES:

1. FWR CONTRIBUTIONS FROM DIVERSIONS INCLUDE WATER FROM CENTRAL DIVERSION SYSTEM IN CONSTRUCTION (YEAR -1) AND FROM THE NORTHERN DIVERSION SYSTEM IN OPERATIONS AND LATE CLOSURE ONWARD.
2. CONTRIBUTIONS FROM THE WATER MANAGEMENT POND (WMP) DECREASE IN YEAR 18 WHEN OPEN PIT MINING CEASES AND THE PIT DEWATERING SYSTEM IS NO LONGER THE PRIMARY SOURCE OF MILL FRESHWATER.
3. WATER MANAGEMENT POND IS DECOMMISSIONED IN YEAR 36 IN THIS MODEL SCENARIO.
4. THE FRESHWATER RESERVOIR IS DECOMMISSIONED AT THE START OF POST-CLOSURE IN THE MODEL SCENARIO (YEAR 47).

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

TABLE C.6

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - OPEN PIT / PIT LAKE (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

	Inputs (Mm^3)										Losses (Mm^3)					Mm^3
Model Year	Upgradient Catchment Runoff (Non-contact)	Runoff from Open Pit Walls	GW Inflow to Open Pit/ Dewatering Wells	Upper Waste Stockpile SCP and Seepage to Open Pit[2]	Precipitation on Pit Lake	TSF C Pumped to Open Pit	ECD Pumped to Open Pit	WMP to Pit Lake[2]	French Drain Seepage Collection to Pit Lake[3]	Total Inputs	Open Pit Sump and GW Well Dewatering	Evaporation from Pit Lake	Seepage from Pit Lake	Pit Lake to Metals WTP (Post-Closure)	Total Losses	Change in Pit Lake Volume
-1	0.01	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	**0.4**	0.4	0.0	0.0	0.0	**0.4**	0.0
1	0.01	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	**0.8**	0.8	0.0	0.0	0.0	**0.8**	0.0
2	0.01	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	**0.9**	0.9	0.0	0.0	0.0	**0.9**	0.0
3	0.01	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	**1.0**	1.0	0.0	0.0	0.0	**1.0**	0.0
4	0.01	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	**1.0**	1.0	0.0	0.0	0.0	**1.0**	0.0
5	0.01	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	**1.1**	1.1	0.0	0.0	0.0	**1.1**	0.0
6	0.01	0.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**	1.6	0.0	0.0	0.0	**1.6**	0.0
7	0.01	0.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	**1.6**	1.6	0.0	0.0	0.0	**1.6**	0.0
8	0.01	0.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	**1.7**	1.7	0.0	0.0	0.0	**1.7**	0.0
9	0.01	0.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	**1.7**	1.7	0.0	0.0	0.0	**1.7**	0.0
10	0.01	0.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	**1.8**	1.8	0.0	0.0	0.0	**1.8**	0.0
11	0.01	0.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	**2.4**	2.4	0.0	0.0	0.0	**2.4**	0.0
12	0.01	0.8	1.7	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
13	0.01	0.8	1.7	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
14	0.01	0.8	1.6	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
15	0.01	0.8	1.6	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
16	0.01	0.8	1.6	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
17	0.01	0.8	1.6	0.01	0.0	0.0	0.0	0.0	0.0	**2.5**	2.5	0.0	0.0	0.0	**2.5**	0.0
18	0.01	0.8	0.3	0.2	0.0	0.0	2.4	0.0	0.0	**3.8**	0.0	0.0	0.0	0.0	**0.0**	3.7
19	0.01	0.8	0.3	0.2	0.1	0.6	2.5	0.0	0.0	**4.5**	0.0	0.1	0.0	0.0	**0.1**	4.4
20	0.01	0.7	0.3	0.2	0.2	0.7	2.7	0.0	0.0	**4.8**	0.0	0.1	0.0	0.0	**0.1**	4.6
21	0.01	0.7	0.3	0.2	0.2	0.4	2.9	0.0	0.0	**4.6**	0.0	0.2	0.0	0.0	**0.2**	4.5
22	0.01	0.7	0.3	0.2	0.2	0.0	3.3	0.0	0.0	**4.7**	0.0	0.2	0.0	0.0	**0.2**	4.5
23	0.01	0.7	0.3	0.2	0.2	0.1	3.3	0.0	0.0	**4.9**	0.0	0.2	0.0	0.0	**0.2**	4.7
24	0.01	0.6	0.3	0.2	0.3	7.2	3.2	0.8	0.0	**12.6**	0.0	0.2	0.0	0.0	**0.2**	12.4
25	0.01	0.6	0.3	0.2	0.3	4.9	3.2	0.8	0.0	**10.3**	0.0	0.3	0.0	0.0	**0.3**	10.0
26	0.01	0.6	0.3	0.2	0.3	4.7	3.2	0.8	0.0	**10.1**	0.0	0.3	0.0	0.0	**0.3**	9.8
27	0.01	0.6	0.3	0.2	0.4	4.5	3.1	0.8	0.0	**9.9**	0.0	0.3	0.0	0.0	**0.3**	9.6
28	0.01	0.5	0.3	0.2	0.4	4.5	3.1	0.8	0.0	**9.9**	0.0	0.4	0.0	0.0	**0.4**	9.5
29	0.01	0.5	0.3	0.2	0.4	4.3	3.1	0.8	0.0	**9.7**	0.0	0.4	0.0	0.0	**0.4**	9.3
30	0.01	0.5	0.3	0.2	0.5	4.5	3.1	0.8	0.0	**9.9**	0.0	0.4	0.0	0.0	**0.4**	9.5
31	0.01	0.5	0.3	0.2	0.5	4.5	3.1	0.8	0.0	**9.9**	0.0	0.4	0.0	0.0	**0.4**	9.5
32	0.01	0.5	0.3	0.2	0.5	4.5	3.1	0.8	0.0	**9.9**	0.0	0.5	0.0	0.0	**0.5**	9.5
33	0.01	0.4	0.3	0.2	0.5	4.3	3.1	0.8	0.0	**9.8**	0.0	0.5	0.0	0.0	**0.5**	9.3
34	0.01	0.4	0.3	0.2	0.6	4.5	3.1	0.8	0.0	**10.0**	0.0	0.5	0.0	0.0	**0.5**	9.4
35	0.01	0.4	0.3	0.2	0.6	4.5	3.1	0.1	0.0	**9.3**	0.0	0.6	0.0	0.0	**0.6**	8.7
36	0.01	0.4	0.1	0.12	0.6	2.7	3.0	0.0	0.0	**7.1**	0.0	0.6	0.0	0.0	**0.6**	6.5
37	0.01	0.4	0.1	0.13	0.6	2.6	3.0	0.0	0.0	**6.9**	0.0	0.6	0.0	0.0	**0.6**	6.3
38	0.01	0.4	0.1	0.13	0.7	2.6	3.0	0.0	0.0	**6.9**	0.0	0.6	0.0	0.0	**0.6**	6.3
39	0.01	0.4	0.1	0.13	0.7	2.6	3.0	0.0	0.0	**6.9**	0.0	0.6	0.0	0.0	**0.6**	6.3
40	0.01	0.3	0.1	0.13	0.7	2.4	2.7	0.0	0.0	**6.4**	0.0	0.6	0.0	0.0	**0.6**	5.8
41	0.01	0.3	0.1	0.13	0.7	2.6	2.7	0.0	0.0	**6.6**	0.0	0.6	0.0	0.0	**0.6**	6.0
42	0.01	0.3	0.1	0.13	0.7	2.4	2.7	0.0	0.0	**6.4**	0.0	0.6	0.0	0.0	**0.6**	5.8
43	0.01	0.3	0.1	0.13	0.7	2.6	2.7	0.0	0.0	**6.6**	0.0	0.7	0.0	0.0	**0.7**	6.0
44	0.01	0.3	0.1	0.06	0.7	1.3	2.3	0.0	0.0	**4.9**	0.0	0.7	0.02	0.0	**0.7**	4.2
45	0.01	0.3	0.1	0.01	0.7	0.0	1.3	0.0	0.1	**2.6**	0.0	0.7	0.03	0.0	**0.7**	1.9
46	0.01	0.3	0.1	0.01	0.7	0.0	1.1	0.0	0.1	**2.4**	0.0	0.7	0.03	0.0	**0.7**	1.7
47	0.01	0.3	0.1	0.01	0.7	0.0	1.0	0.0	0.1	**2.3**	0.0	0.7	0.03	0.4	**1.1**	1.2
48	0.01	0.3	0.1	0.01	0.7	0.0	1.0	0.0	0.1	**2.3**	0.0	0.7	0.03	1.0	**1.7**	0.5
49	0.01	0.3	0.1	0.01	0.7	0.0	0.9	0.0	0.1	**2.2**	0.0	0.7	0.03	1.1	**1.8**	0.4
50	0.01	0.3	0.1	0.01	0.7	0.0	0.9	0.0	0.1	**2.2**	0.0	0.7	0.03	1.1	**1.8**	0.4
51	0.01	0.3	0.1	0.01	0.7	0.0	0.8	0.0	0.1	**2.1**	0.0	0.7	0.03	1.1	**1.8**	0.3
52	0.01	0.3	0.1	0.01	0.7	0.0	0.8	0.0	0.1	**2.0**	0.0	0.7	0.03	1.0	**1.8**	0.3
53	0.01	0.3	0.1	0.01	0.7	0.0	0.7	0.0	0.1	**2.0**	0.0	0.7	0.03	1.0	**1.8**	0.2
54	0.01	0.3	0.1	0.01	0.7	0.0	0.5	0.0	0.1	**1.8**	0.0	0.7	0.03	1.0	**1.8**	0.1
55	0.01	0.3	0.1	0.01	0.7	0.0	0.5	0.0	0.1	**1.8**	0.0	0.7	0.00	1.0	**1.7**	0.0
56	0.01	0.3	0.1	0.01	0.7	0.0	0.4	0.0	0.1	**1.7**	0.0	0.7	0.00	1.0	**1.7**	0.0
57	0.01	0.3	0.1	0.01	0.7	0.0	0.4	0.0	0.1	**1.7**	0.0	0.7	0.00	1.0	**1.7**	-0.1
58	0.01	0.3	0.1	0.01	0.7	0.0	0.3	0.0	0.1	**1.6**	0.0	0.7	0.00	1.0	**1.7**	-0.1
59	0.01	0.3	0.1	0.01	0.7	0.0	0.3	0.0	0.1	**1.6**	0.0	0.7	0.00	1.1	**1.7**	-0.2
60	0.01	0.3	0.1	0.01	0.7	0.0	0.2	0.0	0.1	**1.5**	0.0	0.7	0.00	1.1	**1.7**	-0.2
61	0.01	0.3	0.1	0.01	0.7	0.0	0.04	0.0	0.1	**1.3**	0.0	0.7	0.00	1.1	**1.7**	-0.4
62	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	1.1	**1.7**	-0.5
63	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	1.1	**1.8**	-0.5
64	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	0.7	**1.4**	-0.1
65	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	0.6	**1.2**	0.0
70	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	0.6	**1.3**	0.0
75	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.00	0.6	**1.3**	0.0
80	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.03	0.6	**1.3**	0.0
85	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.03	0.6	**1.3**	0.0
90	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.03	0.6	**1.3**	0.0
95	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.03	0.6	**1.3**	0.0
100	0.01	0.3	0.1	0.01	0.7	0.0	0.0	0.0	0.1	**1.3**	0.0	0.7	0.03	0.6	**1.3**	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.6 Pit_WB

NOTES:

1. UPPER WASTE STOCKPILE FLOWS INCLUDE GROUNDWATER SEEPAGE FROM THE STOCKPILE FOOTPRINT TO THE OPEN PIT.
2. WATER FROM THE WMP IS PUMPED TO THE PIT LAKE DURING THE MONTHS OF AUGUST THROUGH MARCH IN CLOSURE UNTIL THE WMP IS DECOMISSIONED.
3. PIT LAKE SEEPAGE COLLECTED IN PIT LAKE SEEPAGE COLLECTION SYSTEM IS PUMPED BACK TO PIT LAKE.

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

Knight Piésold CONSULTING

TABLE C.7

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - ENVIRONMENTAL CONTROL DAM (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)					Losses (Mm^3)					Mm^3
	SW and GW from Upgradient Catchment (Non-contact)	Precipitation on Pond	Seepage from Facilities	TSF D Embankment Runoff and Toe Discharge	Total Inputs	Evaporation from Pond	TSF D	Pit Lake	Metals WTP (Closure/ Post-Closure)	Total Losses	Change in Pond Volume
1	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
2	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
3	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
4	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
5	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
6	0.0	0.00	0.0	0.0	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0
7	0.9	0.02	0.1	0.0	**1.1**	0.0	1.1	0.0	0.0	**1.1**	0.0
8	0.9	0.02	0.2	0.1	**1.1**	0.0	1.1	0.0	0.0	**1.1**	0.0
9	0.8	0.02	0.3	0.1	**1.3**	0.0	1.3	0.0	0.0	**1.3**	0.0
10	0.8	0.02	0.4	0.1	**1.4**	0.0	1.4	0.0	0.0	**1.4**	0.0
11	0.8	0.02	0.5	0.2	**1.5**	0.0	1.5	0.0	0.0	**1.5**	0.0
12	0.8	0.02	0.7	0.2	**1.6**	0.0	1.6	0.0	0.0	**1.6**	0.0
13	0.7	0.02	0.8	0.2	**1.8**	0.0	1.8	0.0	0.0	**1.8**	0.0
14	0.7	0.02	0.9	0.3	**1.9**	0.0	1.9	0.0	0.0	**1.9**	0.0
15	0.7	0.02	1.0	0.3	**2.0**	0.0	2.0	0.0	0.0	**2.0**	0.0
16	0.7	0.02	1.1	0.3	**2.2**	0.0	2.2	0.0	0.0	**2.2**	0.0
17	0.7	0.02	1.3	0.3	**2.3**	0.0	2.3	0.0	0.0	**2.3**	0.0
18	0.7	0.02	1.4	0.3	**2.4**	0.0	0.0	2.4	0.0	**2.4**	0.0
19	0.7	0.02	1.5	0.3	**2.5**	0.0	0.0	2.5	0.0	**2.5**	0.0
20	0.7	0.02	1.6	0.3	**2.7**	0.0	0.0	2.7	0.0	**2.7**	0.0
21	0.7	0.02	1.8	0.3	**2.9**	0.0	0.0	2.9	0.0	**2.9**	0.0
22	0.7	0.02	2.3	0.3	**3.3**	0.0	0.0	3.3	0.0	**3.3**	0.0
23	0.7	0.02	2.3	0.3	**3.3**	0.0	0.0	3.3	0.0	**3.3**	0.0
24	0.7	0.02	2.1	0.3	**3.2**	0.0	0.0	3.2	0.0	**3.2**	0.0
25	0.7	0.02	2.1	0.3	**3.2**	0.0	0.0	3.2	0.0	**3.2**	0.0
26	0.7	0.02	2.1	0.3	**3.2**	0.0	0.0	3.2	0.0	**3.2**	0.0
27	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
28	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
29	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
30	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
31	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
32	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
33	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
34	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
35	0.7	0.02	2.1	0.3	**3.1**	0.0	0.0	3.1	0.0	**3.1**	0.0
36	0.7	0.02	2.1	0.3	**3.0**	0.0	0.0	3.0	0.0	**3.0**	0.0
37	0.7	0.02	2.1	0.2	**3.0**	0.0	0.0	3.0	0.0	**3.0**	0.0
38	0.7	0.02	2.1	0.2	**3.0**	0.0	0.0	3.0	0.0	**3.0**	0.0
39	0.7	0.02	2.1	0.2	**3.0**	0.0	0.0	3.0	0.0	**3.0**	0.0
40	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	2.7	0.0	**2.7**	0.0
41	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	2.7	0.0	**2.7**	0.0
42	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	2.7	0.0	**2.7**	0.0
43	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	2.7	0.0	**2.7**	0.0
44	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	2.3	0.4	**2.7**	0.0
45	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	1.3	1.5	**2.7**	0.0
50	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.9	1.9	**2.7**	0.0
55	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.5	2.3	**2.7**	0.0
60	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.2	2.5	**2.7**	0.0
65	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
70	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
75	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
80	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
85	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
90	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
95	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0
100	0.4	0.02	2.1	0.2	**2.7**	0.0	0.0	0.0	2.7	**2.7**	0.0

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.7 ECD

NOTES:

1. NORTHERN DIVERSION SYSTSEM CONTRIBUTES TO FWR IN OPERATIONS.
2. CONTRIBUTIONS FROM THE WATER MANAGEMENT POND (WMP) DECREASE IN YEAR 18 WHEN OPEN PIT MINING CEASES AND THE PIT DEWATERING SYSTEM IS NO LONGER THE PRIMARY SOURCE OF MILL FRESHWATER.
3. THE FRESHWATER RESERVOIR IS DECOMMISSIONED AT THE START OF POST-CLOSURE IN THE MODEL SCENARIO (YEAR 47).

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

TABLE C.8

BW GOLD LTD.
BLACKWATER MINE

LIFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - METALS WTP (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Inputs (Mm^3)						
	Open Pit Groundwater Dewatering	Open Pit Sump	Upper Waste Stockpile	Lower Waste Stockpile	Pit Lake	ECD	Total Input
-2	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
-1	0.3	0.1	0.0	0.0	0.0	0.0	**0.4**
1	0.6	0.2	0.0	0.0	0.0	0.0	**0.8**
2	0.6	0.2	0.0	0.1	0.0	0.0	**0.9**
3	0.6	0.3	0.0	0.1	0.0	0.0	**1.1**
4	0.6	0.4	0.0	0.2	0.0	0.0	**1.2**
5	0.6	0.4	0.0	0.2	0.0	0.0	**1.2**
6	1.1	0.4	0.0	0.2	0.0	0.0	**1.8**
7	1.1	0.5	0.0	0.2	0.0	0.0	**1.8**
8	1.1	0.6	0.0	0.2	0.0	0.0	**1.9**
9	1.1	0.7	0.0	0.2	0.0	0.0	**1.9**
10	1.1	0.7	0.0	0.2	0.0	0.0	**2.0**
11	1.7	0.8	0.0	0.2	0.0	0.0	**2.7**
12	1.7	0.8	0.1	0.2	0.0	0.0	**2.8**
13	1.7	0.8	0.2	0.2	0.0	0.0	**2.9**
14	1.7	0.8	0.2	0.2	0.0	0.0	**2.9**
15	1.7	0.8	0.2	0.2	0.0	0.0	**2.9**
16	1.7	0.8	0.2	0.2	0.0	0.0	**2.9**
17	1.7	0.8	0.2	0.2	0.0	0.0	**2.9**
18	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
19	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
20	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
21	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
22	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
23	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
24	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
25	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
26	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
27	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
28	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
29	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
30	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
31	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
32	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
33	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
34	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
35	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
36	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
37	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
38	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
39	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
40	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
41	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
42	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
43	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
44	0.0	0.0	0.1	0.0	0.0	0.4	**0.5**
45	0.0	0.0	0.1	0.0	0.0	1.5	**1.6**
46	0.0	0.0	0.1	0.0	0.0	1.7	**1.8**
47	0.0	0.0	0.1	0.0	0.4	1.7	**2.3**
48	0.0	0.0	0.1	0.0	1.0	1.8	**2.9**
49	0.0	0.0	0.1	0.0	1.1	1.8	**3.0**
50	0.0	0.0	0.1	0.0	1.1	1.9	**3.1**
51	0.0	0.0	0.1	0.0	1.1	1.9	**3.1**
52	0.0	0.0	0.1	0.0	1.0	2.0	**3.2**
53	0.0	0.0	0.1	0.0	1.0	2.0	**3.2**
54	0.0	0.0	0.1	0.0	1.0	2.2	**3.4**
55	0.0	0.0	0.1	0.0	1.0	2.3	**3.4**
60	0.0	0.0	0.1	0.0	1.1	2.5	**3.7**
65	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
70	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
75	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
80	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
85	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
90	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
95	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**
100	0.0	0.0	0.1	0.0	0.6	2.7	**3.4**

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.8 Metals WTP

NOTES:

1. UNITS ARE MILLION CUBIC METERS

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

Knight Piésold CONSULTING

TABLE C.9

BW GOLD LTD.
BLACKWATER MINE

.IFE OF MINE WATER BALANCE MODEL - CLOSURE/POST-CLOSURE WATER MANAGEMENT SCENARIO
ANNUAL WATER BALANCE - MINE SITE DISCHARGE (AVERAGE CLIMATE)

Print Sep/04/24 9:00:30

Model Year	Flows Leaving Downstream Extent of Mine (Mm^3)							
	Non-Contact Water	Metals WTP (ECD+UWS)	Metals WTP (Pit Lake)	Contact Sources /Seepage	TSF Spillway	Pit Lake Discharge	FWSS	Total Discharge
1	5.1	0.3	0.0	0.0	0.0	0.0	0.0	**5.4**
2	4.9	0.3	0.0	0.0	0.0	0.0	0.0	**5.3**
3	5.0	0.4	0.0	0.0	0.0	0.0	0.0	**5.4**
4	4.7	0.5	0.0	0.0	0.0	0.0	0.0	**5.3**
5	4.7	0.6	0.0	0.0	0.0	0.0	0.0	**5.3**
6	5.3	0.4	0.0	0.0	0.0	0.0	0.1	**5.8**
7	5.6	0.3	0.0	0.0	0.0	0.0	0.5	**6.4**
8	5.7	0.4	0.0	0.0	0.0	0.0	0.3	**6.5**
9	5.7	0.5	0.0	0.0	0.0	0.0	0.3	**6.5**
10	5.6	0.5	0.0	0.0	0.0	0.0	0.8	**7.0**
11	5.5	0.4	0.0	0.0	0.0	0.0	1.0	**6.9**
12	5.7	0.5	0.0	0.0	0.0	0.0	1.0	**7.3**
13	5.6	0.6	0.0	0.0	0.0	0.0	1.0	**7.3**
14	5.6	0.7	0.0	0.0	0.0	0.0	1.0	**7.2**
15	5.6	0.7	0.0	0.0	0.0	0.0	1.0	**7.2**
16	5.6	0.7	0.0	0.0	0.0	0.0	1.0	**7.2**
17	5.6	0.7	0.0	0.0	0.0	0.0	1.0	**7.2**
18	3.3	0.0	0.0	0.0	0.0	0.0	2.5	**5.9**
19	3.4	0.0	0.0	0.0	0.0	0.0	2.5	**5.9**
20	3.4	0.0	0.0	0.0	0.0	0.0	2.5	**5.9**
21	3.4	0.0	0.0	0.0	0.0	0.0	2.5	**6.0**
22	3.5	0.0	0.0	0.0	0.0	0.0	2.5	**6.0**
23	4.2	0.0	0.0	0.0	0.0	0.0	2.0	**6.3**
24	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
25	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
26	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
27	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
28	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
29	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
30	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
31	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
32	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
33	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
34	2.6	0.0	0.0	0.0	0.0	0.0	3.2	**5.8**
35	3.3	0.0	0.0	0.0	0.0	0.0	2.7	**6.0**
36	5.2	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
37	5.1	0.0	0.0	0.1	0.0	0.0	1.8	**7.0**
38	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
39	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
40	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
41	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
42	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
43	5.1	0.0	0.0	0.1	0.0	0.0	1.7	**7.0**
44	5.1	0.5	0.0	0.1	1.0	0.0	1.0	**7.7**
45	5.1	1.6	0.0	0.1	2.4	0.0	0.1	**9.3**
46	5.1	1.8	0.0	0.1	2.4	0.0	0.2	**9.7**
47	5.2	1.8	0.4	0.1	2.4	0.0	0.0	**10.0**
48	5.2	1.9	1.0	0.1	2.4	0.0	0.0	**10.6**
49	5.1	1.9	1.1	0.1	2.4	0.0	0.0	**10.7**
50	5.2	2.0	1.1	0.1	2.4	0.0	0.0	**10.8**
51	5.2	2.0	1.1	0.1	2.4	0.0	0.0	**10.8**
52	5.2	2.1	1.0	0.1	2.4	0.0	0.0	**10.9**
53	5.1	2.2	1.0	0.1	2.4	0.0	0.0	**10.9**
54	5.2	2.3	1.0	0.1	2.4	0.0	0.0	**11.0**
55	5.2	2.4	1.0	0.1	2.4	0.0	0.0	**11.1**
60	5.2	2.6	1.1	0.1	2.4	0.0	0.0	**11.3**
65	5.1	2.9	0.6	0.1	2.4	0.0	0.0	**11.1**
70	5.2	2.9	0.6	0.1	2.4	0.0	0.0	**11.1**
75	5.2	2.9	0.6	0.1	2.4	0.0	0.0	**11.1**
80	5.2	2.9	0.6	0.1	2.3	0.0	0.0	**11.0**
85	5.1	2.9	0.6	0.1	2.3	0.0	0.0	**11.0**
90	5.2	2.9	0.6	0.1	2.3	0.0	0.0	**11.0**
95	5.2	2.9	0.6	0.1	2.3	0.0	0.0	**11.0**
100	5.2	2.9	0.6	0.1	2.3	0.0	0.0	**11.0**

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Model files\[Blackwater LOM Wshd_Brine_v2h_Avg_report_r0.xlsx]TABLE C.9 Site Disch.

NOTES:
1. UNITS ARE MILLION CUBIC METERS
2. REPRESENTS FLOWS LEAVING THE FRESHWATER RESERVOIR THROUGH YEAR 11 AND FROM THE PLUNGE POOL ONCE IT IS CONSTRUCTED IN YEAR 12.

0	11JAN'24	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	CHK'D

Knight Piésold CONSULTING

APPENDIX D

Estimated Average Monthly Streamflows and Change in Flow During Life of Mine

(Tables D.1 to D.5)

TABLE D.1

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LIFE OF MINE WATER BALANCE MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS AND CHANGE IN FLOW DURING LIFE OF MINE - AVERAGE CLIMATE

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Streamflow (L/s)

	Davidson Creek																							
	11-DC						H10						H2						H2B					
Month	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)
January	0	0	0	-	-	-	11	11	9	-	-	-	94	63	27	-	-	-	96	81	81	80	80	144
February	0	0	0	-	-	-	9	8	6	-	-	-	77	42	21	-	-	-	78	81	81	80	80	128
March	0	0	0	-	-	-	7	6	4	-	-	-	62	32	16	-	-	-	63	81	81	80	80	117
April	42	26	26	-	-	-	155	138	131	-	-	-	741	489	314	-	-	-	763	691	457	116	116	675
May	90	52	51	-	-	-	254	215	205	-	-	-	1447	1083	490	-	-	-	1476	1254	1269	534	458	1184
June	16	8	7	-	-	-	53	44	42	-	-	-	461	371	118	-	-	-	472	563	563	560	560	491
July	8	2	2	-	-	-	31	25	24	-	-	-	205	69	53	-	-	-	209	226	226	225	225	284
August	4	0	0	-	-	-	20	16	15	-	-	-	141	54	41	-	-	-	143	151	151	150	150	161
September	2	0	0	-	-	-	14	11	11	-	-	-	116	45	34	-	-	-	118	121	121	120	120	160
October	19	9	9	-	-	-	74	62	59	-	-	-	298	102	89	-	-	-	300	121	121	120	120	362
November	10	3	3	-	-	-	36	29	28	-	-	-	263	107	92	-	-	-	266	121	121	120	120	246
December	2	0	0	-	-	-	18	15	14	-	-	-	124	45	35	-	-	-	126	81	81	80	80	168
Annual Average	16	8	8	-	-	-	57	48	46	-	-	-	336	209	111	-	-	-	342	297	279	189	182	343

Predicted Change in Streamflow from Baseline (L/s)

Month	11-DC Baseline (Yr -5)	11-DC Construction (Yr -1)	11-DC Early Operations (Yr 4)	11-DC Late Operations (Yr 22)	11-DC Closure (Unreclaimed) (Yr 25)	11-DC Post-Closure (Yr 100)	H10 Baseline (Yr -5)	H10 Construction (Yr -1)	H10 Early Operations (Yr 4)	H10 Late Operations (Yr 22)	H10 Closure (Unreclaimed) (Yr 25)	H10 Post-Closure (Yr 100)	H2 Baseline (Yr -5)	H2 Construction (Yr -1)	H2 Early Operations (Yr 4)	H2 Late Operations (Yr 22)	H2 Closure (Unreclaimed) (Yr 25)	H2 Post-Closure (Yr 100)	H2B Baseline (Yr -5)	H2B Construction (Yr -1)	H2B Early Operations (Yr 4)	H2B Late Operations (Yr 22)	H2B Closure (Unreclaimed) (Yr 25)	H2B Post-Closure (Yr 100)
January		0	0	-	-	-		0	-2	-	-	-		-31	-68	-	-	-		-15	-15	-16	-16	48
February		0	0	-	-	-		0	-3	-	-	-		-35	-56	-	-	-		3	3	2	2	50
March		0	0	-	-	-		0	-3	-	-	-		-31	-47	-	-	-		18	18	17	17	54
April		-16	-16	-	-	-		-17	-25	-	-	-		-251	-427	-	-	-		-72	-305	-647	-647	-88
May		-38	-39	-	-	-		-39	-48	-	-	-		-364	-957	-	-	-		-222	-206	-942	-1018	-292
June		-8	-9	-	-	-		-9	-11	-	-	-		-90	-343	-	-	-		91	91	88	88	19
July		-6	-6	-	-	-		-6	-7	-	-	-		-136	-152	-	-	-		17	17	16	16	76
August		-4	-4	-	-	-		-4	-5	-	-	-		-87	-100	-	-	-		7	7	7	7	18
September		-2	-2	-	-	-		-3	-3	-	-	-		-71	-82	-	-	-		3	3	2	2	42
October		-9	-9	-	-	-		-11	-14	-	-	-		-195	-209	-	-	-		-179	-179	-180	-180	62
November		-6	-6	-	-	-		-8	-8	-	-	-		-156	-171	-	-	-		-145	-145	-146	-146	-20
December		-2	-2	-	-	-		-3	-4	-	-	-		-78	-89	-	-	-		-45	-45	-46	-46	42
Annual Average		-8	-8	-	-	-		-8	-11	-	-	-		-127	-225	-	-	-		-45	-63	-154	-160	1

Predicted Change in Streamflow from Baseline (%)

Month	11-DC Baseline (Yr -5)	11-DC Construction (Yr -1)	11-DC Early Operations (Yr 4)	11-DC Late Operations (Yr 22)	11-DC Closure (Unreclaimed) (Yr 25)	11-DC Post-Closure (Yr 100)	H10 Baseline (Yr -5)	H10 Construction (Yr -1)	H10 Early Operations (Yr 4)	H10 Late Operations (Yr 22)	H10 Closure (Unreclaimed) (Yr 25)	H10 Post-Closure (Yr 100)	H2 Baseline (Yr -5)	H2 Construction (Yr -1)	H2 Early Operations (Yr 4)	H2 Late Operations (Yr 22)	H2 Closure (Unreclaimed) (Yr 25)	H2 Post-Closure (Yr 100)	H2B Baseline (Yr -5)	H2B Construction (Yr -1)	H2B Early Operations (Yr 4)	H2B Late Operations (Yr 22)	H2B Closure (Unreclaimed) (Yr 25)	H2B Post-Closure (Yr 100)
January		-41%	-41%	-	-	-		-1%	-20%	-	-	-		-33%	-72%	-	-	-		-16%	-16%	-17%	-17%	50%
February		-41%	-41%	-	-	-		-3%	-31%	-	-	-		-46%	-73%	-	-	-		4%	4%	3%	3%	64%
March		-41%	-41%	-	-	-		-7%	-44%	-	-	-		-49%	-75%	-	-	-		28%	28%	27%	27%	85%
April		-38%	-38%	-	-	-		-11%	-16%	-	-	-		-34%	-58%	-	-	-		-9%	-40%	-85%	-85%	-12%
May		-42%	-43%	-	-	-		-15%	-19%	-	-	-		-25%	-66%	-	-	-		-15%	-14%	-64%	-69%	-20%
June		-51%	-55%	-	-	-		-16%	-21%	-	-	-		-20%	-74%	-	-	-		19%	19%	19%	19%	4%
July		-70%	-76%	-	-	-		-19%	-24%	-	-	-		-66%	-74%	-	-	-		8%	8%	8%	8%	36%
August		-100%	-100%	-	-	-		-22%	-26%	-	-	-		-62%	-71%	-	-	-		5%	5%	5%	5%	12%
September		-100%	-100%	-	-	-		-20%	-24%	-	-	-		-61%	-71%	-	-	-		2%	2%	1%	1%	36%
October		-50%	-50%	-	-	-		-15%	-19%	-	-	-		-66%	-70%	-	-	-		-60%	-60%	-60%	-60%	21%
November		-67%	-67%	-	-	-		-21%	-22%	-	-	-		-59%	-65%	-	-	-		-55%	-55%	-55%	-55%	-8%
December		-96%	-96%	-	-	-		-18%	-20%	-	-	-		-63%	-72%	-	-	-		-36%	-36%	-36%	-36%	34%
Annual Average		-48%	-49%	-	-	-		-15%	-20%	-	-	-		-38%	-67%	-	-	-		-13%	-18%	-45%	-47%	0%

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Appendices\App D-Streamflow Change Tables\[App D - StreamflowSummaryTables_LOM Wshd_v2h_r0.xlsx]SC Davidson Flows

NOTES:

1. STREAMFLOWS CALCULATED USING MEAN MONTHLY CLIMATE DATA INPUT TO THE LIFE OF MINE WATER BALANCE MODEL.
2. "-" INDICATES MINE FOOTPRINT OVERLIES MODEL NODE AND NODE NO LONGER EXISTS.

0	11JAN'2024	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

Knight Piésold CONSULTING

TABLE D.2

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LIFE OF MINE WATER BALANCE MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS AND CHANGE IN FLOW DURING LIFE OF MINE - AVERAGE CLIMATE

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		Davidson Creek																	
		H4B						4-DC						1-DC					
	Month	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)
Streamflow (L/s)	January	129	115	115	98	98	172	129	115	115	98	98	172	151	136	136	120	120	193
	February	109	113	113	97	97	153	109	113	113	97	97	153	130	133	133	117	117	174
	March	93	111	111	95	95	141	93	111	111	95	95	141	113	130	130	115	115	160
	April	863	791	558	198	198	767	1035	964	731	371	371	940	1084	1013	779	419	419	988
	May	1600	1378	1394	639	563	1299	1637	1415	1431	676	600	1336	1695	1474	1489	734	658	1394
	June	537	629	629	608	608	548	543	635	635	614	614	554	577	669	669	648	648	588
	July	258	275	275	257	257	326	261	279	279	261	261	329	289	306	306	288	288	357
	August	186	194	194	177	177	197	187	195	195	178	178	198	213	220	220	203	203	223
	September	158	161	161	144	144	193	158	161	161	144	144	193	182	184	184	167	167	217
	October	339	160	160	143	143	394	339	160	160	143	143	394	362	183	183	166	166	418
	November	304	159	159	142	142	277	305	160	160	143	143	278	328	183	183	166	166	301
	December	161	117	117	100	100	197	161	117	117	100	100	197	184	139	139	123	123	220
	Annual Average	395	350	332	225	218	389	413	369	350	243	237	407	442	398	379	272	266	436
Predicted Change in Streamflow from Baseline (L/s)	January		-15	-15	-31	-31	42		-15	-15	-31	-31	42		-15	-15	-31	-31	42
	February		3	3	-13	-13	44		3	3	-13	-13	44		3	3	-13	-13	44
	March		18	18	2	2	48		18	18	2	2	48		18	18	2	2	48
	April		-71	-305	-665	-665	-96		-71	-305	-665	-665	-96		-71	-305	-665	-665	-96
	May		-222	-206	-961	-1037	-301		-222	-206	-961	-1037	-301		-222	-206	-961	-1037	-301
	June		91	91	71	71	11		91	91	71	71	11		91	91	71	71	11
	July		18	18	0	0	69		18	18	0	0	69		18	18	0	0	69
	August		8	8	-10	-10	11		8	8	-10	-10	11		8	8	-10	-10	11
	September		3	3	-14	-14	35		3	3	-14	-14	35		3	3	-14	-14	35
	October		-179	-179	-196	-196	56		-179	-179	-196	-196	56		-179	-179	-196	-196	56
	November		-145	-145	-162	-162	-27		-145	-145	-162	-162	-27		-145	-145	-162	-162	-27
	December		-44	-44	-61	-61	36		-44	-44	-61	-61	36		-44	-44	-61	-61	36
	Annual Average		-45	-63	-170	-176	-6		-45	-63	-170	-176	-6		-45	-63	-170	-176	-6
Predicted Change in Streamflow from Baseline (%)	January		-11%	-11%	-24%	-24%	33%		-11%	-11%	-24%	-24%	33%		-10%	-10%	-21%	-21%	28%
	February		3%	3%	-12%	-12%	40%		3%	3%	-12%	-12%	40%		2%	2%	-10%	-10%	34%
	March		19%	19%	2%	2%	51%		19%	19%	2%	2%	51%		16%	16%	2%	2%	42%
	April		-8%	-35%	-77%	-77%	-11%		-7%	-29%	-64%	-64%	-9%		-7%	-28%	-61%	-61%	-9%
	May		-14%	-13%	-60%	-65%	-19%		-14%	-13%	-59%	-63%	-18%		-13%	-12%	-57%	-61%	-18%
	June		17%	17%	13%	13%	2%		17%	17%	13%	13%	2%		16%	16%	12%	12%	2%
	July		7%	7%	0%	0%	27%		7%	7%	0%	0%	26%		6%	6%	0%	0%	24%
	August		4%	4%	-5%	-5%	6%		4%	4%	-5%	-5%	6%		4%	4%	-5%	-5%	5%
	September		2%	2%	-9%	-9%	22%		2%	2%	-9%	-9%	22%		2%	2%	-8%	-8%	20%
	October		-53%	-53%	-58%	-58%	16%		-53%	-53%	-58%	-58%	16%		-49%	-49%	-54%	-54%	15%
	November		-48%	-48%	-53%	-53%	-9%		-48%	-48%	-53%	-53%	-9%		-44%	-44%	-49%	-49%	-8%
	December		-28%	-28%	-38%	-38%	22%		-28%	-28%	-38%	-38%	22%		-24%	-24%	-33%	-33%	20%
	Annual Average		-11%	-16%	-43%	-45%	-2%		-11%	-15%	-41%	-43%	-1%		-10%	-14%	-38%	-40%	-1%

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Appendices\App D-Streamflow Change Tables\[App D - StreamflowSummaryTables_LOM Wshd_v2h_r0.xlsx]SC Davidson Flows (2)

NOTES:

1. STREAMFLOWS CALCULATED USING MEAN MONTHLY CLIMATE DATA INPUT TO THE LIFE OF MINE WATER BALANCE MODEL.

0	11JAN'2024	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

Knight Piésold CONSULTING

TABLE D.3

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LIFE OF MINE WATER BALANCE MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS AND CHANGE IN FLOW DURING LIFE OF MINE - AVERAGE CLIMATE

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Streamflow (L/s)

	Creek 661																	
	H11						H1						1-661					
Month	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)
January	27	27	22	17	17	16	8	8	6	6	6	8	90	90	82	78	78	78
February	24	24	19	15	15	14	4	4	2	2	2	4	72	72	64	60	60	61
March	22	22	17	13	13	12	3	3	1	1	1	3	59	60	52	48	48	50
April	230	231	225	154	154	151	129	129	126	126	126	129	848	849	840	769	769	770
May	238	236	210	118	118	113	198	197	195	195	195	198	988	984	956	864	864	862
June	92	92	82	56	56	51	59	59	57	57	57	59	395	395	382	357	357	354
July	40	40	34	27	27	22	26	26	24	24	24	26	175	175	167	159	159	157
August	32	31	27	23	23	19	18	18	15	15	15	18	130	129	122	118	118	117
September	29	28	24	20	20	17	12	12	10	10	10	12	103	102	96	91	91	91
October	32	31	27	22	22	19	25	25	23	23	23	25	137	136	130	124	124	124
November	34	32	29	23	23	20	28	28	26	26	26	28	155	153	148	142	142	141
December	29	27	24	20	20	18	13	13	11	11	11	13	114	112	107	103	103	102
Annual Average	69	68	62	42	42	39	44	44	41	41	41	44	272	271	262	243	243	242

Predicted Change in Streamflow from Baseline (L/s)

January		0	-5	-9	-9	-11		0	-2	-2	-2	0		0	-7	-12	-12	-11
February		0	-5	-9	-9	-10		0	-2	-2	-2	0		0	-7	-11	-11	-10
March		0	-5	-9	-9	-10		0	-2	-2	-2	0		0	-7	-11	-11	-10
April		1	-5	-76	-76	-78		-1	-3	-3	-3	0		0	-8	-79	-79	-78
May		-3	-29	-120	-120	-125		-1	-3	-3	-3	0		-4	-32	-123	-123	-125
June		0	-10	-35	-35	-41		0	-3	-3	-3	0		-1	-13	-38	-38	-41
July		0	-6	-13	-13	-18		0	-2	-2	-2	0		0	-8	-16	-16	-18
August		-1	-5	-9	-9	-12		0	-2	-2	-2	0		-1	-7	-11	-11	-12
September		-1	-5	-9	-9	-12		0	-2	-2	-2	0		-1	-7	-11	-11	-12
October		-1	-5	-10	-10	-14		0	-2	-2	-2	0		-1	-7	-13	-13	-14
November		-2	-5	-10	-10	-14		0	-2	-2	-2	0		-2	-7	-13	-13	-14
December		-2	-5	-9	-9	-12		0	-2	-2	-2	0		-2	-7	-12	-12	-12
Annual Average		-1	-7	-27	-27	-30		0	-2	-2	-2	0		-1	-10	-29	-29	-30

Predicted Change in Streamflow from Baseline (%)

January		1%	-19%	-34%	-34%	-42%		0%	-29%	-29%	-29%	0%		0%	-8%	-13%	-13%	-12%
February		1%	-21%	-38%	-38%	-43%		-1%	-54%	-54%	-54%	0%		0%	-10%	-16%	-16%	-15%
March		1%	-22%	-41%	-41%	-45%		-2%	-80%	-80%	-80%	0%		0%	-12%	-19%	-19%	-16%
April		0%	-2%	-33%	-33%	-34%		0%	-2%	-2%	-2%	0%		0%	-1%	-9%	-9%	-9%
May		-1%	-12%	-50%	-50%	-52%		0%	-2%	-2%	-2%	0%		0%	-3%	-12%	-12%	-13%
June		0%	-11%	-39%	-39%	-45%		-1%	-4%	-4%	-4%	0%		0%	-3%	-10%	-10%	-10%
July		0%	-14%	-33%	-33%	-44%		0%	-9%	-9%	-9%	0%		0%	-5%	-9%	-9%	-10%
August		-2%	-15%	-28%	-28%	-39%		0%	-13%	-13%	-13%	0%		0%	-6%	-9%	-9%	-10%
September		-4%	-17%	-31%	-31%	-40%		-1%	-19%	-19%	-19%	0%		-1%	-7%	-11%	-11%	-11%
October		-4%	-15%	-32%	-32%	-42%		0%	-9%	-9%	-9%	0%		-1%	-5%	-9%	-9%	-10%
November		-5%	-15%	-31%	-31%	-42%		0%	-8%	-8%	-8%	0%		-1%	-5%	-8%	-8%	-9%
December		-8%	-17%	-31%	-31%	-40%		0%	-17%	-17%	-17%	0%		-2%	-6%	-10%	-10%	-10%
Annual Average		-1%	-11%	-39%	-39%	-43%		0%	-6%	-6%	-6%	0%		0%	-4%	-11%	-11%	-11%

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Appendices\App D-Streamflow Change Tables\[App D - StreamflowSummaryTables_LOM Wshd_v2h_r0.xlsx]SC Creek 661

NOTES:
1. STREAMFLOWS CALCULATED USING MEAN MONTHLY CLIMATE DATA INPUT TO THE LIFE OF MINE WATER BALANCE MODEL.

0	11JAN'2024	ISSUED WITH LETTER VA23-01383	MCW	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

TABLE D.4

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LIFE OF MINE WATER BALANCE MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS AND CHANGE IN FLOW DURING LIFE OF MINE - AVERAGE CLIMATE

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		Chedakuz Creek											
		15-CC						H5					
	Month	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)
Streamflow (L/s)	January	545	543	538	423	455	544	1027	1010	1005	874	905	1068
	February	506	479	498	368	416	505	972	948	968	822	869	1016
	March	640	600	633	505	550	639	1164	1142	1175	1031	1076	1210
	April	2073	2074	2065	2003	2003	2005	3237	3167	2925	2502	2502	3073
	May	5733	5730	5701	5617	5617	5618	8528	8303	8290	7451	7375	8112
	June	3723	3723	3711	3536	3450	3693	5562	5653	5640	5445	5359	5542
	July	2116	2070	2108	1909	1941	2108	3299	3270	3308	3091	3123	3359
	August	1109	1096	1102	943	949	1107	1814	1808	1814	1637	1644	1822
	September	699	698	692	547	569	698	1261	1263	1257	1095	1117	1295
	October	794	792	786	707	663	790	1446	1266	1260	1164	1120	1499
	November	783	781	776	689	652	779	1376	1230	1224	1121	1084	1346
	December	618	616	611	508	528	616	1132	1086	1080	961	981	1166
	Annual Average	1612	1600	1602	1479	1483	1592	2568	2512	2496	2266	2263	2542
Predicted Change in Streamflow from Baseline (L/s)	January		-2	-7	-122	-90	-1		-17	-22	-153	-121	41
	February		-27	-7	-137	-90	0		-24	-4	-150	-103	44
	March		-41	-7	-136	-90	-2		-23	11	-133	-88	46
	April		0	-8	-71	-71	-68		-71	-313	-735	-735	-164
	May		-4	-32	-116	-116	-115		-225	-238	-1077	-1153	-416
	June		0	-13	-188	-274	-31		91	79	-117	-203	-20
	July		-46	-8	-207	-175	-8		-28	10	-208	-175	61
	August		-14	-7	-167	-160	-2		-6	1	-176	-170	8
	September		-1	-7	-153	-131	-2		2	-4	-167	-145	34
	October		-1	-7	-87	-131	-4		-180	-186	-282	-327	52
	November		-2	-7	-94	-131	-4		-147	-152	-256	-293	-31
	December		-2	-7	-110	-90	-2		-47	-52	-171	-151	34
	Annual Average		-12	-10	-132	-129	-20		-56	-73	-302	-305	-26
Predicted Change in Streamflow from Baseline (%)	January		0%	-1%	-22%	-17%	0%		-2%	-2%	-15%	-12%	4%
	February		-5%	-1%	-27%	-18%	0%		-2%	0%	-15%	-11%	4%
	March		-6%	-1%	-21%	-14%	0%		-2%	1%	-11%	-8%	4%
	April		0%	0%	-3%	-3%	-3%		-2%	-10%	-23%	-23%	-5%
	May		0%	-1%	-2%	-2%	-2%		-3%	-3%	-13%	-14%	-5%
	June		0%	0%	-5%	-7%	-1%		2%	1%	-2%	-4%	0%
	July		-2%	0%	-10%	-8%	0%		-1%	0%	-6%	-5%	2%
	August		-1%	-1%	-15%	-14%	0%		0%	0%	-10%	-9%	0%
	September		0%	-1%	-22%	-19%	0%		0%	0%	-13%	-11%	3%
	October		0%	-1%	-11%	-17%	0%		-12%	-13%	-20%	-23%	4%
	November		0%	-1%	-12%	-17%	-1%		-11%	-11%	-19%	-21%	-2%
	December		0%	-1%	-18%	-15%	0%		-4%	-5%	-15%	-13%	3%
	Annual Average		-1%	-1%	-8%	-8%	-1%		-2%	-3%	-12%	-12%	-1%

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NOTES:

1. STREAMFLOWS CALCULATED USING MEAN MONTHLY CLIMATE DATA INPUT TO THE LIFE OF MINE WATER BALANCE MODEL.

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Knight Piésold CONSULTING

TABLE D.5

BW GOLD LTD.
BLACKWATER GOLD PROJECT

LIFE OF MINE WATER BALANCE MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS AND CHANGE IN FLOW DURING LIFE OF MINE - AVERAGE CLIMATE

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		Creek 705																							
		6-705						4-705						H7						1-705					
	Month	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)	Baseline (Yr -5)	Construction (Yr -1)	Early Operations (Yr 4)	Late Operations (Yr 22)	Closure (Unreclaimed) (Yr 25)	Post-Closure (Yr 100)
Streamflow (L/s)	January	6	9	9	9	9	9	10	13	13	13	13	13	30	33	33	33	33	33	35	38	38	38	38	38
	February	4	6	6	6	6	6	4	6	6	6	6	6	21	23	23	23	23	23	25	27	27	27	27	27
	March	3	4	4	4	4	4	3	4	4	4	4	4	16	17	17	17	17	17	20	21	21	21	21	21
	April	39	58	58	58	58	58	142	161	161	161	161	161	591	609	609	609	609	609	639	658	658	658	658	658
	May	104	145	145	145	145	145	331	373	373	373	373	373	921	963	963	963	963	963	965	1007	1007	1007	1007	1007
	June	43	54	54	54	54	54	178	189	189	189	189	189	499	510	510	510	510	510	510	521	521	521	521	521
	July	16	24	24	24	24	24	44	51	51	51	51	51	94	102	102	102	102	102	103	111	111	111	111	111
	August	11	16	16	16	16	16	26	31	31	31	31	31	58	63	63	63	63	63	65	71	71	71	71	71
	September	9	13	13	13	13	13	17	21	21	21	21	21	44	47	47	47	47	47	50	53	53	53	53	53
	October	14	25	25	25	25	25	44	55	55	55	55	55	159	170	170	170	170	170	166	177	177	177	177	177
	November	15	22	22	22	22	22	49	56	56	56	56	56	168	176	176	176	176	176	175	183	183	183	183	183
	December	8	12	12	12	12	12	19	22	22	22	22	22	46	50	50	50	50	50	52	56	56	56	56	56
	Annual Average	23	32	32	32	32	32	72	82	82	82	82	82	221	230	230	230	230	230	234	244	244	244	244	244
Predicted Change in Streamflow from Baseline (L/s)	January		3	3	3	3	3		3	3	3	3	3		3	3	3	3	3		3	3	3	3	3
	February		2	2	2	2	2		2	2	2	2	2		2	2	2	2	2		2	2	2	2	2
	March		1	1	1	1	1		1	1	1	1	1		1	1	1	1	1		1	1	1	1	1
	April		19	19	19	19	19		19	19	19	19	19		19	19	19	19	19		19	19	19	19	19
	May		42	42	42	42	42		42	42	42	42	42		42	42	42	42	42		42	42	42	42	42
	June		11	11	11	11	11		11	11	11	11	11		11	11	11	11	11		11	11	11	11	11
	July		7	7	7	7	7		7	7	7	7	7		7	7	7	7	7		7	7	7	7	7
	August		5	5	5	5	5		5	5	5	5	5		5	5	5	5	5		5	5	5	5	5
	September		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4
	October		11	11	11	11	11		11	11	11	11	11		11	11	11	11	11		11	11	11	11	11
	November		7	7	7	7	7		7	7	7	7	7		7	7	7	7	7		7	7	7	7	7
	December		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4		4	4	4	4	4
	Annual Average		10	10	10	10	10		10	10	10	10	10		10	10	10	10	10		10	10	10	10	10
Predicted Change in Streamflow from Baseline (%)	January		43%	43%	43%	43%	43%		25%	25%	25%	25%	25%		8%	8%	8%	8%	8%		7%	7%	7%	7%	7%
	February		43%	43%	43%	43%	43%		41%	41%	40%	40%	41%		9%	9%	9%	9%	9%		7%	7%	7%	7%	7%
	March		45%	45%	45%	45%	45%		45%	45%	45%	45%	45%		8%	8%	8%	8%	8%		6%	6%	6%	6%	6%
	April		48%	48%	48%	48%	48%		13%	13%	13%	13%	13%		3%	3%	3%	3%	3%		3%	3%	3%	3%	3%
	May		41%	41%	41%	41%	41%		13%	13%	13%	13%	13%		5%	5%	5%	5%	5%		4%	4%	4%	4%	4%
	June		26%	26%	26%	26%	26%		6%	6%	6%	6%	6%		2%	2%	2%	2%	2%		2%	2%	2%	2%	2%
	July		47%	47%	47%	47%	47%		17%	17%	17%	17%	17%		8%	8%	8%	8%	8%		7%	7%	7%	7%	7%
	August		46%	46%	46%	46%	46%		20%	20%	20%	20%	20%		9%	9%	9%	9%	9%		8%	8%	8%	8%	8%
	September		44%	44%	44%	44%	44%		23%	23%	23%	23%	23%		9%	9%	9%	9%	9%		8%	8%	8%	8%	8%
	October		79%	79%	79%	79%	79%		25%	25%	25%	25%	25%		7%	7%	7%	7%	7%		7%	7%	7%	7%	7%
	November		51%	51%	51%	51%	51%		15%	15%	15%	15%	15%		4%	4%	4%	4%	4%		4%	4%	4%	4%	4%
	December		45%	45%	45%	45%	45%		20%	20%	20%	20%	20%		8%	8%	8%	8%	8%		7%	7%	7%	7%	7%
	Annual Average		43%	43%	43%	43%	43%		13%	13%	13%	13%	13%		4%	4%	4%	4%	4%		4%	4%	4%	4%	4%

\\KPL\VA-Prj$\1\01\00457\39\A\Correspondence\VA23-01383 - Post-Closure Brine Water Management (LOM WBM)\Appendices\App D-Streamflow Change Tables\[App D - StreamflowSummaryTables_LOM Wshd_v2h_r0.xlsx]SC Creek 705

NOTES:

1. STREAMFLOWS CALCULATED USING MEAN MONTHLY CLIMATE DATA INPUT TO THE LIFE OF MINE WATER BALANCE MODEL.

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Appendix C: Water Quality Model Update Report

Water Balance/Water Quality Model Update for Blackwater Gold Mine Brine Management Work Plan

Prepared for:
BW Gold Inc.
Suite 3083 - 595 Burrard St.
Vancouver, BC, Canada V7X 1L3

Prepared by:
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305 - 1770 West 7th Ave.
Vancouver, BC, V6J 4Y6

Project No. A599-4

3 September 2024

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ARTEMIS GOLD INC | Blackwater Mine

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1. Introduction

Blackwater Mine

1. Introduction

This report presents water quality model updates and revised predictions for the Blackwater Gold Mine (the Project) under an updated Post-Closure water management scenario, developed to inform the Project Closure and Post-Closure Water Management Plan prescribed under:

- *Mines Act* permit M-246 Condition C.5.(g)(i) “Post-Closure Water Management Plan”.
- EA Certificate M19-01 Condition 34: “Closure and Post-Closure Water Quality Management Plan”.

Results presented herein are updated from those presented in the water balance model (WBM) and water quality model (WQM) developed in support of the Blackwater Joint Permit Application (model version 12b; Lorax 2021) and subsequent revisions developed in support of the Joint Permit Application Technical Review (version 13e; Lorax 2022) described in further detail below.

A Life of Mine (LOM) WBM describing anticipated conditions at the Project over a 125-year period was developed as part of the Joint Permit Application (KP, 2021). Coupled to the WBM and encoded within a GoldSim modelling framework, Lorax Environmental Services Ltd. (Lorax) developed a site-wide WQM for the Project for all Project phases (Construction, Operations, Closure, Post-Closure). In that model (v12b), the Membrane Treatment Plant was assumed to operate for the duration of the Post-Closure modeled period, with the primary objective of removing sulphate from the contact water stream prior to discharge of treated effluent to the receiving environment. The brine waste stream generated by the Membrane Treatment Plant was managed into the Pit Lake.

The Joint Permit Application (the Application) was submitted in support of permitting for the Construction and Operations Phases, with Closure and Post-Closure information provided for information and conceptual closure plan development purposes. Following Application submission, the WBM was updated to further optimize site water management for the Closure and Post-Closure periods. The WB/WQM was also updated to integrate improved treatment efficiency for selected parameters as well as an update to the brine source term. This update (referred to as the v13e model; Lorax 2022) resulted in an overall improvement to water quality predictions, most notably for the Closure and Post-Closure Project phases, in the v13e model version compared to the model version v12b submitted as part of the Application. In this model version, the Membrane Treatment Plant was still assumed to operate through the duration of the Post-Closure modeled period resulting in brine waste stream which was assumed to be managed in the Pit Lake through the Post-Closure modelled period.

In the present memorandum, an updated WQM scenario is presented (version “v2h”, paired with an updated WBM described under separate cover; KP 2024) that reflects a Closure and Post-Closure water management regime in which the Membrane Treatment Plant does not operate in Post-Closure. As a result, there is no brine waste stream that requires management in this scenario. A number of additional updates are also incorporated into this model, which represent refinements from initial assumptions underlying the Application model work (*e.g.,* gypsum solubility within the TSF).

These updates were originally conceptualized as part of the Application Technical Review process, following submission of the updated WB/WQM version v13e. Through several rounds of Application Technical Review, reviewers expressed their views and provided BW Gold with written comments with respect to the potential risk of long-term water quality impacts, particularly concerning the potential for accumulation of a water treatment residue consisting of a sulphate-rich brine in the open pit from the operation of the membrane water treatment plant. One comment from EMLI (411c) was used as a jumping off point to address a similar concern raised by other Mine Review Committee (MRC) parties including CSFN's technical consultants (Source) to guide additional water balance and water quality work aimed to mitigate the potential for long term WQ impacts. These review comments resulted in the development of a Brine Management Work Plan (Lorax 2023) that was submitted to the MRC in response to these comments (*i.e*., response memo to comment series 411c of the Application Technical Review process). In response to the provision of the Brine Management Work Plan and based on follow-up meetings of the MRC and correspondence by BW Gold, both EMLI and ENV developed permit conditions that were accepted into the final issued *Mines Act* M-246 and *Environmental Management Act* 110652 permits, that formally adopted components of the Brine Management Work Plan. Model updates presented herein were specifically driven by these permit conditions, most notably *Mines Act* permit condition C5(g)(i) (Post-Closure Water Management Plan), which states:

> *Six months prior to commencing construction of the TSF-C dams above 1283 masl, the Permittee must submit a Post-Closure Water Management Plan to the Chief Permitting Officer for approval. The Permittee must ensure that the plan is prepared by a Qualified Professional and includes, but is not limited to, the following:*
>
> *(a) A demonstration of completion of near-term evaluations as listed in Document 2.38;*

(b) An updated surface water and groundwater model, including a modelling scenario demonstrating the feasibility of using dilution to treat sulphate in pit lake discharge after discontinuing membrane treatment, as described in Document 2.39;

(c) A demonstration of the feasibility of achieving environmental and reclamation objectives for pit lake water quality by either post-closure water treatment or an alternative water management option, including management of brine and/or solid water treatment by-products, as applicable;

(d) Recommendations for further evaluations; and

(e) An updated cost estimate for post-closure water management.

Where “Document 2.38” is the Brine Management Work Plan (Lorax 2023), and “Document 2.39” is the conceptual demonstration of a scenario demonstrating the feasibility of using dilution to treat sulphate (BQE 2023).

This memorandum summarizes revised water quality results for both the mine site facilities and the receiving environment at the Blackwater Gold Mine and detailed tabulated results are presented in Appendix A for both mean and 95th percentile output from the Variable Climate Case (VCC) model. Plotted results comparing 95th percentile VCC model predictions from the last model version issued (version v13e; Lorax 2022) and the revised WB/WQM (v2h) are presented in Appendix B for key parameters at key water model nodes. The general site layout including relevant facilities and infrastructure for the Blackwater Project Application is shown in Figure 1-1 for the end of Operations phase and in Figure 1-2 for the Post-Closure phase.

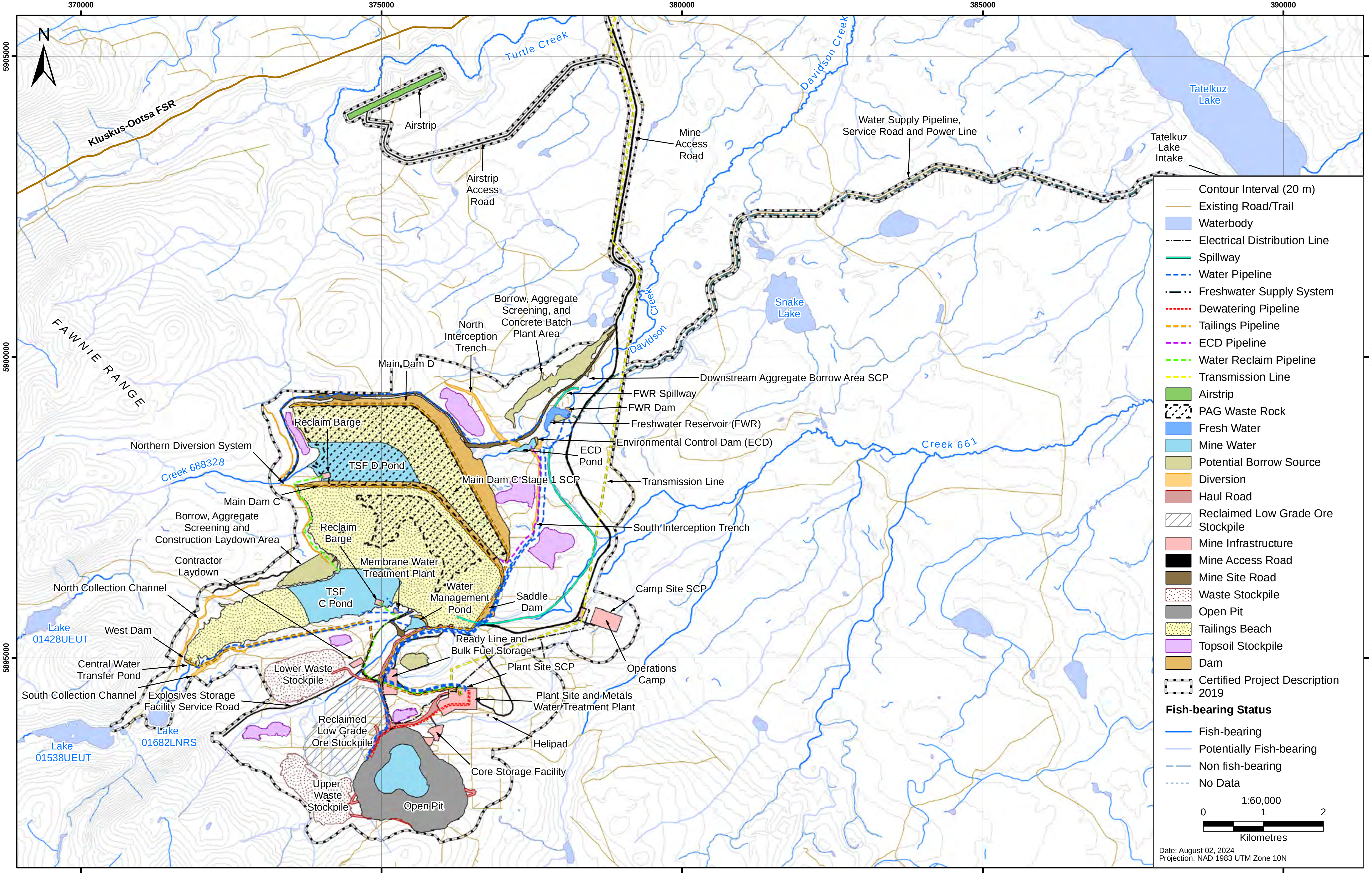

Figure 1-1: General Arrangement of Blackwater Mine for Operations Year +23

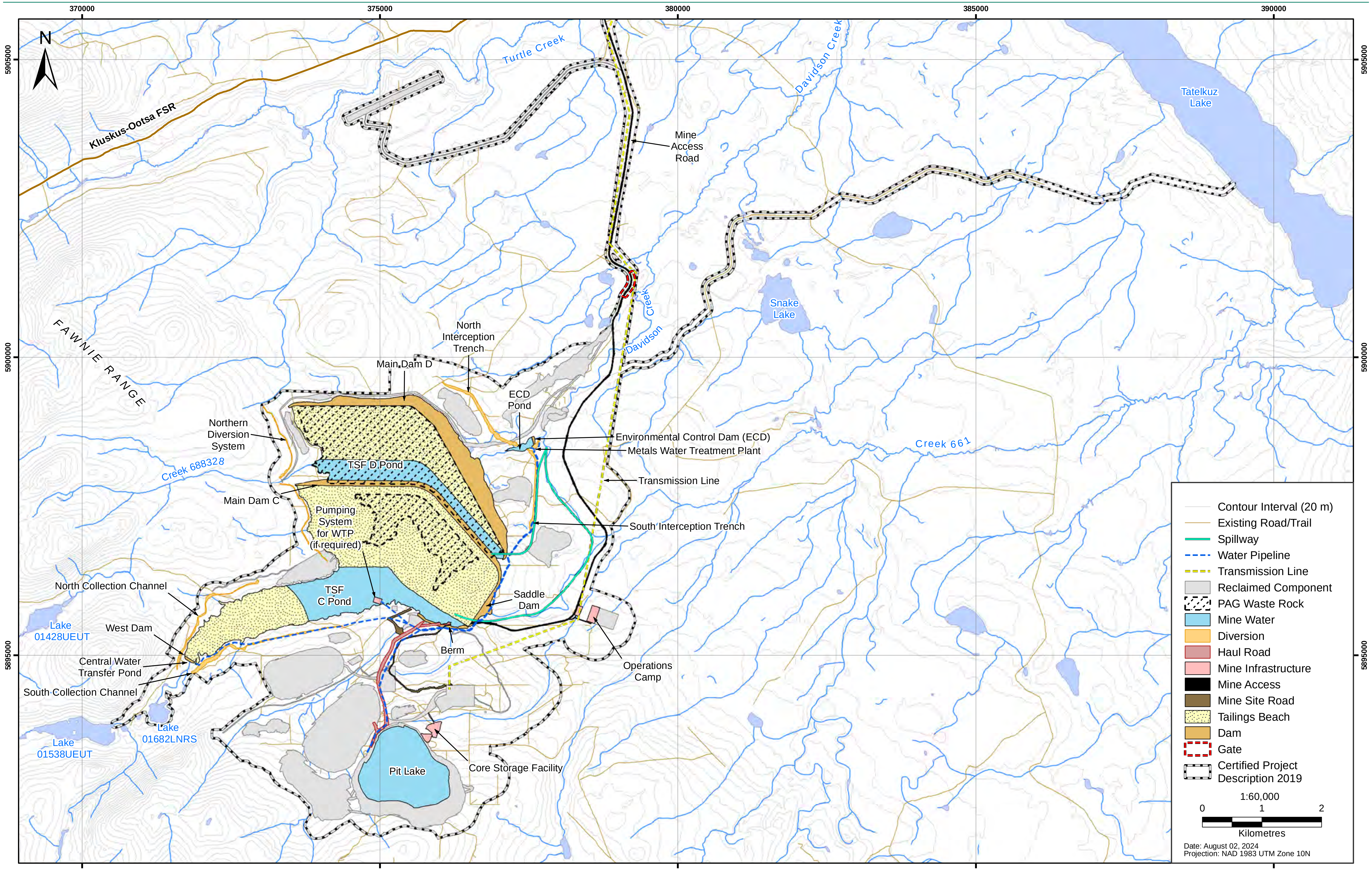

Figure 1-2: General Arrangement of Blackwater Mine at Post-closure Year 46+

2. Summary of Changes to Water Balance/Water Quality Model

ARTEMIS GOLD INC | Blackwater Mine

2. Summary of Changes to Water Balance/Water Quality Model

Updates were integrated to both the water balance model and water quality models as part of Near Term Evaluations identified in the Brine Management Work Plan (Lorax 2023) and as part of ongoing model refinement. These updates were made in part to support the development of a Post-Closure scenario demonstrating the feasibility of using optimized contact water discharge to treat sulphate in Pit Lake discharge after discontinuing membrane treatment. Key updates to the water balance model that are particularly relevant to support the interpretation of water quality predictions are summarized in Section 2.1. In addition to the above updates to the WBM, changes were also made to the geochemical source terms and water quality model assumptions, which are detailed in Sections 2.2 through 2.5.

2.1 Water balance updates

The revised (v2h) WB/WQM incorporates a revised WBM as outlined in KP (2024). In general, water management during early Closure years (Year 24 to 44 in the Average Climate Case model) are unchanged between the v13e and v2h water balance models. Therefore, the below section is focused on key changes to water management between model scenarios during the late Closure and Post-Closure phases as documented in further detail in KP (2024).

2.1.1 TSF Ponds

Ponded water within TSF ponds is directed to the open pit in early Closure years to accelerate filling in both models. In the v13e model, this water continues to be directed to the Pit Lake through the entire Closure phase until the onset of Post-Closure. In the v2h model, TSF ponded water ceases to be directed to the Pit Lake in later years of Closure, a few years prior to the Pit Lake filling to the level that initiates treatment of Pit Lake water (*i.e.,* once the Pit Lake level is 15 m below the rim [1,467 masl]). Water from the TSF ponds also discharges passively via the Closure Spillway and is also actively managed (pumped) to Davidson Creek to increase downstream flows during low flow periods and to facilitate discharge of water collected at the ECD, starting in late Closure and continuing for the duration of the Post-Closure phase.

2.1.2 ECD

Similar to TSF ponded water, ECD water is directed to the open pit in early Closure years to accelerate filling in both models. In the v13e model, this water continues to be directed to Pit Lake through the entire Closure phase until the onset of Post-Closure. In the v2h model, the rate at which ECD water is directed to the Pit Lake declines a few years prior to the Pit Lake filling to the level (10 m below pit rim) that initiates treatment of Pit Lake water at the water treatment plant (WTP). At this point, water collected at the ECD is preferentially directed to the Metals Removal (MR) WTP for treatment prior to discharge to Davidson Creek.

The volume of water directed to the MR WTP versus the Pit Lake is determined in the WBM based upon the capacity to meet the sulphate BC WQG at DC-05 (WQ28). ECD water in excess of the volume that can be discharged (while meeting downstream WQGs) is directed to the Pit Lake for discharge in a later month.

Sulphate concentrations in water collected at the ECD decrease over time, which allows increasingly more ECD water to be directed to the MR WTP (increases from 1.5 Mm^3/yr in Year 45 to 2.7 Mm^3/yr) over the duration of the Post-Closure modelled period. Pumping of ECD water to the Pit Lake is predicted to continue until Year 62 for the average climate condition. In later years, pumping of ECD water to the Pit Lake occurs during the lower flow months (*i.e.*, winter). In previous model versions, ECD water was pumped to the Membrane WTP for treatment and eventual discharge to Davidson Creek.

2.1.3 Pit Lake

In the v13e model, the Pit Lake is maintained as a groundwater sink in Post-Closure at an elevation of 1,440 masl (approximately 40 m below the pit rim) to prevent seepage from the lake to the receiving environment. Mine contact water is preferentially directed to the Pit Lake to accelerate filling for the duration of the closure phase. This lake level is reached in approximately Year 37.

In the v2h model, water from the TSF, WMP, and Upper Waste Stockpile is no longer directed to the Pit Lake in Late Closure when the lake level is 15 m below the pit rim (1,467 masl; *i.e.*, at a higher elevation compared to the v13e model). Pit filling continues at a slower rate following this threshold as ECD and stockpile water is preferentially directed to the MR WTP. Pit Lake water is directed to the MR WTP in the LOM WBM once the modelled Pit Lake is 10 m below the pit rim (1,472 masl; Year 47 [2070] in the average case water balance model, or as early as Years 41-43 [2064-2066] in the variable climate case water balance model]). The onset of metals treatment of Pit Lake water is considered to represent the onset of the Post-Closure phase for the purpose of the water balance model.

Through the Post-Closure phase, the WBM targets a Pit Lake stage at an elevation 10 m below the pit rim (*i.e.,* 1,471 masl or 201 Mm^3 of the available 216 Mm^3 total storage capacity). As noted above, this elevation is higher than what was assumed in the v13e model such that the Post-Closure pit lake is no longer operated as a groundwater sink. This results in Pit Lake seepage that is assumed to daylight at certain surface water model nodes (*e.g.,* TSF Spillway) within the modelled time frame. Previously, in the v13e water balance, the Pit Lake elevation was managed via treatment and maintained at a lower elevation (1,440 m asl), which eliminated the potential for seepage to exit the Pit Lake that previously daylighted at receiving stream nodes (v12b).

Because the Membrane WTP is not operating in the updated v2h scenario, no brine is directed into the Pit Lake. As such, the Pit Lake continues to be modelled as a fully mixed "single cell" system, rather than as a density-stratified or "two cell" system evaluated in previous documents.

2.1.4 Membrane Water Treatment Plant

The updated model scenario v2h assumes there is no Membrane WTP during the Closure and Post-Closure period. Previously, in the v13e water balance, the Membrane WTP was assumed to operate through the duration of the Post-Closure modelled period. Water from the ECD, Upper Waste Stockpile, Pit Lake, and TSF C pond was directed to the Membrane WTP, up to a treatment rate of 190 L/s. Brine waste (retentate) generated by the Membrane WTP was directed into the Pit Lake.

2.1.5 Metals Water Treatment Plant

The MR WTP treats ECD, Pit Lake and Upper Waste Stockpile water collected from the mine site prior to release downstream. Treatment is initiated in the water balance in late Closure when the Pit Lake elevation reaches 15 m below the pit rim, at which point ECD and Upper Waste Stockpile water are directed for treatment for the remainder of the simulation timeline. Once the Pit Lake elevation reaches 10 m below the pit rim (*i.e.,* the onset of the Post-Closure phase), Pit Lake water is also directed for treatment for the remainder of mine life.

Treatment capacity up to 155 L/s is assumed in the WBM, which provides capacity to treat up to 5 Mm^3/yr, noting the average water balance results see almost 4 Mm^3/yr treated when ECD water still directed to the Pit Lake versus 3.4 Mm^3/yr treated and released from the mine site in the long-term). In the v13e model, the MR WTP was assumed to not operate during the Post-Closure modelled period.

In the updated v2h model, rates of treatment and release vary with the natural hydrograph with the intention of optimizing water discharge from site depending on receiver stream (DC-05, formerly referred to as WQ28) capacity. This is accomplished in the model by managing water from ECD and Upper Waste Stockpile preferentially to the MR WTP, with excess water from ECD directed to the Pit Lake, when required. Water volumes from the Pit Lake are directed to the WTP, as capacity is available.

2.1.6 Freshwater Reservoir and Freshwater Supply System

The FWR and FWSS is assumed to continue operating through the Closure phase in both models. These facilities are ultimately decommissioned when water quality and downstream flow criteria (IFN) can be met. In both the v13e and v2h models, FWR decommissioning occurs at the onset of Post-Closure in the Average Climate Case. In the v2h model Variable Climate Case, the FWR is set to be decommissioned in 2069 in all climate iterations; however, the year in which Post-Closure begins (for the purpose of this analysis, the year in which Pit Lake water treatment begins is considered the onset of the Post-Closure phase) may occur earlier than 2069 in certain climate iterations. As such, the technical constraints imposed on the model result in certain climate iterations allowing the FWR to function as the project's primary discharge point to the receiving environment in the first few years of Post-Closure until FWR decommissioning in 2069.

Ultimately, the FWR and FWSS will be decommissioned when water quality targets and downstream flow criteria (IFN) can be reliably met, such that the final date realized for FWR decommissioning may vary from model assumptions. Future iterations of the WB/WQM may evaluate the benefit of continued operation of the FWR in the initial years of the Post-Closure phase as the basis for water management plan updates.

2.2 Pit Wall Source Term Updates

As part of the model update, pit wall source terms have been updated to include exhaustion of reactive mineral phases in acidic wall rock exposures over time in Post-Closure. In the Application model, static source terms were developed for PAG1, PAG2, NAG3, NAG4 and NAG5 rock types that were applied in both Operations and Post-Closure with no consideration for depletion of reactive mineral phases over time. This was a highly conservative assumption, particularly for acidic wall rock which will experience rapid depletion of sulphide minerals and trace metal at the rapid weathering rates expected to occur under acidic conditions. For example, the PAG1 base case HCT loading rates used in source term development were estimated to be 31 mg/kg/wk. At this loading rate, the total sulphur in PAG 1 rock (0.67 wt.%) would be exhausted after 4.2 years of weathering. Similarly rapid depletion rates are observed for the trace metals Cd, Co, Cu, Ni and Zn. Based on these observations, significant depletion can be expected over the >80 year Post-Closure model horizon.

Parameters with loading rates that will result in appreciable changes in solid-phase metal content in wall rock include SO_4, Cd, Co, Cu, Ni and Zn. For these parameters, the loading rates were adjusted in the v2h model update proportional to the rate of removal of these elements. That is, once 50% of the solid phase Zn was leached from PAG 1 wall rock the Zn loading rate will be 50% of the HCT upscaled rate used in the Application model. This adjustment was only made for the parameters listed above in PAG1 and PAG2 wall rock because neutral-pH wall rock exposures do not experience an appreciable change in solid-phase sulphur or metal content over the Post-Closure model horizon. In order to maintain ion balance the major cations Ca, Mg and Na were adjusted proportional to SO_4 decay, contributing to the overall decline in TDS from wall rock runoff. The depletion was not initiated until 2070 in the model as a conservative precaution and in consideration of continued wall rock ravelling that may occur in early closure. The resulting pit wall updates for acidic PAG1 and PAG2 wall rock are shown in Table 2-1. Note that the end of Operations concentration from 2047 shown in Table 2-1 was applied for the duration of the Post-Closure period in the Application v13e model.

Table 2-1:
Pit wall source terms for acidic PAG1 and PAG2 wall rock in Post-Closure in the v2h model update.

	PAG 1 - acidic				PAG 2 - acidic			
Parameter (mg/L)	**2047***	**2080**	**2110**	**2133**	**2047***	**2080**	**2110**	**2133**
SO_4	1067	917	530	215	600	477	183.0	88
Ca	233	201	116	47	209	168	65	31
Cd	1.5	1.1	0.47	0.12	0.096	0.10	0.073	0.058
Co	0.82	0.62	0.28	0.07	0.25	0.26	0.20	0.16
Cu	0.24	0.26	0.25	0.24	0.055	0.052	0.050	0.049
Mg	112	97	56	23	21	17	6.4	3.1
Na	32	87	50	19	5.0	4.0	1.5	0.7
Ni	0.87	0.75	0.44	0.18	0.32	0.34	0.27	0.23
Zn	157	129	67	23	9.7	9.2	9.0	8.0

*The end of Operations source term in 2047 was applied for the duration of the Post-Closure phase in the Application v13e model.

2.3 Mill Source Term

Mill reagent usage is the primary source of SO_4 in Post Closure TSF seepage. Sulphate in the mill originates from SO_2 air used to detoxify CN as per the following reaction:

$$CN^- + SO_2 + O_2 + H_2O = CNO^- + H_2SO_4$$

The end products of this reaction are cyanate, which rapidly hydrolyzes to ammonia, and hydrogen sulphate. The theoretical consumption of SO_2 air is a 1:1 molar ratio with CN (*i.e.,* 2.5 g SO_2: 1 g CN) as per the above stoichiometry. In practice, this ratio will vary depending on the presence of other reduced species which can consume SO_2 and variations in WAD-CN content.

The v13e Application model assumed a relatively high SO_2 air dosage of 6 g SO_2 : 1 g CN. Since Application submission, the SO_2 air usage has been revised based on a review of metallurgical data completed by JAT MetConsult Ltd (Appendix C). This review concluded that a dosage ratio of 2.76 g SO_2: 1 g CN would be adequate for CN destruction within the mill, and recommended a 10% safety factor be incorporated to address variations in CN addition resulting in a dosage of 3 g SO_2: 1 g CN. Assuming tailings are produced at a nominal 45% solids content, this model update reduces the amount of SO_4 added in the mill from 2,300 mg/L (Application v13e model) to 1,200 mg/L (updated v2h model).

The reagent dosage and resulting concentrations applied in the Application v13e model and updated v2h model are shown in Table 2-2. No other changes were made to the mill process water or related TSF source terms.

Table 2-2:
Mill reagent usage and resulting process water concentrations applied in the Application model (v13e) and the updated model (V2h)

	Units	Updated Model (v2h)	Application Model (v13e)
Mill Reagent Addition			
SO_2 Air	kg/t	0.96	1.9
NaCN	kg/t	0.6	0.6
NaOH	kg/t	0.077	0.04
HCl	kg/t	0.1	-
$CuSO_4$	kg/t	0.07	-
Resulting Concentrations			
SO_4	mg/L	1207	2300
Na	mg/L	267	230
CNO-N and NH_3-N	mg/L	140	140
Cl	mg/L	80	-

2.4 Gypsum Formation, Storage and Dissolution

Gypsum may occur within the mill and tailings discharge as a result of SO_2 air and lime usage within the process, and reliance on reclaim water from the TSF pond. The influence of gypsum formation on SO_4 and Ca concentrations was captured in the Application model. The Application assumed that gypsum present within the tailings would influence TSF seepage for the duration of Post-Closure, and did not consider long-term depletion of gypsum present within the TSF. In the updated v2h model, gypsum formation, storage and dissolution is tracked within the mill, TSF C and TSF D, and is described below.

Gypsum formation in the mill is predicted by applying the Na-dependent gypsum solubility relationship defined in the Application and tracking the mass of gypsum discharged to TSF C and TSF D and its accumulation during Operations (Figure 2-1). Dissolution of gypsum is modelled using the same Na-dependent gypsum solubility relationship used to model gypsum formation in the Application. The loss of gypsum is tracked during the Post-Closure period. The loss rate is determined by the solubility of gypsum in seepage chemistry, and the seepage flow rate (Figure 2-2 and Figure 2-3). Overall, the results show that gypsum will be depleted from TSF D by 2054, while only a small portion of gypsum stored in TSF C will be released in the Post-Closure model horizon (*i.e.,* before 2133). Stored gypsum is depleted faster in TSF D because it receives less gypsum from the mill and experiences higher seepage rates.

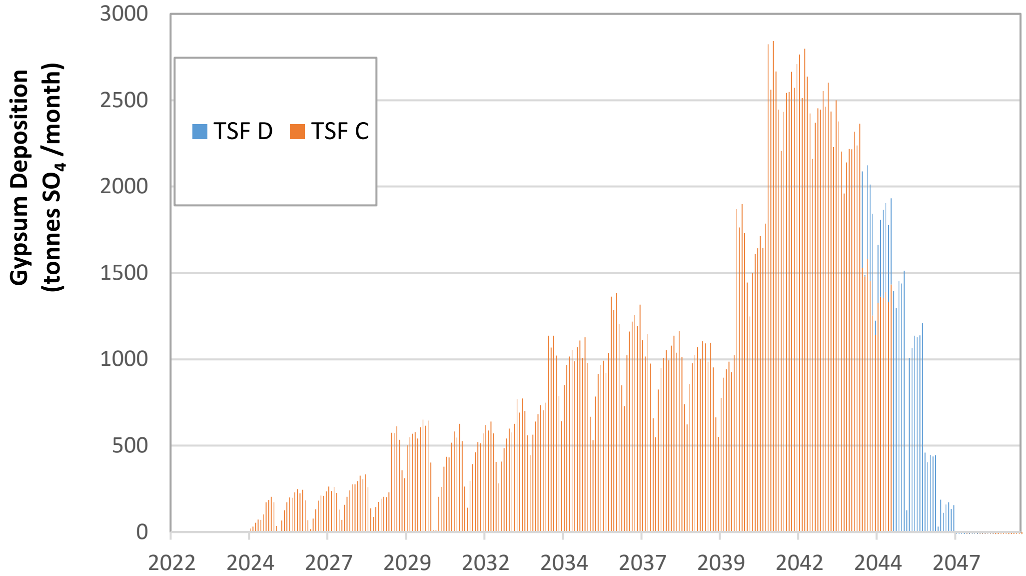

Figure 2-1: Monthly gypsum mass discharged to TSF D or TSF C from the mill during Operations.

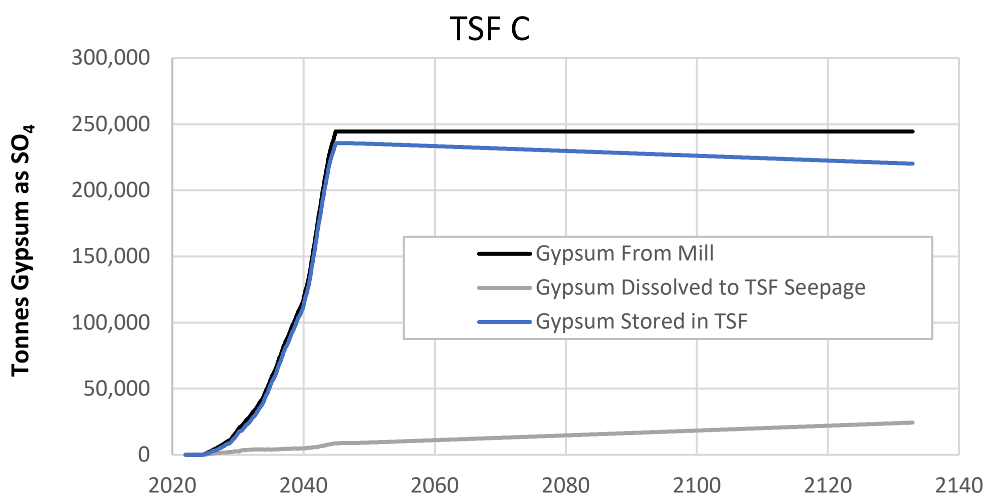

Figure 2-2: Gypsum deposition, storage and dissolution in TSF C during Operations and Post-Closure period.

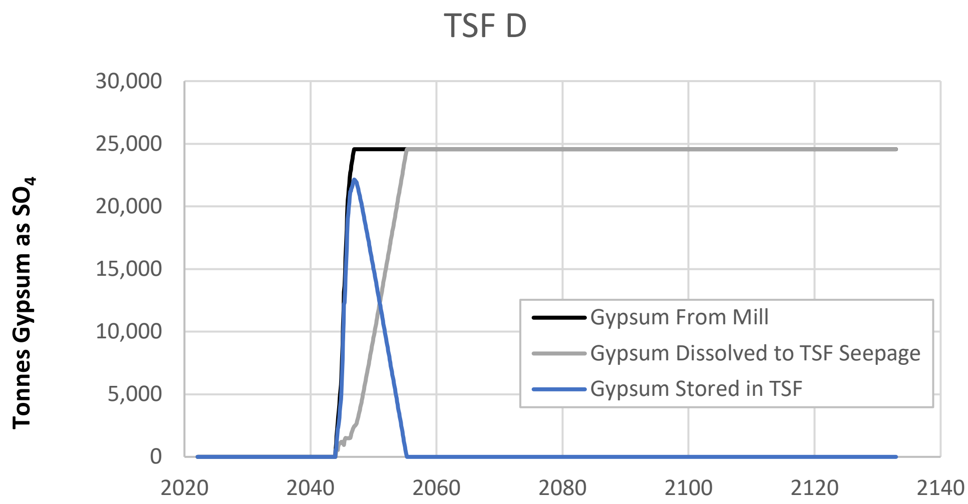

Figure 2-3: Gypsum deposition, storage and dissolution in TSF D during Operations and Post-Closure period.

2.5 TSF Pore Water Rinsing

The TSF seepage concentrations are expected to evolve throughout Operations and Post-Closure as mill reagents are rinsed from the system. The Application model predicted annualized seepage concentrations for the Operations period and applied source terms calculated for the final year of Operations to the entire Post-Closure period. In reality, water soluble species and mill reagents will gradually be rinsed over time from the TSF. To account for this, major ions and parameters present as a result of reagent usage are modelled to be rinsed from TSF pore water reservoir over time in the updated v2h model. Parameters that are allowed to rinse in Post-Closure include SO_4, Ca, Na, T-CN, WAD-CN and NH_3. The supply of SO_4 and Ca is gradually replenished by gypsum dissolution, as discussed in the previous section. Trace metals and other parameters are assumed to remain constant throughout the Post-Closure phase, and have not been updated from the Application model.

2.6 Nitrification in Pit Lake

Nitrogen species are subject to biological transformations in aquatic systems. Ammonia represents a key nitrogen species that is expected to decay in the receiving waterbodies via various processes, including nitrification, biological uptake, and volatilization. Of these processes, biological uptake and volatilization are expected to have limited impact on nitrogen concentrations in the Pit Lake given the limited photic zone depth relative to the total Pit Lake depth. Hence, nitrification is considered the most likely process to influence nitrogen concentration in the Pit Lake, which would occur throughout the entire water column.

Nitrification is a process in which ammonia is oxidized to nitrite and nitrate sequentially by nitrifying bacteria (Bernhard, 2010). Nitrite is an intermediate product generated via ammonia oxidation, the first and rate–limiting step of nitrification. Once generated, nitrite is expected to be quickly consumed via further oxidation to nitrate. The rate of nitrification is dependent on ambient conditions, including dissolved oxygen, temperature, pH, and ammonia concentration. Nitrification was applied to the Pit Lake in the WQM update as follows:

- A conservative nitrification rate of 0.005 mg/L/d is adopted from literature (Nilsson & Widerlund, 2018; Chlot *et al*., 2011) based on observations and simulations for cold climate mining ponds with comparable water quality as predicted in the Pit Lake.
- Nitrification is applied over the growing season (June – September), when water temperatures are more favorable for bacterial growth.
- The modelled mass ratio of ammonia decay and nitrate production is 1:1 based on stoichiometry and conservation of mass.
- Nitrification is applied until ammonia is reduced to the minimum concentration (0.005 mg/L).

3. Results of Revised Water Balance/ Water Quality Model

ARTEMIS GOLD INC | Blackwater Mine

3. Results of Revised Water Balance/ Water Quality Model

Tabulated summaries of water quality predictions are presented in Appendix A for mean and 95th percentile output of the VCC. Time series plots showing 95th percentile output of the VCC for key nodes are provided in Appendix B (*i.e.*, v13e vs. the v2h Brine Management Work Plan updated model).

A discussion of the water quality predictions is provided in the sections that follow with a focus on parameters showing mine-related signatures that illustrate key loading terms within the model:

- In Section 3.1, a comparison of the results from the previous version of the WB/WQM (v13e; Lorax, 2022) and the revised version (v2h) are provided for parameters of potential concern and at key model nodes.
- In Section 3.2, updated Base Case water quality model output (*i.e.*, 95th percentile statistics of the revised VCC model with Base Case source terms) for Closure and Post-Closure Project phases for receiving stream nodes screened against British Columbia (BC) water quality guidelines (WQGs) for the protection of aquatic life.

3.1 Model Output Comparison: v13e vs v2h Model Scenarios

3.1.1 TSF Seepage

A number of modifications to the v2h model were implemented to refine TSF seepage water quality predictions. Updates that impact TSF seepage chemistry include: mill reagent usage (Section 2.3); gypsum formation, storage and dissolution (Section 2.4); and, rinsing of mill reagents from the TSF pore water (Section 2.5). The outcome of these model updates are manifested in TSF C and D seepage chemistry as illustrated in Figure 3-1 and Figure 3-2, respectively.

The v2h model predictions show that concentrations of tracked mine-related parameters in TSF D will decline rapidly compared to TSF C. This is driven by the faster seepage rate, lower initial concentrations, and depletion of the stored gypsum reservoir approximately six years after the onset of Closure (*i.e.*, by 2054). Concentrations in TSF C, which will receive a majority of the tailings, show a more gradual decline in concentrations. Note that the decline in Ca and SO_4 from TSF C is driven by rinsing of Na which lowers the solubility of gypsum, and not the depletion of stored gypsum (Figure 2-2).

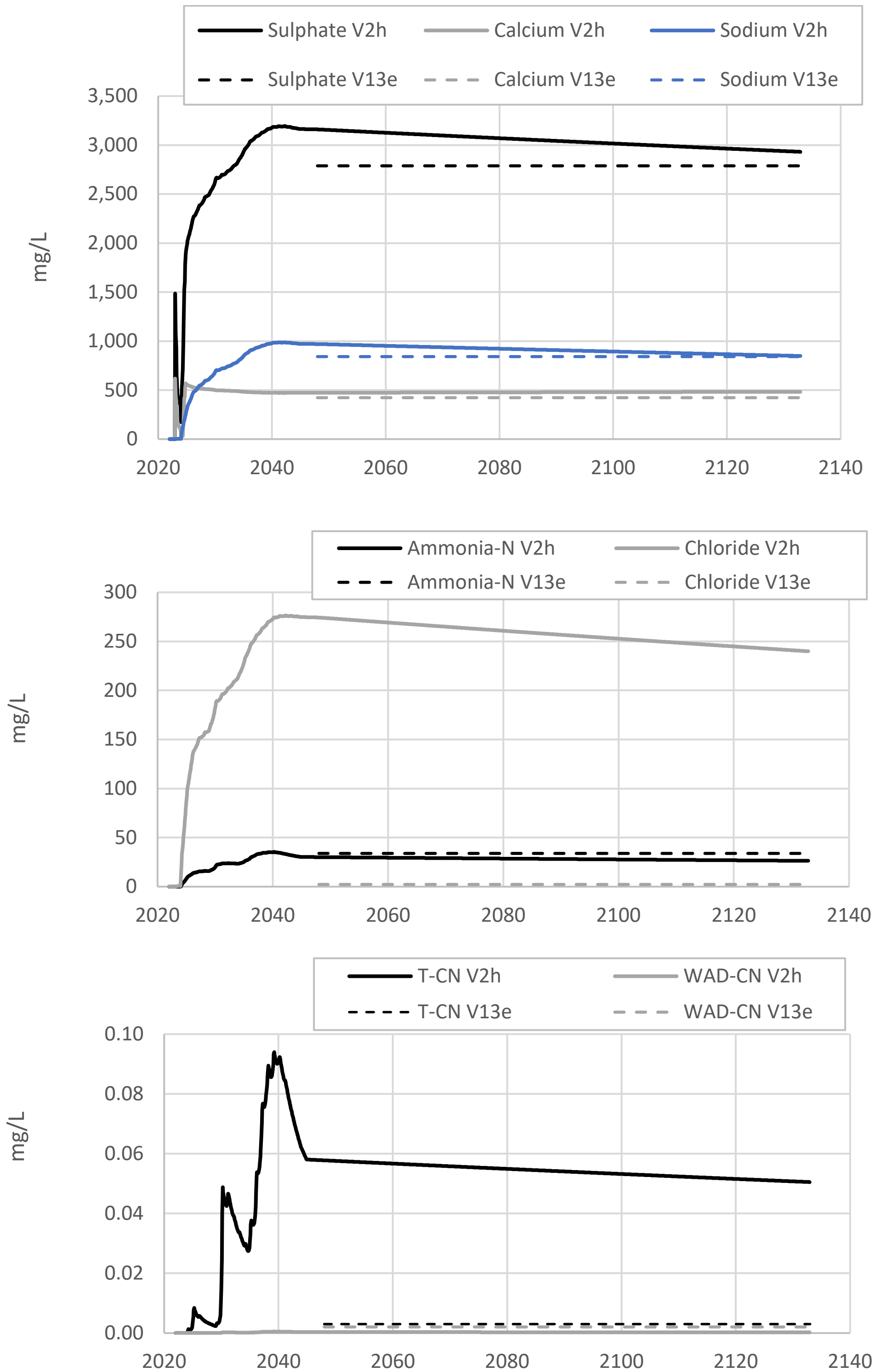

Figure 3-1: TSF C seepage concentrations from v2h model for sulphate, calcium and sodium (top), ammonia and chloride (middle), and T-CN and WAD-CN (bottom) compared to v13e model Post-Closure predictions.

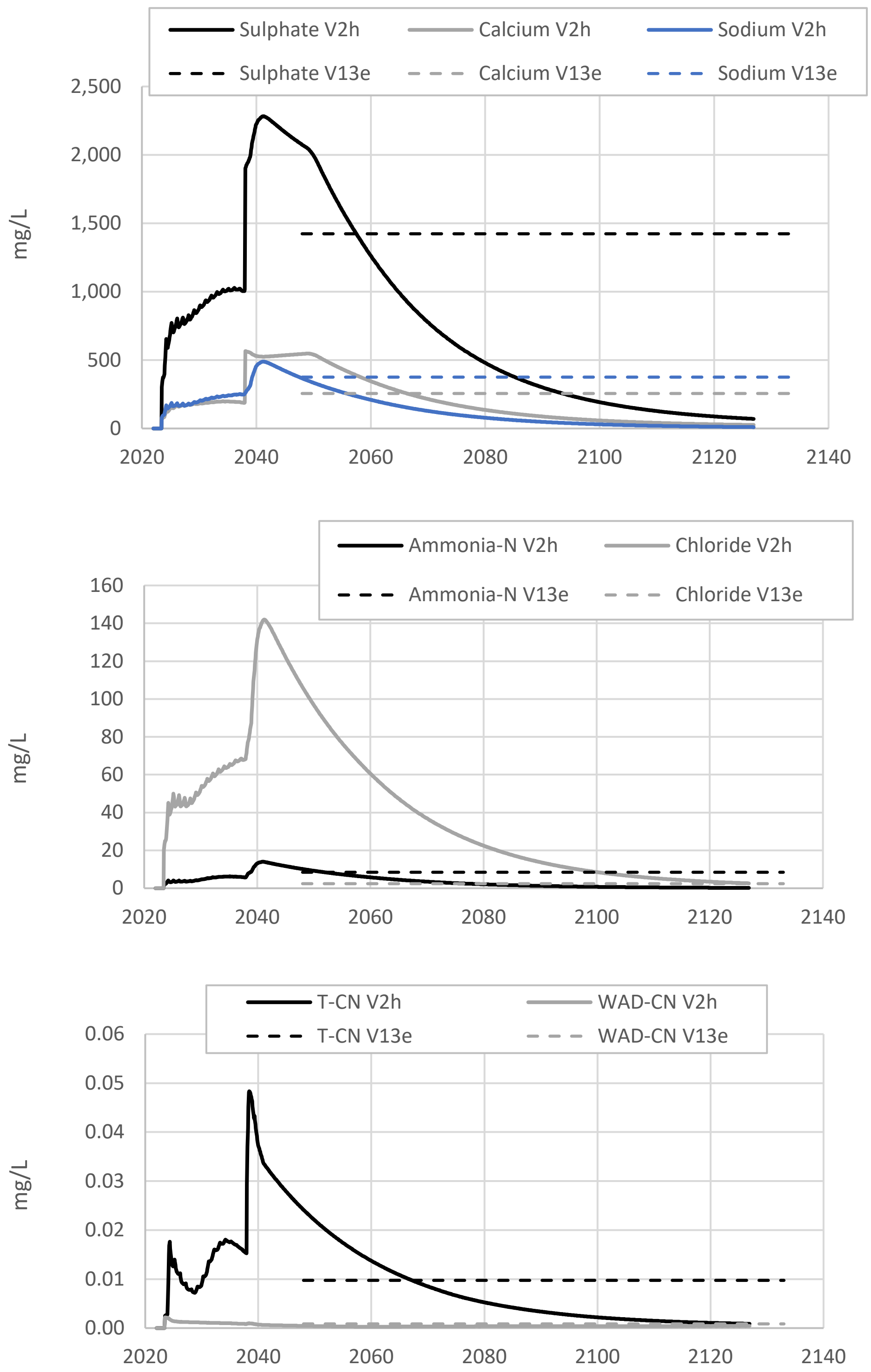

Figure 3-2: TSF D Seepage concentrations from v2h model for sulphate, calcium and sodium (top), ammonia and chloride (middle), and T-CN and WAD-CN (bottom) compared to v13e model Post-Closure predictions.

Concentrations in TSF D and TSF C are initially elevated in the v2h model predicted chemistries compared to the Application model (v13e). Concentrations rapidly decline in TSF D, and by 2060 most concentrations are below that of the Application model, which assumed static source terms. Conversely, owing to the slow rate of rinsing in TSF C most concentrations remain above the static Application model predictions at the end of the Post-Closure model horizon.

The largest differences in concentrations are for Cl and cyanide species. The higher Cl concentrations were introduced from updated mill reagent usage which now includes 0.1 kg/t HCL, which was not tracked in the Application model version. T-CN and WAD-CN are predicted in higher concentrations because these parameters are now tracked conservatively within the TSF pore water similar to other mill reagents. The Application model used saturated column effluent to predict seepage concentrations.

3.1.2 Other Mine Site Facilities

Water quality predictions for certain mine site facilities in the Closure and Post-Closure phases show notable differences between the v13e and v2h WB/WQMs, which are summarized below and illustrated in Figure 3-3 (ammonia), Figure 3-4 (sulphate), and Figure 3-5 (dissolved zinc), and Appendix B (note WQGs are shown for reference only, and are calculated using predicted v2h model hardness for WQ28 [DC-05], and baseline monthly pH, DOC, and temperature). Minor differences are also observed for Construction and Operations phase predictions between the two models, primarily as a result of model updates to mill reagent usage (Section 2.3) and gypsum solubility tracking (Section 2.4) developed for the v2h model that affect all mine phases. Model output for Construction and Operations phases are included in Appendix B plots for completeness but should not be considered final. Updated Operations phase model results will be presented under separate cover (*e.g.*, per *Mines Act* permit M-246 condition C.4.(c)(ii)) and will integrate a complete set of model updates and optimizations for this phase as appropriate, some of which were not implemented for the purpose of the present v2h model update.

Figure 3-3: Ammonia predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for: TSF C, TSF D, Open Pit/Pit Lake, WMP, Spillway, FWR, ECD and Mill.

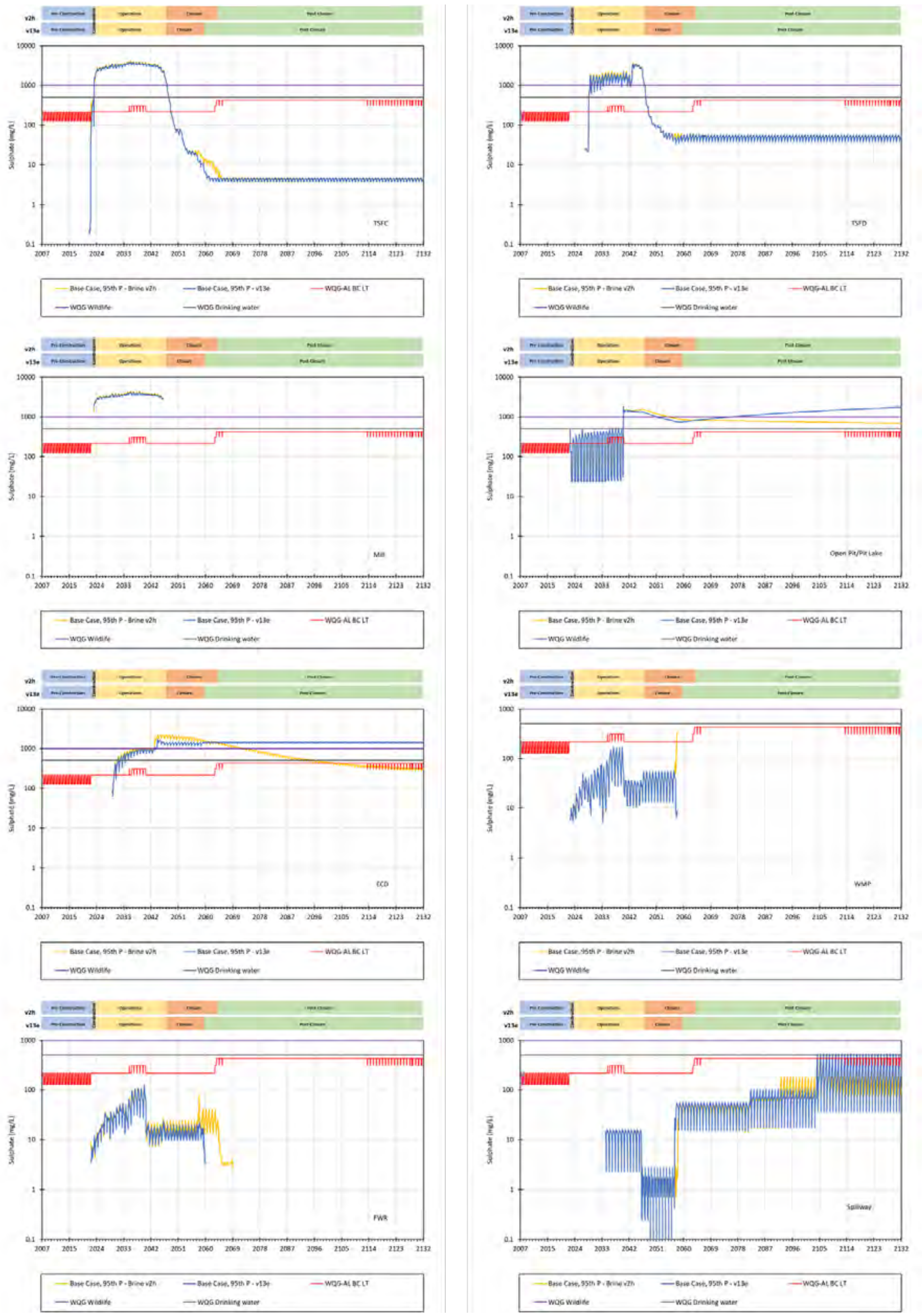

Figure 3-4: Sulphate predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for: TSF C, TSF D, Open Pit/Pit Lake, WMP, Spillway, FWR, ECD and Mill.

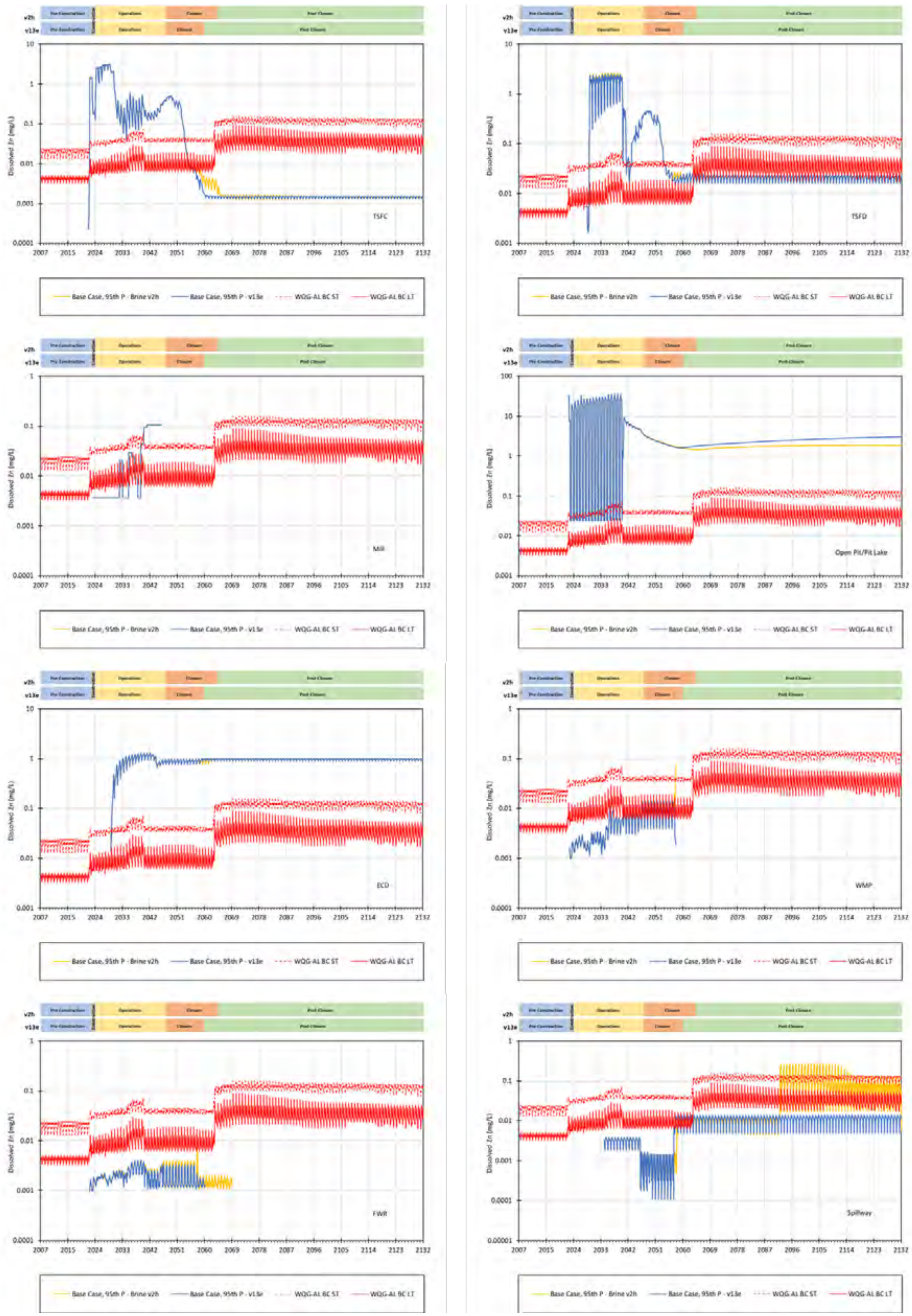

Figure 3-5: Dissolved zinc predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for: TSF C, TSF D, Open Pit/Pit Lake, WMP, Spillway, FWR, ECD and Mill.

For the Closure and Post-Closure model outputs, notable differences between v13e and v2h WQM results are summarized below by facility.

- **TSF C and D**: Overall, concentrations of major ions and metals in TSF C and D ponds show minor differences between the v2h and v13e models (Appendix B.1). During the Closure phase, primary differences in predicted concentrations for major ions (*e.g*., sulphate) and certain metals are attributed to a small extension of the Closure period in the v2h model compared to the v13e model, and associated TSF water management (*e.g*., pump back of TSF D water to TSF C is extended by a few years in the v2h model). After Closure and following the onset of Post-Closure, predicted concentrations in TSF ponds between the v13e and v2h models are comparable.
- **Mill**: Predicted concentrations of process water in the mill are only generated in the model for the Operations phase, when the mill is operating (Appendix B.1). As noted above, minor differences are observed in mill predictions between the two models as a result of model updates to mill reagent usage and gypsum solubility tracking developed for the v2h model.
- **Open Pit**: In the v2h model, the absence of brine input to the Pit Lake results in substantially lower concentrations of sulphate, ammonia, and certain metals in the Post-Closure phase compared to the v13e model (Appendix B.1). Ammonia concentrations are further reduced in the v2h model due to the effect of nitrification applied to the Pit Lake. In the v13e model, predicted concentrations for major ions such as sulphate and sodium, and certain metals reflected a gradually increasing concentration overtime reflecting the accumulation of brine in the Pit Lake, and no nitrification was assumed to occur.

  Previous modelling efforts predicted the introduction of brine to the pit bottom would foster the development of permanent stratification (*i.e*., meromixis) in the water column, in which lower salinity (less dense) surface waters overlie higher salinity (more dense) deep waters. This transition to a stratified water column serves to physically isolate brine waters at depth. The updated model has no brine introduced to the pit, which may yield weak or no stratification within the water column. This difference may have implications for surface Pit Lake water quality. As such, pit lake hydrodynamic modelling should be considered to elucidate this potential change.

  Other model differences that contribute to changes in predicted concentrations: in the v2h model, the Pit Lake is no longer operated as a groundwater sink (per the v13e model) resulting in a higher final Pit Lake elevation in the v2h model.

Accordingly, there is less exposed pit wall and lower loading contributions (*e.g.*, Cd, Zn) from the pit wall in v2h *versus* the v13e model, paired with pit wall term updates that assume a degree of metal depletion over time. Overall, pit wall runoff (for metals) and ECD water (sulphate and ammonia) represent primary loading sources to the Pit Lake in the v2h model.

- **Environmental Control Dam (ECD)**: As described in Section 3.1.1, the most notable differences in ECD predictions are reflected in concentrations for sulphate and ammonia, both of which are subject to TSF load accumulation and flushing applied in the v2h model (Appendix B.1). As such, predicted concentrations of these parameters are higher in the Closure and early Post-Closure period in the v2h model compared to the v13e, reflecting higher flushing rates of these parameters driven by TSF D in the v2h model. As the TSF D load of these parameters decays as the Post-Closure phase continues, the primary loading source to the ECD is increasingly dominated by TSF C. Flushing rates for all parameters from TSF to ECD were assumed to be constant through the Post-Closure phase in the v13e model. Predicted concentrations for other parameters are otherwise similar between models, with the exception a prolonged Closure phase transition in the v2h model as compared to the v13e model.
- **WMP**: Predictions are similar between the v13e and v2h model versions; the pond is assumed to be decommissioned in the Closure phase (Year 36 or 2059 in the v2h model; Appendix B.1). Increasing major ion and metal concentrations are predicted to occur in the final year of pond operation prior to final decommissioning in the v2h model. These increases reflect the WB/WQM transitioning the pond to a closed state (*e.g.*, diversion of background water away from pond while decreasing pond volume).
- **FWR:** The FWR represents a final discharge point for the Project during the Operation and Closure phases. As described above, FWR decommissioning occurs at the conclusion of the Closure phase in the Average Climate Case in both the v13e and v2h models (*i.e.*, end of Year 46 or 2069 in the Average Climate Case of the v2h model). In general, predicted concentrations of most parameters at FWR are similar between the v13e and v2h models (Appendix B.1). Starting in 2058 in the v2h Average Climate Case model, sulphate and ammonia show an increase concentration at the FWR for a period of six years, following decommissioning of the WMP in 2059. After 2059, WMP surplus water is no longer pumped to the FWR; however, the water balance assumes seepage from TSF C continues to report to the FWR until 2065, after which FWR concentrations for both sulphate and ammonia decrease well below Operations and Closure phase concentrations until

decommissioning in 2069. In the v13e model, TSF C seepage and WMP discharge were assumed to both continue to report to the FWR through to FWR decommissioning in 2059.

- **TSF Spillway**: The TSF Spillway discharges to the receiving environment (Plunge Pool) in Davidson Creek. Prior to Post-Closure, discharge via the Spillway represents a minor volume in both the v13e and v2h models and receives water from runoff and plant site seepage. However, in Post-Closure, considerable volumes of overflow from TSF C and TSF D ponds are predicted to report passively to the TSF Spillway. In addition, the TSF spillway begins to receive seepages from the UWS and LWS. The v2h Post-Closure predictions are generally similar to the v13e predictions for the Closure phase and the first half of the modeled Post-Closure phase period (Appendix B.1). Starting in 2093 in the v2h model, the water quality model assumes Pit Lake Seepage begins to report to the Spillway node resulting in a concentration increase for sulphate, nitrate, and metals associated with Pit Lake water (most notably Cd and Zn). A secondary concentration increase is predicted for sulphate, ammonia and certain metals (*e.g.,* As, Co) due to the water quality model assumption that TSF C seepage to the Spillway initiates in approximately 2105.

3.1.3 Receiving Stream Stations

Similar to results described for mine site facilities, water quality predictions for mine receiving environment nodes in Davidson Creek show notable differences between the v13e and v2h WB/WQMs in the Closure and Post-Closure phases and are illustrated below in Figure 3-6 (ammonia), Figure 3-7 (sulphate), and Figure 3-8 (dissolved zinc; see also Appendix B.2; note WQGs are calculated using predicted v2h model hardness, and baseline monthly pH, DOC, and temperature). Results are presented for Davidson Creek nodes and Chedakuz Creek model nodes. Negligible water quality differences are realized for Creek 661 catchment nodes between model updates and Creek 661 results are therefore not discussed further in this document.

In general, Closure and Post Closure modelling for Davidson Creek, including DC-05 (formerly know as WQ28, the most upstream surface water quality station on Davidson Creek) predicts WQGs are met under wide range of conditions under both mean and 95th percentile Variable Climate Case output (Appendix B.2). To evaluate model feasibility and to allow for a more accurate assessment of potential effects, predicted concentrations were compared against BC WQGs calculated using corresponding predicted hardness on a station-by-station basis. Predicted hardness was higher than upper limits established for certain guidelines for certain stations (*e.g*., 250 mg/L hardness cap for the sulfate BC long-term WQG; 399 mg/L hardness cap for the D-Zn BC long-term WQG). In such circumstances, BC ENV suggests the applicability of guidelines may require a site-specific assessment (BC ENV 2023a). For the purpose of this assessment, the upper limit of the calculated guideline (based on the hardness upper limit established for each guideline) was used for screening purposes.

For the Closure phase, predictions for the receiving stream stations are similar between the v13e and v2h model. The extension of the Closure phase in the v2h model results in a small offset in predicted concentration trends compared to the v13e, but the relative concentration magnitude and seasonal concentration trends are similar between models.

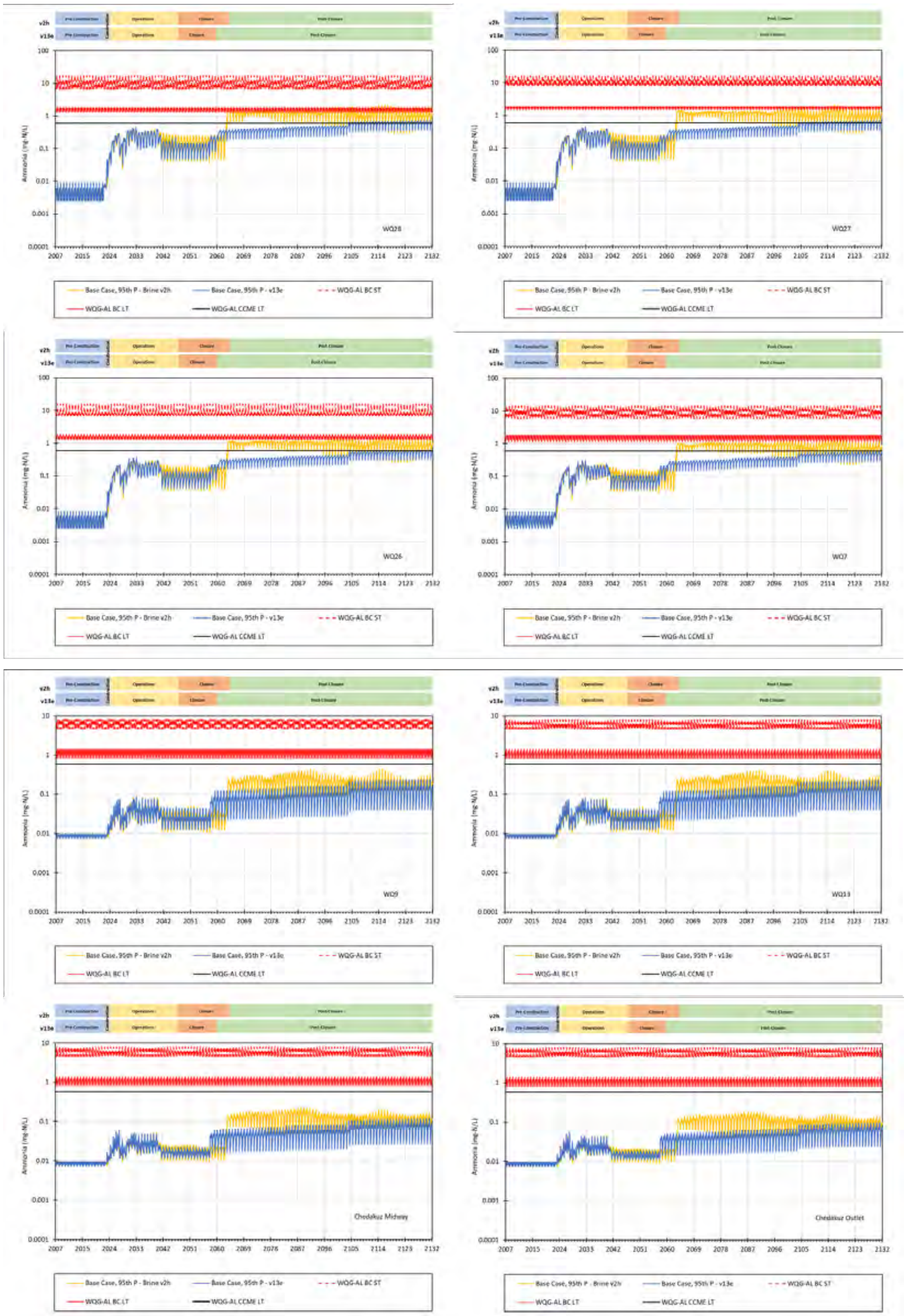

Figure 3-6: Ammonia predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for the following: WQ28, WQ27, WQ7, WQ13, WQ9, WQ26, Chedakuz Midway and Chedakuz Outlet.

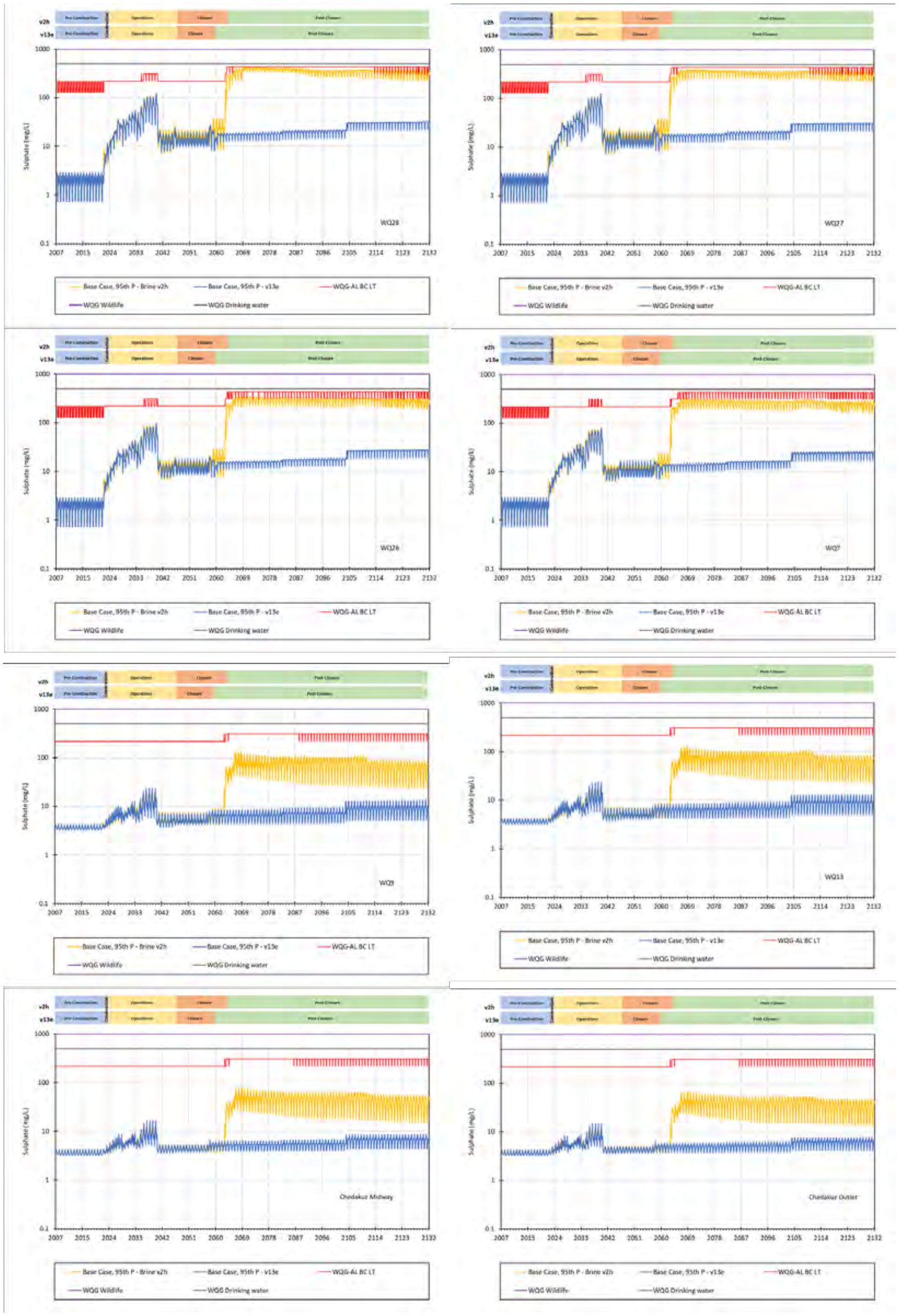

Figure 3-7: Sulphate predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for the following: WQ28, WQ27, WQ7, WQ13, WQ9, WQ26, Chedakuz Midway and Chedakuz Outlet.

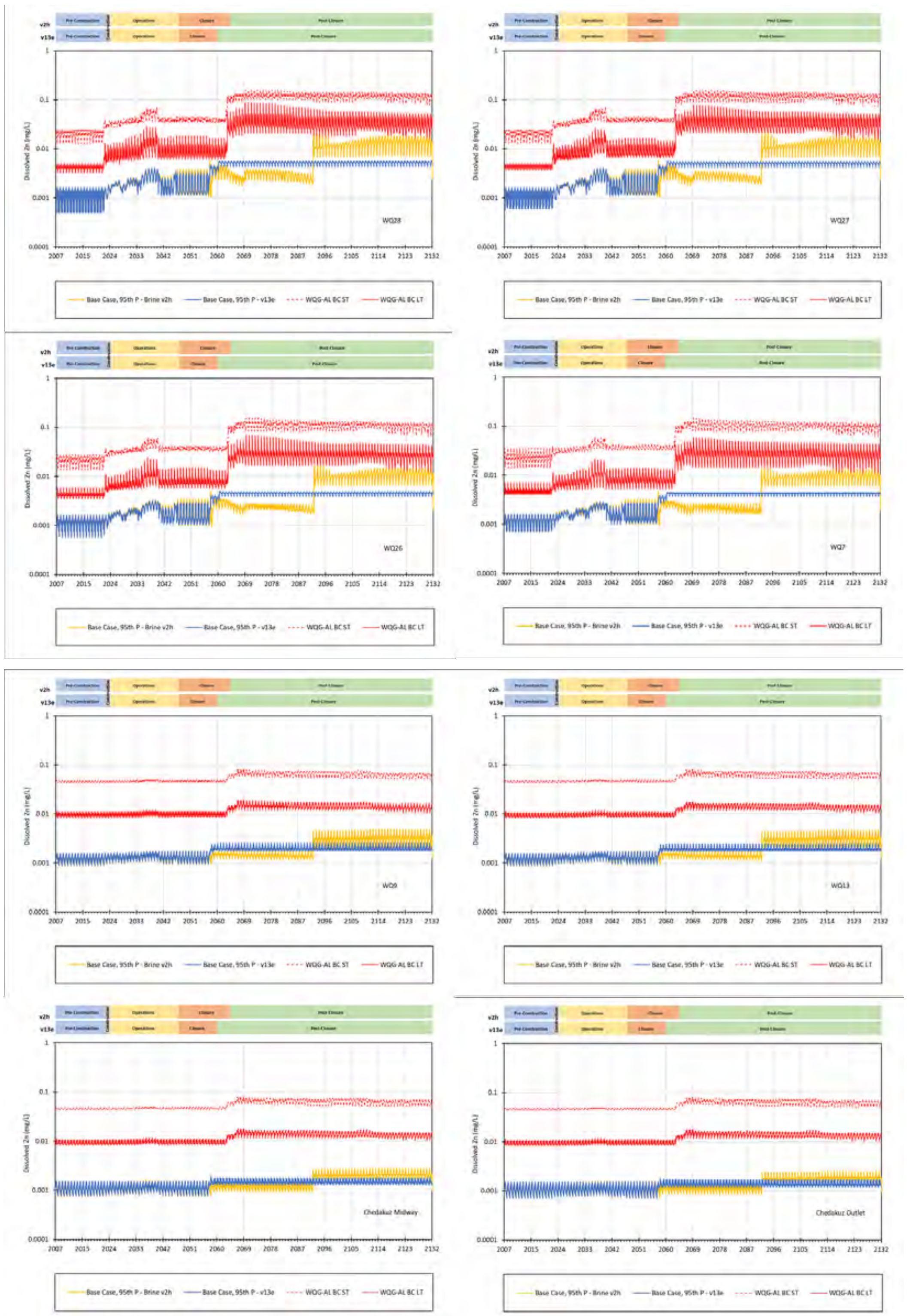

Figure 3-8: Dissolved zinc predictions compared for the v13e and brine v2h simulations. Clockwise from upper left the plots show results for the following: WQ28, WQ27, WQ7, WQ13, WQ9, WQ26, Chedakuz Midway and Chedakuz Outlet.

In the late Closure phase and through the Post-Closure phase, predicted concentrations of major ions and certain metals (most notably sulphate, ammonia and nitrate) at Davidson Creek nodes are measurably higher in the v2h model compared to v13e (but remain below BC WQGs). This result is largely driven by the controlled management of ECD water without the benefit of membrane treatment in the v2h model. Predicted concentrations of other metals in the v2h model, such as Cd and Zn, are similar to or lower than corresponding predictions from the v13e model during Closure and the first half of the modeled Post-Closure period, in part attributed to the benefit of MR WTP treatment of ECD, Pit Lake, and Upper Waste Stockpile water prior to discharge. In the latter part of the modeled Post-Closure period (starting around 2093), concentrations of Cd, Zn, and select metals in the v2h model increase above the corresponding v13e predictions. This increase reflects the onset of seepages from the Pit Lake, and subsequently TSF C, assumed to report to the TSF Spillway, which discharges to Davidson Creek. Model predictions for the v2h output are screened against BC WQGs and discussed further in the following section.

3.2 Model Output Screening

The following section summarizes the comparison of model predictions for mine site facilities that may represent discharge points to the environment in the Closure and Post-Closure phases (*i.e.*, FWR, TSF Spillway, and MR WTP) and receiving stream stations where BC WQGs for the protection of aquatic life may apply.

Water quality predictions for the mean of the VCC water balance are emphasized here, given the model timeline in focus for Closure/Post-Closure water management and inherent increasing model uncertainty under extended time frames. However, 95th percentile output from the WBM VCC was extensively considered as part of model and water management development to demonstrate the feasibility of the proposed water management scenario (*i.e.,* to meet WQGs in the receiving environment) under a range of climate conditions. This work has been focused on demonstrating the feasibility of the proposed water management approach (*i.e.*, to manage site water in the Post-Closure period without the operation of the Membrane WTP) and to meet regulatory requirements outlined in EAC, MA, and EMA permits, and specifically to address *Mines Act* permit condition C.5.(g)(i)(b), as a foundational condition driving Post-Closure Water Management planning.

Screened results for the Base Case mean predictions (from the VCC water balance) are described in the following section to show guideline exceedance frequency and the maximum magnitude of guideline exceedance for the Closure and Post-Closure modelled phases. Note the 95^{th} percentile output do not represent a scenario in which 95^{th} percentile concentrations occur year-over-year for the duration of a given modeled phase. Rather, this model output is intended to capture the potential range of concentrations that may be realized in any given month based on different climate scenarios.

The exceedance frequency is presented as a percentage calculated as the number of months in which a guideline is exceeded divided by the total number of months in a given mine phase (Table 3-1). The phases included in the table represent the timing of the Closure to Post-Closure transition based on the Average Climate Case. There is variability in the transition between Closure and Post-Closure in the VCC model depending on how rapidly the Pit Lake fills to the final elevation; as such, the beginning of Post-Closure can occur between Year 41 and Year 43 in the different scenarios included in the VCC model. Since the screening is completed on a statistical output of the multi-realization VCC, Year 41 to Year 43 (2064 to 2066) represents a transitional period which includes scenarios representing both the Closure and Post-Closure phases.

All parameters predicted to exceed their respective WQG in at least one model time step (*i.e.*, one month) at FWR, MR WTP, and TSF Spillway are presented in Table 3-2 (exceedance frequency) for the mean model output of the VCC. The corresponding 95th percentile model output is presented in Table 3-3. All parameters predicted to exceed their respective WQG in at least one model time step (*i.e.*, one month) at receiving environment stations are presented in Table 3-4 for the mean model output of the VCC. The corresponding 95th percentile model output is presented in Table 3-5. Parameters for which no exceedances are predicted were excluded from the tables.

Table 3-1:
Modelled period and number of months screened by Project phase

Project Phase	Modelled Period	Model Years	Number of Months Modelled
Closure	January 2047 to December 2063	Year 24 to Year 40	204
Post-Closure	January 2064 to January 2133	Year 41 to Year 110	829

Table 3-2:
Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for the FWR, Metals Removal WTP, and TSF Spillway in Closure and Post-Closure
(mean output of Variable Climate Case Base Case water quality model)

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	**Units**	**Cl**	**PC**	**Cl**	**PC**	**Parameter**	**Cl**	**PC**	**Cl**	**PC**
FWR						**FWR**				
None	%	0	N/A	0	N/A	None	-	N/A	-	N/A
Metal Removal WTP						**Metal Removal WTP**				
NH3_N	%	N/A	0	N/A	34	NH3_N	N/A	-	N/A	3.6
NO3_N	%	N/A	0	N/A	0.1	NO3_N	N/A	-	N/A	1.1
SO4	%	N/A	0	N/A	87	SO4	N/A	-	N/A	4.1
TSF Spillway						**TSF Spillway**				
NH3_N	%	0	0	0	0.1	NH3_N	-	-	-	1.0
T_Be	%	0	0	8	31	T_Be	-	-	1.1	1.5
T_Co	%	0	0	0	4	T_Co	-	-	-	1.6
T_Hg	%	0	0	17	77	T_Hg	-	-	1.8	1.9
D_Cd	%	0	4	15	48	D_Cd	-	1.4	1.4	5.0
D_Cu	%	0	0	0	5	D_Cu	-	-	-	1.6
D_Zn	%	0	4	13	44	D_Zn	-	1.5	1.5	6.8

Notes:
FWR = Freshwater Reservoir, TSF = Tailings Storage Facility, WTP = Water Treatment Plant
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; Cl = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding **predicted** hardness, WQ28 **baseline** monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.
N/A = Not evaluated as location does not discharge directly to receiving environment in that phase.

Table 3-3:
Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for the FWR, Metals Removal WTP, and TSF Spillway in Closure and Post-Closure
(95th percentile output of Variable Climate Case Base Case water quality model)

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	**Units**	**Cl**	**PC**	**Cl**	**PC**	**Parameter**	**Cl**	**PC**	**Cl**	**PC**
FWR						**FWR**				
T_Al	%	0	N/A	8	N/A	T_Al	-	N/A	1.2	N/A
T_Hg	%	0	N/A	6	N/A	T_Hg	-	N/A	1.6	N/A
Metal Removal WTP						**Metal Removal WTP**				
NH3_N	%	N/A	0.1	N/A	71	NH3_N	N/A	1.0	N/A	5.3
NO3_N	%	N/A	0	N/A	14	NO3_N	N/A	-	N/A	1.6
SO4	%	N/A	0	N/A	95	SO4	N/A	-	N/A	4.3
TSF Spillway						**TSF Spillway**				
NH3_N	%	0	0	0	6	NH3_N	-	-	-	3.3
SO4	%	0	0	0	1	SO4	-	-	-	1.1
T_Ag	%	0	0	15	0.1	T_Ag	-	-	1.2	1.0
T_As	%	0	0	0	1	T_As	-	-	-	1.2
T_Be	%	0	0	17	80	T_Be	-	-	1.4	2.1
T_Co	%	0	0	0	31	T_Co	-	-	-	3.3
T_Hg	%	0	0	23	100	T_Hg	-	-	2.3	2.7
D_Cd	%	0	16	19	49	D_Cd	-	2.9	1.7	10
D_Cu	%	0	0	0	13	D_Cu	-	-	-	2.4
D_Zn	%	0	16	19	48	D_Zn	-	3.1	1.9	15

Notes:
FWR = Freshwater Reservoir, TSF = Tailings Storage Facility, WTP = Water Treatment Plant
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; Cl = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding predicted hardness, WQ28 baseline monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.
N/A = Not evaluated as location does not discharge directly to receiving environment in that phase.

**Table 3-4:
Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for Davidson and Chedakuz Creek model nodes in Closure and Post-Closure
(mean output of Variable Climate Case Base Case water quality model)**

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	**Units**	**Cl**	**PC**	**Cl**	**PC**	**Parameter**	**Cl**	**PC**	**Cl**	**PC**
Davidson Creek										
DC-05 (WQ28)						**DC-05 (WQ28)**				
None	%	-	-	-	-	*None*	-	-	-	-
DC-10 (WQ27)						**DC-10 (WQ27)**				
None	%	-	-	-	-	*None*	-	-	-	-
DC-15 (WQ26)						**DC-15 (WQ26)**				
D_Zn	%	0	0	0	0.2	D_Zn	-	-	-	1.0
DC-20 (WQ7)						**DC-20 (WQ7)**				
D_Zn	%	0	0	0	0.4	D_Zn	-	-	-	1.0
Chedakuz Creek										
CC-15 (WQ9)						**CC-15 (WQ9)**				
None	%	-	-	-	-	*None*	-	-	-	-
CC-20 (WQ13)						**CC-20 (WQ13)**				
None	%	-	-	-	-	*None*	-	-	-	-
Approx. CC-30 (Chedakuz Mid-way)						**Approx. CC-30 (Chedakuz Mid-way)**				
None	%	-	-	-	-	*None*	-	-	-	-
Approx. CC-40 (Chedakuz Outlet)						**Approx. CC-40 (Chedakuz Outlet)**				
None	%	-	-	-	-	*None*	-	-	-	-

Notes:
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; Cl = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding **predicted** hardness, **baseline** monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.

Table 3-5:
Frequency and highest magnitude of exceedance of the BC guideline for the protection of aquatic life for Davidson and Chedakuz Creek model nodes in Closure and Post-Closure
(95th percentile output of Variable Climate Case Base Case water quality model)

Frequency of exceedance by phase						Highest magnitude of exceedance by phase				
		BC short-term WQG		BC long-term WQG			BC short-term WQG		BC long-term WQG	
Parameter	**Units**	**Cl**	**PC**	**Cl**	**PC**	**Parameter**	**Cl**	**PC**	**Cl**	**PC**
Davidson Creek										
DC-05 (WQ28)						**DC-05 (WQ28)**				
NH3_N	%	0	0	0	14	NH3_N	-	-	-	1.5
SO4	%	0	0	0	1	SO4	-	-	-	1.0
T_Al	%	0	0	6	0	T_Al	-	-	1.2	-
T_Hg	%	0	0	1	2	T_Hg	-	-	1.1	1.1
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.3
DC-10 (WQ27)						**DC-10 (WQ27)**				
NH3_N	%	0	0	0	4	NH3_N	-	-	-	1.3
T_Al	%	0	0	6	0	T_Al	-	-	1.1	-
T_Hg	%	0	0	1	0.5	T_Hg	-	-	1.1	1.0
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.1
DC-15 (WQ26)						**DC-15 (WQ26)**				
NH3_N	%	0	0	0	4	NH3_N	-	-	-	1.4
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.2
DC-20 (WQ7)						**DC-20 (WQ7)**				
NH3_N	%	0	0	0	4	NH3_N	-	-	-	1.5
D_Zn	%	0	0	0	1	D_Zn	-	-	-	1.2
Chedakuz Creek										
CC-15 (WQ9)						**CC-15 (WQ9)**				
None	%	-	-	-	-	*None*	-	-	-	-
CC-20 (WQ13)						**CC-20 (WQ13)**				
None	%	-	-	-	-	*None*	-	-	-	-
Approx. CC-30 (Chedakuz Mid-way)						**Approx. CC-30 (Chedakuz Mid-way)**				
None	%	-	-	-	-	*None*	-	-	-	-
Approx. CC-40 (Chedakuz Outlet)						**Approx. CC-40 (Chedakuz Outlet)**				
None	%	-	-	-	-	*None*	-	-	-	-

Notes:
WQG = British Columbia (BC) water quality guideline for the protection of aquatic life; Cl = Closure phase; PC = Post-Closure phase.
Frequency values are percentages and are calculated as the number of months exceeding the guideline value divided by the total number of months in that given phase. Magnitude values are calculated as predicted value divided by relevant water quality guideline.
Guideline values used to screen model predictions were calculated using its corresponding **predicted** hardness, **baseline** monthly median chloride, pH, or dissolved organic carbon, and highest mean monthly temperature.

3.2.1 Mine Site Facilities

The mine site facilities screening presented below is limited to stations that may represent discharge points to the receiving environment in the Closure (FWR) and Post-Closure (FWR, MR WTP, and TSF Spillway phases.

3.2.1.1 FWR

This analysis screens water quality predictions for FWR discharges through the period of Closure, up to Year 2069. 2069 represents the conclusion of the Closure phase in the Average Case Climate model, although the timing of the transition from Closure to Post-Closure varies within the Variable climate Case model output. In 2069, the FWR is also decommissioned in both the Average and Variable Climate Cases, independent of the timing of transition from Closure to Post-Closure. The actual date of FWR decommissioning will depend on meeting water quality and IFN requirements once the Project as entered Closure. For the purpose of this analysis, model predictions generated for FWR for the Closure phase are discussed.

Mean output from the VCC model shows no predicted exceedances of BC short-term of long-term water quality guidelines in FWR discharge during the Closure phase (Table 3-2). In the 95^{th} percentile output, only total Al and total Hg are predicted to exceed with BC long-term guidelines (Table 3-3). The highest predicted monthly concentrations exceed their guidelines in Closure by less than a magnitude of 2×. Total Al guideline exceedances are driven by elevated background concentrations, for which an SBEB has been approved applicable to the D-Al fraction (ENV 2023b).

Exceedances of Hg can be linked to the use of high detection limits in the calculation of loadings from humidity cell data used in the derivation of source terms. Specifically, concentrations were set equal to the detection limit in the loading calculations, which provides a high degree of conservatism in the source terms for these parameters. This, in turn, results in conservatively high water quality predictions for Hg in the FWR.

3.2.1.2 Metals Removal WTP

The MR WTP is assumed to be decommissioned for the Closure period as contact water is directed to the Pit Lake to accelerate filling and does not require treatment. Once the Pit Lake reaches target elevation (representing the conclusion of the Closure phase and the onset of the Post-Closure phase), the MR WTP is assumed to resume operation and receive Pit Lake and ECD water as influent. However, as noted above, the model assumes the FWR discharges through the period of Closure and for an additional six years following the onset of Post-Closure. Therefore, MR WTP treated effluent is directed to the FWR (via the

WMP) for the first six years of Closure. MR WTP effluent is anticipated to represent a potential direct discharge to Davidson Creek after the FWR is decommissioned in early Post-Closure, subject to regulatory approval.

Because effluent from the MR WTP may be discharged to Davidson Creek in Post-Closure, effluent predictions from the WTP (Post-Closure) system were screened against relevant guidelines for the protection of aquatic life to assess the quality of the proposed discharge. Within the mean output of the VCC model, guideline exceedances were limited to ammonia (34% of months in Post-Closure exceeded the BC long-term WQG, by up to a magnitude of 3.6×), and sulphate (87% of months in Post-Closure exceeded the BC long-term WQG, up to a magnitude of 4.1× the WQG) (Table 3-2). Nitrate slightly exceeds its BC long-term WQG in a single month in 2070 (1.1× the BC long-term WQG; Table 3-2). The highest magnitude of ammonia and sulphate guideline exceedances occur early in the Post-Closure phase, during which the MR WTP effluent will be directed to the WMP prior to discharge rather than directly discharged to Davidson Creek. The elevated concentrations are in part driven by flushing of process water stored in TSF D and gradually subside over the course of the Post-Closure modelled period as the ammonia and sulphate mass within the TSF declines. Predicted concentrations of sulphate and nitrate continue to occur above their BC WQGs after the FWR is assumed to be decommissioned, but the magnitude of such exceedances is lower.

Within the 95th percentile model output, the same parameters are predicted to exceed their long-term WQGs in MR WTP effluent (Table 3-3). As expected, the relative magnitude of the highest guideline exceedance is higher compared to the mean output. The highest magnitude of guideline exceedance predicted is predicted for ammonia (5.3×) while the highest magnitude of sulphate exceedance is 4.3×.

3.2.1.3 TSF Spillway

Prior to Post-Closure, the TSF Spillway receives runoff and unrecoverable seepages and represents a minor flow to the receiving environment. In the Closure phase for mean VCC model output, BC WQG guideline exceedances are predicted for total Be, total Hg, dissolved Cd and dissolved Zn; (Table 3-2). In the Closure phase for 95th percentile VCC model output, BC long-term WQG guideline exceedances are predicted for the same parameters and total Ag (Table 3-3). The exceedances predicted for the Closure phase can be primarily attributed to the variable transition between the Closure and Post-Closure phases described above. The majority of these exceedances are due to scenarios with an earlier transition to Post-Closure (but are screened as “Closure” output), and more accurately reflect the water quality predicted once the TSF Spillway begins receiving additional flows from the TSF C and TSF D ponds, as well as seepages from the LWS.

In Post-Closure, the TSF Spillway begins to receive passive overflow from the TSF C and TSF D ponds, and discharge from this model node is therefore predicted to increase. Seepage and runoff from reclaimed lower and upper overburden stockpiles also reports to the spillway at the onset of Post-Closure, influencing predicted water quality. In 2083, the water quality model assumes TSF C seepage begins to report to the TSF Spillway with an additional incremental increase in the relative monthly volume of seepage in 2105, driving increases in predicted concentrations of notably sulphate and ammonia. In 2093, pit seepage is also assumed to begin to report to the TSF Spillway, which exerts notable influence on predicted metal concentrations (*e.g.*, Cd and Zn) at the TSF Spillway node in the late Post-Closure period.

Short-term guideline exceedances for the TSF Spillway node during the Post-Closure phase are limited to a small number (4% of months) of dissolved Cd and dissolved Zn exceedances up to 1.5× their corresponding guideline in the mean VCC model output (Table 3-2). Additional long-term guideline exceedances are noted for ammonia, total Be, Co, and Hg, and dissolved Cd, Cu and Zn (Table 3-2). Guidance exceedances are predicted in the 95th percentile VCC model output for a similar suite of parameters, albeit the relative magnitude of guideline exceedances are higher (Table 3-3). Guideline exceedances are also predicted for sulphate, total Ag and total As in the 95th percentile output (Table 3-3).

3.2.2 Receiving Stream Stations

Overall, the updated v2h model predictions for Davidson and Chedakuz Creek nodes show few exceedances of the BC WQGs for the Closure and Post Closure phases. Guideline exceedances that occur are low in relative frequency and magnitude, illustrating the feasibility of the proposed Closure and Post-Closure water management concept derived as part of the Brine Management Work Plan (Lorax 2023) under *Mines Act* Condition C5(g)(i).

The water management and corresponding WB/WQM updates presented as part of the v2h WB/WQM do not result in predicted changes to water quantity or quality in the Creek 661 catchment compared to previously presented output (*i.e.*, Lorax 2022). For this reason, model predictions for model nodes WQ5 (corresponding to station 661-10) and WQCk661 (corresponding to station 661-20) in Creek 661 are not discussed here.

Parameters predicted to exceed BC WQGs for aquatic life in Davidson Creek in the mean VCC model output are limited to dissolved Zn in the Post-Closure phase (Table 3-4). Exceedances are predicted to occur only at DC-15 (formerly WQ26) and DC-20 (formerly WQ7) in 0.2% and 0.4% of Post-Closure months modelled, respectively, with the highest predicted concentrations effectively being equal to the guideline (Table 3-4).

In the 95th percentile output from the VCC model, long-term guideline exceedances are predicted in the Closure phase for total Al and total Hg at DC-05 (formerly WQ28) and DC-10 (formerly WQ27; Table 3-5). The relative magnitudes of the predicted exceedances are low (1.2× above the guideline). As discussed for the FWR output, total Al guideline exceedances are driven by elevated background concentrations, for which an SBEB has been approved that is applicable to the D-Al fraction (ENV 2023b). All predicted D-Al values fall below their applicable SBEB value. Exceedances of Hg can be linked to the use of high detection limits in the calculation of loadings from humidity cell data used in the derivation of source terms.

In the Post-Closure phase, ammonia, sulphate, total Hg and dissolved Zn occasionally exceed their corresponding BC long-term WQG at DC-05 in the 95th percentile VCC output. The magnitudes of the highest predicted exceedances are relatively low (1.5× the BC WQG or less). At model nodes further downstream in Davidson Creek, the relative frequency and magnitude of the predicted guideline exceedances are lower with only ammonia and dissolved Zn predicted to exceed their BC long-term WQG at DC-20 (Table 3-5). Downstream of Davidson Creek, in Chedakuz Creek, no BC WQG exceedances are predicted in the Closure phase or Post-Closure phase in both the mean and 95th percentile VCC model output.

4. Closure

ARTEMIS GOLD INC | Blackwater Mine

4. Closure

This memo was prepared by Lorax Environmental Services Ltd. in support of BW Gold Ltd.'s Post-Closure Water Management Plan. Please contact the undersigned should you have any questions or require any clarification.

Sincerely,

LORAX ENVIRONMENTAL SERVICES LTD.

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Appendix A: Tabulated Water Quality Model Output

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Appendix A.1.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF C Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	1.244106054	0.445440441	0.155644745	0.050115637	0.054807503	0.039473601	0.01563336	0.005822597	0.002235289	0.000851949	0.000547726	0.001074246
NO3_N	Closure	P95	11.36738682	11.16338825	11.18290901	9.539613724	7.980786324	7.625043392	7.511248112	7.316256523	6.819986343	6.327360153	5.976619244	5.50937748
NO2_N	Closure	P95	0.103938803	0.100692853	0.100172833	0.087449677	0.073183879	0.070282608	0.068953075	0.066597909	0.062750049	0.057710458	0.054968718	0.050852198
Br	Closure	P95	0.121927328	0.110570952	0.103927001	0.09154778	0.091756798	0.099786818	0.110450856	0.129119501	0.135343656	0.133638099	0.133651242	0.124168701
Cl	Closure	P95	211.8735962	205.2489929	204.0885315	178.4413147	148.5473633	142.4429474	139.8363342	135.065567	127.3281097	117.0847549	111.8229675	103.1133499
F	Closure	P95	0.845655382	0.798948467	0.824720323	0.719836593	0.786926568	0.798410416	0.82289046	0.842256725	0.832092047	0.811585963	0.838030159	0.827970505
TDP	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Closure	P95	2450.445801	2373.426514	2371.743652	2115.062988	1778.228394	1700.331177	1669.263184	1604.066895	1526.467529	1417.179688	1350.233887	1245.886719
T_CN	Closure	P95	2.40296E-07	2.12781E-07	3.55977E-07	1.63889E-07	1.34059E-06	1.59099E-06	5.67983E-07	4.53501E-07	4.17224E-07	3.53423E-07	6.1363E-07	3.77367E-07
WAD_CN	Closure	P95	2.36328E-07	2.09203E-07	3.09023E-07	1.48179E-07	1.34059E-06	1.5851E-06	5.67983E-07	4.44597E-07	4.00724E-07	3.46004E-07	6.02033E-07	3.77218E-07
T_Ag	Closure	P95	0.001868713	0.001834063	0.001883579	0.001773854	0.001754217	0.001756102	0.001813339	0.001864977	0.001821469	0.001798603	0.001842661	0.001821572
T_Al	Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Closure	P95	0.007769875	0.007610509	0.007665714	0.007171234	0.006789416	0.006662381	0.006754425	0.006843717	0.006746673	0.006552314	0.006521459	0.006475207
T_B	Closure	P95	0.051366825	0.047846042	0.048340369	0.044674687	0.049861364	0.051833503	0.053825587	0.054906856	0.053425651	0.051803209	0.052103039	0.051570483
T_Ba	Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Closure	P95	3.69193E-05	3.5292E-05	3.64413E-05	3.42778E-05	3.40934E-05	3.69574E-05	3.85631E-05	4.05337E-05	4.03985E-05	3.9243E-05	3.88744E-05	3.86124E-05
T_Be	Closure	P95	0.000430028	0.000399996	0.000398788	0.000360641	0.000410918	0.000421766	0.000438269	0.000448531	0.000443762	0.000429629	0.000439031	0.000429657
T_Ca	Closure	P95	407.4824524	395.2592163	395.4312744	364.5905762	308.0789795	297.2072449	295.0788269	285.3755493	273.9200439	258.2938232	245.7977448	231.7618561
T_Cd	Closure	P95	0.010366184	0.009792468	0.010149588	0.008772917	0.009529314	0.009697602	0.01003666	0.010329432	0.010104743	0.009964257	0.010218893	0.010117806
T_Co	Closure	P95	0.161523178	0.156517282	0.15597868	0.143076971	0.120607778	0.116096906	0.114828974	0.110914998	0.105978131	0.099989623	0.095308885	0.089426257
T_Cr	Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
T_Cu	Closure	P95	0.067030542	0.065082163	0.064899325	0.059908058	0.052107815	0.050449554	0.050090343	0.048727646	0.047053251	0.044756569	0.043357331	0.041201781
T_Fe	Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Closure	P95	7.40214E-05	7.17294E-05	7.18788E-05	6.10416E-05	6.40184E-05	6.51979E-05	6.87681E-05	7.0869E-05	7.00518E-05	6.98885E-05	7.06739E-05	7.15874E-05
T_K	Closure	P95	65.23141479	63.29585648	63.04555511	57.8910675	48.76188278	46.92699814	46.53842545	44.99066925	43.066185	40.56239319	38.79264069	36.40653229
T_Li	Closure	P95	0.040415242	0.037979119	0.03858199	0.034605853	0.038519766	0.039357066	0.040660582	0.041586731	0.041241344	0.04000856	0.041295268	0.039824598
T_Mg	Closure	P95	7.401628494	7.195530415	7.1801157	6.842984676	6.333597183	6.1277771	6.134797096	6.06770277	6.015608788	5.569427013	5.411718369	5.268837929
T_Mn	Closure	P95	1.31922996	1.31922996	1.31922996	1.195312738	1.30240345	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996
T_Mo	Closure	P95	0.087744392	0.085116223	0.084635176	0.077831343	0.065605678	0.063228771	0.062472217	0.060368497	0.057726581	0.054493513	0.052232977	0.049003873
T_Na	Closure	P95	710.9338989	688.8475342	690.8236694	599.0894775	500.4076233	480.7687073	471.693634	457.466156	429.6925354	395.4916992	378.4647522	349.5509644
T_Ni	Closure	P95	0.020021996	0.018755749	0.01873605	0.016497269	0.01849626	0.018794531	0.019433221	0.020001585	0.019752771	0.019315902	0.019884009	0.019618418
T_P	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Closure	P95	0.002572268	0.002537799	0.002605682	0.002449662	0.002416291	0.002408319	0.002470347	0.002520637	0.00248318	0.002440786	0.002488646	0.002465314
T_S	Closure	P95	0.529022634	0.513820589	0.526521206	0.488149852	0.547593236	0.537168026	0.550979316	0.570540905	0.575919509	0.566867292	0.563142717	0.546201289
T_Sb	Closure	P95	0.031326555	0.030366601	0.030340161	0.027896814	0.024084756	0.023060229	0.023010684	0.022473529	0.021579579	0.020256571	0.019529061	0.01894341
T_Se	Closure	P95	0.004985488	0.004683562	0.004831203	0.004203015	0.004612686	0.004684166	0.004837867	0.004976529	0.004889654	0.004802077	0.00493082	0.004882166
T_Si	Closure	P95	6.385750771	6.219130039	6.355238914	5.807712555	6.191262245	6.074075699	6.383752346	6.619186878	6.675691128	6.68830061	6.579270363	6.528001308
T_Sn	Closure	P95	7.78499E-05	7.39902E-05	7.62978E-05	7.09633E-05	7.06693E-05	7.63309E-05	7.96417E-05	8.44549E-05	8.49537E-05	8.2801E-05	8.24428E-05	8.1563E-05
T_Sr	Closure	P95	0.453060627	0.443576604	0.447357327	0.393192649	0.363913417	0.358265638	0.354058027	0.349560291	0.336901546	0.319065928	0.310925841	0.299895436
T_Ti	Closure	P95	0.003233661	0.003136309	0.003106524	0.002898597	0.002675753	0.003605208	0.003811325	0.003905033	0.003720275	0.003541064	0.00336557	0.003387026
T_Tl	Closure	P95	0.001018011	0.00095405	0.00097895	0.000859795	0.000948028	0.000963122	0.000991104	0.001019183	0.001005024	0.000983112	0.00101338	0.0009983
T_U	Closure	P95	0.005943685	0.005847742	0.006003522	0.005546342	0.005450283	0.005394829	0.005485527	0.005525575	0.005471958	0.005388663	0.00542405	0.005379186
T_V	Closure	P95	0.011117583	0.010475459	0.010421526	0.009297978	0.01040827	0.010690619	0.011069002	0.011357935	0.011253837	0.010927047	0.011235985	0.010892767
T_Zn	Closure	P95	0.499743968	0.469061136	0.476205409	0.412006885	0.457141072	0.465160489	0.483444124	0.497701824	0.487653315	0.480253488	0.491969168	0.488648891
D_Ag	Closure	P95	0.001867285	0.001832901	0.001882404	0.001772342	0.001753458	0.00175154	0.001808467	0.001859807	0.001817095	0.001793475	0.001840491	0.001819547
D_Al	Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Closure	P95	0.007758796	0.007599897	0.00765788	0.007155531	0.006773893	0.006638881	0.006729313	0.006823383	0.006724309	0.006521387	0.006490136	0.006442241
D_B	Closure	P95	0.051366825	0.047846042	0.048340369	0.044674687	0.049861364	0.051833503	0.053825587	0.054906856	0.053425651	0.051803209	0.052103039	0.051570483
D_Ba	Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Closure	P95	3.69193E-05	3.5292E-05	3.64413E-05	3.42778E-05	3.40934E-05	3.69574E-05	3.85631E-05	4.05337E-05	4.03985E-05	3.9243E-05	3.88744E-05	3.86124E-05
D_Be	Closure	P95	0.000430028	0.000399996	0.000398788	0.000360641	0.000410918	0.000421766	0.000438269	0.000448531	0.000443762	0.000429629	0.000439031	0.000429657
D_Ca	Closure	P95	407.4825439	395.258667	395.4265137	364.5878906	308.0682983	297.1989746	295.0667114	285.3617249	273.9081726	258.2887878	245.7816162	231.7510376
D_Cd	Closure	P95	0.010365905	0.009792178	0.010149302	0.008772635	0.009528928	0.009696808	0.010035782	0.010328691	0.010104071	0.009963673	0.010218535	0.010117347
D_Co	Closure	P95	0.161522821	0.156516939	0.155978441	0.143076658	0.120607093	0.116096281	0.114828311	0.110914364	0.10597752	0.099989057	0.095308393	0.089425653
D_Cr	Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
D_Cu	Closure	P95	0.067029357	0.065080971	0.064897813	0.059905972	0.052104544	0.050445147	0.050087344	0.048724774	0.047049545	0.044752665	0.043353595	0.041198377
D_Fe	Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Closure	P95	7.40251E-05	7.17327E-05	7.18813E-05	6.11028E-05	6.40277E-05	6.53372E-05	6.87763E-05	7.09079E-05	7.0109E-05	6.99518E-05	7.07284E-05	7.16351E-05
D_K	Closure	P95	65.22891998	63.29320526	63.04362488	57.89018631	48.75511932	46.92130661	46.53321838	44.98566818	43.06108856	40.55886459	38.79112244	36.40327072
D_Li	Closure	P95	0.040415242	0.037979119	0.03858199	0.034605853	0.038519766	0.039357066	0.040660582	0.041586731	0.041241344	0.04000856	0.041295268	0.039824598
D_Mg	Closure	P95	7.400364876	7.194386959	7.17974329	6.841234207	6.330666065	6.124975204	6.132146358	6.064116478	6.011505604	5.566323757	5.408598423	5.266111374
D_Mn	Closure	P95	1.31922996	1.31922996	1.31922996	1.194049597	1.301816702	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996	1.31922996
D_Mo	Closure	P95	0.087742358	0.08511398	0.084632814	0.077828825	0.065600537	0.063223802	0.062466949	0.060363673	0.057721645	0.054489698	0.052228168	0.048999574
D_Na	Closure	P95	710.8961792	688.8109741	690.7877197	599.0502319	500.3716431	480.7317505	471.6558838	457.4295654	429.6572571	395.4592285	378.4276428	349.5152283
D_Ni	Closure	P95	0.020019701	0.018754054	0.018734278	0.01649636	0.018491395	0.018791586	0.019430947	0.019999709	0.019751132	0.019315591	0.019882342	0.01961609
D_P	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Closure	P95	0.002569425	0.002535544	0.0026034	0.002446727	0.002414197	0.002404665	0.002463853	0.002510971	0.002477705	0.002434545	0.002484435	0.002462996
D_S	Closure	P95	0.459937394	0.443162441	0.449821562	0.428580225	0.468490899	0.47172147	0.4848634	0.511433184	0.512652874	0.502946377	0.495566934	0.479341209
D_Sb	Closure	P95	0.031326555	0.030366601	0.030340161	0.027896814	0.024084756	0.023060229	0.023010684	0.022473529	0.021579579	0.020256571	0.019529061	0.01894341
D_Se	Closure	P95	0.004983576	0.004681283	0.004829427	0.004200731	0.004611169	0.004684374	0.004838497	0.004977432	0.004889723	0.004802142	0.004926704	0.004878918
D_Si	Closure	P95	6.236695766	6.06364584	6.20808363	5.667938232	6.005477428	5.868628025	6.16696167	6.443006516	6.508551598	6.532890797	6.414305687	6.359172821
D_Sn	Closure	P95	7.78499E-05	7.39902E-05	7.62978E-05	7.09633E-05	7.06693E-05	7.63309E-05	7.96417E-05	8.44549E-05	8.49537E-05	8.2801E-05	8.24428E-05	8.1563E-05
D_Sr	Closure	P95	0.45298782	0.44353801	0.447388113	0.393000364	0.363923877	0.358330965	0.353998452	0.349550158	0.336831659	0.319023788	0.310875475	0.299946457
D_Ti	Closure	P95	0.002211547	0.002107899	0.002120811	0.001839979	0.00170686	0.002082935	0.002178279	0.002227841	0.002151974	0.002041629	0.002198528	0.002330558
D_Tl	Closure	P95	0.001018011	0.00095405	0.00097895	0.000859795	0.000948028	0.000963122	0.000991104	0.001019183	0.001005024	0.000983112	0.00101338	0.0009983
D_U	Closure	P95	0.005941951	0.005846085	0.006000713	0.00554361	0.005446446	0.00539073	0.005480315	0.005520378	0.005466482	0.005383534	0.005419665	0.005375443
D_V	Closure	P95	0.011089198	0.0104415	0.010374828	0.009248718	0.01037023	0.010621552	0.010984982	0.01127392	0.011171201	0.010843855	0.01118503	0.010833587
D_Zn	Closure	P95	0.499574363	0.468856007	0.476059765	0.411803961	0.456971884	0.464945912	0.483227938	0.497440696	0.487416834	0.479967982	0.491700262	0.488446027

Appendix A.1.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF C Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.000755435	0.000590753	0.000508815	0.000354341	0.000294997	0.001574314	0.002406634	0.00140081	0.000983214	0.000751983	0.000532272	0.000819035
NO3_N	Post-Closure	P95	0.04532554	0.043862876	0.041685078	0.040855408	0.042678867	0.041830834	0.04330761	0.043959051	0.046281274	0.047440521	0.047549374	0.044107724
NO2_N	Post-Closure	P95	0.000888686	0.000893153	0.000856336	0.000807178	0.000845897	0.000961277	0.001045731	0.001071656	0.000985543	0.000980082	0.000908354	0.000874382
Br	Post-Closure	P95	0.124305047	0.120240308	0.120247833	0.109604381	0.110098802	0.111496501	0.116124906	0.119956739	0.132693887	0.129298508	0.133790657	0.126808763
Cl	Post-Closure	P95	0.632510781	0.620317817	0.569465697	0.514380872	0.484218568	0.56015563	0.536940098	0.558670878	0.576576471	0.574375272	0.577440381	0.550069809
F	Post-Closure	P95	0.06972678	0.069397032	0.067700587	0.062448964	0.06062286	0.069199152	0.075285651	0.077031046	0.073028542	0.07143227	0.071032993	0.069272116
TDP	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Post-Closure	P95	8.474331856	7.954445839	7.690228462	6.602263927	5.921170235	8.192585945	8.707961082	8.861388206	8.571261406	7.955097675	7.573626041	7.043132305
T_CN	Post-Closure	P95	2.30699E-07	1.98392E-07	2.78927E-07	1.44889E-07	1.32134E-06	1.59878E-06	6.01649E-07	4.28865E-07	2.83517E-07	2.98888E-07	4.66476E-07	3.45505E-07
WAD_CN	Post-Closure	P95	2.30699E-07	1.98392E-07	2.78927E-07	1.44889E-07	1.32134E-06	1.59878E-06	6.01649E-07	4.28865E-07	2.83517E-07	2.98888E-07	4.66476E-07	3.45505E-07
T_Ag	Post-Closure	P95	1.65541E-05	1.60426E-05	1.55322E-05	1.36918E-05	1.35788E-05	1.8984E-05	1.94133E-05	2.0095E-05	1.90422E-05	1.75439E-05	1.62526E-05	1.51783E-05
T_Al	Post-Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Post-Closure	P95	0.001377081	0.001412484	0.001406862	0.001293918	0.001184183	0.001215254	0.001263692	0.001311911	0.00130463	0.001324392	0.001297837	0.001321536
T_B	Post-Closure	P95	0.01161679	0.01122302	0.010985474	0.008657271	0.00893203	0.012759901	0.013050047	0.01360314	0.012990197	0.012016882	0.011304659	0.010616885
T_Ba	Post-Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Post-Closure	P95	3.87566E-05	3.86591E-05	3.89328E-05	3.72169E-05	3.53548E-05	4.05153E-05	3.8069E-05	4.12423E-05	3.98593E-05	3.86277E-05	3.86451E-05	3.87834E-05
T_Be	Post-Closure	P95	8.4866E-05	8.20848E-05	8.04591E-05	7.01152E-05	7.01572E-05	9.39925E-05	9.70613E-05	0.000101464	9.55881E-05	9.08016E-05	8.34835E-05	7.8902E-05
T_Ca	Post-Closure	P95	9.153392792	9.214624405	8.95973587	8.347896576	9.055607796	9.512410164	9.985671997	10.28454494	9.925354004	9.654631615	9.314067841	9.037226677
T_Cd	Post-Closure	P95	5.16459E-05	4.88099E-05	4.69478E-05	3.48022E-05	3.21037E-05	5.7869E-05	5.98603E-05	6.08088E-05	5.74986E-05	5.20955E-05	4.94332E-05	4.56518E-05
T_Co	Post-Closure	P95	0.000279654	0.000262687	0.000252364	0.000188958	0.000178937	0.000304348	0.000316121	0.000323076	0.000305705	0.000277306	0.000263532	0.000241246
T_Cr	Post-Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
T_Cu	Post-Closure	P95	0.000548847	0.000522923	0.000506932	0.000475854	0.000442843	0.000615847	0.000609316	0.000650751	0.000605108	0.000561436	0.000525188	0.000509493
T_Fe	Post-Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Post-Closure	P95	2.55112E-05	2.67878E-05	2.64395E-05	2.44841E-05	2.18483E-05	2.0375E-05	2.17308E-05	2.33478E-05	2.36018E-05	2.42661E-05	2.46485E-05	2.51074E-05
T_K	Post-Closure	P95	2.734139681	2.738644838	2.684565067	2.465435743	2.210442781	2.384919882	2.514207602	2.585597038	2.474709988	2.564480066	2.502818346	2.541448593
T_Li	Post-Closure	P95	0.002473027	0.002318626	0.002231657	0.001624243	0.001563288	0.002872685	0.002986321	0.003007715	0.002829775	0.002560611	0.002426269	0.002224317
T_Mg	Post-Closure	P95	1.630939245	1.613864303	1.628234625	1.517613053	1.630722284	1.693381786	1.682717443	1.738925576	1.743382931	1.731028914	1.666699648	1.64978683
T_Mn	Post-Closure	P95	0.011624323	0.011122282	0.010773301	0.009333392	0.008209352	0.012413067	0.012271879	0.013193374	0.012305783	0.011482597	0.010888718	0.010174642
T_Mo	Post-Closure	P95	0.001181559	0.001135932	0.001106627	0.000943925	0.000933576	0.001174879	0.001258128	0.001275124	0.001246738	0.001161499	0.001088589	0.00102473
T_Na	Post-Closure	P95	3.076298714	3.100370407	2.875040054	2.626172543	2.6356318	2.829897165	2.826642513	2.879988194	2.934474945	2.990529776	2.873400688	2.810852289
T_Ni	Post-Closure	P95	0.000657606	0.000625085	0.000609903	0.000456529	0.000477111	0.000729977	0.000757343	0.000784151	0.000748974	0.000687182	0.000644191	0.000598721
T_P	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Post-Closure	P95	6.63695E-05	6.35969E-05	6.19506E-05	5.3377E-05	5.17082E-05	7.18769E-05	7.10579E-05	7.68095E-05	7.21548E-05	6.70396E-05	6.37127E-05	5.99004E-05
T_S	Post-Closure	P95	0.549252391	0.550635338	0.556764722	0.512987435	0.53362304	0.560769737	0.540645063	0.572439492	0.574413359	0.577106416	0.559164405	0.552727342
T_Sb	Post-Closure	P95	0.003421317	0.00316752	0.002991609	0.002165679	0.001824529	0.004165028	0.004293702	0.00424627	0.003946185	0.003517494	0.003275793	0.00296739
T_Se	Post-Closure	P95	0.000116228	0.000110513	0.000108446	8.35272E-05	8.97535E-05	0.000128298	0.000135129	0.000138365	0.000132969	0.000122468	0.000113782	0.00010631
T_Si	Post-Closure	P95	6.569737434	6.514243603	6.549658775	6.150367737	5.878187656	6.48214817	6.19868803	6.600273132	6.7063694	6.600187778	6.542562962	6.611499786
T_Sn	Post-Closure	P95	8.1372E-05	8.14372E-05	8.14302E-05	7.73368E-05	7.34356E-05	8.44474E-05	7.91302E-05	8.56865E-05	8.33303E-05	8.14738E-05	8.15076E-05	8.126E-05
T_Sr	Post-Closure	P95	0.060582422	0.061094388	0.061141275	0.056858875	0.059775107	0.063148402	0.065105453	0.06752345	0.066244133	0.064223222	0.06190696	0.061041668
T_Ti	Post-Closure	P95	0.003556558	0.003476281	0.003478645	0.003203309	0.0029866	0.003726951	0.003763859	0.003996449	0.003880278	0.003631234	0.003570983	0.003615717
T_Tl	Post-Closure	P95	2.44031E-05	2.24089E-05	2.15904E-05	1.60165E-05	1.64991E-05	2.82539E-05	3.05782E-05	3.03094E-05	2.88751E-05	2.60848E-05	2.41068E-05	2.19459E-05
T_U	Post-Closure	P95	0.000211165	0.000203212	0.000199509	0.000171564	0.000183266	0.000229316	0.000244145	0.000249755	0.000237068	0.00022725	0.000206348	0.000194665
T_V	Post-Closure	P95	0.001330047	0.001283636	0.001283148	0.001157935	0.001016478	0.00127506	0.001339487	0.001376016	0.001304969	0.001243967	0.001212644	0.001190659
T_Zn	Post-Closure	P95	0.004097491	0.003922079	0.003823559	0.002869699	0.003002637	0.004610711	0.004732785	0.004908788	0.004656059	0.004276535	0.004023465	0.003742813
D_Ag	Post-Closure	P95	1.46605E-05	1.39052E-05	1.35775E-05	1.14394E-05	1.23825E-05	1.52649E-05	1.73243E-05	1.75799E-05	1.65006E-05	1.58566E-05	1.42015E-05	1.33337E-05
D_Al	Post-Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Post-Closure	P95	0.001331773	0.001369761	0.001362148	0.001252971	0.001139313	0.001167409	0.001201464	0.001254483	0.001255224	0.001281363	0.001253027	0.001279286
D_B	Post-Closure	P95	0.01161679	0.01122302	0.010985474	0.008657271	0.00893203	0.012759901	0.013050047	0.01360314	0.012990197	0.012016882	0.011304659	0.010616885
D_Ba	Post-Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Post-Closure	P95	3.87566E-05	3.86591E-05	3.89328E-05	3.72169E-05	3.53548E-05	4.05153E-05	3.8069E-05	4.12423E-05	3.98593E-05	3.86277E-05	3.86451E-05	3.87834E-05
D_Be	Post-Closure	P95	8.4866E-05	8.20848E-05	8.04591E-05	7.01152E-05	7.01572E-05	9.39925E-05	9.70613E-05	0.000101464	9.55881E-05	9.08016E-05	8.34835E-05	7.8902E-05
D_Ca	Post-Closure	P95	9.124387741	9.197259903	8.933312416	8.333990097	9.062224388	9.50843811	9.974522591	10.26737976	9.905963898	9.634192467	9.30134201	9.026208878
D_Cd	Post-Closure	P95	5.08994E-05	4.80486E-05	4.61871E-05	3.42894E-05	3.11895E-05	5.67762E-05	5.88186E-05	5.98954E-05	5.65889E-05	5.12194E-05	4.85906E-05	4.48563E-05
D_Co	Post-Closure	P95	0.000278493	0.000262012	0.000251711	0.000188377	0.000177506	0.000303215	0.000313864	0.0003215	0.000303664	0.0002755	0.000261854	0.000240277
D_Cr	Post-Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
D_Cu	Post-Closure	P95	0.000543619	0.000519814	0.000503118	0.000469376	0.000438848	0.000603398	0.000599008	0.000643998	0.000601043	0.000558288	0.000521892	0.000503633
D_Fe	Post-Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Post-Closure	P95	2.55172E-05	2.67901E-05	2.64393E-05	2.44868E-05	2.18714E-05	2.04148E-05	2.17343E-05	2.33509E-05	2.36049E-05	2.43085E-05	2.46549E-05	2.51102E-05
D_K	Post-Closure	P95	2.729774952	2.732256651	2.681327581	2.457735062	2.198988438	2.384355068	2.503134489	2.585297346	2.464445591	2.556489944	2.496892691	2.532131433
D_Li	Post-Closure	P95	0.002473027	0.002318626	0.002231657	0.001624243	0.001563288	0.002872685	0.002986321	0.003007715	0.002829775	0.002560611	0.002426269	0.002224317
D_Mg	Post-Closure	P95	1.635629654	1.619775891	1.634617925	1.522095799	1.633674502	1.697622299	1.685694456	1.743546367	1.745712519	1.735302091	1.670637846	1.653934002
D_Mn	Post-Closure	P95	0.00944077	0.009050575	0.0088586	0.007612901	0.006487396	0.009517683	0.009784989	0.010296762	0.009851368	0.0092092	0.00876832	0.008172181
D_Mo	Post-Closure	P95	0.001161617	0.001115855	0.001085834	0.000927005	0.000913566	0.001153112	0.001235247	0.001252401	0.001223878	0.001140452	0.001068112	0.001006072
D_Na	Post-Closure	P95	3.025973797	3.049024343	2.828316689	2.576335907	2.589594841	2.771179914	2.770166874	2.827540159	2.87681365	2.939063311	2.82238698	2.748764277
D_Ni	Post-Closure	P95	0.00065605	0.000624243	0.000608908	0.000455784	0.000473994	0.000728233	0.000753958	0.000782293	0.00074592	0.000684472	0.000642349	0.000597109
D_P	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Post-Closure	P95	6.22709E-05	6.03295E-05	5.90676E-05	4.99449E-05	4.9386E-05	6.46411E-05	6.70026E-05	7.06423E-05	6.83451E-05	6.37644E-05	6.04238E-05	5.63198E-05
D_S	Post-Closure	P95	0.48592481	0.484072834	0.484725446	0.456641138	0.467150927	0.489263445	0.476301074	0.503081501	0.506395459	0.510884941	0.495799571	0.489641607
D_Sb	Post-Closure	P95	0.003421317	0.00316752	0.002991609	0.002165679	0.001824529	0.004165028	0.004293702	0.00424627	0.003946185	0.003517494	0.003275793	0.00296739
D_Se	Post-Closure	P95	0.000107286	0.000101443	9.92089E-05	7.53772E-05	8.29109E-05	0.000121267	0.000126981	0.000129121	0.000124325	0.000114164	0.000105581	9.75063E-05
D_Si	Post-Closure	P95	6.412447929	6.362625599	6.399077415	6.000135899	5.735937595	6.272372723	6.04009676	6.426497936	6.528213501	6.435544014	6.389906406	6.452334404
D_Sn	Post-Closure	P95	8.1372E-05	8.14372E-05	8.14302E-05	7.73368E-05	7.34356E-05	8.44474E-05	7.91302E-05	8.56865E-05	8.33303E-05	8.14738E-05	8.15076E-05	8.126E-05
D_Sr	Post-Closure	P95	0.060352951	0.060893275	0.061000682	0.056605898	0.059797417	0.062839843	0.064854741	0.067277841	0.066023432	0.064012572	0.061630767	0.060810477
D_Ti	Post-Closure	P95	0.002095074	0.002046241	0.00204915	0.001919092	0.001778126	0.00215345	0.002156719	0.002291654	0.002240622	0.00209362	0.002090261	0.002139415
D_Tl	Post-Closure	P95	2.44031E-05	2.24089E-05	2.15904E-05	1.60165E-05	1.64991E-05	2.82539E-05	3.05782E-05	3.03094E-05	2.88751E-05	2.60848E-05	2.41068E-05	2.19459E-05
D_U	Post-Closure	P95	0.00019899	0.000191066	0.000187537	0.00015878	0.000170423	0.000214974	0.000229659	0.000234649	0.000223135	0.000213695	0.000194053	0.000182965
D_V	Post-Closure	P95	0.001286473	0.00124446	0.001259055	0.001124375	0.000970219	0.001215241	0.00129678	0.001313219	0.001259146	0.001203202	0.001174808	0.001155212
D_Zn	Post-Closure	P95	0.003173758	0.002988807	0.002896496	0.002122673	0.002191863	0.003622424	0.003792524	0.003843022	0.003651001	0.003316729	0.003113866	0.002878867

Appendix A.1.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF D Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	16.02184868	6.472617149	2.388459206	0.878343105	0.25737235	0.079523005	0.027838938	0.010256635	0.003590203	0.001336165	0.000835886	0.00211787
NO3_N	Closure	P95	15.72504044	15.9695425	14.14193726	12.55587006	10.25587082	7.906590462	7.153386593	6.744614124	6.217308044	5.73457098	5.278141975	4.974376678
NO2_N	Closure	P95	0.118972734	0.114872821	0.113926075	0.101910472	0.08027295	0.063579269	0.059529986	0.056520674	0.052135881	0.048100796	0.044117235	0.042095412
Br	Closure	P95	0.075265929	0.070478976	0.072092481	0.062672816	0.063473597	0.087940097	0.082641087	0.091001935	0.089477032	0.088921078	0.083640009	0.08018548
Cl	Closure	P95	245.7804871	237.1055756	234.9913177	210.5552826	164.9802094	130.2184448	121.6075211	115.1080933	105.7666321	97.26279449	88.71722412	84.3610611
F	Closure	P95	0.907711744	0.90231514	0.927513957	0.885519862	0.870656312	0.858308554	0.793176115	0.818605006	0.823900223	0.834725022	0.872234464	0.88944006
TDP	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Closure	P95	2871.543213	2785.027832	2773.848145	2519.102783	1960.204834	1640.549316	1539.822266	1467.559082	1325.177856	1232.462036	1154.392944	1106.276489
T_CN	Closure	P95	0.000939394	1.13566E-05	0.000603849	0.000547267	4.719E-05	2.17228E-06	9.53615E-07	6.17745E-07	5.01386E-07	1.57174E-06	1.1608E-06	0.000368386
WAD_CN	Closure	P95	5.01658E-06	1.13566E-05	0.000603849	0.000547267	4.719E-05	2.17228E-06	9.53615E-07	6.17745E-07	5.01386E-07	1.57174E-06	1.1608E-06	0.000368386
T_Ag	Closure	P95	0.001699576	0.001691825	0.001730928	0.001633606	0.00169724	0.00168693	0.001533915	0.001572106	0.001556262	0.001562961	0.001647506	0.001678939
T_Al	Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Closure	P95	0.008263159	0.008362101	0.008549695	0.008100363	0.007546832	0.007260004	0.007357188	0.007562853	0.007627824	0.007695906	0.007853027	0.008062758
T_B	Closure	P95	0.091599785	0.091474041	0.094107963	0.088542834	0.078725956	0.077170901	0.076647297	0.07983081	0.081917144	0.082487553	0.085832857	0.088944018
T_Ba	Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Closure	P95	4.52985E-05	4.36003E-05	4.50085E-05	3.83426E-05	3.62819E-05	5.31104E-05	5.08611E-05	5.19152E-05	5.24558E-05	4.86933E-05	4.62332E-05	4.58205E-05
T_Be	Closure	P95	0.000598113	0.000587807	0.000602381	0.000580151	0.000545693	0.00053812	0.000515938	0.000536325	0.00053964	0.000549489	0.000566818	0.000584263
T_Ca	Closure	P95	487.2507324	474.4446411	474.1290588	453.651886	344.0296021	309.5236206	291.7218018	281.0996704	254.2487946	241.5491791	231.0177917	223.9467773
T_Cd	Closure	P95	0.00954341	0.009450698	0.009661977	0.009152238	0.00938284	0.009423599	0.00856539	0.008798737	0.008719126	0.008768792	0.009237743	0.009421031
T_Co	Closure	P95	0.193758696	0.187837288	0.186821029	0.17683059	0.133745044	0.118223362	0.11121881	0.10633193	0.09479671	0.089393772	0.084832825	0.081676759
T_Cr	Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
T_Cu	Closure	P95	0.07800056	0.075862378	0.07563711	0.07195548	0.056897704	0.050781589	0.048337206	0.046791673	0.042906031	0.040891942	0.03940358	0.038473532
T_Fe	Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Closure	P95	8.11456E-05	8.07492E-05	8.26722E-05	7.89218E-05	7.08207E-05	7.04625E-05	6.85929E-05	7.16855E-05	7.29338E-05	7.38337E-05	7.63944E-05	7.89888E-05
T_K	Closure	P95	77.5115509	75.76347351	75.84060669	72.38117981	55.64522552	50.01848221	48.04231644	46.76828384	42.56389999	40.88689423	39.53768539	38.7388916
T_Li	Closure	P95	0.053384617	0.052673876	0.054394491	0.05195256	0.049297914	0.048439231	0.045939054	0.0477193	0.047863442	0.048952702	0.050513782	0.052114177
T_Mg	Closure	P95	5.73109436	5.683213234	5.756165504	5.621641159	5.044988155	4.7561903	4.655334949	4.687182426	4.587790966	4.570931435	4.541062832	4.555027485
T_Mn	Closure	P95	1.29343152	1.271836877	1.30365932	1.248239398	1.28187561	1.291120648	1.143049479	1.170807958	1.152990341	1.19542098	1.248406291	1.271172523
T_Mo	Closure	P95	0.105175279	0.102779672	0.102933094	0.09843678	0.075388938	0.067727216	0.06469848	0.062890254	0.057113525	0.054749958	0.05286961	0.05184149
T_Na	Closure	P95	826.9816895	797.9937744	793.138916	706.0999756	555.0870361	439.0922546	410.3194885	388.4468689	358.1577454	330.1180115	301.2936096	286.8359985
T_Ni	Closure	P95	0.020807127	0.020408185	0.020886825	0.019998137	0.020036642	0.020020839	0.018227011	0.018727629	0.018827502	0.018985201	0.019987969	0.020439863
T_P	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Closure	P95	0.002418952	0.002420275	0.002464639	0.002333916	0.002379596	0.002368232	0.002157422	0.002206784	0.002212267	0.00221199	0.002334326	0.002383265
T_S	Closure	P95	0.596855879	0.589888513	0.611147881	0.565087259	0.636713564	0.708575726	0.607578874	0.610572219	0.625710249	0.611272216	0.610882103	0.604807138
T_Sb	Closure	P95	0.044368971	0.045427181	0.047038633	0.042725801	0.03679309	0.035436854	0.037110813	0.038814623	0.039166305	0.039629146	0.04098193	0.042779703
T_Se	Closure	P95	0.004905018	0.004851183	0.004940543	0.004715409	0.004762951	0.004757449	0.004333803	0.004448879	0.004437739	0.004476664	0.004711719	0.004815101
T_Si	Closure	P95	7.487247944	7.352921009	7.652752399	6.396486282	6.265538692	8.503509521	7.524237156	7.993247509	8.174424171	7.922999382	7.565409184	7.626995087
T_Sn	Closure	P95	9.19459E-05	8.84105E-05	9.12604E-05	7.78936E-05	7.38457E-05	0.00010771	0.000103107	0.000105873	0.000106886	9.94106E-05	9.42151E-05	9.31003E-05
T_Sr	Closure	P95	0.438934296	0.433184057	0.435441792	0.402008832	0.353833467	0.314363033	0.309665382	0.309720218	0.300696462	0.297785461	0.295397729	0.295832992
T_Ti	Closure	P95	0.004437974	0.004214579	0.004292304	0.003671981	0.003831508	0.005282944	0.005420574	0.005233523	0.005088151	0.004690052	0.004609221	0.004595027
T_Tl	Closure	P95	0.00105902	0.001047058	0.001069129	0.001022859	0.001023503	0.001017566	0.000928606	0.000954283	0.000959275	0.000967663	0.001015751	0.001040048
T_U	Closure	P95	0.005642047	0.005624047	0.005680756	0.005520946	0.005504575	0.005194872	0.004920355	0.005004878	0.005031483	0.005000314	0.005098651	0.005143053
T_V	Closure	P95	0.014734152	0.014423151	0.014844905	0.014254517	0.013456854	0.013324219	0.012632458	0.013135771	0.01317804	0.013475614	0.013937037	0.0143814
T_Zn	Closure	P95	0.462686747	0.45216611	0.462531835	0.440792888	0.45334214	0.456339478	0.414740831	0.426294684	0.422532141	0.424791634	0.447841585	0.456738919
D_Ag	Closure	P95	0.001694064	0.001689136	0.001728787	0.001631353	0.001697193	0.001680747	0.001527317	0.001567817	0.00155281	0.001560653	0.001641497	0.00167318
D_Al	Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Closure	P95	0.008238238	0.008338463	0.008525862	0.008098285	0.007539511	0.007240734	0.007332474	0.007538636	0.007604645	0.007671581	0.007829095	0.008037779
D_B	Closure	P95	0.091599785	0.091474041	0.094107963	0.088542834	0.078725956	0.077170901	0.076647297	0.07983081	0.081917144	0.082487553	0.085832857	0.088944018
D_Ba	Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Closure	P95	4.52985E-05	4.36003E-05	4.50085E-05	3.83426E-05	3.62819E-05	5.31104E-05	5.08611E-05	5.19152E-05	5.24558E-05	4.86933E-05	4.62332E-05	4.58205E-05
D_Be	Closure	P95	0.000598113	0.000587807	0.000602381	0.000580151	0.000545693	0.00053812	0.000515938	0.000536325	0.00053964	0.000549489	0.000566818	0.000584263
D_Ca	Closure	P95	487.2537231	474.4443665	474.1255798	453.6389771	344.0317993	309.5148315	291.7085876	281.0725098	254.2240906	241.5325012	230.9845123	223.9152222
D_Cd	Closure	P95	0.009542817	0.009450496	0.009661779	0.009152137	0.009382297	0.009422492	0.008564479	0.008798469	0.008718855	0.008768504	0.009237021	0.00942032
D_Co	Closure	P95	0.193758681	0.187837273	0.186821029	0.1768305	0.133744329	0.11822255	0.111217551	0.106330737	0.09479557	0.089392699	0.084831841	0.081675813
D_Cr	Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
D_Cu	Closure	P95	0.078000493	0.075862065	0.075635418	0.071952492	0.056893114	0.050772544	0.048333157	0.046787847	0.042900566	0.04088622	0.039398253	0.038467735
D_Fe	Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Closure	P95	8.11203E-05	8.07565E-05	8.26968E-05	7.88748E-05	7.07947E-05	7.07195E-05	6.86315E-05	7.1723E-05	7.29131E-05	7.38587E-05	7.64334E-05	7.90185E-05
D_K	Closure	P95	77.51139832	75.76351166	75.84044647	72.38130188	55.63664246	50.01245117	48.03875351	46.76478195	42.55680847	40.88008118	39.52972794	38.73180008
D_Li	Closure	P95	0.053384617	0.052673876	0.054394491	0.05195256	0.049297914	0.048439231	0.045939054	0.0477193	0.047863442	0.048952702	0.050513782	0.052114177
D_Mg	Closure	P95	5.731198788	5.68322134	5.756084919	5.620101452	5.040847301	4.749181747	4.648227692	4.679619789	4.580786228	4.563975334	4.533864498	4.550327778
D_Mn	Closure	P95	1.291146159	1.269705176	1.301078081	1.246542692	1.28046	1.287513375	1.139524698	1.168634892	1.151468754	1.193772078	1.245320201	1.268832088
D_Mo	Closure	P95	0.105174929	0.102777876	0.102930784	0.098433048	0.075383738	0.067719281	0.064690031	0.062883072	0.057104662	0.054742068	0.052860852	0.05183268
D_Na	Closure	P95	826.9431152	797.956604	793.104187	706.0637207	555.0576172	439.0566101	410.2748718	388.4016724	358.1186829	330.0820313	301.2543335	286.7920532
D_Ni	Closure	P95	0.020807035	0.020407975	0.020886756	0.019996656	0.020031659	0.020020457	0.018224098	0.018726854	0.018825553	0.01898291	0.01998787	0.020438233
D_P	Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Closure	P95	0.002413268	0.002415056	0.002457212	0.002329543	0.002379541	0.002352923	0.002144616	0.00219846	0.002210273	0.002207348	0.002322662	0.002372088
D_S	Closure	P95	0.506113052	0.50367856	0.527781308	0.492222786	0.557516932	0.644148111	0.539721847	0.547980249	0.559163749	0.536057532	0.517346084	0.512120485
D_Sb	Closure	P95	0.044368971	0.045427181	0.047038633	0.042725801	0.03679309	0.035436854	0.037110813	0.038814623	0.039166305	0.039629146	0.04098193	0.042779703
D_Se	Closure	P95	0.004900113	0.004846138	0.00493501	0.004709708	0.004761567	0.004758739	0.004332925	0.004448292	0.00443443	0.004474189	0.004709284	0.004811853
D_Si	Closure	P95	7.295808315	7.137545586	7.439634323	6.197367668	6.042276382	8.132915497	7.225914955	7.715334415	7.905517578	7.692933083	7.351153851	7.44342947
D_Sn	Closure	P95	9.19459E-05	8.84105E-05	9.12604E-05	7.78936E-05	7.38457E-05	0.00010771	0.000103107	0.000105873	0.000106886	9.94106E-05	9.42151E-05	9.31003E-05
D_Sr	Closure	P95	0.438921899	0.433163106	0.43531844	0.401836902	0.353945613	0.314251125	0.309511274	0.309473544	0.300509989	0.297662467	0.295276284	0.296034962
D_Ti	Closure	P95	0.002917629	0.002591717	0.002593287	0.0022634	0.002156321	0.002995134	0.002979665	0.002899606	0.002887291	0.00273262	0.002931863	0.00321866
D_Tl	Closure	P95	0.00105902	0.001047058	0.001069129	0.001022859	0.001023503	0.001017566	0.000928606	0.000954283	0.000959275	0.000967663	0.001015751	0.001040048
D_U	Closure	P95	0.005641743	0.005623627	0.005679792	0.005520086	0.005501614	0.005188724	0.004914922	0.004999502	0.005025144	0.004995898	0.005093396	0.005137849
D_V	Closure	P95	0.014652553	0.014345803	0.014771998	0.01418556	0.013408676	0.013194311	0.012539905	0.013044827	0.013120245	0.013417109	0.013848864	0.014295726
D_Zn	Closure	P95	0.462322116	0.451867133	0.462222725	0.440462857	0.453164816	0.455993176	0.41450119	0.426011115	0.422229737	0.424512714	0.447469711	0.456382692

Appendix A.1.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF D Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.004860508	0.003791685	0.004500706	0.005629853	0.005347114	0.006611206	0.007128866	0.006617961	0.005902755	0.004882266	0.005203119	0.004218167
NO3_N	Post-Closure	P95	0.068551883	0.070493609	0.07170172	0.066698372	0.054590397	0.064060465	0.065284304	0.070398644	0.075801335	0.073982611	0.06665802	0.069837116
NO2_N	Post-Closure	P95	0.002555252	0.002659024	0.002678364	0.002126562	0.00194357	0.002172195	0.002368361	0.002651566	0.002557578	0.002421721	0.002433017	0.00253963
Br	Post-Closure	P95	0.075136892	0.070548058	0.067512326	0.06483414	0.070783526	0.090169057	0.092176951	0.100449368	0.087070584	0.086449482	0.085911699	0.079993457
Cl	Post-Closure	P95	0.898139238	0.913324416	0.895827174	0.73784256	0.681071997	0.781865299	0.875598311	0.966516852	0.894807994	0.862221777	0.881255925	0.890103698
F	Post-Closure	P95	0.268938959	0.286042958	0.285971612	0.2152334	0.187786594	0.213065609	0.238214329	0.274314135	0.259770453	0.250566959	0.253223389	0.267656773
TDP	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Post-Closure	P95	57.99128723	61.84162521	61.28872299	45.44845581	38.09303665	43.62646103	48.24925232	56.17202377	54.00042725	51.97031403	52.33161545	56.46094131
T_CN	Post-Closure	P95	0.001414206	0.001161163	0.001115627	0.003187371	0.003034218	0.002686548	0.002807011	0.001851711	0.00178467	0.00182369	0.00172092	0.001403392
WAD_CN	Post-Closure	P95	0.001414206	0.001161163	0.001115627	0.003187371	0.003034218	0.002686548	0.002807011	0.001851711	0.00178467	0.00182369	0.00172092	0.001403392
T_Ag	Post-Closure	P95	7.27538E-05	7.71419E-05	7.70838E-05	6.00996E-05	5.02847E-05	5.99228E-05	6.62989E-05	7.34772E-05	7.09289E-05	6.78637E-05	6.83883E-05	7.21816E-05
T_Al	Post-Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Post-Closure	P95	0.004375858	0.004673324	0.00465574	0.003500183	0.002976781	0.003410321	0.003818083	0.004329863	0.00415189	0.003990072	0.004027546	0.00430864
T_B	Post-Closure	P95	0.064527564	0.068907082	0.068941846	0.051821403	0.043584879	0.050069213	0.056111734	0.063649371	0.061363507	0.058823217	0.059428144	0.063644849
T_Ba	Post-Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Post-Closure	P95	4.45096E-05	4.30473E-05	4.21437E-05	3.86934E-05	4.27749E-05	5.5188E-05	5.02312E-05	5.09116E-05	5.15846E-05	4.51069E-05	4.31986E-05	4.3459E-05
T_Be	Post-Closure	P95	0.000330467	0.000349603	0.000349135	0.000271236	0.000232297	0.000265143	0.000295041	0.000332887	0.00032143	0.000306403	0.000310401	0.00032842
T_Ca	Post-Closure	P95	24.27414322	25.6693306	25.86481476	19.94003868	19.07818031	21.04442787	22.84626579	25.64016151	24.1426239	22.92232513	23.06257629	24.14811325
T_Cd	Post-Closure	P95	0.000492953	0.000525414	0.000520762	0.000385973	0.000318885	0.000368748	0.000410671	0.000473774	0.000456962	0.000439847	0.000443093	0.000478848
T_Co	Post-Closure	P95	0.002391215	0.00254691	0.002527789	0.001876538	0.001553123	0.001790329	0.001998998	0.002303518	0.002221975	0.002136959	0.002153689	0.002325411
T_Cr	Post-Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
T_Cu	Post-Closure	P95	0.002125329	0.00224879	0.002232842	0.001755269	0.001464905	0.001732795	0.001919745	0.002151385	0.002063132	0.001971776	0.002002347	0.002112634
T_Fe	Post-Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Post-Closure	P95	5.18743E-05	5.54413E-05	5.52943E-05	4.18581E-05	3.4625E-05	4.07034E-05	4.55801E-05	5.09669E-05	4.93665E-05	4.74287E-05	4.80041E-05	5.12862E-05
T_K	Post-Closure	P95	10.72057152	11.43555355	11.41118526	8.480856895	7.274564743	8.411799431	9.445986748	10.62047863	10.19799995	9.800053596	9.928822517	10.62147141
T_Li	Post-Closure	P95	0.022882948	0.02436946	0.024195287	0.017973036	0.014895864	0.017166901	0.019167136	0.022035673	0.021263869	0.02045545	0.020613981	0.022253435
T_Mg	Post-Closure	P95	2.515622377	2.547374964	2.551004887	2.215724468	2.63097024	2.651716948	2.595523834	2.735523701	2.718173981	2.441389561	2.571493626	2.421926022
T_Mn	Post-Closure	P95	0.066311732	0.070670344	0.070544139	0.053239748	0.043618705	0.051438265	0.057741769	0.064813025	0.062747642	0.060287628	0.061028413	0.06534861
T_Mo	Post-Closure	P95	0.006896271	0.007357979	0.007312815	0.00544574	0.004651032	0.005273704	0.005855788	0.006738947	0.006477074	0.006214183	0.006251673	0.006732942
T_Na	Post-Closure	P95	4.320543766	4.379783154	4.37253809	3.685636044	3.911171198	4.130384445	4.281928062	4.618877888	4.532164097	4.126036167	4.27933836	4.190973759
T_Ni	Post-Closure	P95	0.004257758	0.004542738	0.004534888	0.003396626	0.002837134	0.00326282	0.003670358	0.004169361	0.004022663	0.003858885	0.003896222	0.004181503
T_P	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Post-Closure	P95	0.000299943	0.000319862	0.000318757	0.000244748	0.000203541	0.000239225	0.000266754	0.000299322	0.000288608	0.000276359	0.000279947	0.000297641
T_S	Post-Closure	P95	0.591238916	0.586246252	0.603459775	0.60067457	0.78164345	0.75350529	0.66156882	0.653406799	0.620128334	0.594735801	0.694815636	0.616392493
T_Sb	Post-Closure	P95	0.041376505	0.044102877	0.043639272	0.032262705	0.026585391	0.030689906	0.034008719	0.039545495	0.038159918	0.036761783	0.03701634	0.040092956
T_Se	Post-Closure	P95	0.000688095	0.000735689	0.000736202	0.000552891	0.000468543	0.000532482	0.000596336	0.00067745	0.000652795	0.00062419	0.000630062	0.000674752
T_Si	Post-Closure	P95	7.599217892	7.363131523	7.221923828	6.533275127	7.341085434	8.740877151	8.021969795	7.882817745	8.055681229	7.412884712	7.634337425	7.224935055
T_Sn	Post-Closure	P95	9.03742E-05	8.72972E-05	8.53873E-05	7.85126E-05	8.68522E-05	0.000112277	0.000102213	0.000103516	0.000104943	9.22748E-05	8.85153E-05	8.83761E-05
T_Sr	Post-Closure	P95	0.139812186	0.147119015	0.147891179	0.116214596	0.112866215	0.124596551	0.133583575	0.148703083	0.14252162	0.13238363	0.133459851	0.139159143
T_Ti	Post-Closure	P95	0.004274165	0.004026921	0.004041432	0.003789129	0.003875442	0.006458574	0.005790697	0.005239321	0.005100521	0.004411866	0.004756515	0.004399545
T_Tl	Post-Closure	P95	0.000211601	0.0002251	0.000223937	0.000166683	0.000139491	0.000159964	0.000179949	0.000205135	0.000197925	0.000190152	0.000191157	0.000205957
T_U	Post-Closure	P95	0.000825595	0.000879156	0.000878347	0.000676882	0.000591844	0.00066953	0.000742016	0.000836696	0.000805062	0.000765783	0.000772077	0.000817329
T_V	Post-Closure	P95	0.006923181	0.007387951	0.00733586	0.00547886	0.004525741	0.005258393	0.005903736	0.006700856	0.006454584	0.006218581	0.006265107	0.006743097
T_Zn	Post-Closure	P95	0.025721686	0.027453333	0.027458947	0.020615164	0.01719215	0.019883463	0.022313682	0.025243804	0.024381198	0.023384888	0.023624109	0.025313949
D_Ag	Post-Closure	P95	7.10753E-05	7.55801E-05	7.60574E-05	5.73858E-05	4.9585E-05	5.61986E-05	6.29177E-05	7.12759E-05	6.87384E-05	6.56811E-05	6.58681E-05	7.01774E-05
D_Al	Post-Closure	P95	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Post-Closure	P95	0.0043309	0.004623388	0.004598585	0.003446007	0.002931359	0.003342824	0.003747714	0.004268527	0.004089504	0.003931668	0.003965269	0.004250705
D_B	Post-Closure	P95	0.064527564	0.068907082	0.068941846	0.051821403	0.043584879	0.050069213	0.056111734	0.063649371	0.061363507	0.058823217	0.059428144	0.063644849
D_Ba	Post-Closure	P95	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Post-Closure	P95	4.45096E-05	4.30473E-05	4.21437E-05	3.86934E-05	4.27749E-05	5.5188E-05	5.02312E-05	5.09116E-05	5.15846E-05	4.51069E-05	4.31986E-05	4.3459E-05
D_Be	Post-Closure	P95	0.000330467	0.000349603	0.000349135	0.000271236	0.000232297	0.000265143	0.000295041	0.000332887	0.00032143	0.000306403	0.000310401	0.00032842
D_Ca	Post-Closure	P95	24.21912193	25.60051918	25.80234146	19.88310814	19.05014229	21.01702309	22.81089211	25.60480309	24.14049911	22.88452148	22.99971008	24.09536171
D_Cd	Post-Closure	P95	0.000492406	0.000524691	0.000519998	0.000385221	0.000318113	0.00036758	0.000409114	0.000472982	0.000456151	0.000438943	0.000442219	0.000478217
D_Co	Post-Closure	P95	0.002390412	0.002546221	0.002526799	0.00187556	0.001551416	0.001788932	0.001995974	0.002301842	0.002220286	0.002135485	0.002152548	0.002324488
D_Cr	Post-Closure	P95	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
D_Cu	Post-Closure	P95	0.002120108	0.002233806	0.002223733	0.001747342	0.001457523	0.001719973	0.001910207	0.002139899	0.002056379	0.001967004	0.001998649	0.002109658
D_Fe	Post-Closure	P95	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Post-Closure	P95	5.18728E-05	5.54379E-05	5.52887E-05	4.18801E-05	3.4627E-05	4.08141E-05	4.56335E-05	5.10008E-05	4.93626E-05	4.74181E-05	4.79966E-05	5.12789E-05
D_K	Post-Closure	P95	10.71695423	11.43168259	11.40877342	8.48033905	7.255385399	8.401960373	9.437590599	10.60399437	10.18662453	9.790075302	9.921796799	10.61616325
D_Li	Post-Closure	P95	0.022882948	0.02436946	0.024195287	0.017973036	0.014895864	0.017166901	0.019167136	0.022035673	0.021263869	0.02045545	0.020613981	0.022253435
D_Mg	Post-Closure	P95	2.533967018	2.563044071	2.555880785	2.220134974	2.628819942	2.649302483	2.594496965	2.737213612	2.718445778	2.441442728	2.570527077	2.434398651
D_Mn	Post-Closure	P95	0.064372584	0.068519898	0.068100408	0.050679084	0.042003185	0.048562966	0.054397687	0.062295519	0.06005048	0.05775043	0.058285728	0.062828913
D_Mo	Post-Closure	P95	0.00686985	0.007327271	0.007283355	0.005421824	0.004625231	0.005248506	0.005826292	0.006711707	0.006451178	0.00619165	0.006228149	0.006708426
D_Na	Post-Closure	P95	4.241255283	4.305083275	4.309941769	3.618667603	3.851933002	4.060484409	4.219202518	4.556610584	4.44617939	4.059863091	4.189136028	4.126333237
D_Ni	Post-Closure	P95	0.004256484	0.004542125	0.004534117	0.003395927	0.002833364	0.003259951	0.003667872	0.004165767	0.004019971	0.003856763	0.003895157	0.004180644
D_P	Post-Closure	P95	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Post-Closure	P95	0.000296683	0.00031683	0.000317072	0.00023948	0.000202183	0.000231996	0.000260191	0.00029501	0.000284356	0.000272122	0.000275055	0.00029375
D_S	Post-Closure	P95	0.499220163	0.501603305	0.496921301	0.525063157	0.683263719	0.681221783	0.585161328	0.569916427	0.546717107	0.52468437	0.507543445	0.497763157
D_Sb	Post-Closure	P95	0.041376505	0.044102877	0.043639272	0.032262705	0.026585391	0.030689906	0.034008719	0.039545495	0.038159918	0.036761783	0.03701634	0.040092956
D_Se	Post-Closure	P95	0.000676802	0.000720895	0.000722683	0.000542899	0.000457623	0.000524447	0.000587454	0.000667291	0.000642604	0.000613842	0.000617714	0.000661768
D_Si	Post-Closure	P95	7.387080193	7.157681942	7.04147625	6.349030495	7.069286346	8.363451004	7.728412151	7.633245945	7.805437088	7.220388412	7.453431606	7.033466339
D_Sn	Post-Closure	P95	9.03742E-05	8.72972E-05	8.53873E-05	7.85126E-05	8.68522E-05	0.000112277	0.000102213	0.000103516	0.000104943	9.22748E-05	8.85153E-05	8.83761E-05
D_Sr	Post-Closure	P95	0.140147299	0.146780729	0.147653148	0.11582803	0.112904362	0.124538824	0.133262187	0.14837043	0.142274216	0.132019609	0.132993028	0.139113709
D_Ti	Post-Closure	P95	0.002813231	0.002629653	0.00258407	0.002211422	0.002163307	0.003573567	0.003217622	0.002912691	0.002978352	0.002695133	0.003483554	0.002920277
D_Tl	Post-Closure	P95	0.000211601	0.0002251	0.000223937	0.000166683	0.000139491	0.000159964	0.000179949	0.000205135	0.000197925	0.000190152	0.000191157	0.000205957
D_U	Post-Closure	P95	0.000811612	0.000865162	0.00086495	0.000663156	0.000578667	0.000653984	0.000726042	0.000820126	0.000789032	0.00075141	0.000757527	0.000803218
D_V	Post-Closure	P95	0.006892665	0.007354259	0.007291295	0.00542786	0.004499427	0.005187355	0.005793996	0.006652052	0.006402161	0.006171145	0.006214137	0.006700727
D_Zn	Post-Closure	P95	0.02477991	0.026385887	0.026269183	0.019620655	0.016313983	0.018896317	0.021257412	0.024084061	0.023252038	0.022306537	0.022465527	0.02417619

Appendix A.1.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Mill

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Br	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
F	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.1.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Mill

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Br	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
F	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.1.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Pit Lake

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	4.437812805	4.425438881	4.38457346	4.303718567	4.194475651	4.019931793	3.855873346	3.692386389	3.522100449	3.46429038	3.437183142	3.427650213
NO3_N	Closure	P95	7.206990242	7.206955433	7.210003853	7.177479744	7.065877438	7.194279671	7.298399925	7.412438393	7.463300705	7.381398201	7.316272736	7.256825924
NO2_N	Closure	P95	0.043503977	0.043318074	0.043228194	0.043711402	0.04374982	0.044080716	0.044244975	0.044316832	0.043956604	0.043795504	0.043688867	0.043700613
Br	Closure	P95	0.04157627	0.041608322	0.041594651	0.041593969	0.04169333	0.041783154	0.041871127	0.041956216	0.042124759	0.042173132	0.042312808	0.042323958
Cl	Closure	P95	101.2073669	101.1932755	101.1456223	100.2153702	100.3529816	100.9902191	100.9232254	101.1666031	101.5417328	101.2659683	101.0632706	101.0778732
F	Closure	P95	0.795453727	0.79438448	0.785712123	0.77263087	0.762436628	0.768517733	0.769787073	0.771104634	0.770285726	0.765009522	0.765264213	0.761275947
TDP	Closure	P95	0.033509977	0.033359502	0.033184182	0.032739945	0.032654047	0.033937521	0.034454569	0.034369033	0.034370299	0.034079261	0.03403157	0.033762366
SO4	Closure	P95	1492.975342	1492.694824	1491.907349	1490.008789	1491.895996	1498.261719	1502.71582	1499.402344	1499.598022	1490.640625	1490.30603	1491.696899
T_CN	Closure	P95	0.024271449	0.02402457	0.023667019	0.023263071	0.022663567	0.022273215	0.021967152	0.021547753	0.021259258	0.020881226	0.020653054	0.020456245
WAD_CN	Closure	P95	0.000806443	0.00079778	0.000784817	0.000767604	0.000747127	0.000739741	0.000728091	0.000712419	0.000706874	0.00070108	0.00070668	0.000703663
T_Ag	Closure	P95	0.000897322	0.000899949	0.00090188	0.000901115	0.000893555	0.000895369	0.000897559	0.000897719	0.000898391	0.000895932	0.000897475	0.000897591
T_Al	Closure	P95	0.153497577	0.149270192	0.1447822	0.139556825	0.131713465	0.12966761	0.12570776	0.122025162	0.119015716	0.115881823	0.113407396	0.111103274
T_As	Closure	P95	0.03740941	0.03676901	0.035921812	0.034644417	0.033984385	0.033999994	0.034089599	0.033472929	0.032823253	0.032334395	0.032064412	0.031700168
T_B	Closure	P95	0.301698238	0.296775877	0.291076124	0.28191632	0.272801608	0.269705892	0.266830444	0.263745099	0.26091525	0.257216901	0.255238146	0.253270864
T_Ba	Closure	P95	0.005302472	0.00525168	0.005176575	0.005056804	0.004943837	0.004963599	0.004947564	0.00491222	0.004877349	0.004830514	0.004811652	0.004784961
T_Bi	Closure	P95	1.97864E-05	1.97606E-05	1.97055E-05	1.96537E-05	1.96242E-05	1.96491E-05	1.96401E-05	1.96603E-05	1.96758E-05	1.96411E-05	1.96747E-05	1.97021E-05
T_Be	Closure	P95	0.001976732	0.001937423	0.001890883	0.001820325	0.001775181	0.001768941	0.001766679	0.001735505	0.001701689	0.001675605	0.001658909	0.001640793
T_Ca	Closure	P95	292.9637756	293.2496643	293.2516785	293.6629028	291.8379517	293.3815613	292.9698181	293.0736694	293.9561157	292.6190186	292.6207275	292.3718872
T_Cd	Closure	P95	0.052384358	0.051367264	0.050099555	0.048194975	0.04718655	0.047192857	0.047267362	0.04629105	0.045255903	0.044535559	0.043840509	0.043176856
T_Co	Closure	P95	0.0907491	0.090763994	0.090623118	0.090080664	0.089912295	0.090718456	0.091136761	0.091339879	0.090772577	0.090806358	0.090826765	0.090741724
T_Cr	Closure	P95	0.002139124	0.002085136	0.002036331	0.001973249	0.001911192	0.001930269	0.001934616	0.0018978	0.001858222	0.001826883	0.001795269	0.001758766
T_Cu	Closure	P95	0.034771767	0.034889832	0.034809064	0.03471354	0.034217082	0.034200799	0.034238163	0.03436669	0.034547023	0.034654971	0.034710649	0.03467378
T_Fe	Closure	P95	0.090501428	0.088205069	0.085716136	0.082783721	0.079443209	0.080233574	0.080034181	0.078252122	0.076583989	0.075059742	0.073965669	0.072639711
T_Hg	Closure	P95	0.000253459	0.000249006	0.000244436	0.000237307	0.000229539	0.000227306	0.000224541	0.000222179	0.000220066	0.000217192	0.000215224	0.00021365
T_K	Closure	P95	65.3891449	65.48244476	65.29068756	64.83448792	63.61764526	63.79311371	63.68803406	63.35467148	62.98132324	62.89306259	62.77730179	62.62365723
T_Li	Closure	P95	0.129822016	0.1276052	0.12522538	0.121988125	0.11816375	0.117109969	0.115890935	0.114799768	0.113557957	0.112130709	0.111153767	0.110067517
T_Mg	Closure	P95	11.54348469	11.44430923	11.28782272	11.17759132	10.86412621	10.89697361	10.82934093	10.73471928	10.67959881	10.58555984	10.55636978	10.51755905
T_Mn	Closure	P95	4.678422451	4.56667757	4.463335991	4.334050179	4.202129364	4.237649918	4.25666666	4.176286221	4.090431213	4.031637669	3.967330694	3.893807411
T_Mo	Closure	P95	0.06142915	0.061915264	0.06203023	0.062061872	0.061537124	0.061772414	0.061615966	0.061635453	0.06164325	0.061327547	0.061204277	0.061062209
T_Na	Closure	P95	358.4764709	358.4165344	358.1652222	353.362854	355.6150208	357.1870117	359.6282654	359.7319641	358.9702148	357.3748169	357.5236206	358.2368774
T_Ni	Closure	P95	0.054567721	0.053613059	0.052452732	0.050642695	0.049563456	0.049346853	0.049234014	0.048451956	0.047668781	0.047065709	0.046768561	0.046343677
T_P	Closure	P95	0.033091735	0.032940023	0.032762382	0.032320678	0.03222058	0.033494547	0.033994399	0.033937924	0.03395319	0.033664089	0.033613697	0.033344332
T_Pb	Closure	P95	0.017275408	0.016921023	0.016511889	0.015908074	0.015580456	0.015551406	0.015514223	0.015202017	0.014925055	0.014691617	0.014558496	0.014390701
T_S	Closure	P95	0.502261579	0.498237729	0.493715227	0.483424097	0.476704806	0.472741842	0.466017306	0.461382449	0.45638144	0.45194298	0.450620055	0.448508054
T_Sb	Closure	P95	0.197451204	0.194008887	0.190324351	0.184652671	0.178709701	0.176707402	0.174467385	0.172263294	0.170274436	0.167717516	0.166060194	0.164711013
T_Se	Closure	P95	0.003583766	0.003598714	0.003594982	0.003577157	0.003547592	0.003557559	0.003560136	0.003571409	0.003572412	0.003558151	0.003565883	0.003574573
T_Si	Closure	P95	4.253861904	4.254649162	4.254296303	4.248984337	4.222438812	4.239186764	4.240839005	4.243958473	4.245900154	4.248129368	4.251104832	4.24939394
T_Sn	Closure	P95	3.0012E-05	3.00271E-05	3.00265E-05	2.9995E-05	3.00325E-05	3.0044E-05	3.00479E-05	3.0068E-05	3.00953E-05	3.00917E-05	3.01355E-05	3.01582E-05
T_Sr	Closure	P95	0.604338109	0.600181282	0.593212664	0.587185621	0.576704621	0.577557147	0.575949013	0.571856976	0.566827416	0.563180208	0.559959888	0.557048619
T_Ti	Closure	P95	0.001488553	0.001488745	0.001487932	0.001486179	0.00147928	0.001486007	0.00148499	0.001488036	0.001489133	0.001489459	0.001490803	0.001490245
T_Tl	Closure	P95	0.001156202	0.001149533	0.001135743	0.001116781	0.001097089	0.001091187	0.001085902	0.001084846	0.001085347	0.001077971	0.001076853	0.001071608
T_U	Closure	P95	0.007658351	0.007619784	0.007534062	0.00737161	0.007282361	0.007304681	0.007294927	0.007251395	0.007226673	0.007179071	0.007175362	0.007136333
T_V	Closure	P95	0.033516578	0.032908399	0.032304961	0.031392511	0.030370982	0.03011799	0.029763168	0.029473828	0.029186318	0.02884051	0.028578114	0.028267866
T_Zn	Closure	P95	4.47561121	4.362308025	4.257627964	4.124508858	3.980502605	3.99446106	4.005798817	3.914233685	3.820266962	3.754810572	3.68400383	3.605946064
D_Ag	Closure	P95	0.000895852	0.00089871	0.000900638	0.000899647	0.000892325	0.000894103	0.000896608	0.000896767	0.000897435	0.000894652	0.000896188	0.000895838
D_Al	Closure	P95	0.15078564	0.146610528	0.142177612	0.136319533	0.129171848	0.124953888	0.12142618	0.118215472	0.115194537	0.11214491	0.109886065	0.107659645
D_As	Closure	P95	0.037402797	0.036761098	0.035913799	0.034635738	0.033977285	0.033991586	0.034081038	0.033464074	0.032814756	0.032323953	0.032055255	0.031690821
D_B	Closure	P95	0.301698238	0.296775877	0.291076124	0.28191632	0.272801608	0.269705892	0.266830444	0.263745099	0.26091525	0.257216901	0.255238146	0.253270864
D_Ba	Closure	P95	0.005270551	0.005222175	0.005147921	0.005024519	0.00491188	0.004935166	0.004916185	0.004881576	0.004846169	0.00479942	0.004778145	0.00475146
D_Bi	Closure	P95	1.97855E-05	1.97596E-05	1.97052E-05	1.96534E-05	1.96239E-05	1.96489E-05	1.96398E-05	1.966E-05	1.96755E-05	1.96408E-05	1.96744E-05	1.97018E-05
D_Be	Closure	P95	0.001976732	0.001937423	0.001890883	0.001820325	0.001775181	0.001768941	0.001766679	0.001735505	0.001701689	0.001675605	0.001658909	0.001640793
D_Ca	Closure	P95	292.9613953	293.2471008	293.249176	293.6589355	291.8363953	293.3799438	292.9698181	293.072113	293.9545593	292.616394	292.6187439	292.3702087
D_Cd	Closure	P95	0.052384172	0.051367067	0.050099362	0.048194785	0.047186337	0.047192659	0.047267161	0.046290845	0.045255702	0.044535365	0.043840315	0.04317667
D_Co	Closure	P95	0.090748832	0.090763763	0.090622842	0.09008044	0.089912124	0.090718254	0.09113659	0.091339685	0.090772338	0.090806141	0.090826504	0.090741508
D_Cr	Closure	P95	0.002134036	0.002080458	0.00203174	0.00196901	0.001905917	0.001924727	0.001929931	0.001892901	0.001853224	0.001821392	0.001789692	0.001753011
D_Cu	Closure	P95	0.034770057	0.034888096	0.034807328	0.034711868	0.034215204	0.03419885	0.034236282	0.034364898	0.034545336	0.034653354	0.03470901	0.034672096
D_Fe	Closure	P95	0.086523741	0.084278956	0.081859194	0.078645043	0.076011613	0.076587252	0.075634129	0.074123077	0.072540499	0.071361311	0.070174374	0.068887204
D_Hg	Closure	P95	0.00025346	0.000249007	0.000244435	0.000237302	0.000229537	0.000227303	0.000224544	0.000222176	0.000220072	0.000217191	0.000215222	0.000213655
D_K	Closure	P95	65.38780212	65.48104858	65.28921509	64.8327179	63.61658859	63.79207993	63.68669128	63.35325623	62.97960281	62.89160919	62.77568817	62.62202454
D_Li	Closure	P95	0.129822016	0.1276052	0.12522538	0.121988125	0.11816375	0.117109969	0.115890935	0.114799768	0.113557957	0.112130709	0.111153767	0.110067517
D_Mg	Closure	P95	11.54170704	11.4426012	11.28623676	11.1763792	10.86260891	10.89585781	10.82783031	10.73353767	10.67834377	10.58402157	10.55491924	10.51613331
D_Mn	Closure	P95	4.678126335	4.566377163	4.463056564	4.333772659	4.201822758	4.237322807	4.256320953	4.175922871	4.090044022	4.031236649	3.966912985	3.893377304
D_Mo	Closure	P95	0.061427977	0.06191415	0.062029067	0.062060695	0.061535887	0.061771169	0.061614685	0.061633922	0.061641492	0.061326135	0.061202779	0.061060645
D_Na	Closure	P95	358.4519653	358.3920898	358.1407166	353.338562	355.5939941	357.1650085	359.6060791	359.7098389	358.9474792	357.3508911	357.4994507	358.2130737
D_Ni	Closure	P95	0.054567017	0.053612355	0.052452035	0.050642014	0.049562998	0.049346142	0.049233276	0.048451189	0.047668133	0.047065049	0.046767879	0.046342991
D_P	Closure	P95	0.035917003	0.035802685	0.035593584	0.035138313	0.035065476	0.036224104	0.036875293	0.036890667	0.036619429	0.036488343	0.036410298	0.036096871
D_Pb	Closure	P95	0.017274443	0.01692003	0.016510911	0.015907099	0.015578895	0.015550306	0.015513131	0.015200886	0.01492393	0.014690465	0.014557312	0.0143895
D_S	Closure	P95	0.494569123	0.490199894	0.484748065	0.472557992	0.465383142	0.460950673	0.454679489	0.449643523	0.44690904	0.443644106	0.440831631	0.438067079
D_Sb	Closure	P95	0.197451159	0.194008842	0.190324306	0.184652627	0.178709656	0.176707357	0.17446734	0.17226325	0.170274377	0.167717472	0.166060165	0.164710969
D_Se	Closure	P95	0.00358315	0.003597931	0.003594303	0.003576183	0.00354666	0.003556744	0.003559195	0.003570469	0.003571449	0.003557317	0.003564726	0.003573946
D_Si	Closure	P95	4.175158501	4.175922394	4.175553322	4.17033577	4.144174576	4.160017014	4.160480499	4.165063381	4.16668129	4.169018269	4.171892166	4.170772552
D_Sn	Closure	P95	3.0012E-05	3.00271E-05	3.00265E-05	2.9995E-05	3.00325E-05	3.0044E-05	3.00479E-05	3.0068E-05	3.00953E-05	3.00917E-05	3.01355E-05	3.01582E-05
D_Sr	Closure	P95	0.604307413	0.600165665	0.59324199	0.587129474	0.576746404	0.577500522	0.575940251	0.571799874	0.566806078	0.563190401	0.559917152	0.557008088
D_Ti	Closure	P95	0.000980471	0.000980127	0.000979369	0.00097749	0.000974303	0.000978764	0.000977361	0.000978022	0.000978809	0.000979035	0.000979582	0.000979696
D_Tl	Closure	P95	0.001156202	0.001149533	0.001135743	0.001116781	0.001097089	0.001091187	0.001085902	0.001084846	0.001085347	0.001077971	0.001076853	0.001071608
D_U	Closure	P95	0.007657106	0.007618502	0.007532761	0.007370064	0.007281065	0.007303169	0.007293514	0.007249924	0.007225304	0.007177644	0.007173872	0.007134881
D_V	Closure	P95	0.033506475	0.032898996	0.032295641	0.031382371	0.030360125	0.030106209	0.029751308	0.029461734	0.029173516	0.028827216	0.028564285	0.028253704
D_Zn	Closure	P95	4.475581169	4.362278461	4.257597923	4.124473095	3.980472565	3.994423866	4.005761623	3.914195061	3.820226192	3.754767895	3.683958292	3.605897903

Appendix A.1.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Pit Lake

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.038783394	0.047354646	0.054775003	0.062984005	0.070793964	0.005	0.005	0.005	0.005	0.011798864	0.019043826	0.025821602
NO3_N	Post-Closure	P95	5.037117958	5.030268669	5.027438164	5.022419453	5.00911665	5.050627708	5.048871517	5.050139427	5.049592972	5.045239925	5.045193672	5.03840971
NO2_N	Post-Closure	P95	0.014382465	0.014361711	0.014337315	0.014284004	0.014259481	0.01425818	0.014251968	0.014244169	0.014237386	0.014212972	0.01420445	0.01419627
Br	Post-Closure	P95	0.076945089	0.076357685	0.076354042	0.076302804	0.076507032	0.076551691	0.076652959	0.076755166	0.076851398	0.076851502	0.076976344	0.076977074
Cl	Post-Closure	P95	45.60374832	45.60704803	45.5966568	45.47745895	45.31371307	45.34710693	45.36268997	45.38370132	45.37969971	45.33585739	45.331604	45.31756973
F	Post-Closure	P95	0.643537223	0.642153323	0.642114699	0.641574144	0.641022682	0.642706811	0.643138528	0.643369496	0.644005835	0.643450856	0.64406091	0.644146025
TDP	Post-Closure	P95	0.092664324	0.091615424	0.091618367	0.091587014	0.0917257	0.092031501	0.092450857	0.092548877	0.092538856	0.092628464	0.092714079	0.09268681
SO4	Post-Closure	P95	815.3296509	815.5699463	815.6421509	815.3766479	816.1428223	816.3188477	815.7144165	815.9841309	816.0144653	815.6571045	815.5776978	815.1014404
T_CN	Post-Closure	P95	0.015308428	0.015321855	0.015322423	0.0153206	0.015305801	0.015313	0.015310407	0.015307552	0.015312386	0.015308915	0.015306192	0.015308117
WAD_CN	Post-Closure	P95	0.000741342	0.000740748	0.000740859	0.000740443	0.000741223	0.000741405	0.000741344	0.00074171	0.00074077	0.000740713	0.000740883	0.000741056
T_Ag	Post-Closure	P95	0.000605196	0.000604737	0.000603997	0.000600902	0.000598667	0.00059795	0.000597982	0.000597786	0.000597108	0.000596428	0.000596196	0.000595913
T_Al	Post-Closure	P95	0.040194124	0.040158968	0.040121377	0.04007924	0.039948434	0.040114786	0.040140491	0.040136531	0.04010842	0.040065449	0.040032398	0.039999858
T_As	Post-Closure	P95	0.023602061	0.023556257	0.023556819	0.023566453	0.023516171	0.023556961	0.023596244	0.023600925	0.023598408	0.023597281	0.023600863	0.023609689
T_B	Post-Closure	P95	0.177556723	0.177457988	0.177473038	0.177501708	0.177348465	0.177400604	0.177507401	0.177496567	0.17749922	0.177422225	0.177478343	0.177519098
T_Ba	Post-Closure	P95	0.005206245	0.005187972	0.005187964	0.005185534	0.005185302	0.005193304	0.005202766	0.005205302	0.005198853	0.00520144	0.005205083	0.005205327
T_Bi	Post-Closure	P95	1.96365E-05	1.96378E-05	1.96281E-05	1.95925E-05	1.95773E-05	1.96287E-05	1.96313E-05	1.96179E-05	1.95866E-05	1.95747E-05	1.9566E-05	1.95592E-05
T_Be	Post-Closure	P95	0.001273709	0.001269471	0.001269389	0.001269184	0.001266237	0.001270175	0.001273417	0.001274198	0.001274349	0.00127414	0.001274279	0.0012737
T_Ca	Post-Closure	P95	197.7159576	197.7400208	197.7876434	197.7432098	197.8905487	197.8924561	197.6994781	197.8549652	197.8084412	197.796814	197.7792206	197.6470642
T_Cd	Post-Closure	P95	0.023943651	0.023941342	0.023940135	0.023922402	0.023897462	0.02394421	0.023952955	0.023950173	0.023958942	0.023952009	0.023952385	0.023947826
T_Co	Post-Closure	P95	0.051609639	0.05163224	0.051626287	0.051640525	0.051541544	0.051629841	0.051643908	0.051665198	0.051651038	0.051636979	0.051635556	0.051608112
T_Cr	Post-Closure	P95	0.001714327	0.001703105	0.001702922	0.001702827	0.001706031	0.001708123	0.001711561	0.001713125	0.00171337	0.001714092	0.00171531	0.00171432
T_Cu	Post-Closure	P95	0.020183086	0.020176759	0.020184023	0.020187955	0.020159321	0.020183133	0.02019033	0.020199865	0.020188922	0.020193983	0.020188576	0.020175057
T_Fe	Post-Closure	P95	0.055877231	0.055547897	0.055544909	0.055505682	0.055493116	0.055670086	0.055836368	0.055856325	0.055777062	0.055830445	0.055882331	0.055876702
T_Hg	Post-Closure	P95	0.000156705	0.000156663	0.000156668	0.000156629	0.000156629	0.000156655	0.000156691	0.000156667	0.000156686	0.000156648	0.000156678	0.00015661
T_K	Post-Closure	P95	41.46370316	41.4718895	41.47502518	41.46963501	41.40513229	41.46623611	41.48011398	41.47776794	41.46447372	41.45939636	41.46283722	41.46822357
T_Li	Post-Closure	P95	0.07759048	0.077560998	0.077562727	0.077552333	0.077520907	0.077561051	0.077587873	0.077579588	0.077586576	0.07754726	0.077579945	0.07753545
T_Mg	Post-Closure	P95	6.925086975	6.923061848	6.923022747	6.916433334	6.911746025	6.922827244	6.925024509	6.926299095	6.927106857	6.926685333	6.92647934	6.925607204
T_Mn	Post-Closure	P95	2.168412209	2.168037415	2.167895555	2.166512966	2.164442539	2.16765523	2.169755697	2.169911385	2.169024467	2.168802023	2.170086384	2.169420719
T_Mo	Post-Closure	P95	0.039146356	0.039145853	0.039154708	0.039165251	0.039093714	0.039140813	0.039153848	0.039153125	0.039141323	0.039133679	0.039136115	0.039131913
T_Na	Post-Closure	P95	157.7349548	157.6771088	157.576767	157.5562286	157.5098572	157.4188843	157.4267273	157.491272	157.4578094	157.4430084	157.4833374	157.4884491
T_Ni	Post-Closure	P95	0.030230151	0.03022733	0.030225862	0.030203536	0.030177606	0.030232353	0.030239087	0.030228589	0.030240072	0.030236347	0.030240215	0.030233026
T_P	Post-Closure	P95	0.091634266	0.090558037	0.09056057	0.090521865	0.090671651	0.090973318	0.091441803	0.091535881	0.091534659	0.091569774	0.09166608	0.09165933
T_Pb	Post-Closure	P95	0.010555534	0.010517483	0.010516653	0.010513778	0.010480944	0.010519045	0.010548973	0.010559903	0.01055517	0.010559614	0.010564619	0.010556778
T_S	Post-Closure	P95	0.433337927	0.431943804	0.432023942	0.431275129	0.431464911	0.431437701	0.432283342	0.432763457	0.43289876	0.432754695	0.433330953	0.433111787
T_Sb	Post-Closure	P95	0.113811895	0.113793544	0.113772109	0.113800786	0.113773979	0.113800444	0.113799863	0.113831207	0.113781907	0.113808841	0.113807894	0.113738917
T_Se	Post-Closure	P95	0.002683999	0.002682714	0.002679925	0.002668919	0.002659435	0.002656115	0.002655978	0.00265652	0.002655576	0.002654537	0.002654445	0.002654207
T_Si	Post-Closure	P95	4.526969433	4.518036842	4.518217564	4.515595913	4.518876553	4.524239063	4.526040554	4.528143883	4.524082661	4.524503708	4.52630949	4.526188374
T_Sn	Post-Closure	P95	3.01461E-05	3.0164E-05	3.01603E-05	3.01773E-05	3.01505E-05	3.01912E-05	3.02012E-05	3.01812E-05	3.01567E-05	3.01398E-05	3.01265E-05	3.01101E-05
T_Sr	Post-Closure	P95	0.343255013	0.342769682	0.342759252	0.342346102	0.342460692	0.343210071	0.343338072	0.343384743	0.343479365	0.343195915	0.343465298	0.343245149
T_Ti	Post-Closure	P95	0.001490622	0.001489914	0.001487995	0.001486213	0.00148458	0.001485224	0.001484901	0.00148553	0.001484783	0.001483927	0.001484225	0.001483099
T_Tl	Post-Closure	P95	0.000778895	0.000778603	0.000777978	0.000775106	0.000774451	0.00077544	0.000775539	0.000775526	0.000775754	0.000775437	0.000775143	0.000775121
T_U	Post-Closure	P95	0.004901587	0.00490133	0.00490265	0.004899298	0.004887592	0.004896287	0.004905001	0.004907211	0.004904932	0.004902768	0.004903543	0.004901879
T_V	Post-Closure	P95	0.020081453	0.020069921	0.020071061	0.020068968	0.020059038	0.020074055	0.020085722	0.020084055	0.020080101	0.02007604	0.020086568	0.02007388
T_Zn	Post-Closure	P95	1.879181266	1.879044652	1.878919125	1.876501679	1.876577258	1.879100084	1.880977511	1.880597591	1.880155444	1.880059123	1.879977703	1.880295277
D_Ag	Post-Closure	P95	0.000603524	0.000603067	0.000602329	0.000599244	0.000597087	0.000596551	0.00059663	0.000596449	0.0005955	0.000595051	0.00059482	0.000594539
D_Al	Post-Closure	P95	0.036921788	0.036889754	0.03685547	0.036817048	0.036697131	0.036815025	0.036827732	0.036827255	0.036800105	0.03676901	0.036739536	0.036709934
D_As	Post-Closure	P95	0.023580251	0.023533862	0.023534423	0.023544053	0.023494067	0.023534177	0.023574	0.023578489	0.023576088	0.023575168	0.023578115	0.023587869
D_B	Post-Closure	P95	0.17755644	0.177457705	0.177472755	0.17750141	0.177348182	0.177400336	0.177507117	0.177496254	0.177498937	0.177421927	0.177478075	0.177518785
D_Ba	Post-Closure	P95	0.005164329	0.00514609	0.005146087	0.005143791	0.005144191	0.005152063	0.005160764	0.005162936	0.005156914	0.005159162	0.005163162	0.005163411
D_Bi	Post-Closure	P95	1.96362E-05	1.96376E-05	1.96278E-05	1.95922E-05	1.95771E-05	1.96284E-05	1.9631E-05	1.96176E-05	1.95864E-05	1.95745E-05	1.95658E-05	1.95589E-05
D_Be	Post-Closure	P95	0.001273709	0.001269471	0.001269389	0.001269184	0.001266237	0.001270175	0.001273417	0.001274198	0.001274349	0.00127414	0.001274279	0.0012737
D_Ca	Post-Closure	P95	197.7069397	197.7310028	197.7786102	197.7341766	197.8815308	197.8834381	197.6904602	197.8459473	197.7994232	197.7878113	197.7702026	197.6380615
D_Cd	Post-Closure	P95	0.02394327	0.02394096	0.023939753	0.023922021	0.02389708	0.023943828	0.023952572	0.023949811	0.023958582	0.023951648	0.023952004	0.023947442
D_Co	Post-Closure	P95	0.051608987	0.051631566	0.051625628	0.051639874	0.051540889	0.051629189	0.051643256	0.051664546	0.051650383	0.051636327	0.051634908	0.051607445
D_Cr	Post-Closure	P95	0.001707788	0.001696587	0.001696406	0.001696311	0.001698928	0.001701017	0.001705423	0.001707032	0.00170709	0.001707859	0.001708427	0.001707781
D_Cu	Post-Closure	P95	0.02017995	0.020173624	0.020180898	0.020184824	0.020156205	0.020179994	0.020187194	0.020196719	0.02018578	0.020190842	0.020185435	0.020171918
D_Fe	Post-Closure	P95	0.051574592	0.051271494	0.051250137	0.051219963	0.051260371	0.051405501	0.051525239	0.05154445	0.051477604	0.051527247	0.051579375	0.051574089
D_Hg	Post-Closure	P95	0.00015673	0.000156688	0.000156692	0.000156653	0.000156655	0.00015668	0.000156715	0.000156691	0.000156711	0.000156675	0.000156703	0.000156634
D_K	Post-Closure	P95	41.45962143	41.46776962	41.47090149	41.46551514	41.40077972	41.46206284	41.476017	41.47354889	41.46038055	41.4548378	41.45874786	41.46409607
D_Li	Post-Closure	P95	0.07759048	0.077560998	0.077562727	0.077552333	0.077520907	0.077561051	0.077587873	0.077579588	0.077586576	0.07754726	0.077579945	0.07753545
D_Mg	Post-Closure	P95	6.923764229	6.921739101	6.921700954	6.91511488	6.910423756	6.921496391	6.92371273	6.924987793	6.925783634	6.925374031	6.925172329	6.924284458
D_Mn	Post-Closure	P95	2.167527914	2.167150736	2.167009115	2.16563201	2.163557291	2.166772842	2.168908596	2.16908288	2.168137074	2.167913675	2.169257879	2.168539047
D_Mo	Post-Closure	P95	0.039139766	0.039139237	0.039148092	0.039158683	0.039087094	0.039134204	0.039147243	0.03914655	0.039134718	0.039127082	0.039129518	0.039125282
D_Na	Post-Closure	P95	157.6996002	157.6417236	157.5413055	157.5207825	157.4743958	157.3834381	157.3912811	157.4557953	157.422348	157.4075317	157.447876	157.4529724
D_Ni	Post-Closure	P95	0.030229375	0.030226555	0.030225085	0.030202761	0.03017683	0.030231575	0.030238155	0.030227814	0.030239295	0.03023557	0.03023928	0.030232251
D_P	Post-Closure	P95	0.09457048	0.093532242	0.093493611	0.093437761	0.093507253	0.09393689	0.094167598	0.09419091	0.094494149	0.094487183	0.09455616	0.094558813
D_Pb	Post-Closure	P95	0.010552476	0.010514429	0.010513771	0.010510897	0.010478203	0.010516149	0.010545915	0.010556842	0.01055211	0.010556554	0.010561725	0.01055386
D_S	Post-Closure	P95	0.408990204	0.407601118	0.407727957	0.407271832	0.40729025	0.407066107	0.407814741	0.408082277	0.408417016	0.408606708	0.409005105	0.408975184
D_Sb	Post-Closure	P95	0.113811851	0.1137935	0.113772072	0.113800742	0.113773935	0.113800399	0.113799818	0.113831162	0.113781862	0.113808796	0.11380785	0.113738872
D_Se	Post-Closure	P95	0.002681619	0.002680329	0.002677538	0.002666052	0.00265665	0.002653328	0.002653109	0.002653696	0.002652752	0.002651714	0.002651602	0.002651116
D_Si	Post-Closure	P95	4.463486195	4.454164982	4.454473972	4.451867104	4.455320358	4.460650444	4.462194443	4.464312553	4.460554123	4.460827351	4.462836266	4.462706089
D_Sn	Post-Closure	P95	3.01461E-05	3.0164E-05	3.01603E-05	3.01773E-05	3.01505E-05	3.01912E-05	3.02012E-05	3.01812E-05	3.01567E-05	3.01398E-05	3.01265E-05	3.01101E-05
D_Sr	Post-Closure	P95	0.343221933	0.342736602	0.342726171	0.342313051	0.34242776	0.343176991	0.343304962	0.343351692	0.343446285	0.343162864	0.343432218	0.343212098
D_Ti	Post-Closure	P95	0.000977524	0.000977521	0.000977099	0.000976449	0.000975523	0.000978057	0.000977568	0.000978352	0.000977549	0.00097636	0.000975614	0.00097492
D_Tl	Post-Closure	P95	0.000778895	0.000778603	0.000777979	0.000775106	0.000774451	0.00077544	0.000775539	0.000775526	0.000775754	0.000775437	0.000775143	0.000775121
D_U	Post-Closure	P95	0.004897559	0.004897302	0.00489862	0.004895324	0.004883585	0.004892256	0.004900988	0.004903227	0.00490097	0.00489876	0.004899535	0.004897872
D_V	Post-Closure	P95	0.020052368	0.020044167	0.020045333	0.020043146	0.020032508	0.020047523	0.020059876	0.020054026	0.020054383	0.020048836	0.020060143	0.020046545
D_Zn	Post-Closure	P95	1.878950834	1.87881434	1.878688693	1.876275182	1.876351118	1.878865004	1.880746722	1.880366445	1.879924417	1.879828691	1.879747272	1.880064726

Appendix A.1.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, ECD

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	14.29249954	14.783535	14.9117794	12.19862843	10.82300282	12.00446701	12.23499775	12.64824677	12.78350735	12.2437191	12.62340641	13.32265091
NO3_N	Closure	P95	0.822686076	0.759239256	0.695433557	1.122943163	1.369169116	0.802971125	0.994850039	0.941001415	0.869444251	0.852052569	0.821665287	0.795134842
NO2_N	Closure	P95	0.008245951	0.007647692	0.00691475	0.011902451	0.014499698	0.008504701	0.010377854	0.009716181	0.009009345	0.008875323	0.008588553	0.008265938
Br	Closure	P95	0.004392549	0.003833202	0.006053776	0.021634132	0.024872947	0.014926562	0.013231666	0.009338623	0.007268666	0.014072984	0.007742108	0.005073873
Cl	Closure	P95	134.3536835	137.2370148	136.8376923	129.9789276	100.7447891	114.4959564	115.9264908	119.4038239	121.5664291	122.9754715	124.9733734	128.7444611
F	Closure	P95	0.52483964	0.513125777	0.501241982	0.517964005	0.541372478	0.502107322	0.528866947	0.559620976	0.543173313	0.551970065	0.54179728	0.537207603
TDP	Closure	P95	0.009872075	0.008346369	0.00718058	0.008597105	0.010187242	0.010599497	0.006945672	0.010707064	0.009951821	0.010635296	0.01076029	0.011109783
SO4	Closure	P95	2171.690918	2200.320313	2198.016846	2075.735107	1765.070313	1910.23877	1946.702515	1991.638306	2027.412842	2051.47876	2083.93335	2119.091064
T_CN	Closure	P95	0.057918958	0.059373975	0.060179953	0.048625845	0.042330928	0.049211353	0.049951352	0.049712535	0.050990429	0.051375449	0.053823791	0.055436216
WAD_CN	Closure	P95	0.000952351	0.000926573	0.000910864	0.002094414	0.00247915	0.001457683	0.001230243	0.00106585	0.0010289	0.001342143	0.001119722	0.000975917
T_Ag	Closure	P95	0.000671487	0.000663872	0.000656758	0.00063102	0.000624632	0.000654288	0.000665005	0.000679501	0.000677565	0.000693204	0.000688101	0.000678407
T_Al	Closure	P95	0.003488131	0.003338379	0.00336722	0.022633953	0.165597975	0.061486512	0.019061051	0.014465326	0.004611956	0.020799261	0.01570319	0.004186899
T_As	Closure	P95	0.022809014	0.022798257	0.022784619	0.022405619	0.021493742	0.022481432	0.0225167	0.022636387	0.022664834	0.022681314	0.02280321	0.022798913
T_B	Closure	P95	0.338207364	0.322146118	0.305063218	0.394059241	0.462460577	0.328914225	0.387904227	0.389094234	0.369991511	0.371858746	0.357388824	0.355652869
T_Ba	Closure	P95	0.00365832	0.003573585	0.003567508	0.005478271	0.004952067	0.003866615	0.003965112	0.004085036	0.003713139	0.004039831	0.003868613	0.003688663
T_Bi	Closure	P95	2.32218E-05	3.8332E-06	3.49727E-06	3.86334E-05	4.41724E-05	1.25462E-05	1.01447E-05	4.76653E-05	5.43986E-06	2.8303E-05	2.79603E-05	2.65118E-05
T_Be	Closure	P95	0.001450489	0.001447588	0.001444503	0.001416718	0.001367421	0.001428649	0.001430949	0.001439394	0.001443353	0.001441945	0.001448889	0.001451034
T_Ca	Closure	P95	512.0084839	516.2984009	515.8062744	494.9364929	427.6599426	459.8278198	469.8284302	480.258667	484.6285706	489.159668	498.1382446	506.3042603
T_Cd	Closure	P95	0.029248232	0.029396381	0.029501339	0.028776318	0.026229138	0.027806753	0.028093668	0.02839469	0.028460583	0.02856412	0.028848924	0.029076647
T_Co	Closure	P95	0.096369162	0.096794277	0.097102009	0.094808757	0.087006778	0.092099905	0.09290795	0.093812369	0.094033256	0.094329037	0.095238134	0.095876083
T_Cr	Closure	P95	0.000448303	0.000426322	0.000412804	0.000426227	0.000446143	0.000458014	0.000468817	0.000465105	0.000474464	0.000477604	0.000483414	0.000472552
T_Cu	Closure	P95	0.032905288	0.032889452	0.032890216	0.03237569	0.03088947	0.032319456	0.03242489	0.032574236	0.032646522	0.032647621	0.032854456	0.032882359
T_Fe	Closure	P95	0.016392089	0.016643768	0.016769139	0.057370048	0.133537501	0.050750397	0.033267077	0.02970087	0.017479511	0.036856789	0.025690744	0.016093954
T_Hg	Closure	P95	0.000293633	0.000277378	0.000260713	0.000350353	0.000417039	0.000288621	0.000344287	0.000343082	0.000326125	0.000326247	0.000312163	0.000310782
T_K	Closure	P95	76.07927704	74.0533371	72.05756378	75.35668945	81.40644836	72.9569397	77.15895844	81.70773315	79.14070129	80.70751953	78.8177948	77.99912262
T_Li	Closure	P95	0.147801176	0.139687613	0.131220922	0.179469466	0.213899195	0.145057753	0.174123332	0.172957376	0.163840801	0.163877383	0.156754941	0.156374827
T_Mg	Closure	P95	10.48808956	10.21800327	9.942419052	10.74745178	10.88696575	10.0756588	10.70711231	11.23974419	10.91795921	11.01568127	10.79569054	10.74800205
T_Mn	Closure	P95	0.892614365	0.893898904	0.893998802	0.877906561	0.829226434	0.870257258	0.873682857	0.879050136	0.881725013	0.881982505	0.889055908	0.891015887
T_Mo	Closure	P95	0.075675763	0.075157322	0.074667521	0.072136432	0.070659213	0.073981188	0.074628122	0.075342223	0.075608477	0.076783702	0.076446883	0.075974301
T_Na	Closure	P95	466.5713501	476.4458008	479.2433167	444.3147888	347.5799255	395.8788757	400.97229	412.3042297	423.0709229	429.2070313	436.137085	449.2243958
T_Ni	Closure	P95	0.048426881	0.0483726	0.048328757	0.047485933	0.045573834	0.047714639	0.047768924	0.048022985	0.048098475	0.048121393	0.048385732	0.048424587
T_P	Closure	P95	0.00784563	0.004577783	0.006064373	0.012915509	0.019011227	0.012829239	0.008260187	0.00632256	0.010805497	0.010456644	0.008806094	0.00884031
T_Pb	Closure	P95	0.014960802	0.015057351	0.015122482	0.014721206	0.013232194	0.014069567	0.014260694	0.014441936	0.014474852	0.014542574	0.014697689	0.014849907
T_S	Closure	P95	0.224920884	0.176159486	0.140516132	0.502643526	0.309945166	0.229202643	0.277815104	0.294551879	0.243860289	0.366393775	0.238350034	0.256698489
T_Sb	Closure	P95	0.229782179	0.217339411	0.20432134	0.277831882	0.330672771	0.225265607	0.269987881	0.268559337	0.25441283	0.254650116	0.24368152	0.242980778
T_Se	Closure	P95	0.003984126	0.003828813	0.003666297	0.004339733	0.004949508	0.003827569	0.004330499	0.004460646	0.004261491	0.004314635	0.004175335	0.004141399
T_Si	Closure	P95	1.815853715	1.596823215	1.488274097	4.080179691	3.853870869	2.832758188	2.796894073	2.636273384	2.205950022	2.988411427	2.586053371	2.06779623
T_Sn	Closure	P95	8.7851E-06	7.6664E-06	6.99917E-06	3.94053E-05	4.74867E-05	2.52114E-05	2.04436E-05	1.60662E-05	1.09454E-05	2.3812E-05	1.51098E-05	1.01477E-05
T_Sr	Closure	P95	0.459700197	0.415721893	0.372392863	0.69746691	0.857976258	0.499733269	0.620081544	0.586527944	0.546298206	0.541638613	0.525305271	0.50670743
T_Ti	Closure	P95	0.000445143	2.4518E-05	2.25296E-05	0.001630805	0.003370201	0.001470264	0.000650953	0.001375489	6.90866E-05	0.001629992	0.001114003	0.00050445
T_Tl	Closure	P95	0.001264172	0.001217776	0.001167358	0.00136272	0.00154732	0.001214531	0.001359806	0.001408047	0.001347264	0.001366939	0.001324055	0.001311734
T_U	Closure	P95	0.007578167	0.007493439	0.007412175	0.007124919	0.007045381	0.007384629	0.00750608	0.007702599	0.007676146	0.007847337	0.007784845	0.007655763
T_V	Closure	P95	0.037055694	0.035159916	0.033198666	0.043718472	0.051650763	0.036195837	0.042913832	0.042902283	0.040778268	0.040830746	0.039181732	0.039054669
T_Zn	Closure	P95	0.989291787	0.993592203	0.996693015	0.97326386	0.893987417	0.946053922	0.954207182	0.96336174	0.965655208	0.968622506	0.977917254	0.984318674
D_Ag	Closure	P95	0.000671487	0.000663872	0.000656758	0.00063102	0.000623714	0.000654288	0.000665005	0.000679501	0.000677565	0.000693204	0.000688101	0.000678407
D_Al	Closure	P95	0.003383524	0.003336143	0.00336722	0.015652066	0.117528245	0.052753221	0.014260899	0.011245429	0.004056516	0.015544787	0.013520367	0.003744608
D_As	Closure	P95	0.022809014	0.022798242	0.022784712	0.022405555	0.021485511	0.022480439	0.022516545	0.022635669	0.022664675	0.022681011	0.02280299	0.022798562
D_B	Closure	P95	0.338207364	0.322146118	0.305063218	0.394059241	0.462460577	0.328914225	0.387904227	0.389094234	0.369991511	0.371858746	0.357388824	0.355652869
D_Ba	Closure	P95	0.003655868	0.003568702	0.003564975	0.005287993	0.004566405	0.00370558	0.003900039	0.00407277	0.003717106	0.00395846	0.003816617	0.003687728
D_Bi	Closure	P95	2.32218E-05	3.8332E-06	3.49727E-06	3.86334E-05	4.41724E-05	1.25462E-05	1.01447E-05	4.76653E-05	5.43986E-06	2.8303E-05	2.79603E-05	2.65118E-05
D_Be	Closure	P95	0.001450489	0.001447588	0.001444503	0.001416718	0.001367421	0.001428649	0.001430949	0.001439394	0.001443353	0.001441945	0.001448889	0.001451034
D_Ca	Closure	P95	512.0142212	516.3046265	515.8117676	494.9421997	427.6644592	459.8315735	469.83255	480.2640381	484.6340027	489.1650085	498.1437988	506.3100586
D_Cd	Closure	P95	0.029248232	0.029396381	0.029501339	0.028776318	0.026229002	0.027806753	0.028093679	0.028394688	0.028460581	0.02856412	0.028848924	0.029076647
D_Co	Closure	P95	0.096369162	0.096794277	0.097102009	0.094808757	0.087006778	0.09209989	0.09290795	0.093812369	0.094033256	0.094329037	0.095238134	0.095876083
D_Cr	Closure	P95	0.00044725	0.000425887	0.000412478	0.000423295	0.000440077	0.00045499	0.000465592	0.000464539	0.000471754	0.000473776	0.000478465	0.000472032
D_Cu	Closure	P95	0.032905288	0.032889452	0.032890216	0.03237566	0.030887721	0.032319762	0.03242489	0.032574236	0.032646444	0.032647621	0.032854456	0.032882359
D_Fe	Closure	P95	0.016392089	0.016643768	0.016769139	0.040644608	0.081098124	0.038658865	0.028653478	0.026596334	0.016191665	0.030961877	0.022468664	0.016093707
D_Hg	Closure	P95	0.000293633	0.000277378	0.000260713	0.000350353	0.00041735	0.000288485	0.000344287	0.000343082	0.000326125	0.000326247	0.000312163	0.000310782
D_K	Closure	P95	76.07930756	74.05327606	72.05760193	75.3361969	81.41542816	72.9569397	77.15875244	81.70735931	79.140625	80.70722198	78.81783295	77.9990387
D_Li	Closure	P95	0.147801176	0.139687613	0.131220922	0.179469466	0.213899195	0.145057753	0.174123332	0.172957376	0.163840801	0.163877383	0.156754941	0.156374827
D_Mg	Closure	P95	10.48801136	10.21794701	9.941967964	10.73925877	10.88058662	10.07149696	10.70577908	11.23957062	10.91773891	11.01555157	10.79589748	10.74889469
D_Mn	Closure	P95	0.892614365	0.893898904	0.893998802	0.877905428	0.828838646	0.870248258	0.873678803	0.879044414	0.881723106	0.881982386	0.889055908	0.891015887
D_Mo	Closure	P95	0.075674765	0.075156644	0.07466726	0.072135985	0.070658483	0.07398092	0.074628666	0.075342149	0.075608484	0.076783702	0.076446883	0.075974278
D_Na	Closure	P95	466.5439148	476.4177551	479.2159729	444.2903137	347.555603	395.8554688	400.9500427	412.2812195	423.0474854	429.1821899	436.1117859	449.1981812
D_Ni	Closure	P95	0.048426881	0.0483726	0.048328742	0.047485914	0.045573834	0.047714639	0.047768924	0.048022985	0.048098475	0.048121393	0.048385732	0.048424587
D_P	Closure	P95	0.007986978	0.004674159	0.006212169	0.015965953	0.023931025	0.014431491	0.010771143	0.017762922	0.011350211	0.040897097	0.027996268	0.009060957
D_Pb	Closure	P95	0.014960802	0.015057351	0.015122482	0.014721206	0.013230412	0.014069567	0.014260694	0.014441936	0.014474852	0.014542574	0.014697689	0.014849907
D_S	Closure	P95	0.224920884	0.17597723	0.140927166	0.449395567	0.297899693	0.225960329	0.276046872	0.265149862	0.243537754	0.244533092	0.238350034	0.252732038
D_Sb	Closure	P95	0.229782179	0.217339411	0.20432134	0.277831882	0.330672771	0.225265607	0.269987881	0.268559337	0.25441283	0.254650116	0.24368152	0.242980778
D_Se	Closure	P95	0.003983947	0.003828627	0.003666253	0.004342214	0.004953096	0.003827295	0.004330974	0.00446048	0.004261349	0.004314386	0.00417521	0.004141288
D_Si	Closure	P95	1.813089848	1.594526172	1.488208175	3.891662836	3.680518389	2.795791388	2.790516138	2.615454435	2.206552505	2.948919773	2.566197395	2.058751106
D_Sn	Closure	P95	8.7851E-06	7.6664E-06	6.99917E-06	3.94053E-05	4.74867E-05	2.52114E-05	2.04436E-05	1.60662E-05	1.09454E-05	2.3812E-05	1.51098E-05	1.01477E-05
D_Sr	Closure	P95	0.459695995	0.415694147	0.372371435	0.697941899	0.857611299	0.499522895	0.619745851	0.586545944	0.54632318	0.541519403	0.525665939	0.506732643
D_Ti	Closure	P95	0.000434562	2.40928E-05	2.20158E-05	0.000954138	0.001960259	0.000738717	0.00036638	0.001317554	5.53796E-05	0.001541606	0.001114003	0.000501971
D_Tl	Closure	P95	0.001264172	0.001217776	0.001167358	0.00136272	0.00154732	0.001214531	0.001359806	0.001408047	0.001347264	0.001366939	0.001324055	0.001311734
D_U	Closure	P95	0.007578037	0.007493295	0.007412059	0.007124624	0.007044387	0.007384442	0.007505888	0.007701906	0.007676128	0.007847314	0.007784832	0.007655681
D_V	Closure	P95	0.037055694	0.035159916	0.033198617	0.043697204	0.051521596	0.036192171	0.042906761	0.042901564	0.040778268	0.040830746	0.039181557	0.039054669
D_Zn	Closure	P95	0.989291787	0.993592203	0.996692777	0.973263741	0.893955886	0.946053326	0.954205573	0.963359773	0.96565485	0.968622386	0.977917254	0.984318554

Appendix A.1.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, ECD

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	8.403521538	8.438829422	8.428678513	7.923032284	5.806214809	6.550963402	7.353082657	7.584581852	7.856919289	7.81893158	7.873677731	7.964744091
NO3_N	Post-Closure	P95	0.549357831	0.464532673	0.42683664	0.396878898	0.427010268	0.484321713	0.561129391	0.54137373	0.535914004	0.531296015	0.551962435	0.550638616
NO2_N	Post-Closure	P95	0.005777767	0.004878523	0.004480308	0.004196736	0.00449593	0.005248944	0.00588542	0.005661014	0.005600025	0.005568292	0.005858429	0.0057849
Br	Post-Closure	P95	0.001388169	0.001114826	0.004293106	0.021500353	0.024869785	0.013627227	0.011667564	0.006661252	0.005044306	0.012855133	0.005074503	0.001407957
Cl	Post-Closure	P95	71.12809753	71.45261383	71.70323944	67.70887756	61.74424744	66.86113739	66.85022736	67.78536224	66.88334656	66.97743225	67.39682007	67.85375214
F	Post-Closure	P95	0.517114997	0.500074029	0.492069185	0.471113592	0.471271694	0.493527502	0.507862747	0.510446787	0.510463834	0.50293684	0.500766575	0.51719588
TDP	Post-Closure	P95	0.003143968	0.002757886	0.002550198	0.005320876	0.006652565	0.004631865	0.003021961	0.003939589	0.002986986	0.004088586	0.003372188	0.003100019
SO4	Post-Closure	P95	1472.688477	1472.851929	1469.180542	1410.312134	1323.393799	1417.243774	1417.772095	1420.807129	1408.266724	1407.666992	1412.861572	1412.270508
T_CN	Post-Closure	P95	0.036300804	0.036477551	0.036382232	0.03322611	0.01812779	0.029785777	0.031694185	0.033020847	0.034118846	0.034107681	0.034419101	0.03476638
WAD_CN	Post-Closure	P95	0.000813704	0.000810378	0.000821436	0.002131349	0.002463777	0.001379868	0.001082234	0.000891148	0.000815705	0.001278895	0.000928239	0.000817198
T_Ag	Post-Closure	P95	0.000678245	0.000663676	0.000656577	0.000631492	0.000625028	0.000654155	0.000664903	0.000669223	0.000670128	0.000664496	0.000664173	0.000678319
T_Al	Post-Closure	P95	0.003695403	0.003340948	0.003274602	0.022636138	0.165590659	0.061482068	0.019065013	0.014469932	0.004619777	0.020801924	0.015707998	0.004195299
T_As	Post-Closure	P95	0.022805817	0.022795182	0.022782123	0.022403587	0.021513836	0.022480521	0.02251506	0.022636035	0.022663498	0.022680044	0.022802327	0.022797983
T_B	Post-Closure	P95	0.316565841	0.294218957	0.284082741	0.266357362	0.275335729	0.293664545	0.314068973	0.311423153	0.310465187	0.301629424	0.305846453	0.316670299
T_Ba	Post-Closure	P95	0.003051736	0.002988671	0.002990811	0.005478225	0.00495192	0.003644389	0.003639039	0.003623828	0.003158419	0.003916803	0.003416258	0.003038069
T_Bi	Post-Closure	P95	5.63228E-06	1.03702E-06	1.02195E-06	2.23512E-05	2.55564E-05	1.09429E-05	8.15842E-06	1.26016E-05	2.21205E-06	1.32165E-05	8.48645E-06	5.63692E-06
T_Be	Post-Closure	P95	0.001450907	0.001447384	0.001444239	0.001416498	0.00136861	0.001430427	0.001430795	0.001439309	0.001443199	0.00144178	0.001448757	0.001450907
T_Ca	Post-Closure	P95	390.618103	389.9141846	389.1952209	377.0939026	352.2845459	374.4078369	375.7341614	376.79245	375.3202515	374.4588013	374.5260925	375.3131714
T_Cd	Post-Closure	P95	0.029250568	0.029398613	0.029505918	0.02878149	0.026261095	0.027812123	0.028098075	0.028396899	0.028462686	0.0285659	0.028851273	0.029079616
T_Co	Post-Closure	P95	0.096372485	0.096799515	0.097113132	0.094822466	0.087109178	0.092109703	0.092916518	0.093807623	0.094033875	0.094328851	0.095232986	0.095882453
T_Cr	Post-Closure	P95	0.000300898	0.000297142	0.000296454	0.000295826	0.000299699	0.000298934	0.000298829	0.000299278	0.000301672	0.000302073	0.00030501	0.000301363
T_Cu	Post-Closure	P95	0.032900076	0.032884922	0.032886848	0.032373637	0.030919261	0.032317359	0.032422289	0.032568961	0.032644741	0.032642398	0.032850303	0.03288177
T_Fe	Post-Closure	P95	0.014420495	0.014242398	0.014276135	0.057371143	0.133532941	0.050749987	0.033270322	0.029705584	0.017488178	0.036860287	0.025696399	0.014916806
T_Hg	Post-Closure	P95	0.000273539	0.000251843	0.000242054	0.000226631	0.00023553	0.000251778	0.00027214	0.000268912	0.000267902	0.000260512	0.00026505	0.000273645
T_K	Post-Closure	P95	75.60749817	72.74155426	71.40544128	67.95187378	68.26963806	71.71180725	74.18387604	74.50440216	74.49766541	73.2675705	72.878479	75.61615753
T_Li	Post-Closure	P95	0.135668516	0.124647342	0.119674318	0.11197792	0.11640963	0.124690592	0.134974554	0.133366093	0.132846951	0.129151613	0.131476521	0.135722294
T_Mg	Post-Closure	P95	10.18498611	9.819161415	9.655673981	9.246751785	9.253921509	9.677084923	9.999650002	10.03892517	10.04409885	9.876346588	9.826901436	10.17784786
T_Mn	Post-Closure	P95	0.892867386	0.894162953	0.894270837	0.878227532	0.830371439	0.870600939	0.874015033	0.879373729	0.882037699	0.882294059	0.889387906	0.891340673
T_Mo	Post-Closure	P95	0.075955942	0.075137749	0.074641593	0.072202317	0.070714429	0.073959865	0.074618056	0.075137854	0.075308442	0.074969143	0.075141072	0.075953998
T_Na	Post-Closure	P95	246.9763031	248.1724091	248.2162781	233.3899078	215.8662109	235.4248047	235.1108093	237.1420898	233.6223145	234.1271057	235.5101318	236.4865112
T_Ni	Post-Closure	P95	0.048421096	0.048366457	0.04832229	0.047480009	0.045616247	0.047709677	0.047763817	0.048020557	0.048092354	0.048113003	0.048379473	0.048421096
T_P	Post-Closure	P95	0.002710421	0.001911666	0.002358184	0.012214266	0.018739276	0.007566178	0.006034159	0.003134717	0.003311374	0.007075468	0.00330279	0.002718924
T_Pb	Post-Closure	P95	0.014963012	0.015059359	0.015125899	0.014724723	0.01324924	0.014073227	0.014263538	0.014443489	0.014476303	0.014543753	0.014699218	0.014852015
T_S	Post-Closure	P95	0.0615252	0.045956306	0.039754719	0.463530928	0.258804113	0.132524505	0.116431311	0.128708988	0.067723453	0.264526337	0.077597417	0.059681054
T_Sb	Post-Closure	P95	0.211374596	0.19441478	0.186758161	0.174754634	0.181567475	0.194437623	0.210216671	0.207810163	0.207007185	0.201208383	0.204817742	0.211455405
T_Se	Post-Closure	P95	0.003825046	0.003610341	0.003513262	0.003304601	0.003383599	0.003593147	0.003774551	0.003766425	0.003758657	0.003661145	0.003665096	0.003825322
T_Si	Post-Closure	P95	0.935845852	0.761556447	0.73781693	3.946968794	3.733876228	2.250733614	1.948244572	1.707689166	0.979506731	2.504092693	1.676079512	0.937836289
T_Sn	Post-Closure	P95	2.77634E-06	2.07189E-06	2.06654E-06	3.89045E-05	4.74025E-05	2.20182E-05	1.64902E-05	1.02367E-05	4.5268E-06	2.06945E-05	9.66752E-06	2.7849E-06
T_Sr	Post-Closure	P95	0.353505969	0.298402399	0.273935229	0.2574099	0.274598897	0.313388497	0.359880328	0.346279889	0.342722386	0.342031717	0.359904587	0.353611708
T_Ti	Post-Closure	P95	0.000127405	8.38214E-06	8.23242E-06	0.001439574	0.003316454	0.001470237	0.000651106	0.000752675	5.65077E-05	0.001497155	0.000886385	0.000117272
T_Tl	Post-Closure	P95	0.001219734	0.001154228	0.001124252	0.001058906	0.001081521	0.001148083	0.001202451	0.001201008	0.001199105	0.001169474	0.001166626	0.001220038
T_U	Post-Closure	P95	0.007654522	0.00749078	0.00740974	0.007130157	0.007049926	0.007382698	0.007504665	0.007553004	0.007563611	0.007498983	0.007495569	0.007654339
T_V	Post-Closure	P95	0.034237094	0.031670824	0.030516107	0.028585985	0.029631581	0.031649809	0.034008678	0.033670533	0.033557959	0.032606963	0.033140793	0.034249481
T_Zn	Post-Closure	P95	0.989588678	0.993894041	0.997038424	0.973644435	0.895274699	0.946465254	0.954596758	0.963692367	0.965987802	0.968948483	0.978260636	0.98464638
D_Ag	Post-Closure	P95	0.000678245	0.000663676	0.000656577	0.000631492	0.000624129	0.000654155	0.000664903	0.000669222	0.000670128	0.000664495	0.000664172	0.000678319
D_Al	Post-Closure	P95	0.003517519	0.003267668	0.003239861	0.015654335	0.117523566	0.052749798	0.014265129	0.0112501	0.004063596	0.015547743	0.013524906	0.003752301
D_As	Post-Closure	P95	0.022805817	0.022795169	0.02278221	0.022403518	0.021505767	0.022479532	0.022514902	0.02263532	0.022663334	0.022679735	0.022802033	0.022797629
D_B	Post-Closure	P95	0.316565841	0.294218957	0.284082741	0.266357362	0.275335729	0.293664545	0.314068973	0.311423153	0.310465187	0.301629424	0.305846453	0.316670299
D_Ba	Post-Closure	P95	0.003046218	0.00298249	0.002987785	0.005287942	0.00456628	0.003444611	0.00354313	0.003609406	0.003160525	0.003790569	0.003352068	0.003036636
D_Bi	Post-Closure	P95	5.63228E-06	1.03702E-06	1.02195E-06	2.23512E-05	2.55564E-05	1.09429E-05	8.15842E-06	1.26016E-05	2.21205E-06	1.32165E-05	8.48645E-06	5.63692E-06
D_Be	Post-Closure	P95	0.001450907	0.001447384	0.001444239	0.001416498	0.00136861	0.001430427	0.001430795	0.001439309	0.001443199	0.00144178	0.001448757	0.001450907
D_Ca	Post-Closure	P95	390.6112366	389.9071045	389.1879272	377.0884705	352.2757263	374.3983765	375.7240601	376.783905	375.3144836	374.4518127	374.5184021	375.3071899
D_Cd	Post-Closure	P95	0.029250568	0.029398613	0.029505918	0.02878149	0.026260963	0.027812123	0.028098086	0.028396899	0.028462684	0.0285659	0.028851271	0.029079616
D_Co	Post-Closure	P95	0.096372485	0.096799515	0.097113132	0.094822466	0.087109178	0.092109673	0.092916518	0.093807623	0.094033875	0.094328851	0.095232986	0.095882453
D_Cr	Post-Closure	P95	0.00029948	0.000296611	0.000295902	0.000294911	0.000294896	0.00029703	0.000296147	0.000298653	0.000299613	0.000300401	0.000301605	0.000300929
D_Cu	Post-Closure	P95	0.032900076	0.032884922	0.032886848	0.032373618	0.030917542	0.032317657	0.032422289	0.032568961	0.032644659	0.032642398	0.032850303	0.03288177
D_Fe	Post-Closure	P95	0.014230011	0.014216899	0.014275003	0.040646393	0.081096418	0.038659826	0.028656891	0.026600981	0.016164802	0.030965518	0.022474311	0.014314209
D_Hg	Post-Closure	P95	0.000273539	0.000251843	0.000242054	0.000226631	0.000235564	0.000251761	0.00027214	0.000268912	0.000267902	0.000260512	0.00026505	0.000273645
D_K	Post-Closure	P95	75.60759735	72.74138641	71.40553284	67.95093536	68.27063751	71.71180725	74.18377686	74.50389862	74.49757385	73.26703644	72.87859344	75.61607361
D_Li	Post-Closure	P95	0.135668516	0.124647342	0.119674318	0.11197792	0.11640963	0.124690592	0.134974554	0.133366093	0.132846951	0.129151613	0.131476521	0.135722294
D_Mg	Post-Closure	P95	10.18483543	9.819088936	9.655164719	9.246617317	9.253216743	9.676710129	9.999014854	10.03869724	10.04380035	9.876109123	9.827361107	10.17936039
D_Mn	Post-Closure	P95	0.892867148	0.894162774	0.894270599	0.878226101	0.829991162	0.870592058	0.874010861	0.879367888	0.882035673	0.882293761	0.889387608	0.891340435
D_Mo	Post-Closure	P95	0.075953811	0.075137071	0.074641317	0.072201893	0.070713714	0.073959589	0.074618615	0.075137116	0.075308591	0.074968658	0.075141057	0.075952783
D_Na	Post-Closure	P95	246.9346313	248.1303864	248.1738281	233.3478241	215.8243256	235.3835297	235.0704346	237.1005249	233.5823975	234.0856323	235.4682159	236.4441528
D_Ni	Post-Closure	P95	0.048421096	0.048366457	0.048322275	0.047479991	0.045616247	0.047709677	0.047763817	0.048020557	0.048092354	0.048113003	0.048379473	0.048421096
D_P	Post-Closure	P95	0.003013044	0.002029588	0.002405745	0.015419341	0.023902543	0.009348123	0.008887204	0.016532358	0.004026935	0.040907487	0.026234606	0.003037029
D_Pb	Post-Closure	P95	0.014963012	0.015059359	0.015125899	0.014724723	0.013247494	0.014073227	0.014263538	0.014443487	0.014476303	0.014543752	0.014699217	0.014852015
D_S	Post-Closure	P95	0.0615252	0.045731783	0.0402078	0.405151457	0.245250523	0.128934667	0.112291813	0.094273321	0.066666029	0.126326993	0.077592127	0.053969242
D_Sb	Post-Closure	P95	0.211374596	0.19441478	0.186758161	0.174754634	0.181567475	0.194437623	0.210216671	0.207810163	0.207007185	0.201208383	0.204817742	0.211455405
D_Se	Post-Closure	P95	0.003824699	0.003610102	0.003513212	0.003304579	0.003383995	0.003592927	0.00377464	0.003766206	0.003758462	0.003660694	0.003661867	0.003825186
D_Si	Post-Closure	P95	0.930079341	0.758799613	0.737724364	3.750209808	3.547032356	2.203337431	1.936678171	1.681725383	0.980342984	2.461774588	1.647181153	0.926616549
D_Sn	Post-Closure	P95	2.77634E-06	2.07189E-06	2.06654E-06	3.89045E-05	4.74025E-05	2.20182E-05	1.64902E-05	1.02367E-05	4.5268E-06	2.06945E-05	9.66752E-06	2.7849E-06
D_Sr	Post-Closure	P95	0.353498429	0.298369199	0.273909539	0.257450402	0.274528176	0.313210428	0.359784722	0.346298546	0.342756718	0.34196946	0.360899329	0.353638947
D_Ti	Post-Closure	P95	0.000104797	7.74532E-06	7.51666E-06	0.000709892	0.001853099	0.000738742	0.000366497	0.00068473	4.09429E-05	0.001396652	0.000886282	0.000113584
D_Tl	Post-Closure	P95	0.001219734	0.001154228	0.001124252	0.001058906	0.001081521	0.001148083	0.001202451	0.001201008	0.001199105	0.001169474	0.001166626	0.001220038
D_U	Post-Closure	P95	0.007654326	0.007490637	0.007409623	0.007129882	0.007048951	0.00738251	0.007504474	0.00755286	0.007563582	0.007498864	0.007495491	0.007654157
D_V	Post-Closure	P95	0.034237094	0.031670816	0.030516041	0.028583473	0.029617295	0.031649336	0.034006681	0.033669576	0.033557955	0.032606956	0.033136304	0.034249473
D_Zn	Post-Closure	P95	0.989588439	0.993893921	0.997038305	0.973644257	0.895243704	0.946464598	0.954595089	0.963690341	0.965987384	0.968948245	0.978260517	0.984646142

Appendix A.1.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, WMPond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.006535073	0.006773343	0.007210345	0.007098344	0.007377567	0.007341905	0.010291737	0.014386067	0.016610797	0.018891066	0.020203311	0.020770535
NO3_N	Closure	P95	0.144333363	0.21818395	0.263512641	0.254309803	0.179838091	0.219802365	0.486024231	0.754302979	0.897363305	1.066192389	1.161391854	1.191492915
NO2_N	Closure	P95	0.002007914	0.002620363	0.003025668	0.003004688	0.001852422	0.002451617	0.004775916	0.007193902	0.008606287	0.010237553	0.010885045	0.011226255
Br	Closure	P95	0.034597833	0.029581329	0.02831348	0.041475203	0.036597621	0.037833691	0.047858201	0.067593887	0.077429309	0.088108473	0.091662131	0.087719873
Cl	Closure	P95	0.653290689	0.791774929	0.895135164	0.892296076	0.53161335	0.670093417	1.299180031	1.945109963	2.295503139	2.719824791	2.928397417	3.023719072
F	Closure	P95	0.144277602	0.190397218	0.220025823	0.217400119	0.135444745	0.166613296	0.346439421	0.527829885	0.631994069	0.75820446	0.808269918	0.831144035
TDP	Closure	P95	0.009009769	0.007656304	0.00731926	0.00594665	0.008220977	0.010738073	0.01154604	0.014652927	0.018547436	0.019692132	0.021088399	0.020494794
SO4	Closure	P95	45.99554825	70.49486542	83.65126801	83.49441528	50.30606079	62.77120972	137.7071381	213.6032715	257.7671509	311.7516785	333.0992432	343.5325317
T_CN	Closure	P95	0.003135902	0.002696431	0.002613171	0.002535431	0.002890674	0.002835318	0.002814347	0.002753394	0.002925658	0.002545854	0.003573106	0.003293213
WAD_CN	Closure	P95	0.003135902	0.002696431	0.002613171	0.002535431	0.002890674	0.002835318	0.002814347	0.002753394	0.002925658	0.002545854	0.003573106	0.003293213
T_Ag	Closure	P95	5.24311E-05	7.71548E-05	9.10036E-05	9.08344E-05	5.82791E-05	7.41106E-05	0.000153244	0.000233411	0.000279392	0.000334935	0.000356925	0.000368579
T_Al	Closure	P95	0.076070532	0.061111897	0.060243431	0.05855776	0.232980639	0.3243801	0.304036647	0.099832952	0.091066882	0.072615176	0.07773155	0.079030849
T_As	Closure	P95	0.001886673	0.002400948	0.002762825	0.002788201	0.001659547	0.002027795	0.004114499	0.006205141	0.00762571	0.009099301	0.0096489	0.00997967
T_B	Closure	P95	0.047749713	0.069444858	0.081756644	0.081167094	0.048927292	0.061088946	0.132465452	0.204592824	0.246926531	0.298108459	0.318122506	0.327114969
T_Ba	Closure	P95	0.007887742	0.007179074	0.007374824	0.007348892	0.00860285	0.006828719	0.006780039	0.006654745	0.00793682	0.007817972	0.008992696	0.008061188
T_Bi	Closure	P95	3.1359E-05	2.69643E-05	2.61317E-05	2.53543E-05	2.89068E-05	2.83532E-05	2.81435E-05	2.7534E-05	2.92566E-05	2.54586E-05	3.57311E-05	3.29321E-05
T_Be	Closure	P95	0.000173707	0.000221727	0.000254538	0.000252614	0.000154088	0.000187111	0.000382548	0.000579931	0.000694511	0.00082916	0.000882566	0.000911306
T_Ca	Closure	P95	22.55893326	26.91904068	30.43496704	30.17615891	18.20864487	24.18528175	43.63764572	65.23096466	77.14596558	91.80834198	97.85037231	101.1534424
T_Cd	Closure	P95	0.000211801	0.000326817	0.00038867	0.000386652	0.000232342	0.000294845	0.000648872	0.001006745	0.001220844	0.001475461	0.001575359	0.001617266
T_Co	Closure	P95	0.001300735	0.00198203	0.002350474	0.002328845	0.001391307	0.001768765	0.003902399	0.006055644	0.007349002	0.008880807	0.009479604	0.009715024
T_Cr	Closure	P95	0.000401371	0.000312713	0.000263213	0.000255651	0.000300751	0.000350013	0.00041568	0.000607483	0.000622705	0.000596735	0.00060771	0.000581308
T_Cu	Closure	P95	0.001216628	0.001643539	0.001911181	0.001907707	0.001196159	0.001483897	0.003029352	0.004598353	0.005489303	0.006592802	0.007019851	0.007244414
T_Fe	Closure	P95	0.113109879	0.093583412	0.0918006	0.088907719	0.1704368	0.233618155	0.222252786	0.110310189	0.120506674	0.105162218	0.125421569	0.117834114
T_Hg	Closure	P95	4.66495E-05	7.39832E-05	8.81925E-05	9.32411E-05	5.57254E-05	6.43364E-05	0.00013581	0.000209886	0.000247943	0.000300828	0.000329347	0.000344831
T_K	Closure	P95	8.168815613	12.8288517	15.29086304	15.69246864	9.533033371	11.26831722	24.38861656	37.82099152	45.22591782	54.79593277	59.02907562	61.53885269
T_Li	Closure	P95	0.017235022	0.026435753	0.031381179	0.03108798	0.018587284	0.023680361	0.052300651	0.081186555	0.098329	0.118886486	0.126938954	0.130274624
T_Mg	Closure	P95	2.741925955	2.472841978	2.588629484	2.641393185	2.944024801	2.645926237	2.954251289	4.084328175	4.62933588	5.335434437	5.704764366	5.850743771
T_Mn	Closure	P95	0.037681077	0.056265697	0.066323198	0.066228531	0.040318552	0.050541475	0.108072408	0.166286215	0.200668111	0.242034227	0.258136898	0.265538573
T_Mo	Closure	P95	0.005254221	0.007829678	0.009223035	0.009211797	0.005590761	0.006850028	0.014818714	0.022890095	0.027551189	0.03327335	0.035530448	0.036686476
T_Na	Closure	P95	4.533606529	4.634444714	5.035462379	5.046196938	3.830570698	4.105712891	6.108556747	8.771121025	10.12178898	11.88402653	12.75807095	13.15386963
T_Ni	Closure	P95	0.002299063	0.003328188	0.003915404	0.003880738	0.002338128	0.002926497	0.006349073	0.009802157	0.01185714	0.014311833	0.015265469	0.015656006
T_P	Closure	P95	0.012097641	0.010538047	0.009901852	0.00968395	0.012988832	0.017158307	0.01905633	0.023208436	0.024121601	0.023832096	0.023583176	0.022994453
T_Pb	Closure	P95	0.000113984	0.000153458	0.000178326	0.00017948	0.000112979	0.000137393	0.000278256	0.000421658	0.000502362	0.000604058	0.000643254	0.000665767
T_S	Closure	P95	0.874522924	0.708909869	0.790018559	0.781740844	0.90791893	0.652716577	0.453131258	0.326653928	0.545166731	0.567662656	1.080525398	0.915481091
T_Sb	Closure	P95	0.026597211	0.041567951	0.049482163	0.049001988	0.029196741	0.037419524	0.083149232	0.12930268	0.156792894	0.189647123	0.202540293	0.207783967
T_Se	Closure	P95	0.000517366	0.000740466	0.000870347	0.000862987	0.000522449	0.000649727	0.001405719	0.002169026	0.002618357	0.00315652	0.003367978	0.003463589
T_Si	Closure	P95	8.168073654	7.275843143	7.088348866	6.743873119	7.240548134	6.170963287	6.143474579	6.321447849	7.031873703	6.491219044	8.830071449	8.305161476
T_Sn	Closure	P95	6.28845E-05	5.39581E-05	5.22636E-05	5.07089E-05	5.80792E-05	5.70099E-05	5.67105E-05	5.52471E-05	5.87404E-05	5.12182E-05	7.1693E-05	6.60382E-05
T_Sr	Closure	P95	0.131986171	0.152850136	0.170625985	0.169671744	0.105286963	0.135312557	0.232701659	0.344301671	0.405318022	0.480652422	0.512522638	0.52948904
T_Ti	Closure	P95	0.005192508	0.002750097	0.002493045	0.002400714	0.004035993	0.005613719	0.005351135	0.003028065	0.003672533	0.002006317	0.006409961	0.005406244
T_Tl	Closure	P95	0.000148976	0.000227695	0.000270149	0.000267559	0.000162272	0.000206598	0.000452653	0.000700834	0.000848087	0.001023712	0.001092666	0.001121579
T_U	Closure	P95	0.000671464	0.000896675	0.00103619	0.001027794	0.000634773	0.000784095	0.001608135	0.002442105	0.002927024	0.003505872	0.003731386	0.003840492
T_V	Closure	P95	0.004879965	0.007380659	0.008738911	0.008665528	0.005219529	0.006641329	0.01453353	0.022465361	0.027447149	0.033078823	0.035255291	0.036035448
T_Zn	Closure	P95	0.012039327	0.017268427	0.02028531	0.020172767	0.012276466	0.015288937	0.032746356	0.050397236	0.060703386	0.07316047	0.078044482	0.080361158
D_Ag	Closure	P95	5.24297E-05	7.71548E-05	9.10035E-05	9.08342E-05	5.71185E-05	7.07096E-05	0.000150074	0.000230252	0.000276849	0.000332811	0.000355011	0.000366437
D_Al	Closure	P95	0.057558496	0.042664424	0.04178898	0.040403865	0.165992975	0.231165871	0.216687843	0.076601051	0.067213766	0.053758167	0.05731748	0.064308934
D_As	Closure	P95	0.001832988	0.002358556	0.002720551	0.002746869	0.001628787	0.001975075	0.00406389	0.006154698	0.007591535	0.009066042	0.009618941	0.009955997
D_B	Closure	P95	0.047749713	0.069444858	0.081756644	0.081167094	0.048927292	0.061088946	0.132465452	0.204592824	0.246926531	0.298108459	0.318122506	0.327114969
D_Ba	Closure	P95	0.007543984	0.006886284	0.006851287	0.006871444	0.008253048	0.006549163	0.006338646	0.006199302	0.007739188	0.007844251	0.008450172	0.007687628
D_Bi	Closure	P95	3.1359E-05	2.69643E-05	2.61317E-05	2.53543E-05	2.89068E-05	2.83532E-05	2.81435E-05	2.7534E-05	2.92566E-05	2.54586E-05	3.57311E-05	3.29321E-05
D_Be	Closure	P95	0.000173707	0.000221727	0.000254538	0.000252614	0.000154088	0.000187111	0.000382548	0.000579931	0.000694511	0.00082916	0.000882566	0.000911306
D_Ca	Closure	P95	22.31041718	26.88660049	30.40318489	30.15171432	18.27375984	24.25662041	43.6664238	65.259552	77.15466309	91.81354523	97.86705017	101.1693726
D_Cd	Closure	P95	0.000212749	0.000328801	0.000390603	0.000388753	0.000232615	0.000293976	0.00064806	0.001005938	0.001220374	0.001475003	0.001574948	0.001616888
D_Co	Closure	P95	0.001300723	0.00198203	0.002350473	0.002328843	0.001389639	0.001766685	0.003900156	0.006053408	0.007347407	0.008879255	0.009478205	0.009713434
D_Cr	Closure	P95	0.000310267	0.000235743	0.000225205	0.000211589	0.000210086	0.000278873	0.000347162	0.000584016	0.000606375	0.000574941	0.000591335	0.000566117
D_Cu	Closure	P95	0.001215736	0.001643136	0.001910785	0.001907591	0.001188237	0.001470441	0.003018552	0.004587587	0.005486225	0.006589437	0.00701687	0.007237236
D_Fe	Closure	P95	0.087459505	0.070213072	0.064899251	0.063277915	0.097931452	0.133054286	0.127979606	0.089163549	0.099781044	0.080266699	0.099974796	0.091736272
D_Hg	Closure	P95	4.66487E-05	7.39831E-05	8.81924E-05	9.32409E-05	5.58204E-05	6.44664E-05	0.000135889	0.000209964	0.000247932	0.000300818	0.000329397	0.000344879
D_K	Closure	P95	8.132090569	12.82574749	15.28782463	15.69044209	9.513027191	11.24670315	24.36836433	37.80080414	45.21678162	54.78702164	59.01343155	61.52392197
D_Li	Closure	P95	0.017235022	0.026435753	0.031381179	0.03108798	0.018587284	0.023680361	0.052300651	0.081186555	0.098329	0.118886486	0.126938954	0.130274624
D_Mg	Closure	P95	2.750545979	2.49830699	2.648804665	2.637190342	2.912710428	2.639583349	2.948529005	4.078617573	4.626191139	5.332343578	5.702012539	5.848100662
D_Mn	Closure	P95	0.036530521	0.05483773	0.064930193	0.064805128	0.039039094	0.048748318	0.106288113	0.164507493	0.199333176	0.24073565	0.25696528	0.264168441
D_Mo	Closure	P95	0.005202656	0.00779363	0.009187881	0.009175329	0.005569943	0.006838589	0.014807479	0.022878909	0.027541785	0.033267047	0.035524782	0.036677178
D_Na	Closure	P95	4.453783989	4.586769104	4.985364914	5.001167774	3.77404356	4.05928421	6.072890759	8.735588074	10.07826614	11.85449505	12.72972965	13.12679195
D_Ni	Closure	P95	0.002299063	0.003328188	0.003915404	0.003880738	0.002333681	0.002920949	0.006343878	0.00979698	0.011854616	0.014309374	0.015263266	0.015652401
D_P	Closure	P95	0.156547099	0.083910562	0.072086468	0.068994872	0.021807015	0.031910069	0.033234853	0.041493077	0.092733741	0.045119379	0.192805395	0.161385179
D_Pb	Closure	P95	0.000113981	0.000153458	0.000178326	0.00017948	0.000109408	0.000130791	0.000272102	0.000415526	0.000498124	0.000599934	0.000639538	0.000661608
D_S	Closure	P95	0.651711583	0.602370143	0.778133154	0.797501802	0.798383713	0.539209187	0.397294641	0.289341807	0.38482061	0.533783972	0.391421199	0.351494581
D_Sb	Closure	P95	0.026597211	0.041567951	0.049482163	0.049001988	0.029196741	0.037419524	0.083149232	0.12930268	0.156792894	0.189647123	0.202540293	0.207783967
D_Se	Closure	P95	0.000479221	0.000725136	0.000855371	0.00084855	0.000518603	0.000651806	0.001407108	0.002170413	0.002618019	0.003156598	0.003368037	0.003464098
D_Si	Closure	P95	7.871287823	6.845227242	6.723146915	6.513280392	6.814547062	5.83526516	5.806801796	6.264753342	6.934212208	6.466848373	8.666457176	8.022227287
D_Sn	Closure	P95	6.28845E-05	5.39581E-05	5.22636E-05	5.07089E-05	5.80792E-05	5.70099E-05	5.67105E-05	5.52471E-05	5.87404E-05	5.12182E-05	7.1693E-05	6.60382E-05
D_Sr	Closure	P95	0.133505777	0.155756697	0.173579723	0.172594279	0.106816597	0.136245444	0.233068228	0.344665885	0.405478597	0.480731726	0.512799203	0.529752731
D_Ti	Closure	P95	0.005140724	0.002514424	0.002374839	0.002286103	0.002184051	0.003030807	0.002948474	0.001895219	0.00323211	0.001364359	0.006376089	0.005352282
D_Tl	Closure	P95	0.000148976	0.000227695	0.000270149	0.000267559	0.000162272	0.000206598	0.000452653	0.000700834	0.000848087	0.001023712	0.001092666	0.001121579
D_U	Closure	P95	0.00065883	0.000886867	0.001026621	0.00101801	0.000629933	0.000772988	0.001599403	0.002433399	0.002919578	0.003500449	0.003726505	0.003833754
D_V	Closure	P95	0.004878626	0.007369995	0.008728491	0.008655133	0.005183899	0.006569881	0.014465704	0.022397745	0.02740157	0.033034466	0.035215337	0.035996947
D_Zn	Closure	P95	0.010794481	0.016595282	0.019628569	0.019516606	0.011959629	0.015123695	0.032586087	0.050237194	0.06056511	0.073052235	0.077946834	0.080196418

Appendix A.1.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, WMPond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Br	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
F	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Post-Closure	P95	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.2.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF C Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.718712986	0.258015603	0.095770165	0.031239826	0.019151801	0.021119107	0.008408073	0.003301318	0.001252973	0.000512004	0.000417063	0.000505515
NO3_N	Closure	Mean	9.504240036	9.258312225	9.253108978	7.527092934	5.721581459	5.724571705	5.581636429	5.41296339	5.14099884	4.646493912	4.452059746	4.256165504
NO2_N	Closure	Mean	0.088176869	0.084913559	0.084571451	0.068720587	0.052606404	0.056934219	0.055199832	0.053416912	0.050658781	0.045810048	0.04373854	0.041828714
Br	Closure	Mean	0.095301419	0.090054303	0.088476904	0.066636503	0.062185608	0.087852381	0.095971435	0.104562193	0.10767296	0.105402276	0.108604982	0.102023199
Cl	Closure	Mean	179.540329	172.8926086	172.1924896	139.8905792	107.045433	115.938591	112.3466721	108.6981277	103.0711823	93.20227814	88.94169617	85.03334808
F	Closure	Mean	0.778339386	0.734369934	0.738089919	0.550502419	0.511128783	0.728612304	0.756243408	0.780703425	0.77152884	0.722167075	0.775576234	0.78265202
TDP	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Closure	Mean	2109.177002	2032.703613	2025.826172	1647.789185	1275.502197	1400.699951	1363.128906	1323.014893	1258.638794	1142.196045	1098.629639	1054.718018
T_CN	Closure	Mean	1.76931E-07	1.55083E-07	2.3683E-07	1.0263E-07	5.81023E-07	8.2055E-07	3.13543E-07	2.46684E-07	2.10854E-07	2.1889E-07	2.5345E-07	2.53084E-07
WAD_CN	Closure	Mean	1.67717E-07	1.45725E-07	2.19401E-07	9.36156E-08	5.75733E-07	8.2055E-07	3.10087E-07	2.43974E-07	2.06269E-07	2.10881E-07	2.48603E-07	2.42965E-07
T_Ag	Closure	Mean	0.00178209	0.001748049	0.00176488	0.001455996	0.001318323	0.001657745	0.001687694	0.001710175	0.001692558	0.001608738	0.001698709	0.001717499
T_Al	Closure	Mean	0.002631	0.002631	0.002631	0.002574011	0.002416233	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Closure	Mean	0.007356077	0.007188648	0.00724122	0.005961305	0.00514811	0.00631252	0.00639362	0.006439108	0.006340521	0.005971808	0.006167119	0.006148146
T_B	Closure	Mean	0.046867505	0.044174656	0.044578597	0.036741186	0.032993536	0.045945007	0.047894116	0.049168084	0.048234683	0.044529837	0.047449708	0.047588039
T_Ba	Closure	Mean	0.002225	0.002225	0.002225	0.001997729	0.002038145	0.002225	0.002211815	0.002224275	0.002225	0.002214838	0.002225	0.002225
T_Bi	Closure	Mean	3.3535E-05	3.296E-05	3.34145E-05	2.57254E-05	2.2701E-05	3.36332E-05	3.50597E-05	3.6381E-05	3.59973E-05	3.39291E-05	3.38236E-05	3.38899E-05
T_Be	Closure	Mean	0.000401255	0.000372394	0.000364342	0.000261239	0.000247682	0.000383012	0.000399199	0.000410989	0.000404583	0.00037607	0.000402871	0.000405501
T_Ca	Closure	Mean	360.1134033	347.8696289	347.3460083	283.3670959	225.5755157	254.9881592	250.4552307	245.0316772	234.9503326	215.135849	210.7355347	204.2216492
T_Cd	Closure	Mean	0.009503271	0.008958736	0.009012007	0.006767117	0.006306098	0.008831671	0.009141056	0.009433454	0.009326598	0.008750956	0.009423894	0.009531369
T_Co	Closure	Mean	0.141418159	0.136512235	0.136205271	0.111011744	0.087762907	0.098650724	0.096721999	0.094471239	0.090450466	0.082699224	0.080726981	0.07814806
T_Cr	Closure	Mean	0.000235	0.000235	0.000235	0.000207085	0.000207321	0.000234612	0.000233408	0.000234525	0.000234945	0.000231721	0.000235	0.000235
T_Cu	Closure	Mean	0.060299911	0.058325011	0.058269691	0.047545411	0.038646623	0.044628985	0.044117708	0.043432746	0.041874472	0.038613971	0.038384292	0.037445664
T_Fe	Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.001955886	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Closure	Mean	6.72788E-05	6.40391E-05	6.29284E-05	4.491E-05	3.9923E-05	6.02141E-05	6.31392E-05	6.58013E-05	6.56625E-05	6.17455E-05	6.58393E-05	6.72042E-05
T_K	Closure	Mean	57.16758728	55.20810699	55.10785675	44.92607498	35.51760864	40.09302521	39.39489365	38.55237961	36.97122192	33.83247375	33.07188416	32.05774307
T_Li	Closure	Mean	0.037832864	0.035052288	0.035195921	0.025270874	0.023603484	0.035845328	0.037248738	0.038362294	0.03781132	0.035251636	0.037829857	0.038126774
T_Mg	Closure	Mean	7.100183964	6.895247936	6.912295818	5.664465904	4.699728489	5.322599411	5.292984486	5.256451607	5.114565372	4.758852482	4.804054737	4.728784561
T_Mn	Closure	Mean	1.272031665	1.215108395	1.219994426	0.878713131	0.818586469	1.205349803	1.242038846	1.269569755	1.254691005	1.176949143	1.267184973	1.277959585
T_Mo	Closure	Mean	0.076892979	0.074256569	0.074118085	0.060429122	0.047862146	0.054070447	0.053102318	0.051932372	0.049778022	0.045554705	0.044576593	0.043214221
T_Na	Closure	Mean	604.8438721	582.5578613	580.2802734	471.4323425	361.5125732	392.2720032	380.3688049	368.26474	349.4398499	316.2301331	302.2811279	289.2640686
T_Ni	Closure	Mean	0.01846789	0.017027715	0.016991397	0.012216195	0.011504592	0.017177995	0.017823888	0.018400716	0.018188749	0.017041683	0.018351533	0.018547123
T_P	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Closure	Mean	0.002475597	0.002427338	0.002450138	0.002020935	0.001819351	0.002282778	0.002322836	0.002352495	0.002327141	0.002209819	0.002315721	0.002325362
T_S	Closure	Mean	0.470623195	0.463326305	0.473006219	0.365617752	0.350222409	0.46407029	0.474816859	0.488280356	0.488288522	0.46360597	0.475410521	0.469918549
T_Sb	Closure	Mean	0.028519491	0.027501265	0.02741603	0.022304349	0.017813291	0.020883679	0.020784328	0.020432701	0.019617675	0.017926812	0.017792914	0.017264515
T_Se	Closure	Mean	0.004589645	0.004296318	0.004321861	0.003106811	0.002894553	0.004274677	0.00442885	0.004569568	0.004516074	0.004233208	0.004556586	0.004606569
T_Si	Closure	Mean	5.814716816	5.688068867	5.680448532	4.495654583	3.916774035	5.450288773	5.734120846	5.914212227	5.867848873	5.558262348	5.734568596	5.836798668
T_Sn	Closure	Mean	7.01524E-05	6.87741E-05	6.95816E-05	5.34959E-05	4.73759E-05	6.99769E-05	7.31558E-05	7.61705E-05	7.55777E-05	7.14312E-05	7.13776E-05	7.11859E-05
T_Sr	Closure	Mean	0.404605031	0.393586218	0.395314068	0.325035393	0.26507172	0.301919162	0.30035615	0.298388898	0.29048413	0.270300955	0.27166304	0.268097997
T_Ti	Closure	Mean	0.002894115	0.002758288	0.002692195	0.002102196	0.001768875	0.002919292	0.003103653	0.003142452	0.003082636	0.002809475	0.002956076	0.003007688
T_Tl	Closure	Mean	0.000939445	0.00087741	0.000882017	0.000633604	0.000591947	0.000878844	0.000911217	0.000939613	0.000927865	0.000868691	0.00093446	0.000943895
T_U	Closure	Mean	0.005721745	0.005598405	0.005642268	0.004646559	0.004125426	0.005117355	0.005190001	0.005237714	0.005164395	0.004886291	0.005089114	0.005081393
T_V	Closure	Mean	0.010364158	0.009615743	0.009471347	0.006820783	0.006373609	0.009742638	0.010145002	0.010464984	0.010331727	0.009636453	0.010337162	0.010432849
T_Zn	Closure	Mean	0.458466977	0.422648489	0.42564258	0.306147367	0.287278414	0.423987806	0.439290047	0.453698993	0.44884491	0.421424925	0.454291016	0.459667623
D_Ag	Closure	Mean	0.001781157	0.001747148	0.001763985	0.001455251	0.001317787	0.001655579	0.001685463	0.001708001	0.001690473	0.001606824	0.001695986	0.001714931
D_Al	Closure	Mean	0.002631	0.002631	0.002631	0.002472512	0.002377663	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Closure	Mean	0.007341784	0.007174878	0.007227413	0.00595007	0.005136363	0.006285885	0.006364629	0.006410388	0.006311991	0.00594551	0.006139937	0.006120827
D_B	Closure	Mean	0.046867505	0.044174656	0.044578597	0.036741186	0.032993536	0.045945007	0.047894116	0.049168084	0.048234683	0.044529837	0.047449708	0.047588039
D_Ba	Closure	Mean	0.002225	0.002225	0.002225	0.001997065	0.002037941	0.002225	0.00221114	0.002224033	0.002225	0.002214881	0.002225	0.002225
D_Bi	Closure	Mean	3.3535E-05	3.296E-05	3.34145E-05	2.57254E-05	2.2701E-05	3.36332E-05	3.50597E-05	3.6381E-05	3.59973E-05	3.39291E-05	3.38236E-05	3.38899E-05
D_Be	Closure	Mean	0.000401255	0.000372394	0.000364342	0.000261239	0.000247682	0.000383012	0.000399199	0.000410989	0.000404583	0.00037607	0.000402871	0.000405501
D_Ca	Closure	Mean	360.10495	347.8606262	347.3361511	283.3570557	225.5748138	254.9872131	250.4507599	245.022995	234.9419708	215.1305847	210.7161255	204.2027893
D_Cd	Closure	Mean	0.009502938	0.008958446	0.009011727	0.006767019	0.006305934	0.008830981	0.009140369	0.009432937	0.009326113	0.008750484	0.009423461	0.009530943
D_Co	Closure	Mean	0.141417831	0.136511892	0.136204958	0.111011468	0.087762296	0.098650068	0.09672109	0.094470344	0.090449609	0.082698449	0.080726236	0.078147344
D_Cr	Closure	Mean	0.000235	0.000235	0.000235	0.000206958	0.000206558	0.000234555	0.000233289	0.000234426	0.000234883	0.00023143	0.000235	0.000235
D_Cu	Closure	Mean	0.060298048	0.058323126	0.058267385	0.047543313	0.038643572	0.044622332	0.044112559	0.043427754	0.041869741	0.038609445	0.038379941	0.0374415
D_Fe	Closure	Mean	0.00203	0.00203	0.00203	0.002026519	0.001926903	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Closure	Mean	6.7307E-05	6.40653E-05	6.29534E-05	4.49295E-05	3.99309E-05	6.03229E-05	6.31879E-05	6.5847E-05	6.57047E-05	6.17827E-05	6.58721E-05	6.72346E-05
D_K	Closure	Mean	57.16550446	55.20613861	55.10582733	44.92454529	35.51163864	40.08836365	39.39046097	38.54797745	36.96669006	33.82836533	33.06663513	32.05293274
D_Li	Closure	Mean	0.037832864	0.035052288	0.035195921	0.025270874	0.023603484	0.035845328	0.037248738	0.038362294	0.03781132	0.035251636	0.037829857	0.038126774
D_Mg	Closure	Mean	7.098860264	6.893922806	6.910946846	5.663068771	4.697284222	5.318582535	5.288370609	5.251493454	5.10962677	4.754109859	4.798836708	4.724757195
D_Mn	Closure	Mean	1.271554589	1.214212537	1.219139457	0.87807411	0.818105161	1.203743935	1.240594268	1.268594384	1.253892303	1.176239967	1.266499877	1.277418137
D_Mo	Closure	Mean	0.076889977	0.074253239	0.074114494	0.060426045	0.047858424	0.05406497	0.053096425	0.051927019	0.04977246	0.045549806	0.044570707	0.043208543
D_Na	Closure	Mean	604.8054199	582.520813	580.243103	471.4019165	361.4865417	392.2378235	380.3296204	368.2264709	349.4021912	316.1958618	302.2451172	289.2260437
D_Ni	Closure	Mean	0.018466396	0.017026344	0.016990175	0.012215373	0.011502169	0.017175436	0.017821454	0.018398393	0.01818664	0.017039882	0.018349843	0.018545525
D_P	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Closure	Mean	0.002473786	0.002425589	0.002448401	0.002019489	0.00181831	0.002278573	0.002318505	0.002348274	0.002323094	0.002206102	0.002312134	0.002320377
D_S	Closure	Mean	0.403389871	0.400369644	0.410722315	0.319961816	0.306176066	0.411912173	0.423221171	0.436907262	0.433764726	0.413516045	0.407382548	0.405263573
D_Sb	Closure	Mean	0.028519491	0.027501265	0.02741603	0.022304349	0.017813291	0.020883679	0.020784328	0.020432701	0.019617675	0.017926812	0.017792914	0.017264515
D_Se	Closure	Mean	0.004586065	0.00429314	0.004318552	0.003104486	0.002893436	0.004274305	0.004427771	0.004568585	0.004514861	0.004231952	0.004553685	0.00460288
D_Si	Closure	Mean	5.653727531	5.533876419	5.542520523	4.378567219	3.802532911	5.263976574	5.542912483	5.727364063	5.707043648	5.413404465	5.575965405	5.679209232
D_Sn	Closure	Mean	7.01524E-05	6.87741E-05	6.95816E-05	5.34959E-05	4.73759E-05	6.99769E-05	7.31558E-05	7.61705E-05	7.55777E-05	7.14312E-05	7.13776E-05	7.11859E-05
D_Sr	Closure	Mean	0.404561967	0.393541604	0.395256609	0.324971706	0.265093654	0.301860183	0.3002716	0.298253745	0.290367693	0.270219177	0.271561056	0.268150449
D_Ti	Closure	Mean	0.001863536	0.001766985	0.001724877	0.001345295	0.001093833	0.001723791	0.00181578	0.001845657	0.001834141	0.00167755	0.001855066	0.001937296
D_Tl	Closure	Mean	0.000939445	0.00087741	0.000882017	0.000633604	0.000591947	0.000878844	0.000911217	0.000939613	0.000927865	0.000868691	0.00093446	0.000943895
D_U	Closure	Mean	0.005719499	0.005596186	0.005640003	0.004644643	0.004123079	0.005113086	0.005185397	0.005233026	0.005159792	0.004882076	0.005084745	0.005077025
D_V	Closure	Mean	0.010315194	0.009570519	0.009430792	0.006792167	0.006350367	0.009673304	0.010073845	0.010394881	0.010265197	0.009578319	0.010282875	0.010380297
D_Zn	Closure	Mean	0.458227307	0.422440231	0.425434172	0.306001633	0.287180185	0.423775256	0.439071268	0.453467935	0.448611945	0.421204239	0.454038471	0.459428698

Appendix A.2.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF C Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.000463141	0.000409507	0.000364326	0.000236484	0.00016788	0.000734436	0.001453563	0.000875137	0.000650054	0.000500962	0.000400602	0.000470742
NO3_N	Post-Closure	Mean	0.038631085	0.036625735	0.035460558	0.035085309	0.038252071	0.038503565	0.036949921	0.038778331	0.040375594	0.040598053	0.039346751	0.03781173
NO2_N	Post-Closure	Mean	0.000765253	0.000756007	0.000758458	0.000726961	0.000731563	0.000782278	0.000812527	0.000818971	0.000809858	0.000771773	0.00075612	0.000764652
Br	Post-Closure	Mean	0.102810524	0.098712839	0.097222544	0.092278868	0.091210581	0.088806801	0.097292446	0.105166018	0.108071141	0.108539723	0.110897936	0.106482163
Cl	Post-Closure	Mean	0.536101818	0.519456387	0.507646501	0.450638592	0.435669661	0.471707076	0.483646899	0.498954386	0.503544867	0.488430083	0.485328138	0.482562095
F	Post-Closure	Mean	0.058756314	0.057318904	0.056416556	0.054129969	0.052970454	0.055390887	0.057457644	0.059577089	0.060435668	0.059189018	0.059087519	0.057992745
TDP	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Post-Closure	Mean	5.491149902	5.392670155	5.343516827	4.146261215	3.576285124	4.520372868	4.676918983	4.723182201	4.73845768	4.622068882	4.510056019	4.484107018
T_CN	Post-Closure	Mean	1.68199E-07	1.45276E-07	1.87811E-07	9.11024E-08	5.8797E-07	8.19892E-07	3.20052E-07	2.37375E-07	1.97638E-07	2.01127E-07	2.22567E-07	2.21069E-07
WAD_CN	Post-Closure	Mean	1.68199E-07	1.45276E-07	1.87811E-07	9.11024E-08	5.8797E-07	8.19892E-07	3.20052E-07	2.37375E-07	1.97638E-07	2.01127E-07	2.22567E-07	2.21069E-07
T_Ag	Post-Closure	Mean	1.25149E-05	1.2228E-05	1.20497E-05	1.14524E-05	1.11508E-05	1.40962E-05	1.44126E-05	1.41712E-05	1.37881E-05	1.30217E-05	1.24206E-05	1.22441E-05
T_Al	Post-Closure	Mean	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Post-Closure	Mean	0.001103756	0.001125786	0.001151447	0.001089163	0.000987772	0.000939849	0.000966944	0.001004028	0.001036322	0.001017156	0.001014711	0.001037082
T_B	Post-Closure	Mean	0.008175852	0.008043075	0.00796054	0.007123256	0.006811974	0.008244041	0.008380259	0.008451184	0.008372683	0.008024326	0.007816003	0.00780955
T_Ba	Post-Closure	Mean	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Post-Closure	Mean	3.51673E-05	3.48189E-05	3.49798E-05	3.3447E-05	3.23667E-05	3.37877E-05	3.4558E-05	3.60373E-05	3.59598E-05	3.49322E-05	3.45162E-05	3.50305E-05
T_Be	Post-Closure	Mean	6.83154E-05	6.68515E-05	6.58318E-05	6.27597E-05	6.1187E-05	7.05292E-05	7.19122E-05	7.26737E-05	7.19072E-05	6.86397E-05	6.6967E-05	6.67689E-05
T_Ca	Post-Closure	Mean	8.03291893	7.941388607	7.876927853	7.546919823	7.702048779	7.905851841	7.921545982	8.070951462	8.100235939	7.859606266	7.785059929	7.832767487
T_Cd	Post-Closure	Mean	2.25539E-05	2.21343E-05	2.19935E-05	1.71697E-05	1.40408E-05	2.23491E-05	2.33895E-05	2.3288E-05	2.3136E-05	2.19535E-05	2.05801E-05	2.01812E-05
T_Co	Post-Closure	Mean	0.000146254	0.000141793	0.000139216	0.000106943	8.48229E-05	0.000135227	0.000139908	0.000140243	0.000139393	0.000131944	0.000124616	0.000122267
T_Cr	Post-Closure	Mean	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
T_Cu	Post-Closure	Mean	0.000437385	0.000427701	0.00042367	0.000403921	0.000380878	0.000466682	0.000469569	0.000473279	0.000469617	0.000447108	0.000431867	0.000428529
T_Fe	Post-Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Post-Closure	Mean	1.98057E-05	2.05112E-05	2.09478E-05	2.04707E-05	1.77636E-05	1.54986E-05	1.62931E-05	1.74348E-05	1.8067E-05	1.81577E-05	1.84445E-05	1.90299E-05
T_K	Post-Closure	Mean	2.068505526	2.118308306	2.17102766	2.020501614	1.775930524	1.625263691	1.713029027	1.794035673	1.8630234	1.853518128	1.865188837	1.920309186
T_Li	Post-Closure	Mean	0.001110349	0.001074048	0.001051259	0.000803806	0.000712843	0.00117851	0.001226509	0.001196803	0.001154167	0.001092608	0.001029165	0.001006641
T_Mg	Post-Closure	Mean	1.441581607	1.430053949	1.438407898	1.378077388	1.416268945	1.411400557	1.408733368	1.444841981	1.450915217	1.419188619	1.420387387	1.434868455
T_Mn	Post-Closure	Mean	0.00809304	0.007973619	0.007919612	0.006953783	0.006252376	0.007934741	0.008117529	0.008209738	0.008244098	0.008001048	0.007623207	0.007540206
T_Mo	Post-Closure	Mean	0.000823797	0.000821711	0.000823449	0.000668919	0.00064481	0.000741307	0.000760252	0.000761611	0.000759545	0.000739846	0.000725015	0.000730462
T_Na	Post-Closure	Mean	2.678455591	2.644076824	2.621556997	2.390171766	2.365023136	2.426396132	2.435104847	2.49766016	2.520944118	2.442728996	2.426087856	2.456517458
T_Ni	Post-Closure	Mean	0.000418607	0.000408818	0.000402376	0.000347635	0.000332231	0.000424716	0.000436567	0.000441323	0.000438852	0.000417645	0.000402488	0.000398855
T_P	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Post-Closure	Mean	5.07003E-05	4.98973E-05	4.94478E-05	4.62797E-05	4.31076E-05	5.17756E-05	5.24849E-05	5.32292E-05	5.32215E-05	5.08178E-05	4.92354E-05	4.90642E-05
T_S	Post-Closure	Mean	0.4861902	0.482607126	0.486927897	0.466266364	0.47463727	0.465929538	0.464716643	0.48029384	0.483497262	0.470430881	0.479347616	0.48042348
T_Sb	Post-Closure	Mean	0.000891221	0.000835298	0.000800283	0.000603567	0.000445432	0.001011285	0.001087435	0.001009121	0.000931208	0.000864996	0.000762188	0.000714533
T_Se	Post-Closure	Mean	7.77682E-05	7.66374E-05	7.56732E-05	6.70905E-05	6.54222E-05	7.95052E-05	8.16169E-05	8.1649E-05	8.05361E-05	7.70291E-05	7.47845E-05	7.43669E-05
T_Si	Post-Closure	Mean	5.855649471	5.824342728	5.873356819	5.639003754	5.45962286	5.457836628	5.579547405	5.830682278	5.84892416	5.702487469	5.683162689	5.797059536
T_Sn	Post-Closure	Mean	7.37162E-05	7.28252E-05	7.30711E-05	6.98347E-05	6.76746E-05	7.0318E-05	7.22521E-05	7.55305E-05	7.5518E-05	7.35441E-05	7.27979E-05	7.36329E-05
T_Sr	Post-Closure	Mean	0.053891096	0.053611185	0.054061741	0.051913075	0.05228202	0.053109884	0.053272281	0.05438827	0.054671016	0.052968904	0.052660104	0.053371865
T_Ti	Post-Closure	Mean	0.002912228	0.0028418	0.002817661	0.002662282	0.002505932	0.002928998	0.003010973	0.003089521	0.003058533	0.00291525	0.002903014	0.002957966
T_Tl	Post-Closure	Mean	1.13572E-05	1.09484E-05	1.06729E-05	8.18355E-06	8.14936E-06	1.24034E-05	1.31639E-05	1.27755E-05	1.22534E-05	1.15172E-05	1.07975E-05	1.05027E-05
T_U	Post-Closure	Mean	0.000168956	0.000166229	0.000164489	0.00015609	0.000155544	0.000175128	0.000178566	0.000179847	0.000177956	0.000170389	0.000165184	0.000164361
T_V	Post-Closure	Mean	0.000975892	0.000995479	0.001019719	0.00092173	0.000825529	0.000875813	0.000900938	0.00092091	0.000935905	0.000909581	0.000896779	0.000913215
T_Zn	Post-Closure	Mean	0.002656918	0.002594168	0.002552778	0.002231331	0.002127845	0.002765114	0.002834456	0.002834843	0.002795658	0.002660708	0.002561485	0.002538266
D_Ag	Post-Closure	Mean	1.06539E-05	1.05104E-05	1.04235E-05	9.67024E-06	9.70471E-06	1.06021E-05	1.12266E-05	1.12545E-05	1.1118E-05	1.06157E-05	1.02934E-05	1.02624E-05
D_Al	Post-Closure	Mean	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Post-Closure	Mean	0.001055976	0.001080489	0.00110753	0.001043874	0.000943729	0.000880366	0.000907725	0.000947048	0.000980881	0.000965856	0.000965459	0.00098837
D_B	Post-Closure	Mean	0.008175852	0.008043075	0.00796054	0.007123256	0.006811974	0.008244041	0.008380259	0.008451184	0.008372683	0.008024326	0.007816003	0.00780955
D_Ba	Post-Closure	Mean	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Post-Closure	Mean	3.51673E-05	3.48189E-05	3.49798E-05	3.3447E-05	3.23667E-05	3.37877E-05	3.4558E-05	3.60373E-05	3.59598E-05	3.49322E-05	3.45162E-05	3.50305E-05
D_Be	Post-Closure	Mean	6.83154E-05	6.68515E-05	6.58318E-05	6.27597E-05	6.1187E-05	7.05292E-05	7.19122E-05	7.26737E-05	7.19072E-05	6.86397E-05	6.6967E-05	6.67689E-05
D_Ca	Post-Closure	Mean	8.002731323	7.910567284	7.844705105	7.511761665	7.68418932	7.895222664	7.904837132	8.048305511	8.078968048	7.843546391	7.75276041	7.80057478
D_Cd	Post-Closure	Mean	2.185E-05	2.14537E-05	2.13312E-05	1.6669E-05	1.34019E-05	2.12577E-05	2.23504E-05	2.24164E-05	2.22877E-05	2.11168E-05	1.97984E-05	1.9405E-05
D_Co	Post-Closure	Mean	0.000145534	0.000141124	0.000138591	0.000106445	8.37783E-05	0.000134305	0.000138639	0.000139068	0.000138317	0.00013099	0.000123766	0.000121484
D_Cr	Post-Closure	Mean	0.000235	0.000235	0.000235	0.000235	0.000232515	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235	0.000235
D_Cu	Post-Closure	Mean	0.000433462	0.000423814	0.000419018	0.000399463	0.000375405	0.000456777	0.000463132	0.000467412	0.000464241	0.000441941	0.000427312	0.000424381
D_Fe	Post-Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Post-Closure	Mean	1.98268E-05	2.05297E-05	2.09701E-05	2.04859E-05	1.77772E-05	1.56144E-05	1.63361E-05	1.74656E-05	1.80948E-05	1.8179E-05	1.8466E-05	1.90508E-05
D_K	Post-Closure	Mean	2.06431222	2.114500284	2.167324066	2.017459631	1.766933322	1.619697332	1.708035946	1.789358258	1.858138204	1.849191546	1.859841704	1.915776491
D_Li	Post-Closure	Mean	0.001110349	0.001074048	0.001051259	0.000803806	0.000712843	0.00117851	0.001226509	0.001196803	0.001154167	0.001092608	0.001029165	0.001006641
D_Mg	Post-Closure	Mean	1.448282957	1.436658859	1.445027709	1.383900881	1.420485258	1.414746284	1.411724567	1.448263526	1.454567432	1.422862649	1.423836946	1.439950705
D_Mn	Post-Closure	Mean	0.006003533	0.005961458	0.005973984	0.004908959	0.004391834	0.005307059	0.005468551	0.005626867	0.005744803	0.005661123	0.005441552	0.005420184
D_Mo	Post-Closure	Mean	0.000804146	0.000801434	0.00080288	0.0006487	0.000624915	0.000720657	0.000739409	0.000741646	0.000739347	0.000721072	0.000705723	0.000711574
D_Na	Post-Closure	Mean	2.627895117	2.595952749	2.57427001	2.341247082	2.318713188	2.377737999	2.379576445	2.444123268	2.468145609	2.393931866	2.374821424	2.401674747
D_Ni	Post-Closure	Mean	0.000417574	0.000407853	0.000401479	0.000346763	0.000330039	0.000422668	0.000434708	0.000439607	0.000437278	0.000416256	0.000401253	0.000397719
D_P	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Post-Closure	Mean	4.70877E-05	4.65631E-05	4.62909E-05	4.28242E-05	4.03036E-05	4.49929E-05	4.63002E-05	4.75673E-05	4.80384E-05	4.61474E-05	4.51062E-05	4.52173E-05
D_S	Post-Closure	Mean	0.420082569	0.419174194	0.424289554	0.407755733	0.415681958	0.413847148	0.414295346	0.429682702	0.429870069	0.419373602	0.412909895	0.416939229
D_Sb	Post-Closure	Mean	0.000891221	0.000835298	0.000800283	0.000603567	0.000445432	0.001011285	0.001087435	0.001009121	0.000931208	0.000864996	0.000762188	0.000714533
D_Se	Post-Closure	Mean	6.82882E-05	6.71681E-05	6.61387E-05	5.77601E-05	5.74648E-05	7.32565E-05	7.44597E-05	7.43989E-05	7.30058E-05	6.9597E-05	6.6232E-05	6.50846E-05
D_Si	Post-Closure	Mean	5.709372044	5.680312157	5.729257107	5.504542351	5.315083981	5.28599453	5.415284157	5.668488503	5.691361904	5.556513786	5.5435853	5.654974937
D_Sn	Post-Closure	Mean	7.37162E-05	7.28252E-05	7.30711E-05	6.98347E-05	6.76746E-05	7.0318E-05	7.22521E-05	7.55305E-05	7.5518E-05	7.35441E-05	7.27979E-05	7.36329E-05
D_Sr	Post-Closure	Mean	0.053714555	0.053419016	0.053833276	0.051659219	0.05212649	0.052816909	0.052937821	0.053969476	0.05428379	0.052638564	0.052289147	0.053180795
D_Ti	Post-Closure	Mean	0.001837085	0.001784335	0.001768733	0.001673201	0.001532712	0.001723737	0.001766247	0.001813869	0.001824116	0.00174546	0.001796857	0.001867975
D_Tl	Post-Closure	Mean	1.13572E-05	1.09484E-05	1.06729E-05	8.18355E-06	8.14936E-06	1.24034E-05	1.31639E-05	1.27755E-05	1.22534E-05	1.15172E-05	1.07975E-05	1.05027E-05
D_U	Post-Closure	Mean	0.00015703	0.000154575	0.000152986	0.000144305	0.000143732	0.000161582	0.000164999	0.000166306	0.000164711	0.000157996	0.000153152	0.000152423
D_V	Post-Closure	Mean	0.000938298	0.000960755	0.000986914	0.000886145	0.000792303	0.000812251	0.000841296	0.00086463	0.000883199	0.000862226	0.000854889	0.00087309
D_Zn	Post-Closure	Mean	0.001713501	0.001665533	0.001631961	0.001302625	0.001262712	0.001838199	0.001905506	0.001878708	0.00183386	0.00172771	0.001625642	0.001612296

Appendix A.2.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF D Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	13.81239414	5.616167068	2.04662776	0.709073544	0.210069031	0.061520733	0.020407101	0.007393378	0.002699801	0.001050562	0.000535846	0.000676893
NO3_N	Closure	Mean	13.62029076	13.71653748	12.0419569	10.34414768	8.149094582	5.217458725	4.469240665	3.990789413	3.622471809	3.307373285	2.952820778	2.75814414
NO2_N	Closure	Mean	0.10226576	0.097786322	0.095806569	0.081212334	0.063687444	0.041130472	0.036180992	0.032942094	0.030180361	0.027670808	0.024790574	0.023430843
Br	Closure	Mean	0.063785426	0.061495032	0.059471369	0.045892317	0.043769803	0.059262719	0.061842803	0.066510051	0.06782078	0.066914029	0.06771405	0.06626378
Cl	Closure	Mean	211.4684143	201.9482574	197.6702271	167.3587036	130.6409607	83.60172272	73.07338715	66.16087341	60.27300644	54.96326828	48.89004135	45.90018082
F	Closure	Mean	0.830125213	0.83000201	0.848256707	0.720707536	0.741883039	0.759965181	0.730980217	0.746562421	0.754168987	0.760875165	0.798097491	0.812002122
TDP	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Closure	Mean	2584.427979	2474.369629	2426.36084	2060.291504	1631.224854	1074.967651	948.3677979	870.5969849	803.6394653	742.760376	675.7196045	643.2365112
T_CN	Closure	Mean	0.000914003	1.36418E-05	7.26489E-05	0.000100532	6.70947E-06	1.02749E-06	4.18569E-07	2.97019E-07	3.60326E-07	5.66031E-06	2.45571E-05	3.77883E-05
WAD_CN	Closure	Mean	1.58095E-05	1.36418E-05	7.26489E-05	0.000100532	6.70947E-06	1.02749E-06	4.18569E-07	2.97019E-07	3.60326E-07	5.66031E-06	2.45571E-05	3.77883E-05
T_Ag	Closure	Mean	0.00162226	0.001612829	0.001621826	0.001420093	0.00152452	0.001476855	0.001399524	0.001411877	0.001411838	0.001416149	0.001495942	0.001507856
T_Al	Closure	Mean	0.002631	0.002631	0.002631	0.002595819	0.002574705	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Closure	Mean	0.007703767	0.007818379	0.007989149	0.007118342	0.007023309	0.00642882	0.006248404	0.006427914	0.006568348	0.006654245	0.006879853	0.007065911
T_B	Closure	Mean	0.081874378	0.082743257	0.085501395	0.073342554	0.069782443	0.068773761	0.067323186	0.070027485	0.072049208	0.073357061	0.075991914	0.078779608
T_Ba	Closure	Mean	0.002225	0.002225	0.002225	0.002192516	0.002183833	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
T_Bi	Closure	Mean	3.71529E-05	3.67885E-05	3.64064E-05	2.82452E-05	2.71141E-05	3.66205E-05	3.70877E-05	3.85811E-05	3.84768E-05	3.66785E-05	3.7014E-05	3.77652E-05
T_Be	Closure	Mean	0.00054662	0.000542397	0.000556842	0.000475678	0.000472219	0.000479918	0.00046772	0.000481807	0.000490637	0.000496484	0.000516962	0.000530715
T_Ca	Closure	Mean	461.0070801	443.413147	436.2243958	372.2971191	305.2893372	213.5636902	191.3994293	179.6620026	169.2247314	159.7111511	150.646347	145.8733215
T_Cd	Closure	Mean	0.008591588	0.008505181	0.008643528	0.0073005	0.007825973	0.008206299	0.007807009	0.007898293	0.007908421	0.007940906	0.008394456	0.008469552
T_Co	Closure	Mean	0.18201524	0.174162135	0.170600519	0.14480041	0.116983481	0.080131955	0.071102202	0.066000201	0.061518993	0.057485525	0.053608503	0.051463794
T_Cr	Closure	Mean	0.000235	0.000235	0.000235	0.000221521	0.000227351	0.000235	0.000235	0.000235	0.000234756	0.00023469	0.000235	0.000235
T_Cu	Closure	Mean	0.074070938	0.071245112	0.070037037	0.059696369	0.050637614	0.037579637	0.033913929	0.032175992	0.030579653	0.029161362	0.0282565	0.027540492
T_Fe	Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Closure	Mean	7.32525E-05	7.34787E-05	7.57695E-05	6.49331E-05	6.22701E-05	6.27276E-05	6.14558E-05	6.3561E-05	6.51001E-05	6.60972E-05	6.84394E-05	7.06996E-05
T_K	Closure	Mean	73.14743805	70.74783325	69.8897171	59.91107178	49.06712341	34.66479874	31.49774361	30.01659012	28.71823883	27.44500351	26.09023857	25.69089699
T_Li	Closure	Mean	0.04855964	0.048529379	0.049850244	0.042553656	0.042505387	0.042849191	0.041472003	0.042639833	0.043404676	0.043976352	0.045972355	0.047152087
T_Mg	Closure	Mean	5.56453371	5.515769482	5.543187141	4.855651855	4.709699154	3.996775389	3.778435469	3.784575224	3.777447462	3.77400136	3.833461046	3.852389336
T_Mn	Closure	Mean	1.17325449	1.156273961	1.175215483	0.99311012	1.066646576	1.118855715	1.065296054	1.078080177	1.079624534	1.084220648	1.146374941	1.156587005
T_Mo	Closure	Mean	0.099094205	0.095746621	0.094546661	0.081066646	0.066366099	0.046463609	0.042056613	0.03995749	0.038163859	0.036469329	0.034739152	0.034175634
T_Na	Closure	Mean	710.9414063	679.1987305	664.9986572	563.1742554	441.1803284	284.0102844	248.6346588	225.6397858	206.0199585	188.3374634	168.3082428	158.371109
T_Ni	Closure	Mean	0.018912354	0.018579217	0.018967813	0.016098278	0.016858794	0.017496374	0.016766164	0.017074808	0.017207732	0.017339149	0.018257683	0.018537078
T_P	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Closure	Mean	0.002288543	0.002282668	0.002300961	0.002019724	0.002146584	0.002073955	0.001975251	0.002001698	0.002007912	0.002017224	0.002125728	0.00214941
T_S	Closure	Mean	0.504710376	0.504376173	0.504475534	0.407165855	0.450879961	0.495780081	0.486213326	0.497442335	0.49991098	0.481892765	0.506440759	0.507932723
T_Sb	Closure	Mean	0.037395526	0.038794879	0.040442627	0.036256354	0.033398148	0.029008619	0.028908966	0.030504435	0.031940132	0.032827634	0.033595935	0.035419147
T_Se	Closure	Mean	0.004430301	0.004386324	0.004468655	0.003786051	0.003999612	0.004161324	0.003975383	0.004035422	0.004054565	0.004078736	0.004300663	0.004353963
T_Si	Closure	Mean	6.30384779	6.284558773	6.343678951	5.376859665	5.302340984	5.906296253	5.998717308	6.284852505	6.311618805	6.057538033	6.179656982	6.352344036
T_Sn	Closure	Mean	7.56372E-05	7.48121E-05	7.39645E-05	5.73726E-05	5.48905E-05	7.43729E-05	7.54129E-05	7.85584E-05	7.84205E-05	7.48685E-05	7.55627E-05	7.69551E-05
T_Sr	Closure	Mean	0.393991947	0.389193773	0.390495449	0.340885341	0.308792919	0.247537017	0.233585864	0.233009428	0.232089117	0.230494648	0.230741978	0.233031616
T_Ti	Closure	Mean	0.003458356	0.003354046	0.00334416	0.002787461	0.002462388	0.003593848	0.003699056	0.003743612	0.003687409	0.003409385	0.00352163	0.003611078
T_Tl	Closure	Mean	0.000962449	0.000953883	0.000973478	0.000825868	0.000863163	0.000891873	0.000855082	0.000870144	0.000876557	0.000883018	0.000929278	0.000943378
T_U	Closure	Mean	0.00556221	0.005524465	0.005554333	0.004862198	0.004994224	0.004658921	0.004421693	0.004443679	0.004434729	0.004431982	0.004615706	0.004646662
T_V	Closure	Mean	0.01338587	0.013260652	0.013635367	0.01165237	0.011606178	0.011771321	0.011406246	0.011740695	0.011962312	0.012120367	0.01265381	0.012990413
T_Zn	Closure	Mean	0.416080832	0.4077245	0.414555073	0.350447088	0.376880169	0.396461904	0.377385974	0.382005841	0.382640779	0.38431251	0.406397939	0.410109341
D_Ag	Closure	Mean	0.001622189	0.001612762	0.00162176	0.001420036	0.001524477	0.001472323	0.001395755	0.001407547	0.001407891	0.001412557	0.001492722	0.001504837
D_Al	Closure	Mean	0.002631	0.002631	0.002631	0.002542785	0.00255846	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Closure	Mean	0.007701979	0.007816683	0.007986732	0.007116977	0.00701414	0.00638198	0.006200283	0.006383012	0.006523842	0.006612996	0.006839238	0.007024813
D_B	Closure	Mean	0.081874378	0.082743257	0.085501395	0.073342554	0.069782443	0.068773761	0.067323186	0.070027485	0.072049208	0.073357061	0.075991914	0.078779608
D_Ba	Closure	Mean	0.002225	0.002225	0.002225	0.002190838	0.002183271	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225	0.002225
D_Bi	Closure	Mean	3.71529E-05	3.67885E-05	3.64064E-05	2.82452E-05	2.71141E-05	3.66205E-05	3.70877E-05	3.85811E-05	3.84768E-05	3.66785E-05	3.7014E-05	3.77652E-05
D_Be	Closure	Mean	0.00054662	0.000542397	0.000556842	0.000475678	0.000472219	0.000479918	0.00046772	0.000481807	0.000490637	0.000496484	0.000516962	0.000530715
D_Ca	Closure	Mean	461.007782	443.4083862	436.2140808	372.2754211	305.2911072	213.5656281	191.3842621	179.632431	169.1983795	159.6955414	150.5991058	145.829834
D_Cd	Closure	Mean	0.008591333	0.008504952	0.008643303	0.007300322	0.007825623	0.00820536	0.007806212	0.007897899	0.007908043	0.007940457	0.008394063	0.008469149
D_Co	Closure	Mean	0.18201521	0.174162105	0.170600504	0.144800246	0.116982423	0.08013121	0.071100362	0.065998562	0.061517496	0.057484169	0.053607304	0.051462669
D_Cr	Closure	Mean	0.000235	0.000235	0.000235	0.000220642	0.000227154	0.000235	0.000235	0.000235	0.000234723	0.000234606	0.000235	0.000235
D_Cu	Closure	Mean	0.074070834	0.071244478	0.07003355	0.059692025	0.050631117	0.037566591	0.033910058	0.032172527	0.030576481	0.029157648	0.028253239	0.02753745
D_Fe	Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Closure	Mean	7.3236E-05	7.34631E-05	7.57541E-05	6.49215E-05	6.22617E-05	6.29014E-05	6.14266E-05	6.35344E-05	6.50764E-05	6.60757E-05	6.84207E-05	7.06821E-05
D_K	Closure	Mean	73.14722443	70.74778748	69.88923645	59.91102982	49.0559082	34.66181946	31.49496841	30.01395226	28.71440887	27.44129944	26.08407211	25.68585396
D_Li	Closure	Mean	0.04855964	0.048529379	0.049850244	0.042553656	0.042505387	0.042849191	0.041472003	0.042639833	0.043404676	0.043976352	0.045972355	0.047152087
D_Mg	Closure	Mean	5.565002441	5.515944481	5.543166637	4.853598595	4.704980373	3.989971638	3.770016909	3.775419235	3.768460512	3.764982224	3.824147463	3.846504927
D_Mn	Closure	Mean	1.171281576	1.154402733	1.173382521	0.991607547	1.065474749	1.116173506	1.062576175	1.075497389	1.077160358	1.081903815	1.144275546	1.154574513
D_Mo	Closure	Mean	0.099093616	0.095743373	0.094541699	0.081061363	0.066359177	0.046455335	0.042047475	0.039950769	0.038156133	0.036462784	0.034730725	0.034167774
D_Na	Closure	Mean	710.9053345	679.1642456	664.9629517	563.1432495	441.1499939	283.9727783	248.5777893	225.5884399	205.9692383	188.2912903	168.2604828	158.3171997
D_Ni	Closure	Mean	0.018911207	0.01857817	0.01896679	0.016097393	0.016855568	0.017494071	0.016764166	0.017073026	0.017206112	0.017337682	0.018256389	0.018535864
D_P	Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Closure	Mean	0.002288407	0.002282538	0.002300834	0.002019614	0.002146501	0.002065159	0.001965966	0.001993293	0.002000249	0.002010251	0.002119479	0.00214355
D_S	Closure	Mean	0.423500597	0.426896065	0.429460943	0.339973271	0.381352395	0.439111143	0.433015376	0.444286942	0.441430032	0.426146954	0.424435079	0.429088533
D_Sb	Closure	Mean	0.037395526	0.038794879	0.040442627	0.036256354	0.033398148	0.029008619	0.028908966	0.030504435	0.031940132	0.032827634	0.033595935	0.035419147
D_Se	Closure	Mean	0.004423941	0.004379806	0.004461621	0.003780125	0.003996042	0.004160969	0.003972747	0.004033196	0.00405194	0.004075805	0.004295563	0.004347551
D_Si	Closure	Mean	6.123221874	6.105376244	6.156413555	5.221813202	5.13050127	5.687357903	5.789494514	6.083236694	6.11722517	5.882753372	6.006166458	6.177212715
D_Sn	Closure	Mean	7.56372E-05	7.48121E-05	7.39645E-05	5.73726E-05	5.48905E-05	7.43729E-05	7.54129E-05	7.85584E-05	7.84205E-05	7.48685E-05	7.55627E-05	7.69551E-05
D_Sr	Closure	Mean	0.393960238	0.389150113	0.390364707	0.340670615	0.308796614	0.247346386	0.233331308	0.232589722	0.231761798	0.230293721	0.23050645	0.233231902
D_Ti	Closure	Mean	0.002235057	0.00218573	0.002189925	0.001825362	0.001566326	0.002073405	0.002114701	0.002146112	0.002158367	0.002008378	0.002185947	0.002304746
D_Tl	Closure	Mean	0.000962449	0.000953883	0.000973478	0.000825868	0.000863163	0.000891873	0.000855082	0.000870144	0.000876557	0.000883018	0.000929278	0.000943378
D_U	Closure	Mean	0.005561915	0.005523837	0.005553339	0.004860892	0.004991149	0.004651912	0.004414374	0.00443639	0.004427673	0.004425495	0.004609292	0.004640223
D_V	Closure	Mean	0.013325457	0.0132056	0.013581604	0.011608612	0.011566923	0.011669777	0.011315994	0.011655105	0.01188164	0.012047006	0.012588283	0.012926659
D_Zn	Closure	Mean	0.41573289	0.407388449	0.414206535	0.350162148	0.376669556	0.396157146	0.377103031	0.381702513	0.382327288	0.3839854	0.406041861	0.40977788

Appendix A.2.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, TSF D Pond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.00121495	0.000989592	0.001111204	0.001080064	0.000849171	0.001612513	0.0023317	0.00155258	0.001495088	0.001107892	0.00111337	0.00116337
NO3_N	Post-Closure	Mean	0.05513617	0.055571627	0.055567615	0.047343243	0.039805595	0.039381266	0.047355305	0.04988113	0.053142048	0.052603718	0.050943039	0.052164003
NO2_N	Post-Closure	Mean	0.001907956	0.001944865	0.001930328	0.00150462	0.001229507	0.00149809	0.001610937	0.001738089	0.001722397	0.001688334	0.001738482	0.001824338
Br	Post-Closure	Mean	0.060516939	0.057467308	0.053852919	0.050114091	0.044977475	0.060607553	0.063721657	0.068519473	0.065025404	0.064080253	0.063562579	0.061353989
Cl	Post-Closure	Mean	0.69274497	0.695863426	0.680019557	0.540147126	0.454770416	0.578979671	0.613927126	0.659779847	0.648227394	0.633454621	0.648283899	0.669890165
F	Post-Closure	Mean	0.186083972	0.192341387	0.192325816	0.141946599	0.108751178	0.127618298	0.140739277	0.155875087	0.158198178	0.158569872	0.16613178	0.176006079
TDP	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000473682	0.000463908	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
SO4	Post-Closure	Mean	37.6566124	39.45521164	39.78821945	28.22249794	20.51511765	23.43763542	26.48151207	29.70697021	30.69170761	30.80208206	32.70286179	35.19559097
T_CN	Post-Closure	Mean	0.000235733	0.000193528	0.000206893	0.000554104	0.000388162	0.000351068	0.000296504	0.000241544	0.000240284	0.00024898	0.000241418	0.000209186
WAD_CN	Post-Closure	Mean	0.000235733	0.000193528	0.000206893	0.000554104	0.000388162	0.000351068	0.000296504	0.000241544	0.000240284	0.00024898	0.000241418	0.000209186
T_Ag	Post-Closure	Mean	5.1545E-05	5.31237E-05	5.31372E-05	3.90845E-05	3.09403E-05	3.85577E-05	4.15943E-05	4.51264E-05	4.49329E-05	4.45654E-05	4.60936E-05	4.88193E-05
T_Al	Post-Closure	Mean	0.002631	0.002631	0.002631	0.002604422	0.002430831	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
T_As	Post-Closure	Mean	0.002987029	0.003100696	0.003107003	0.002248901	0.001703735	0.00201443	0.002224596	0.002455567	0.002512181	0.002508011	0.002638017	0.002813822
T_B	Post-Closure	Mean	0.044045988	0.045777526	0.045857079	0.033003483	0.024889346	0.029383296	0.0325449	0.035954293	0.036841415	0.03677731	0.038760282	0.041426025
T_Ba	Post-Closure	Mean	0.00217511	0.002149147	0.002110103	0.001994086	0.001907931	0.002225	0.002197504	0.002225	0.002225	0.0021993	0.002198242	0.00218372
T_Bi	Post-Closure	Mean	3.59523E-05	3.51429E-05	3.36335E-05	2.96248E-05	2.74251E-05	3.75171E-05	3.7808E-05	3.86316E-05	3.71537E-05	3.48984E-05	3.51178E-05	3.54542E-05
T_Be	Post-Closure	Mean	0.000237894	0.000244712	0.000243487	0.000180469	0.000142146	0.000172255	0.000186832	0.000204737	0.000205747	0.000204312	0.000213142	0.000225627
T_Ca	Post-Closure	Mean	18.06640244	18.49241447	18.3562088	14.57724571	11.95917416	13.80940723	14.58740902	15.94137383	16.02976608	15.84753799	16.4537735	17.24503326
T_Cd	Post-Closure	Mean	0.000317911	0.000333469	0.000336568	0.000236759	0.000170136	0.000196412	0.000222742	0.000250121	0.000258391	0.000259078	0.000275286	0.000296783
T_Co	Post-Closure	Mean	0.001553677	0.001627584	0.001640736	0.001157577	0.000836854	0.000968239	0.00109513	0.001228179	0.001267823	0.001270431	0.001348377	0.00145176
T_Cr	Post-Closure	Mean	0.000227428	0.000224308	0.000218661	0.000201792	0.000186273	0.000234924	0.000230586	0.00023388	0.000229635	0.000222944	0.000227338	0.00022556
T_Cu	Post-Closure	Mean	0.00152939	0.001572554	0.001564707	0.001145426	0.000909735	0.001136944	0.001225176	0.001334804	0.001332419	0.001321765	0.001371914	0.001450764
T_Fe	Post-Closure	Mean	0.00203	0.00203	0.00203	0.00203	0.001965657	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
T_Hg	Post-Closure	Mean	3.54037E-05	3.67775E-05	3.68615E-05	2.63124E-05	1.97989E-05	2.39816E-05	2.65595E-05	2.91503E-05	2.97634E-05	2.96877E-05	3.11726E-05	3.33035E-05
T_K	Post-Closure	Mean	7.218650341	7.503866196	7.514146328	5.348986626	3.929877281	4.630998135	5.232674599	5.814954758	5.971539974	5.978621006	6.320917606	6.778196335
T_Li	Post-Closure	Mean	0.014879286	0.01558584	0.015712833	0.011100004	0.008040426	0.009301684	0.010506989	0.011768501	0.012146683	0.012170835	0.012917321	0.013906408
T_Mg	Post-Closure	Mean	2.008355379	2.016679287	1.975398302	1.745653391	1.522142291	1.817192554	1.831347823	1.933912158	1.922817945	1.858594775	1.90127492	1.94937551
T_Mn	Post-Closure	Mean	0.044823524	0.04660419	0.046743661	0.033226762	0.024861367	0.03006576	0.033362754	0.036782727	0.037651919	0.037567899	0.039385937	0.042133603
T_Mo	Post-Closure	Mean	0.004571103	0.004774769	0.004804412	0.003453181	0.002566913	0.002935391	0.003279881	0.003650551	0.003764088	0.003773174	0.003989029	0.004281771
T_Na	Post-Closure	Mean	3.416541338	3.431922436	3.355199575	2.834107161	2.439721107	2.987630606	3.067159176	3.267916918	3.240011692	3.131738901	3.208096504	3.309166908
T_Ni	Post-Closure	Mean	0.002861607	0.002981216	0.002992732	0.002139895	0.001591791	0.001871821	0.002087954	0.002316595	0.002378671	0.002376291	0.002508508	0.002686519
T_P	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000472255	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
T_Pb	Post-Closure	Mean	0.000209736	0.000216947	0.000216816	0.000156621	0.000120897	0.000147667	0.000161479	0.000176891	0.000178982	0.000178095	0.000186162	0.000198004
T_S	Post-Closure	Mean	0.486846477	0.48304686	0.467345715	0.447924048	0.409903973	0.502601445	0.490720093	0.496337146	0.485128731	0.460279673	0.48130092	0.480123132
T_Sb	Post-Closure	Mean	0.026441241	0.027786428	0.028076714	0.019678488	0.014037914	0.01605746	0.018293267	0.020622766	0.021354206	0.021433404	0.022837201	0.024646608
T_Se	Post-Closure	Mean	0.000465955	0.000485275	0.000488573	0.000352203	0.000264194	0.000308984	0.000342824	0.000378918	0.000388834	0.000388481	0.000409617	0.00043778
T_Si	Post-Closure	Mean	6.098164082	6.004529953	5.772338867	5.058794975	4.589274883	6.035424709	6.108952522	6.302004814	6.115631104	5.777085304	5.885257244	5.984698772
T_Sn	Post-Closure	Mean	7.31325E-05	7.14019E-05	6.82779E-05	6.02739E-05	5.57277E-05	7.61886E-05	7.69114E-05	7.87574E-05	7.57008E-05	7.12555E-05	7.16575E-05	7.22032E-05
T_Sr	Post-Closure	Mean	0.106820561	0.108851194	0.107731245	0.086796932	0.072024062	0.084948473	0.088962473	0.096472546	0.09670192	0.094904333	0.097954854	0.102315053
T_Ti	Post-Closure	Mean	0.003336005	0.003174686	0.002962793	0.002477702	0.00243966	0.003744223	0.003792453	0.003738616	0.003504449	0.003226953	0.00336234	0.003349602
T_Tl	Post-Closure	Mean	0.000138263	0.000144655	0.000145873	0.000103932	7.61443E-05	8.78124E-05	9.88636E-05	0.000110244	0.000113593	0.000113692	0.000120329	0.000129373
T_U	Post-Closure	Mean	0.00058965	0.000607948	0.000607089	0.00045442	0.000359001	0.000429792	0.000464942	0.000509136	0.000510783	0.000507883	0.000527876	0.000558891
T_V	Post-Closure	Mean	0.004567762	0.00477272	0.004804742	0.003412778	0.002513251	0.002958423	0.003307183	0.00367576	0.003775208	0.003774968	0.00398772	0.004279225
T_Zn	Post-Closure	Mean	0.017393824	0.018101512	0.018165452	0.013003886	0.009732079	0.011535679	0.012817171	0.014168178	0.014522766	0.014498305	0.015275757	0.016342752
D_Ag	Post-Closure	Mean	4.88603E-05	5.06503E-05	5.08406E-05	3.74482E-05	2.87173E-05	3.36726E-05	3.71609E-05	4.08086E-05	4.14775E-05	4.12967E-05	4.32157E-05	4.60685E-05
D_Al	Post-Closure	Mean	0.002631	0.002631	0.002631	0.002550456	0.002396628	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631	0.002631
D_As	Post-Closure	Mean	0.002926958	0.003043906	0.003054659	0.002204427	0.001655054	0.001937972	0.002151453	0.002383678	0.002446641	0.002445529	0.002576993	0.002753045
D_B	Post-Closure	Mean	0.044045988	0.045777526	0.045857079	0.033003483	0.024889346	0.029383296	0.0325449	0.035954293	0.036841415	0.03677731	0.038760282	0.041426025
D_Ba	Post-Closure	Mean	0.002172527	0.002143195	0.002103747	0.001985854	0.001903424	0.002225	0.002195903	0.002224227	0.002225	0.002194618	0.002193928	0.002179385
D_Bi	Post-Closure	Mean	3.59523E-05	3.51429E-05	3.36335E-05	2.96248E-05	2.74251E-05	3.75171E-05	3.7808E-05	3.86316E-05	3.71537E-05	3.48984E-05	3.51178E-05	3.54542E-05
D_Be	Post-Closure	Mean	0.000237894	0.000244712	0.000243487	0.000180469	0.000142146	0.000172255	0.000186832	0.000204737	0.000205747	0.000204312	0.000213142	0.000225627
D_Ca	Post-Closure	Mean	18.02056885	18.44390678	18.3009491	14.55665779	11.95303154	13.79974651	14.56247139	15.90629482	16.00228882	15.82231903	16.39894104	17.19800186
D_Cd	Post-Closure	Mean	0.000317136	0.000332724	0.000335863	0.000236058	0.00016933	0.000195116	0.000221654	0.000249206	0.000257486	0.000258154	0.000274445	0.000295983
D_Co	Post-Closure	Mean	0.001552722	0.001626703	0.001639811	0.001156316	0.000835485	0.000966666	0.001093525	0.001226762	0.0012665	0.001269204	0.001347336	0.001450761
D_Cr	Post-Closure	Mean	0.000226674	0.000223859	0.000217752	0.000192677	0.000178355	0.000231953	0.000230019	0.000233477	0.000227497	0.000219437	0.000225539	0.000225
D_Cu	Post-Closure	Mean	0.001524868	0.001566241	0.001557308	0.001138288	0.000901099	0.001128058	0.001218731	0.001328304	0.001327245	0.001316333	0.001367308	0.001446363
D_Fe	Post-Closure	Mean	0.00203	0.00203	0.00203	0.002023924	0.001930081	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203	0.00203
D_Hg	Post-Closure	Mean	3.54258E-05	3.67975E-05	3.68807E-05	2.63276E-05	1.9859E-05	2.40595E-05	2.65948E-05	2.91832E-05	2.97841E-05	2.97102E-05	3.11939E-05	3.3324E-05
D_K	Post-Closure	Mean	7.214758396	7.500115871	7.511016846	5.339771748	3.919173002	4.626745224	5.229561806	5.811477661	5.967651844	5.9747715	6.315462589	6.773753166
D_Li	Post-Closure	Mean	0.014879286	0.01558584	0.015712833	0.011100004	0.008040426	0.009301684	0.010506989	0.011768501	0.012146683	0.012170835	0.012917321	0.013906408
D_Mg	Post-Closure	Mean	2.014777899	2.022761106	1.97951448	1.747056961	1.522676229	1.8178581	1.831406951	1.934226632	1.923319101	1.859302282	1.902646422	1.954416513
D_Mn	Post-Closure	Mean	0.042175047	0.044088107	0.044382647	0.031380527	0.02284674	0.026624976	0.030014288	0.033586089	0.034644596	0.03468696	0.036715608	0.039484221
D_Mo	Post-Closure	Mean	0.004548184	0.004750656	0.004780756	0.003433559	0.002548727	0.002912696	0.003258183	0.003629218	0.003743301	0.003753446	0.003967711	0.00426012
D_Na	Post-Closure	Mean	3.353140354	3.371139526	3.298186541	2.786542177	2.395897865	2.926494837	2.994115591	3.198862791	3.17515564	3.072614193	3.145264387	3.244949341
D_Ni	Post-Closure	Mean	0.002860599	0.00298029	0.002991801	0.002137615	0.001588944	0.001869725	0.002086232	0.00231506	0.002377264	0.00237497	0.002507426	0.002685467
D_P	Post-Closure	Mean	0.000474	0.000474	0.000474	0.000474	0.000472744	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474	0.000474
D_Pb	Post-Closure	Mean	0.000204524	0.000212146	0.000212358	0.000153445	0.000116359	0.000138184	0.000152873	0.00016851	0.000172274	0.00017175	0.000180576	0.000192664
D_S	Post-Closure	Mean	0.407923192	0.408999681	0.400257438	0.386458308	0.356668711	0.446456373	0.438184619	0.442670554	0.429683268	0.405310005	0.398988187	0.399978042
D_Sb	Post-Closure	Mean	0.026441241	0.027786428	0.028076714	0.019678488	0.014037914	0.01605746	0.018293267	0.020622766	0.021354206	0.021433404	0.022837201	0.024646608
D_Se	Post-Closure	Mean	0.000454832	0.000474032	0.000477946	0.0003448	0.000258782	0.000302355	0.000335604	0.00037131	0.000380864	0.000380359	0.000399079	0.000426877
D_Si	Post-Closure	Mean	5.925273418	5.8346138	5.613687992	4.900352955	4.429487228	5.807952881	5.896183968	6.103084564	5.934051037	5.614360332	5.724635601	5.817657471
D_Sn	Post-Closure	Mean	7.31325E-05	7.14019E-05	6.82779E-05	6.02739E-05	5.57277E-05	7.61886E-05	7.69114E-05	7.87574E-05	7.57008E-05	7.12555E-05	7.16575E-05	7.22032E-05
D_Sr	Post-Closure	Mean	0.106712468	0.108648255	0.107403278	0.086656876	0.071942411	0.084541261	0.088473126	0.095876925	0.096229434	0.094501145	0.097596325	0.102177501
D_Ti	Post-Closure	Mean	0.002130566	0.002014042	0.001869387	0.001495111	0.001426731	0.002152228	0.00216404	0.002152321	0.002053702	0.001913351	0.002156988	0.002149344
D_Tl	Post-Closure	Mean	0.000138263	0.000144655	0.000145873	0.000103932	7.61443E-05	8.78124E-05	9.88636E-05	0.000110244	0.000113593	0.000113692	0.000120329	0.000129373
D_U	Post-Closure	Mean	0.000575702	0.000594281	0.000593833	0.000442684	0.000347398	0.000414039	0.000449476	0.000492871	0.000495996	0.000494023	0.000514205	0.000545092
D_V	Post-Closure	Mean	0.004514567	0.004723805	0.004759388	0.003375799	0.002464997	0.002870191	0.00322521	0.003600362	0.003707553	0.003711612	0.003931675	0.004224646
D_Zn	Post-Closure	Mean	0.01635086	0.017075097	0.017188776	0.012232573	0.009006904	0.010557611	0.011827081	0.013146048	0.013508575	0.013498893	0.014252986	0.015315985

Appendix A.2.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Mill

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Br	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
F	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.2.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Mill

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Br	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
F	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.2.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Pit Lake

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	3.307762146	3.310221672	3.293625116	3.266459942	3.187980652	2.999519587	2.821160793	2.648283243	2.490595818	2.477468967	2.478932381	2.481892109
NO3_N	Closure	Mean	6.193262577	6.171216488	6.173353672	6.157645702	6.056473732	6.190040112	6.288513184	6.377994061	6.463778496	6.372166634	6.309289455	6.24698782
NO2_N	Closure	Mean	0.03705791	0.036990717	0.036841657	0.036807496	0.036765654	0.03725899	0.037312511	0.037404068	0.037452139	0.037276406	0.037245035	0.037143055
Br	Closure	Mean	0.040951934	0.040969223	0.040954247	0.040888634	0.040928461	0.041163832	0.041253794	0.041390177	0.041504655	0.041583128	0.041712452	0.041738253
Cl	Closure	Mean	89.34023285	89.49040222	89.42465973	88.89177704	87.67910004	88.67612457	88.87798309	89.17847443	89.43135071	89.17921448	89.29377747	89.26590729
F	Closure	Mean	0.766222537	0.763725519	0.757281184	0.748819351	0.73486501	0.745387971	0.748894691	0.74861753	0.7480793	0.744774044	0.74498421	0.742276132
TDP	Closure	Mean	0.029227043	0.029109197	0.028986884	0.028760292	0.028592506	0.029298505	0.029731812	0.029685702	0.029621476	0.029567888	0.029563051	0.029382603
SO4	Closure	Mean	1352.309204	1353.275635	1353.231689	1361.782959	1350.504028	1360.906006	1361.046387	1361.556885	1361.931519	1355.475586	1355.094604	1352.783325
T_CN	Closure	Mean	0.010667288	0.010557864	0.010407038	0.010240683	0.009942502	0.009781721	0.009651773	0.009520697	0.009423181	0.009293795	0.009225065	0.009167411
WAD_CN	Closure	Mean	0.000732906	0.000724429	0.000711924	0.000697475	0.000678499	0.000673589	0.000663714	0.000651765	0.000648818	0.000642806	0.000644299	0.000642529
T_Ag	Closure	Mean	0.000868995	0.000871436	0.000872473	0.000869597	0.000863343	0.000864483	0.000863888	0.000866093	0.000868079	0.000866897	0.000868405	0.000868274
T_Al	Closure	Mean	0.138663933	0.134993613	0.131337896	0.127202779	0.12162444	0.119158484	0.116174415	0.112927713	0.11062748	0.107910477	0.105845831	0.103847697
T_As	Closure	Mean	0.034770995	0.03413555	0.033447098	0.032656875	0.031697225	0.031955373	0.031869315	0.03141351	0.03099658	0.030556526	0.030255374	0.029856423
T_B	Closure	Mean	0.281950116	0.277309746	0.271972835	0.265790612	0.257896662	0.256807715	0.254454464	0.251491636	0.248753458	0.245270431	0.243198305	0.240967333
T_Ba	Closure	Mean	0.005033062	0.004989509	0.004919596	0.004837709	0.004727154	0.004764972	0.004760229	0.004717208	0.004692015	0.004655228	0.004652024	0.004629334
T_Bi	Closure	Mean	1.88034E-05	1.88062E-05	1.87939E-05	1.87552E-05	1.87204E-05	1.87583E-05	1.87513E-05	1.87649E-05	1.87824E-05	1.87749E-05	1.87878E-05	1.87915E-05
T_Be	Closure	Mean	0.001804781	0.00176913	0.001731147	0.001687954	0.001634539	0.001637256	0.001627669	0.001603527	0.001581733	0.001557979	0.001541785	0.001522156
T_Ca	Closure	Mean	276.5958252	277.1136475	278.4077454	279.1481018	276.1009521	277.9311523	277.932251	277.9766846	278.0589905	276.8051758	276.8738708	276.5221863
T_Cd	Closure	Mean	0.047800425	0.046817325	0.045790773	0.044623278	0.043224975	0.043490428	0.043294586	0.042578198	0.041927885	0.041261856	0.040776439	0.040174458
T_Co	Closure	Mean	0.084631562	0.084628195	0.084450997	0.084349498	0.083726883	0.084897168	0.085161112	0.08524365	0.085293017	0.084940381	0.084938265	0.084724128
T_Cr	Closure	Mean	0.00197061	0.001924231	0.001876764	0.001822986	0.001765634	0.001793985	0.001794561	0.001763751	0.001735547	0.001708054	0.001687736	0.001659329
T_Cu	Closure	Mean	0.032473523	0.03254845	0.032537121	0.032347102	0.031908065	0.031938825	0.031992458	0.032173935	0.032326538	0.032300211	0.032408401	0.032419913
T_Fe	Closure	Mean	0.082070664	0.080115102	0.07809227	0.075792953	0.073229864	0.074133076	0.073559441	0.071977295	0.070915975	0.069715895	0.069006875	0.067952573
T_Hg	Closure	Mean	0.000236585	0.000232812	0.000228408	0.000223304	0.00021679	0.000215931	0.000213993	0.000211707	0.000209624	0.000206876	0.000205359	0.000203704
T_K	Closure	Mean	64.46071625	64.45223999	64.06821442	63.50654984	62.31172943	62.50627518	62.26448822	61.9492836	61.64352036	61.08148193	60.83057785	60.50167465
T_Li	Closure	Mean	0.121480495	0.119654313	0.117484622	0.11495436	0.111718476	0.111445546	0.110530935	0.109413579	0.108382933	0.107006043	0.106246457	0.105397783
T_Mg	Closure	Mean	11.28478909	11.20326996	11.07379723	10.91307068	10.66629982	10.70343971	10.65396595	10.55643845	10.46921825	10.3525486	10.29051304	10.21022797
T_Mn	Closure	Mean	4.280375004	4.187870979	4.092490196	3.983669996	3.862564802	3.91515708	3.911699533	3.850085497	3.792720318	3.735053778	3.69261837	3.635152578
T_Mo	Closure	Mean	0.058537513	0.059139546	0.059274994	0.059265222	0.058508709	0.058812894	0.058715001	0.058654834	0.058589917	0.058236223	0.058164056	0.058014132
T_Na	Closure	Mean	310.1672363	310.6236572	310.3487854	308.4455872	305.6383362	308.8206482	309.3448792	310.1825867	310.8936462	309.8889465	310.1751404	309.9850159
T_Ni	Closure	Mean	0.049826022	0.048983101	0.048044037	0.046970118	0.045564149	0.045576431	0.045289639	0.044692714	0.044164445	0.043566272	0.043183573	0.042721413
T_P	Closure	Mean	0.028858235	0.028739238	0.028613798	0.028387293	0.028211735	0.028912446	0.029354608	0.029310813	0.029243503	0.029203748	0.029196229	0.029014656
T_Pb	Closure	Mean	0.015675478	0.015377942	0.015060683	0.014700251	0.014237327	0.014251966	0.014157508	0.013925082	0.013718163	0.013501705	0.013347131	0.013165198
T_S	Closure	Mean	0.436604559	0.434148192	0.429281741	0.423135966	0.413535982	0.408974886	0.404874086	0.400785863	0.397937447	0.393707365	0.392723173	0.391066343
T_Sb	Closure	Mean	0.185342014	0.182270572	0.178743705	0.174646914	0.169478819	0.168741494	0.167074651	0.16501157	0.163092658	0.160686985	0.159208775	0.157658577
T_Se	Closure	Mean	0.003490676	0.003500594	0.00349974	0.003483668	0.00345602	0.003467641	0.003468511	0.003473897	0.003477866	0.003470165	0.003479282	0.003483378
T_Si	Closure	Mean	4.115674973	4.115317822	4.112724781	4.103228569	4.092202187	4.104287624	4.106377602	4.110718727	4.113797188	4.112965584	4.116092205	4.11555624
T_Sn	Closure	Mean	2.9072E-05	2.90882E-05	2.90826E-05	2.9039E-05	2.90132E-05	2.91148E-05	2.91324E-05	2.91898E-05	2.92364E-05	2.9253E-05	2.92975E-05	2.9318E-05
T_Sr	Closure	Mean	0.594302654	0.589716733	0.582517505	0.573440731	0.560854256	0.564148486	0.56176877	0.557272792	0.552969813	0.546834171	0.543644667	0.539402425
T_Ti	Closure	Mean	0.001421478	0.00142164	0.001420769	0.00141784	0.001414752	0.001419731	0.00141948	0.001421107	0.001422545	0.001422294	0.001423528	0.001423827
T_Tl	Closure	Mean	0.001103817	0.001098273	0.001087231	0.001073289	0.001050577	0.001054579	0.001052241	0.001049557	0.001047081	0.001040184	0.001038893	0.001035662
T_U	Closure	Mean	0.007375981	0.007350383	0.007287548	0.007205716	0.007059657	0.007099536	0.007085955	0.007053802	0.007025534	0.006972219	0.006953582	0.006920237
T_V	Closure	Mean	0.031191725	0.030687502	0.030103045	0.029426608	0.028567629	0.028480439	0.028247176	0.027953083	0.027681977	0.027324913	0.027125197	0.026901247
T_Zn	Closure	Mean	4.06241703	3.960710526	3.859491825	3.745211363	3.620297432	3.658386946	3.646322489	3.576947451	3.512770891	3.450217485	3.401866436	3.341043711
D_Ag	Closure	Mean	0.000867872	0.000870395	0.000871432	0.00086856	0.000862315	0.000863417	0.00086283	0.000865018	0.000866985	0.000865794	0.000867291	0.000867155
D_Al	Closure	Mean	0.135521188	0.131907135	0.128318295	0.124264233	0.118799046	0.116061233	0.113135837	0.109969869	0.107646033	0.104958758	0.10288348	0.100915864
D_As	Closure	Mean	0.034762386	0.034126714	0.033438195	0.032647964	0.03168828	0.031945784	0.031859681	0.031403624	0.030986182	0.030545915	0.030244322	0.029845167
D_B	Closure	Mean	0.281949848	0.277309477	0.271972597	0.265790373	0.257896453	0.256807506	0.254454255	0.251491427	0.248753265	0.245270237	0.243198082	0.240967125
D_Ba	Closure	Mean	0.005001715	0.004958369	0.004889083	0.004807831	0.004697851	0.004734108	0.00472958	0.004687305	0.004661184	0.004624232	0.004621088	0.0045991
D_Bi	Closure	Mean	1.88032E-05	1.88059E-05	1.87937E-05	1.87549E-05	1.87201E-05	1.8758E-05	1.8751E-05	1.87647E-05	1.87822E-05	1.87747E-05	1.87875E-05	1.87913E-05
D_Be	Closure	Mean	0.001804781	0.00176913	0.001731147	0.001687954	0.001634539	0.001637256	0.001627669	0.001603527	0.001581733	0.001557979	0.001541785	0.001522156
D_Ca	Closure	Mean	276.5921326	277.1123657	278.4062195	279.1462402	276.0994568	277.9294739	277.9304504	277.974884	278.0567627	276.8024597	276.8708496	276.5195313
D_Cd	Closure	Mean	0.047800235	0.046817139	0.04579059	0.044623103	0.0432248	0.043490235	0.043294396	0.042578008	0.041927688	0.041261669	0.040776253	0.040174268
D_Co	Closure	Mean	0.08463122	0.084627852	0.084450655	0.084349245	0.083726607	0.084896892	0.085160822	0.085243359	0.085292697	0.084940054	0.084937923	0.084723793
D_Cr	Closure	Mean	0.001966147	0.001919726	0.00187232	0.001818599	0.001761228	0.001789454	0.001790099	0.001759388	0.001731139	0.001703554	0.001683094	0.001654537
D_Cu	Closure	Mean	0.032471627	0.032546535	0.032535195	0.032345165	0.031906091	0.031936709	0.031990696	0.032172088	0.032324765	0.032298431	0.032406587	0.032418039
D_Fe	Closure	Mean	0.078311689	0.076418646	0.074472353	0.072268829	0.069791615	0.070417926	0.069914311	0.068432771	0.06733951	0.06618873	0.065482996	0.064438097
D_Hg	Closure	Mean	0.000236595	0.000232822	0.000228418	0.000223314	0.000216799	0.000215943	0.000214003	0.000211719	0.000209634	0.000206885	0.000205369	0.000203713
D_K	Closure	Mean	64.45925903	64.450737	64.06671906	63.50506973	62.31003189	62.50468063	62.2628212	61.94758224	61.64178467	61.07972336	60.8286972	60.49975967
D_Li	Closure	Mean	0.121480495	0.119654313	0.117484622	0.11495436	0.111718476	0.111445546	0.110530935	0.109413579	0.108382933	0.107006043	0.106246457	0.105397783
D_Mg	Closure	Mean	11.28332138	11.2018528	11.07245541	10.91175842	10.66495705	10.70202637	10.65252209	10.55494976	10.46762276	10.35087204	10.28874016	10.20839787
D_Mn	Closure	Mean	4.280023575	4.187513828	4.092130661	3.983309031	3.862207174	3.914768696	3.911310434	3.849685431	3.792296886	3.734619141	3.692167044	3.634691238
D_Mo	Closure	Mean	0.058536187	0.059138138	0.059273515	0.059263635	0.05850707	0.05881118	0.05871325	0.058653034	0.058588017	0.058234327	0.058162026	0.058012091
D_Na	Closure	Mean	310.1433411	310.5993347	310.3243408	308.4211731	305.6170044	308.7989197	309.3229675	310.1605225	310.8707886	309.8659668	310.1517639	309.9614563
D_Ni	Closure	Mean	0.049825564	0.048982643	0.048043586	0.046969675	0.045563657	0.045575947	0.045289144	0.044692207	0.044163924	0.043565746	0.04318304	0.042720877
D_P	Closure	Mean	0.032189947	0.032168996	0.032064561	0.0318483	0.031625371	0.032245364	0.03255548	0.032455228	0.032364927	0.032288261	0.032367595	0.03222632
D_Pb	Closure	Mean	0.015674205	0.015376661	0.015059404	0.014698978	0.014236079	0.014250576	0.014156139	0.013923669	0.013716694	0.013500211	0.01334561	0.013163659
D_S	Closure	Mean	0.428422421	0.424875379	0.419404149	0.412858754	0.402824312	0.397975236	0.393646359	0.389340043	0.386277229	0.381950557	0.380020887	0.378177196
D_Sb	Closure	Mean	0.185341969	0.182270527	0.17874366	0.174646884	0.169478789	0.16874145	0.167074621	0.16501154	0.163092628	0.160686955	0.15920873	0.157658547
D_Se	Closure	Mean	0.003489778	0.003499645	0.003498772	0.003482684	0.00345504	0.003466667	0.003467527	0.003472919	0.003476865	0.003469163	0.003478464	0.003482538
D_Si	Closure	Mean	4.036381245	4.036037445	4.033918858	4.02457571	4.013589859	4.025321484	4.02741909	4.031617641	4.03457737	4.033750057	4.036804676	4.036268711
D_Sn	Closure	Mean	2.9072E-05	2.90882E-05	2.90826E-05	2.9039E-05	2.90132E-05	2.91148E-05	2.91324E-05	2.91898E-05	2.92364E-05	2.9253E-05	2.92975E-05	2.9318E-05
D_Sr	Closure	Mean	0.594279408	0.58970046	0.582503736	0.573426783	0.560843706	0.564132869	0.561753094	0.557255447	0.552948654	0.546806574	0.543617249	0.539380491
D_Ti	Closure	Mean	0.000929831	0.000929941	0.000929359	0.000927436	0.000925105	0.000927765	0.000927325	0.000928038	0.000928752	0.000928337	0.000929088	0.000929385
D_Tl	Closure	Mean	0.001103817	0.001098273	0.001087231	0.001073289	0.001050577	0.001054579	0.001052241	0.001049557	0.001047082	0.001040184	0.001038894	0.001035662
D_U	Closure	Mean	0.007374708	0.007349072	0.007286219	0.007204372	0.007058288	0.007098088	0.007084489	0.007052293	0.007023943	0.006970579	0.006951876	0.006918501
D_V	Closure	Mean	0.031179948	0.030675557	0.030091073	0.029414656	0.028555742	0.028467452	0.028234247	0.027939718	0.027667984	0.027310546	0.027110349	0.026886165
D_Zn	Closure	Mean	4.062378407	3.960669994	3.859449863	3.745168209	3.620254517	3.658340454	3.646276236	3.576900005	3.512721777	3.450166225	3.401811361	3.340985537

Appendix A.2.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, Pit Lake

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.031452116	0.038094234	0.043891501	0.050387658	0.056327898	0.005	0.005	0.005	0.005	0.009817602	0.014574988	0.019259632
NO3_N	Post-Closure	Mean	4.190576077	4.183731556	4.176636219	4.162783146	4.150614262	4.19320488	4.191460609	4.19133091	4.191175938	4.184744835	4.180063248	4.175474644
NO2_N	Post-Closure	Mean	0.012415441	0.012399248	0.012381408	0.012343215	0.012296769	0.012275817	0.012262339	0.012251928	0.012240469	0.012224939	0.012214318	0.012204166
Br	Post-Closure	Mean	0.076399729	0.075890593	0.075885162	0.075836793	0.075869158	0.076077878	0.076192848	0.076278545	0.076319382	0.076340489	0.076433629	0.076408483
Cl	Post-Closure	Mean	42.70049667	42.69632721	42.68190765	42.60490036	42.49100876	42.44852066	42.42684174	42.42026138	42.41503525	42.39543915	42.39285278	42.39176941
F	Post-Closure	Mean	0.63153559	0.630074501	0.630026639	0.629564643	0.629029512	0.630454183	0.631393194	0.6316396	0.631584644	0.631460845	0.631816506	0.631608963
TDP	Post-Closure	Mean	0.091446787	0.090412974	0.090414837	0.090357497	0.090343505	0.090832233	0.09114977	0.091252923	0.091298535	0.091351725	0.091464914	0.091445677
SO4	Post-Closure	Mean	782.4453125	782.5813599	782.4968872	782.2667847	781.5526733	781.9668579	782.0645142	781.9960327	782.0142212	782.0491943	782.1039429	781.9414063
T_CN	Post-Closure	Mean	0.006805053	0.006808031	0.006807983	0.006808897	0.006804788	0.006806483	0.006806296	0.006806084	0.006805635	0.006804845	0.006805618	0.006804354
WAD_CN	Post-Closure	Mean	0.000664744	0.000663084	0.000663202	0.000662887	0.000662388	0.00066368	0.000664162	0.000664409	0.0006644	0.000664222	0.000664577	0.000664587
T_Ag	Post-Closure	Mean	0.000565738	0.000565458	0.000565058	0.000563789	0.000562118	0.000561567	0.000561279	0.000561117	0.000560944	0.000560573	0.000560422	0.00056027
T_Al	Post-Closure	Mean	0.036521338	0.036463864	0.03640439	0.036285896	0.036164291	0.036307938	0.0362917	0.036253013	0.036209416	0.036155492	0.036118478	0.036081392
T_As	Post-Closure	Mean	0.023417937	0.023360474	0.023361094	0.023346104	0.023325173	0.023370264	0.023402225	0.02341195	0.023411365	0.02340764	0.023422003	0.023417367
T_B	Post-Closure	Mean	0.175126508	0.175123245	0.175120026	0.175081283	0.174934834	0.175114676	0.175216436	0.175239116	0.175223202	0.175185829	0.175188169	0.175118923
T_Ba	Post-Closure	Mean	0.005125427	0.005106493	0.005106608	0.005103385	0.005099616	0.005112471	0.005120529	0.005123099	0.005123305	0.005122998	0.005126365	0.005125333
T_Bi	Post-Closure	Mean	1.87916E-05	1.87936E-05	1.87854E-05	1.8747E-05	1.87317E-05	1.87593E-05	1.87567E-05	1.87612E-05	1.87678E-05	1.87559E-05	1.87551E-05	1.87514E-05
T_Be	Post-Closure	Mean	0.001259617	0.001255251	0.001255137	0.001254194	0.001253225	0.001256811	0.001259099	0.001259663	0.001259591	0.001259454	0.001260238	0.001259792
T_Ca	Post-Closure	Mean	191.7879333	191.8222351	191.8204346	191.8081207	191.6534271	191.7454987	191.7721405	191.7817993	191.7774353	191.7646484	191.7840881	191.7312622
T_Cd	Post-Closure	Mean	0.023490028	0.023485765	0.023483695	0.023467261	0.023441568	0.023475861	0.023496764	0.023501877	0.023502761	0.023500912	0.023502229	0.023494877
T_Co	Post-Closure	Mean	0.049234796	0.049238391	0.049244568	0.049240939	0.049199637	0.049244169	0.049269151	0.049272541	0.049267028	0.049253456	0.04925517	0.049236976
T_Cr	Post-Closure	Mean	0.001698275	0.00168658	0.001686422	0.001685155	0.001684293	0.001691348	0.001695867	0.001697074	0.001697335	0.001697647	0.001699134	0.001698519
T_Cu	Post-Closure	Mean	0.019450691	0.019450404	0.019448787	0.019445192	0.019428307	0.019450162	0.01946274	0.019465063	0.019463943	0.019458514	0.019460836	0.019453526
T_Fe	Post-Closure	Mean	0.053964596	0.05363287	0.05362808	0.053588174	0.053558256	0.053795926	0.053916831	0.053947736	0.053949557	0.053951178	0.053991068	0.053972017
T_Hg	Post-Closure	Mean	0.000154228	0.000154246	0.000154237	0.000154212	0.000154081	0.000154218	0.000154285	0.000154295	0.000154289	0.000154266	0.000154275	0.00015422
T_K	Post-Closure	Mean	40.35613251	40.35850143	40.36040115	40.35764313	40.32400131	40.35695267	40.3752861	40.37839127	40.37308502	40.36499405	40.36367798	40.3481102
T_Li	Post-Closure	Mean	0.07638368	0.076388113	0.076386653	0.076366238	0.07630299	0.076377861	0.07641843	0.076424599	0.076420844	0.076407686	0.076412521	0.07638251
T_Mg	Post-Closure	Mean	6.816190243	6.815512657	6.814755917	6.811014175	6.804893494	6.813532352	6.818567276	6.819839001	6.819806576	6.818561554	6.819210529	6.817327023
T_Mn	Post-Closure	Mean	2.120052576	2.119759798	2.119630814	2.117964983	2.11564064	2.11882925	2.121119499	2.121564865	2.120883942	2.120398521	2.120892525	2.120319605
T_Mo	Post-Closure	Mean	0.037792187	0.03779861	0.037805066	0.037809007	0.037777793	0.037797872	0.03780869	0.037809886	0.037804052	0.037794448	0.037792802	0.037780214
T_Na	Post-Closure	Mean	149.1448212	149.130188	149.0797119	148.8112793	148.4157715	148.2679749	148.1924744	148.1697235	148.151825	148.0836029	148.0747833	148.0713196
T_Ni	Post-Closure	Mean	0.029672824	0.029668866	0.029666305	0.029646097	0.029615246	0.029658217	0.02968296	0.029688939	0.029689701	0.029686555	0.029687827	0.029678827
T_P	Post-Closure	Mean	0.090408914	0.089383587	0.089384928	0.089327395	0.089311413	0.089798957	0.090115234	0.090217762	0.090263531	0.090318017	0.090428196	0.090408511
T_Pb	Post-Closure	Mean	0.010433639	0.010395309	0.01039432	0.010386486	0.01037865	0.010409511	0.010429128	0.010433842	0.010433277	0.010432347	0.010438975	0.010435169
T_S	Post-Closure	Mean	0.421131939	0.419838965	0.419953108	0.419785321	0.41943872	0.419826448	0.4203327	0.420577586	0.420633465	0.420621604	0.420920521	0.420978785
T_Sb	Post-Closure	Mean	0.112239562	0.112250946	0.11225412	0.112238467	0.112142384	0.112237446	0.11228516	0.112290017	0.112286866	0.112267397	0.11227522	0.112233371
T_Se	Post-Closure	Mean	0.002557102	0.002556477	0.002555135	0.002549857	0.002542987	0.002541859	0.002541759	0.002542042	0.002542137	0.002541176	0.002541171	0.002541004
T_Si	Post-Closure	Mean	4.451314926	4.441847801	4.442110538	4.439418793	4.435518265	4.443173885	4.448301792	4.450088501	4.449960232	4.449109554	4.451669693	4.451002598
T_Sn	Post-Closure	Mean	2.94226E-05	2.94136E-05	2.93968E-05	2.93457E-05	2.93534E-05	2.93756E-05	2.93859E-05	2.94134E-05	2.94302E-05	2.94248E-05	2.9433E-05	2.94304E-05
T_Sr	Post-Closure	Mean	0.337047935	0.336755663	0.336734712	0.336490422	0.336158633	0.336722553	0.337107062	0.337199003	0.337138921	0.337031156	0.337184161	0.337079674
T_Ti	Post-Closure	Mean	0.001423741	0.001423818	0.001423228	0.001420289	0.001418623	0.001422172	0.001422043	0.001422486	0.001422652	0.001421637	0.001421421	0.001420917
T_Tl	Post-Closure	Mean	0.000753883	0.000753921	0.000753906	0.000753733	0.000753102	0.000753843	0.00075424	0.000754297	0.000754255	0.00075413	0.000754186	0.000753884
T_U	Post-Closure	Mean	0.004832624	0.004830022	0.004829613	0.00482602	0.004821156	0.004829321	0.004834645	0.00483571	0.004834618	0.004832913	0.004834916	0.00483325
T_V	Post-Closure	Mean	0.019753134	0.019753188	0.019752683	0.019747458	0.019731266	0.019751297	0.01976214	0.019764202	0.019763058	0.019759759	0.019760402	0.019751668
T_Zn	Post-Closure	Mean	1.836156726	1.836079597	1.835890889	1.834552288	1.832528353	1.835337281	1.837228775	1.837545276	1.837098837	1.83667171	1.837117553	1.836533308
D_Ag	Post-Closure	Mean	0.000564296	0.000564017	0.000563619	0.000562353	0.000560687	0.000560128	0.000559841	0.000559679	0.000559506	0.000559137	0.000558987	0.000558836
D_Al	Post-Closure	Mean	0.033529077	0.033476815	0.03342266	0.03331431	0.033197753	0.033288471	0.033272561	0.033236567	0.033196691	0.033147752	0.033113793	0.033079904
D_As	Post-Closure	Mean	0.023396341	0.023338849	0.023339473	0.023324499	0.023303593	0.023348644	0.023380594	0.023390323	0.023389747	0.023386037	0.023400396	0.023395767
D_B	Post-Closure	Mean	0.17512624	0.175123006	0.175119773	0.175081015	0.174934566	0.175114423	0.175216198	0.175238863	0.175222948	0.175185591	0.175187901	0.17511867
D_Ba	Post-Closure	Mean	0.005087631	0.005068765	0.005068884	0.005065688	0.005061946	0.005074637	0.005082676	0.005085248	0.005085471	0.005085189	0.005088551	0.005087531
D_Bi	Post-Closure	Mean	1.87914E-05	1.87933E-05	1.87852E-05	1.87468E-05	1.87314E-05	1.87591E-05	1.87564E-05	1.8761E-05	1.87676E-05	1.87556E-05	1.87549E-05	1.87511E-05
D_Be	Post-Closure	Mean	0.001259617	0.001255251	0.001255137	0.001254194	0.001253225	0.001256811	0.001259099	0.001259663	0.001259591	0.001259454	0.001260238	0.001259792
D_Ca	Post-Closure	Mean	191.7737427	191.808136	191.8063354	191.7940369	191.639389	191.7314606	191.7581024	191.767746	191.7633972	191.7506104	191.77005	191.7171631
D_Cd	Post-Closure	Mean	0.023489658	0.023485394	0.023483325	0.023466889	0.023441197	0.023475489	0.023496391	0.023501504	0.023502391	0.023500541	0.023501858	0.023494506
D_Co	Post-Closure	Mean	0.049234211	0.04923781	0.049243987	0.049240351	0.049199056	0.049243584	0.04926857	0.049271956	0.049266443	0.049252875	0.049254589	0.049236391
D_Cr	Post-Closure	Mean	0.001692088	0.001680393	0.001680236	0.001678973	0.001678114	0.001685152	0.00168967	0.001690877	0.001691141	0.001691458	0.001692944	0.001692331
D_Cu	Post-Closure	Mean	0.01944741	0.019447125	0.019445511	0.019441919	0.019425038	0.01944688	0.019459454	0.019461779	0.019460658	0.01945523	0.019457553	0.019450245
D_Fe	Post-Closure	Mean	0.049869929	0.049548481	0.049544081	0.049507193	0.049480733	0.049696181	0.049815878	0.049847052	0.049850732	0.049855102	0.049894374	0.049876757
D_Hg	Post-Closure	Mean	0.000154242	0.00015426	0.000154251	0.000154225	0.000154094	0.000154232	0.000154299	0.000154308	0.000154303	0.00015428	0.000154289	0.000154234
D_K	Post-Closure	Mean	40.3525238	40.35489273	40.35679626	40.35403442	40.32039642	40.35335159	40.37168121	40.37479019	40.36948013	40.36138153	40.36005783	40.34449387
D_Li	Post-Closure	Mean	0.07638368	0.076388113	0.076386653	0.076366238	0.07630299	0.076377861	0.07641843	0.076424599	0.076420844	0.076407686	0.076412521	0.07638251
D_Mg	Post-Closure	Mean	6.8147192	6.814040184	6.81328392	6.80954504	6.803424835	6.812059402	6.817093849	6.818365574	6.818333626	6.817089081	6.817737103	6.815855503
D_Mn	Post-Closure	Mean	2.119159937	2.118867636	2.118739843	2.117073298	2.114750147	2.11793685	2.12022686	2.120672226	2.119992018	2.119505882	2.120002031	2.119427919
D_Mo	Post-Closure	Mean	0.03778556	0.037791986	0.037798442	0.037802394	0.037771188	0.037791263	0.037802082	0.037803274	0.037797444	0.03778781	0.037786197	0.037773583
D_Na	Post-Closure	Mean	149.1099701	149.0953064	149.0448303	148.7764435	148.3809662	148.2330933	148.1575775	148.1347961	148.1168823	148.0486603	148.0398254	148.0363464
D_Ni	Post-Closure	Mean	0.029671943	0.029667985	0.029665422	0.029645216	0.029614367	0.029657336	0.029682077	0.029688057	0.029688818	0.029685672	0.029686948	0.029677948
D_P	Post-Closure	Mean	0.093024753	0.092005201	0.092006266	0.091946691	0.091928273	0.092418581	0.09273535	0.092837542	0.092882112	0.092934787	0.093045309	0.093024783
D_Pb	Post-Closure	Mean	0.010431131	0.010392801	0.010391812	0.010383979	0.010376147	0.010406999	0.010426616	0.010431331	0.010430766	0.010429838	0.010436464	0.010432659
D_S	Post-Closure	Mean	0.397724986	0.396378994	0.396495581	0.396346539	0.396022737	0.396395117	0.396890551	0.397137195	0.397203684	0.397207737	0.397501618	0.397568077
D_Sb	Post-Closure	Mean	0.112239517	0.112250909	0.112254076	0.112238429	0.112142347	0.112237401	0.112285115	0.112289973	0.112286821	0.11226736	0.112275176	0.112233326
D_Se	Post-Closure	Mean	0.002554336	0.002553708	0.002552363	0.002547088	0.002540221	0.002539091	0.002538988	0.002539269	0.002539363	0.002538403	0.002538397	0.002538229
D_Si	Post-Closure	Mean	4.387321949	4.377747059	4.378015518	4.375372887	4.37154007	4.379111767	4.384209156	4.385998726	4.385900497	4.385092735	4.387644291	4.386999607
D_Sn	Post-Closure	Mean	2.94226E-05	2.94136E-05	2.93968E-05	2.93457E-05	2.93534E-05	2.93756E-05	2.93859E-05	2.94134E-05	2.94302E-05	2.94248E-05	2.9433E-05	2.94304E-05
D_Sr	Post-Closure	Mean	0.337010413	0.336718321	0.3366974	0.33645311	0.33612144	0.336685002	0.337069511	0.337161481	0.33710137	0.336993635	0.33714664	0.337042153
D_Ti	Post-Closure	Mean	0.000929156	0.00092922	0.000928827	0.00092691	0.000925563	0.00092749	0.000927246	0.000927375	0.000927429	0.000926687	0.000926567	0.000926261
D_Tl	Post-Closure	Mean	0.000753883	0.000753921	0.000753906	0.000753733	0.000753102	0.000753843	0.00075424	0.000754297	0.000754255	0.00075413	0.000754186	0.000753884
D_U	Post-Closure	Mean	0.004828596	0.004825987	0.004825579	0.004821988	0.00481713	0.004825288	0.004830611	0.004831677	0.004830587	0.004828884	0.004830887	0.004829222
D_V	Post-Closure	Mean	0.019726846	0.019726915	0.019726425	0.019721227	0.019704962	0.019724943	0.019735781	0.01973795	0.019736711	0.019733431	0.019734079	0.019725325
D_Zn	Post-Closure	Mean	1.83592248	1.83584547	1.835656643	1.834318161	1.832294464	1.835102558	1.836994171	1.837310672	1.836864233	1.836437345	1.83688283	1.836298943

Appendix A.2.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, ECD

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	11.52377129	11.89871883	11.94237041	8.04749012	6.454274654	8.645795822	9.55327034	9.965320587	10.25649071	9.732995033	9.988446236	10.64280701
NO3_N	Closure	Mean	0.729657471	0.674263418	0.623547912	0.7648592	0.888085485	0.703710318	0.769939721	0.751149356	0.745795429	0.766012847	0.729388654	0.677873492
NO2_N	Closure	Mean	0.007190384	0.006678979	0.006068029	0.007937714	0.009287892	0.007295782	0.007954544	0.007765368	0.007706318	0.007957463	0.00760089	0.007040658
Br	Closure	Mean	0.002841101	0.002477626	0.003358687	0.013782077	0.016045485	0.00916086	0.007126943	0.005959141	0.005359903	0.006688045	0.004550288	0.003287943
Cl	Closure	Mean	118.7386093	122.5629272	123.7285461	85.30786896	68.67591858	90.57099915	100.4030914	104.7735748	107.9799728	103.3155746	105.7684402	112.1800613
F	Closure	Mean	0.505851924	0.495689571	0.481849521	0.450121015	0.455126464	0.455631226	0.506485522	0.514113486	0.52151829	0.518227935	0.516008139	0.518418908
TDP	Closure	Mean	0.006778494	0.005737162	0.005201104	0.007013943	0.009052986	0.009461248	0.005958307	0.008764276	0.007604823	0.008033355	0.007952024	0.007662037
SO4	Closure	Mean	2011.904663	2053.352051	2056.199219	1506.443115	1290.798584	1585.04248	1762.880859	1828.646118	1880.468994	1816.162354	1850.018799	1941.215698
T_CN	Closure	Mean	0.027214592	0.027917719	0.028105579	0.019438462	0.016162084	0.021050435	0.022814007	0.023819018	0.024448788	0.022996554	0.023624355	0.025167104
WAD_CN	Closure	Mean	0.000754901	0.000734379	0.000728238	0.001328746	0.00167282	0.001056104	0.000889579	0.000838855	0.00079153	0.00083232	0.000822619	0.000758499
T_Ag	Closure	Mean	0.000652289	0.000645109	0.000631004	0.000552353	0.000549161	0.000566063	0.000631277	0.00064398	0.000656683	0.000648858	0.000649808	0.000659373
T_Al	Closure	Mean	0.003335848	0.003252609	0.003270488	0.012883557	0.102981314	0.030969921	0.007291547	0.0053021	0.003508154	0.006519722	0.006252681	0.003498111
T_As	Closure	Mean	0.022732254	0.022721434	0.022559298	0.017170051	0.015739607	0.019053126	0.021392448	0.022005547	0.022387924	0.021309139	0.021958437	0.02271474
T_B	Closure	Mean	0.31074971	0.295770526	0.280082375	0.299256742	0.33353892	0.298064709	0.334131092	0.334584773	0.3376652	0.341530114	0.335370839	0.327230513
T_Ba	Closure	Mean	0.003563805	0.003508803	0.003495724	0.004369125	0.004183159	0.003719224	0.003662797	0.003690718	0.003600389	0.003619269	0.003615409	0.003585669
T_Bi	Closure	Mean	1.52468E-05	2.44791E-06	2.33221E-06	3.0237E-05	3.81517E-05	7.56858E-06	5.49859E-06	3.88399E-05	3.85175E-06	2.02506E-05	1.97771E-05	1.75578E-05
T_Be	Closure	Mean	0.00143949	0.001436731	0.001425145	0.001112627	0.001034904	0.001215686	0.001361134	0.00139929	0.001420812	0.001354375	0.001394624	0.001440211
T_Ca	Closure	Mean	483.2225952	491.2351685	491.1307983	366.5756531	317.0032959	384.8006592	428.8131104	444.5827026	457.2312317	442.9343872	451.4092102	473.2214661
T_Cd	Closure	Mean	0.028475482	0.028688101	0.028658997	0.019235713	0.015727844	0.022993388	0.025942437	0.026870986	0.027523709	0.026166854	0.027010076	0.0282019
T_Co	Closure	Mean	0.094158098	0.094768956	0.094597928	0.063561231	0.052646335	0.076364629	0.086125724	0.089131542	0.091224656	0.0867301	0.089511752	0.093357496
T_Cr	Closure	Mean	0.000388955	0.000374259	0.00037022	0.000358134	0.000387361	0.000426997	0.000431361	0.00042798	0.000421738	0.000419197	0.000422787	0.00040421
T_Cu	Closure	Mean	0.032790765	0.032809488	0.032601528	0.024178516	0.021977484	0.0272964	0.030697996	0.031608365	0.032201625	0.030626841	0.03157689	0.032723915
T_Fe	Closure	Mean	0.015531685	0.015827123	0.015940022	0.036221571	0.086203992	0.030439608	0.018363068	0.016640957	0.01535625	0.017958622	0.01701433	0.015374697
T_Hg	Closure	Mean	0.000266229	0.000251317	0.00023647	0.000260251	0.000296319	0.000260755	0.000292418	0.000291753	0.000293679	0.000298264	0.000292031	0.000282689
T_K	Closure	Mean	72.93527222	71.19617462	68.90942383	64.24954224	66.41048431	65.47740173	73.28076935	74.26709747	75.45796967	75.1727066	74.75991058	74.7937088
T_Li	Closure	Mean	0.133687228	0.126193598	0.118620515	0.131813169	0.149763167	0.130705535	0.146653906	0.146351516	0.147486955	0.14978607	0.146539241	0.141959518
T_Mg	Closure	Mean	10.05960655	9.812973976	9.527656555	9.293891907	9.194414139	9.188427925	10.19906425	10.2953186	10.41741467	10.36889744	10.30891323	10.31632519
T_Mn	Closure	Mean	0.884964406	0.886994421	0.882473767	0.6342026	0.564856529	0.731702924	0.823227465	0.848957062	0.865916729	0.823363364	0.849263549	0.881596982
T_Mo	Closure	Mean	0.073903054	0.073642246	0.072502553	0.060639318	0.057987358	0.062854625	0.07057777	0.072361566	0.073380232	0.071940742	0.072375342	0.074067563
T_Na	Closure	Mean	410.3061218	423.3936462	427.332428	295.0188599	237.8536377	313.223114	347.2260742	362.2223816	373.2548218	357.2601318	365.6835022	387.6968689
T_Ni	Closure	Mean	0.048216514	0.048167884	0.047808539	0.036353029	0.033382699	0.040350404	0.045365386	0.046668947	0.047492646	0.045166072	0.046562754	0.048194166
T_P	Closure	Mean	0.005434334	0.003254029	0.004436598	0.007948977	0.012662818	0.010840227	0.005525419	0.004935736	0.008187301	0.007045459	0.006492099	0.006135358
T_Pb	Closure	Mean	0.014458328	0.014596171	0.014604781	0.009792563	0.007954821	0.011572815	0.013064625	0.01355477	0.01390687	0.013222757	0.013651823	0.014286119
T_S	Closure	Mean	0.146342978	0.113172226	0.094234698	0.332639456	0.269651085	0.194189087	0.228027821	0.206378654	0.174626887	0.196528122	0.166811302	0.16882883
T_Sb	Closure	Mean	0.208167747	0.196661085	0.184983194	0.204659194	0.232085407	0.203028411	0.227876931	0.227554098	0.229321703	0.232811972	0.227845967	0.220870599
T_Se	Closure	Mean	0.003734281	0.003593643	0.003437899	0.003468023	0.003740822	0.003481779	0.003897954	0.003926306	0.00396945	0.003988184	0.003937566	0.003885804
T_Si	Closure	Mean	1.305921316	1.142547131	1.064266324	2.646878004	2.938160896	2.254176378	2.026483536	1.790321708	1.682644963	1.829991937	1.754531145	1.491768599
T_Sn	Closure	Mean	5.64549E-06	4.8973E-06	4.71574E-06	2.2674E-05	3.03982E-05	1.52167E-05	1.10786E-05	9.18087E-06	7.7789E-06	1.00835E-05	8.60736E-06	6.57589E-06
T_Sr	Closure	Mean	0.377250761	0.338193595	0.303629339	0.444086105	0.541500509	0.42117092	0.469471991	0.45920676	0.45595935	0.474503368	0.455048919	0.421149343
T_Ti	Closure	Mean	0.00028855	1.50555E-05	1.45187E-05	0.001089104	0.0023472	0.00068169	0.000164471	0.000858122	3.03659E-05	0.000599602	0.00052581	0.000331809
T_Tl	Closure	Mean	0.001188852	0.001146619	0.001098211	0.00109729	0.001176867	0.001102811	0.001234123	0.001243412	0.001259305	0.001264008	0.001249057	0.00123478
T_U	Closure	Mean	0.007387665	0.007306462	0.007144481	0.006265416	0.006189229	0.006428249	0.007164944	0.007307314	0.007445592	0.007356157	0.007367773	0.007470476
T_V	Closure	Mean	0.033780888	0.032026883	0.030253338	0.032792967	0.036922969	0.032745518	0.036699984	0.036656834	0.036964826	0.037438873	0.036717698	0.035707656
T_Zn	Closure	Mean	0.967006326	0.973160803	0.971320868	0.653120875	0.541438103	0.784851432	0.885018528	0.91576004	0.937179983	0.891050518	0.919584155	0.958920419
D_Ag	Closure	Mean	0.000652289	0.000645109	0.000631004	0.000552353	0.000549207	0.000566063	0.000631277	0.00064398	0.000656683	0.000648858	0.000649808	0.000659373
D_Al	Closure	Mean	0.003312581	0.003238863	0.003261686	0.009394393	0.073526531	0.026978251	0.00608714	0.004682282	0.003373208	0.005531781	0.005714787	0.003379323
D_As	Closure	Mean	0.022732254	0.022721367	0.022559386	0.017154936	0.015692713	0.019041078	0.02139111	0.022003405	0.022387655	0.021305745	0.021955667	0.022714524
D_B	Closure	Mean	0.31074971	0.295770526	0.280082375	0.299256742	0.33353892	0.298064709	0.334131092	0.334584773	0.3376652	0.341530114	0.335370839	0.327230513
D_Ba	Closure	Mean	0.003563083	0.003507625	0.003494946	0.004302189	0.003967696	0.00364239	0.003645222	0.00368865	0.003601621	0.003602641	0.003602605	0.003585317
D_Bi	Closure	Mean	1.52468E-05	2.44791E-06	2.33221E-06	3.0237E-05	3.81517E-05	7.56858E-06	5.49859E-06	3.88399E-05	3.85175E-06	2.02506E-05	1.97771E-05	1.75578E-05
D_Be	Closure	Mean	0.00143949	0.001436731	0.001425145	0.001112627	0.001034904	0.001215686	0.001361134	0.00139929	0.001420812	0.001354375	0.001394624	0.001440211
D_Ca	Closure	Mean	483.227417	491.2402039	491.1349182	366.6143188	317.0062561	384.7861023	428.8088074	444.5874634	457.2380676	442.9179688	451.4140015	473.2265015
D_Cd	Closure	Mean	0.028475482	0.028688101	0.028658997	0.019235212	0.015726922	0.022993375	0.025942646	0.026870975	0.027523676	0.026166849	0.027010048	0.028201921
D_Co	Closure	Mean	0.094158098	0.094768956	0.094597913	0.063559398	0.052646335	0.076363057	0.086125724	0.089131542	0.091224656	0.0867301	0.089511752	0.093357496
D_Cr	Closure	Mean	0.000388745	0.000374189	0.000370078	0.000339668	0.000368259	0.00042092	0.000427015	0.000426628	0.000420513	0.000415312	0.000419704	0.000404078
D_Cu	Closure	Mean	0.032790709	0.032809246	0.032601353	0.024172703	0.021967491	0.027305836	0.030697996	0.031608365	0.032201368	0.030626841	0.03157689	0.032723915
D_Fe	Closure	Mean	0.015501437	0.01579907	0.015919685	0.027483193	0.054140352	0.024867835	0.017277591	0.016195823	0.015068779	0.016862256	0.016374102	0.015221081
D_Hg	Closure	Mean	0.000266229	0.000251317	0.00023647	0.000260251	0.000296519	0.000260563	0.000292418	0.000291753	0.000293679	0.000298264	0.000292031	0.000282689
D_K	Closure	Mean	72.93528748	71.1961441	68.9094696	64.22871399	66.41625977	65.47740173	73.28063202	74.26644897	75.457901	75.17081451	74.76035309	74.79368591
D_Li	Closure	Mean	0.133687228	0.126193598	0.118620515	0.131813169	0.149763167	0.130705535	0.146653906	0.146351516	0.147486955	0.14978607	0.146539241	0.141959518
D_Mg	Closure	Mean	10.05958271	9.812960625	9.527430534	9.288072586	9.190308571	9.185516357	10.19819832	10.29502296	10.41720581	10.3680563	10.31085777	10.31677055
D_Mn	Closure	Mean	0.884959579	0.886993885	0.882472515	0.633981764	0.562647462	0.731100678	0.823131442	0.848888755	0.865892887	0.823312461	0.849223256	0.881586611
D_Mo	Closure	Mean	0.073902816	0.073642105	0.072502434	0.060634125	0.057983231	0.062851712	0.070578553	0.072360605	0.073380359	0.071939074	0.072375305	0.074067309
D_Na	Closure	Mean	410.2827759	423.3693848	427.3079834	294.9907227	237.8200836	313.1781311	347.2062378	362.1996155	373.2331238	357.2351074	365.6556396	387.6738892
D_Ni	Closure	Mean	0.048216514	0.048167884	0.047808528	0.03634838	0.033382699	0.040350404	0.045365386	0.046668947	0.047492646	0.045166072	0.046562754	0.048194166
D_P	Closure	Mean	0.005476002	0.003277347	0.004449241	0.009520285	0.015665529	0.011653479	0.00628709	0.007003594	0.008381222	0.013174293	0.011393118	0.00621857
D_Pb	Closure	Mean	0.014458328	0.014596171	0.014604781	0.009792563	0.00794409	0.011572815	0.013064625	0.01355477	0.01390687	0.013222757	0.013651823	0.014286119
D_S	Closure	Mean	0.146342978	0.113128223	0.094361126	0.303969055	0.263071567	0.193815723	0.2276005	0.200945303	0.174441367	0.172004059	0.166811302	0.167332888
D_Sb	Closure	Mean	0.208167747	0.196661085	0.184983194	0.204659194	0.232085407	0.203028411	0.227876931	0.227554098	0.229321703	0.232811972	0.227845967	0.220870599
D_Se	Closure	Mean	0.003734227	0.003593596	0.003437877	0.003469652	0.003743131	0.00347933	0.003898041	0.003926023	0.003969314	0.003986586	0.0039364	0.003885764
D_Si	Closure	Mean	1.305153489	1.142014027	1.064246178	2.551109791	2.832382679	2.236110005	2.024769068	1.786599994	1.682952881	1.824172139	1.748769164	1.48895967
D_Sn	Closure	Mean	5.64549E-06	4.8973E-06	4.71574E-06	2.2674E-05	3.03982E-05	1.52167E-05	1.10786E-05	9.18087E-06	7.7789E-06	1.00835E-05	8.60736E-06	6.57589E-06
D_Sr	Closure	Mean	0.377249599	0.338187128	0.303618103	0.444397718	0.541266203	0.421066165	0.469369113	0.459230602	0.455982983	0.474470109	0.455337018	0.421157211
D_Ti	Closure	Mean	0.000285438	1.49529E-05	1.43606E-05	0.000726375	0.001523816	0.000339513	0.000100696	0.000845345	2.81044E-05	0.000586325	0.00052581	0.000330875
D_Tl	Closure	Mean	0.001188852	0.001146619	0.001098211	0.00109729	0.001176867	0.001102811	0.001234123	0.001243412	0.001259305	0.001264008	0.001249057	0.00123478
D_U	Closure	Mean	0.007387634	0.007306433	0.007144431	0.006261576	0.006183558	0.006426682	0.007164554	0.007307117	0.007445571	0.007355736	0.00736745	0.007470422
D_V	Closure	Mean	0.033780888	0.032026883	0.03025331	0.032779001	0.036839839	0.032740332	0.03669782	0.036655601	0.036964826	0.037438873	0.036716077	0.035707656
D_Zn	Closure	Mean	0.967004597	0.973159075	0.97132057	0.652998745	0.541258693	0.784810543	0.884974658	0.915735304	0.937166512	0.890981734	0.919584155	0.958914936

Appendix A.2.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, ECD

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	6.483479977	6.52410841	6.505076885	4.405587196	3.449599743	5.064426422	5.712395191	5.923326015	6.062749863	5.749831676	5.913808823	6.165093422
NO3_N	Post-Closure	Mean	0.392878622	0.32990092	0.305928886	0.23409453	0.261412472	0.412609011	0.453212768	0.442587048	0.427877843	0.407189399	0.412660897	0.394277632
NO2_N	Post-Closure	Mean	0.004129472	0.003459552	0.003183741	0.002669371	0.002976457	0.004445203	0.004748319	0.004626178	0.004458031	0.00426812	0.004343957	0.004136368
Br	Post-Closure	Mean	0.000927664	0.000783967	0.001833715	0.012869091	0.014993564	0.006872869	0.004424707	0.003340383	0.002898384	0.004514736	0.002105083	0.000948704
Cl	Post-Closure	Mean	67.77854919	68.10688019	67.86347961	45.40277863	37.1149292	53.69844437	60.33904266	62.30830002	63.63403702	60.3033638	62.03598404	64.61128235
F	Post-Closure	Mean	0.483949512	0.470903695	0.462853789	0.331135392	0.293786198	0.425475299	0.473609239	0.481810451	0.485174656	0.462780863	0.475093603	0.484063745
TDP	Post-Closure	Mean	0.002674657	0.002340611	0.002172255	0.003903187	0.005217157	0.003679008	0.002339478	0.002985281	0.002665576	0.002956548	0.00278389	0.002679244
SO4	Post-Closure	Mean	1422.07605	1420.520386	1408.795654	948.2884521	791.1855469	1156.50647	1297.206055	1333.086548	1355.174561	1283.982178	1320.291138	1366.13855
T_CN	Post-Closure	Mean	0.015107865	0.01518762	0.015126983	0.01153397	0.009097018	0.012108627	0.01331033	0.013838702	0.014146069	0.013752255	0.013952876	0.014341495
WAD_CN	Post-Closure	Mean	0.000462549	0.000450629	0.000447067	0.00125022	0.001618284	0.000806463	0.000595269	0.00052624	0.000480361	0.000601168	0.000532564	0.000463281
T_Ag	Post-Closure	Mean	0.000648514	0.000637166	0.000628264	0.000432723	0.000382242	0.000558749	0.000624502	0.000638368	0.000645621	0.000614101	0.000632383	0.000648578
T_Al	Post-Closure	Mean	0.00334925	0.003226804	0.0032116	0.01288833	0.102974333	0.030971747	0.007298622	0.005309824	0.00351637	0.006526984	0.006259835	0.003506267
T_As	Post-Closure	Mean	0.022729615	0.022718897	0.022556702	0.015435182	0.013101921	0.019056143	0.021391975	0.022004243	0.022386728	0.021308323	0.021957671	0.022713892
T_B	Post-Closure	Mean	0.27477932	0.257968843	0.249767214	0.175763443	0.167635262	0.251010656	0.279612571	0.28148064	0.280394047	0.266875416	0.274021447	0.274877757
T_Ba	Post-Closure	Mean	0.002982942	0.002946501	0.002930969	0.004244866	0.004127512	0.003237632	0.003121608	0.003080579	0.003004677	0.003117448	0.003065062	0.002979619
T_Bi	Post-Closure	Mean	4.50044E-06	7.36974E-07	7.09011E-07	1.46093E-05	1.8731E-05	5.04179E-06	2.54375E-06	9.45441E-06	1.18555E-06	6.21033E-06	5.4692E-06	4.50716E-06
T_Be	Post-Closure	Mean	0.001440102	0.001436509	0.001424894	0.000984886	0.000845883	0.001215765	0.001360991	0.00139913	0.001420661	0.001354253	0.001394508	0.001440102
T_Ca	Post-Closure	Mean	377.3619385	376.73172	373.4655457	255.1773834	212.2219238	308.1272583	345.2625122	354.5205994	360.0877686	341.4704285	350.8601074	362.650238
T_Cd	Post-Closure	Mean	0.028475624	0.028690256	0.028663926	0.019248195	0.015746318	0.023002319	0.025947299	0.026874183	0.027526483	0.026169129	0.027012225	0.028204998
T_Co	Post-Closure	Mean	0.094151825	0.094772361	0.09460929	0.063597359	0.052241668	0.076388083	0.086135574	0.089135453	0.091226444	0.086730629	0.089511119	0.093362592
T_Cr	Post-Closure	Mean	0.000295275	0.00029106	0.00028835	0.000281917	0.000296184	0.000290067	0.000294323	0.000295547	0.000296724	0.000297045	0.000299045	0.000295714
T_Cu	Post-Closure	Mean	0.032786839	0.032806285	0.032598566	0.022124859	0.018767579	0.02730005	0.030696591	0.031605236	0.032198153	0.030623626	0.031573549	0.03272301
T_Fe	Post-Closure	Mean	0.014013654	0.013987978	0.01397193	0.036225386	0.086200617	0.030443935	0.018370669	0.016531879	0.01459328	0.01796647	0.016633077	0.014174979
T_Hg	Post-Closure	Mean	0.000233037	0.000216707	0.000208992	0.000147215	0.000143903	0.000215669	0.000239604	0.000240557	0.000238897	0.000227315	0.00023335	0.000233138
T_K	Post-Closure	Mean	70.05679321	67.86741638	66.55147552	45.80550003	41.06132889	61.31716919	68.62495422	69.82383728	70.28421021	66.83776855	68.77788544	70.06490326
T_Li	Post-Closure	Mean	0.115156911	0.106882386	0.102991045	0.072321095	0.07005769	0.106602386	0.118614487	0.119037062	0.118200608	0.112402834	0.115398109	0.115207873
T_Mg	Post-Closure	Mean	9.492095947	9.212156296	9.047970772	6.920138836	5.944105148	8.386254311	9.331873894	9.476317406	9.525812149	9.125387192	9.339856148	9.490389824
T_Mn	Post-Closure	Mean	0.885189295	0.887236238	0.882755399	0.596669793	0.501340151	0.732127428	0.823554575	0.849252939	0.866215527	0.823650658	0.84955436	0.881900966
T_Mo	Post-Closure	Mean	0.074012436	0.073267199	0.072444737	0.049455684	0.04250719	0.062850676	0.0705612	0.072342478	0.073361486	0.069763109	0.071880437	0.074011959
T_Na	Post-Closure	Mean	235.2969666	236.4296417	235.5698242	158.3284607	129.237915	186.654953	209.6544342	216.4256287	221.0062408	209.5438538	215.5253601	224.3951416
T_Ni	Post-Closure	Mean	0.048209887	0.04816132	0.047801457	0.032431286	0.027472798	0.040353868	0.04536121	0.046662319	0.047485635	0.045159709	0.046556298	0.048191365
T_P	Post-Closure	Mean	0.002295233	0.001633282	0.001949713	0.006704661	0.01136764	0.004352695	0.002601678	0.002173797	0.002796259	0.003181673	0.002506512	0.002315328
T_Pb	Post-Closure	Mean	0.01445884	0.014597974	0.014608338	0.009799368	0.007964508	0.011577873	0.013067649	0.013556886	0.013908695	0.013224226	0.013653193	0.014288311
T_S	Post-Closure	Mean	0.045240011	0.03361572	0.028194265	0.258607507	0.170163453	0.075234495	0.063101627	0.059999526	0.047583897	0.082548261	0.047426909	0.044788707
T_Sb	Post-Closure	Mean	0.17979309	0.167056933	0.161047339	0.112749882	0.108899415	0.166092679	0.184923247	0.185678944	0.184436381	0.175352648	0.180060923	0.179869324
T_Se	Post-Closure	Mean	0.003420922	0.003258883	0.003174931	0.002218058	0.002051006	0.003068558	0.003421065	0.003461388	0.003463392	0.003295754	0.003387023	0.003421603
T_Si	Post-Closure	Mean	0.666148245	0.547946632	0.513479292	2.305439234	2.525560856	1.410092354	1.042256474	0.87791127	0.756338954	1.002148628	0.890900731	0.668020427
T_Sn	Post-Closure	Mean	1.85533E-06	1.47337E-06	1.47133E-06	2.05072E-05	2.81257E-05	1.01728E-05	5.17892E-06	3.52576E-06	2.45398E-06	5.3105E-06	3.6262E-06	1.86473E-06
T_Sr	Post-Closure	Mean	0.252862483	0.211760551	0.194857359	0.168068409	0.181531772	0.266762584	0.291176736	0.283791512	0.273220628	0.262249947	0.266301841	0.253106296
T_Ti	Post-Closure	Mean	9.08694E-05	5.18615E-06	5.18531E-06	0.000804431	0.002074834	0.000681863	0.000164777	0.00028324	1.5777E-05	0.000364189	0.000281893	8.81333E-05
T_Tl	Post-Closure	Mean	0.001095684	0.001046161	0.001019923	0.000708939	0.000651002	0.000979806	0.001092439	0.001106069	0.001108014	0.001053715	0.001083437	0.001095962
T_U	Post-Closure	Mean	0.007320366	0.007192791	0.007091486	0.004904025	0.004291454	0.006307411	0.007052796	0.007207843	0.007288626	0.006936018	0.007141277	0.007320463
T_V	Post-Closure	Mean	0.029453639	0.027521987	0.02659942	0.018664328	0.017973701	0.02705857	0.030120304	0.030279549	0.030127294	0.028658673	0.029430244	0.029465353
T_Zn	Post-Closure	Mean	0.967259228	0.973436773	0.971684873	0.653704584	0.537679136	0.785345674	0.88540256	0.91609931	0.937512517	0.891358852	0.919891298	0.959231794
D_Ag	Post-Closure	Mean	0.000648514	0.000637165	0.000628264	0.000432723	0.000376722	0.000558749	0.000624502	0.000638367	0.000645621	0.0006141	0.000632383	0.000648577
D_Al	Post-Closure	Mean	0.003295765	0.003209921	0.00320066	0.009399065	0.073522545	0.026980169	0.006093724	0.004689378	0.003380681	0.005538494	0.005721323	0.003372274
D_As	Post-Closure	Mean	0.022729615	0.022718832	0.022556787	0.015416459	0.013048105	0.019044111	0.021390636	0.022002099	0.022386456	0.021304924	0.021954896	0.022713672
D_B	Post-Closure	Mean	0.27477932	0.257968843	0.249767214	0.175763443	0.167635262	0.251010656	0.279612571	0.28148064	0.280394047	0.266875416	0.274021447	0.274877757
D_Ba	Post-Closure	Mean	0.002981284	0.002945124	0.002930069	0.004144624	0.003896391	0.003142787	0.003097208	0.003077148	0.003006059	0.003093137	0.00304925	0.002979184
D_Bi	Post-Closure	Mean	4.50044E-06	7.36974E-07	7.09011E-07	1.46093E-05	1.8731E-05	5.04179E-06	2.54375E-06	9.45441E-06	1.18555E-06	6.21033E-06	5.4692E-06	4.50716E-06
D_Be	Post-Closure	Mean	0.001440102	0.001436509	0.001424894	0.000984886	0.000845883	0.001215765	0.001360991	0.00139913	0.001420661	0.001354253	0.001394508	0.001440102
D_Ca	Post-Closure	Mean	377.3541565	376.7237549	373.4563293	255.2070923	212.2155457	308.0989685	345.2450256	354.5134888	360.0827942	341.4385376	350.8525696	362.6422119
D_Cd	Post-Closure	Mean	0.028475624	0.028690256	0.028663926	0.019247696	0.0157454	0.023002306	0.025947504	0.026874172	0.027526449	0.026169121	0.027012197	0.028205018
D_Co	Post-Closure	Mean	0.094151825	0.094772361	0.094609275	0.063595526	0.052241668	0.076386511	0.086135574	0.089135453	0.091226444	0.086730629	0.089511119	0.093362592
D_Cr	Post-Closure	Mean	0.000294793	0.000290977	0.000288186	0.000259528	0.000271584	0.000283139	0.000289334	0.00029398	0.000295306	0.000292673	0.000295485	0.000295551
D_Cu	Post-Closure	Mean	0.032786787	0.032806043	0.032598391	0.022118762	0.018757027	0.027309472	0.030696588	0.031605236	0.032197904	0.030623626	0.031573549	0.03272301
D_Fe	Post-Closure	Mean	0.013944122	0.013954259	0.013947607	0.02748742	0.054140341	0.02487232	0.017284412	0.015921131	0.014226066	0.016869312	0.015841231	0.013985827
D_Hg	Post-Closure	Mean	0.000233037	0.000216707	0.000208992	0.000147215	0.000144114	0.000215441	0.000239604	0.000240557	0.000238897	0.000227315	0.00023335	0.000233138
D_K	Post-Closure	Mean	70.05682373	67.86737823	66.5515213	45.78374481	41.06752396	61.317173	68.62480164	69.82305145	70.28412628	66.83557892	68.77844238	70.06487274
D_Li	Post-Closure	Mean	0.115156911	0.106882386	0.102991045	0.072321095	0.07005769	0.106602386	0.118614487	0.119037062	0.118200608	0.112402834	0.115398109	0.115207873
D_Mg	Post-Closure	Mean	9.492041588	9.21213913	9.047714233	6.91547823	5.94192934	8.382921219	9.33097744	9.475995064	9.52556324	9.124645233	9.342227936	9.490926743
D_Mn	Post-Closure	Mean	0.885184228	0.887235522	0.882753849	0.596290171	0.498785704	0.731525898	0.823458493	0.849184513	0.866191566	0.823599577	0.849513829	0.881890416
D_Mo	Post-Closure	Mean	0.074011907	0.073267035	0.072444603	0.049448118	0.04249968	0.062847771	0.070561975	0.072341517	0.07336162	0.069760822	0.071880393	0.074011654
D_Na	Post-Closure	Mean	235.2556763	236.3877258	235.5279236	158.2846985	129.1881104	186.5887756	209.6166534	216.3844299	220.966217	209.5003204	215.4780884	224.3538666
D_Ni	Post-Closure	Mean	0.048209887	0.04816132	0.04780145	0.032426409	0.027472798	0.040353868	0.04536121	0.046662319	0.047485635	0.045159705	0.046556298	0.048191365
D_P	Post-Closure	Mean	0.002386158	0.001660097	0.001964401	0.008365121	0.014594593	0.005281037	0.003475796	0.004563918	0.003020717	0.010080108	0.008157543	0.002411669
D_Pb	Post-Closure	Mean	0.014458839	0.014597974	0.014608338	0.009799368	0.007953794	0.011577873	0.013067649	0.013556885	0.013908695	0.013224226	0.013653192	0.014288311
D_S	Post-Closure	Mean	0.045240011	0.033560071	0.028327616	0.228304207	0.16315487	0.074818917	0.062617451	0.05371752	0.047364611	0.054952469	0.047421005	0.043063018
D_Sb	Post-Closure	Mean	0.17979309	0.167056933	0.161047339	0.112749882	0.108899415	0.166092679	0.184923247	0.185678944	0.184436381	0.175352648	0.180060923	0.179869324
D_Se	Post-Closure	Mean	0.003420799	0.003258828	0.003174905	0.00221869	0.002051825	0.003065554	0.003421058	0.003461008	0.003463221	0.003293724	0.003385599	0.003421554
D_Si	Post-Closure	Mean	0.664383233	0.547305346	0.513438523	2.204047441	2.411839962	1.388091922	1.039271593	0.873017251	0.756664336	0.993900478	0.883767188	0.66456449
D_Sn	Post-Closure	Mean	1.85533E-06	1.47337E-06	1.47133E-06	2.05072E-05	2.81257E-05	1.01728E-05	5.17892E-06	3.52576E-06	2.45398E-06	5.3105E-06	3.6262E-06	1.86473E-06
D_Sr	Post-Closure	Mean	0.252859801	0.211752981	0.194844425	0.168347701	0.181207106	0.266632348	0.291046381	0.283819675	0.273249686	0.26220271	0.26665771	0.253115952
D_Ti	Post-Closure	Mean	8.40768E-05	4.93753E-06	4.87726E-06	0.000420937	0.001191256	0.000339645	9.28067E-05	0.000268398	1.30582E-05	0.00034934	0.000281771	8.69299E-05
D_Tl	Post-Closure	Mean	0.001095684	0.001046161	0.001019923	0.000708939	0.000651002	0.000979806	0.001092439	0.001106069	0.001108014	0.001053715	0.001083437	0.001095962
D_U	Post-Closure	Mean	0.007320297	0.007192758	0.007091427	0.004898853	0.004283752	0.006305451	0.007052208	0.007207567	0.007288595	0.006935343	0.007140881	0.007320398
D_V	Post-Closure	Mean	0.029453639	0.027521979	0.026599387	0.018649677	0.017886039	0.027052404	0.030117691	0.030278031	0.030127287	0.028658668	0.02942826	0.029465346
D_Zn	Post-Closure	Mean	0.96725744	0.973434985	0.971684515	0.653582513	0.537306726	0.785304844	0.885358691	0.916074514	0.937499106	0.891290069	0.919891119	0.95922631

Appendix A.2.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, WMPond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.004776664	0.005223815	0.005600054	0.003121782	0.004144704	0.005378794	0.005768903	0.006518086	0.01027214	0.01094641	0.012392081	0.01347055
NO3_N	Closure	Mean	0.099593841	0.150089487	0.180095121	0.103783324	0.082881689	0.111522384	0.17391625	0.305857897	0.536900282	0.597967625	0.686433196	0.746488154
NO2_N	Closure	Mean	0.001428058	0.001897271	0.002190485	0.001155537	0.001005701	0.001440164	0.001965693	0.003065761	0.00528567	0.005795223	0.006604264	0.007268711
Br	Closure	Mean	0.02608134	0.02380641	0.023846405	0.018652348	0.021802528	0.027640548	0.026321873	0.027862515	0.03601931	0.038956616	0.047873441	0.045597382
Cl	Closure	Mean	0.494996667	0.601137698	0.674708247	0.359825969	0.293062985	0.440223962	0.573674142	0.832362354	1.414814115	1.54826653	1.779110909	1.948941708
F	Closure	Mean	0.102317393	0.136887774	0.158445492	0.084615946	0.066657849	0.094702706	0.13727954	0.225459442	0.391508907	0.430709422	0.492044538	0.540084541
TDP	Closure	Mean	0.00488147	0.005978187	0.005825753	0.00249713	0.005190427	0.00756451	0.007559214	0.006434214	0.008624189	0.008369742	0.010201489	0.01036764
SO4	Closure	Mean	31.66619301	48.64306259	58.65024185	31.50003815	21.18655968	30.37453079	49.87039566	89.15918732	158.4413605	175.8209839	200.6042328	221.9590302
T_CN	Closure	Mean	0.002465731	0.002313863	0.002328101	0.001485461	0.001742169	0.002189574	0.002081935	0.002306396	0.002429627	0.002238556	0.002496767	0.002466775
WAD_CN	Closure	Mean	0.002465731	0.002313863	0.002328101	0.001485461	0.001742169	0.002189574	0.002081935	0.002306396	0.002429627	0.002238556	0.002496767	0.002466775
T_Ag	Closure	Mean	3.64097E-05	5.39203E-05	6.43615E-05	3.44212E-05	2.6865E-05	4.38947E-05	6.33063E-05	9.82327E-05	0.000171303	0.000188853	0.00021498	0.000237439
T_Al	Closure	Mean	0.062769011	0.054506756	0.0518324	0.025437407	0.071835555	0.186284065	0.148726642	0.07731121	0.069584802	0.03632658	0.055108525	0.071429238
T_As	Closure	Mean	0.001394462	0.001801361	0.002066578	0.001097609	0.000827789	0.001256205	0.001793455	0.002832419	0.004833248	0.005258952	0.006008898	0.006594455
T_B	Closure	Mean	0.032850888	0.048308313	0.057494178	0.030641837	0.020985838	0.031252742	0.049775701	0.086204715	0.15233238	0.168521717	0.192107618	0.212145448
T_Ba	Closure	Mean	0.006127722	0.006201741	0.006542203	0.004346913	0.00478411	0.004832693	0.004170055	0.005643854	0.006776744	0.006962902	0.006441833	0.00608624
T_Bi	Closure	Mean	2.46573E-05	2.31386E-05	2.3281E-05	1.48546E-05	1.74217E-05	2.18957E-05	2.08194E-05	2.3064E-05	2.42963E-05	2.23856E-05	2.49677E-05	2.46678E-05
T_Be	Closure	Mean	0.00012525	0.000162141	0.00018562	9.75847E-05	7.43245E-05	0.000112956	0.000158857	0.00024746	0.000428622	0.000470647	0.000537344	0.000591544
T_Ca	Closure	Mean	16.75029755	20.27971649	22.72811127	11.87757778	10.63565254	13.80408478	17.86034966	27.75577736	47.7399826	52.31871033	59.90222549	65.76985168
T_Cd	Closure	Mean	0.000143255	0.000223351	0.000270194	0.000144977	9.66977E-05	0.000143626	0.000237975	0.000423882	0.000752298	0.000833132	0.000948892	0.001048977
T_Co	Closure	Mean	0.000879333	0.001353188	0.001629968	0.000871353	0.000579645	0.000859467	0.001429433	0.00255457	0.004533194	0.005017516	0.005710766	0.006307725
T_Cr	Closure	Mean	0.000277275	0.000238573	0.000228203	0.00014634	0.000188051	0.000246271	0.000247871	0.000284866	0.00029107	0.00026711	0.000310902	0.00030683
T_Cu	Closure	Mean	0.000861662	0.001182207	0.001380047	0.000732538	0.000539554	0.000929862	0.001315924	0.001964715	0.003403771	0.00373784	0.004258181	0.004695319
T_Fe	Closure	Mean	0.096713245	0.083707049	0.079876535	0.039005615	0.080550909	0.136368528	0.104011938	0.09162274	0.104769781	0.090907291	0.087678969	0.089409076
T_Hg	Closure	Mean	3.6047E-05	5.50827E-05	6.69457E-05	3.68944E-05	2.32858E-05	3.32926E-05	5.06726E-05	8.52268E-05	0.000151015	0.000168777	0.000195198	0.000218708
T_K	Closure	Mean	5.948729515	9.175452232	11.12987614	6.063827515	3.934483528	5.500849724	8.812348366	15.56112957	27.66620255	30.82320023	35.40136337	39.40927887
T_Li	Closure	Mean	0.011625033	0.018005254	0.02172436	0.011619038	0.007744655	0.011441479	0.019042559	0.034073379	0.060539279	0.067097291	0.076406658	0.084423281
T_Mg	Closure	Mean	2.026332855	2.174716473	2.284243584	1.594297767	1.449901342	1.50205195	1.474710345	1.77923584	2.851861238	3.045140266	3.532086849	3.823822737
T_Mn	Closure	Mean	0.026646314	0.03939613	0.046984266	0.025123084	0.017105892	0.027718209	0.04289443	0.070770107	0.124295637	0.137234703	0.156157792	0.172480017
T_Mo	Closure	Mean	0.003721991	0.00548768	0.006540409	0.003494521	0.002437544	0.003427867	0.005439394	0.009560908	0.016938537	0.018781368	0.021437962	0.023710348
T_Na	Closure	Mean	3.531524658	3.772242308	4.02677393	2.180653811	2.031893253	2.630171776	2.935079575	3.897171974	6.412160873	6.901725769	7.951852798	8.668235779
T_Ni	Closure	Mean	0.001577502	0.002312687	0.002749273	0.001463553	0.001004709	0.001504116	0.002399517	0.004156022	0.007332778	0.008098789	0.009222643	0.010177352
T_P	Closure	Mean	0.008380875	0.00805702	0.008709422	0.005684503	0.007457323	0.010890566	0.010714802	0.010090948	0.011600603	0.010656443	0.01205691	0.012160691
T_Pb	Closure	Mean	8.22432E-05	0.000111959	0.00013056	6.95439E-05	5.10354E-05	8.70846E-05	0.000122009	0.000180887	0.000312514	0.000342813	0.000391163	0.000431789
T_S	Closure	Mean	0.528470993	0.576483428	0.714319468	0.464027941	0.436420649	0.345885545	0.244278163	0.247302487	0.453818381	0.494684219	0.741765618	0.414454252
T_Sb	Closure	Mean	0.017825883	0.028123215	0.034092721	0.018259127	0.012020899	0.017709898	0.029947642	0.054181188	0.096455276	0.106979713	0.121796027	0.13461037
T_Se	Closure	Mean	0.000354198	0.00051597	0.000612495	0.000326061	0.000227827	0.000332177	0.00052574	0.000912873	0.001612723	0.001784045	0.002033869	0.002245466
T_Si	Closure	Mean	6.645480633	6.290141106	6.269227028	3.913950205	4.07245636	4.35737133	4.111263752	5.364117146	6.126877308	5.702924728	6.400580406	6.374050617
T_Sn	Closure	Mean	4.93858E-05	4.63107E-05	4.65903E-05	2.98991E-05	3.50624E-05	4.38827E-05	4.17588E-05	4.63678E-05	4.88896E-05	4.51093E-05	5.02892E-05	4.94987E-05
T_Sr	Closure	Mean	0.101472571	0.117885351	0.130030885	0.067482248	0.061710387	0.080493748	0.099754803	0.14849326	0.252520412	0.275364131	0.315401614	0.345712274
T_Ti	Closure	Mean	0.00251382	0.001954758	0.00179731	0.000906198	0.001861149	0.00374076	0.003400833	0.0025348	0.003139996	0.001183579	0.004298103	0.004573307
T_Tl	Closure	Mean	0.000100516	0.000155196	0.00018709	0.000100023	6.97331E-05	0.000101534	0.000165661	0.000294092	0.000521429	0.000577503	0.000657421	0.000726223
T_U	Closure	Mean	0.000483029	0.00064662	0.000747756	0.000394314	0.000311331	0.000456803	0.000650887	0.001041175	0.001809165	0.001988574	0.00226537	0.002494386
T_V	Closure	Mean	0.003338708	0.005072961	0.006088087	0.003253943	0.002195819	0.00338448	0.005531984	0.00966096	0.017017363	0.018772846	0.021361755	0.023550704
T_Zn	Closure	Mean	0.008338802	0.012098248	0.014348706	0.007644296	0.005334666	0.008183208	0.012665002	0.021270217	0.037441179	0.041363791	0.047147114	0.052061435
D_Ag	Closure	Mean	3.64094E-05	5.39201E-05	6.43613E-05	3.4421E-05	2.6372E-05	3.73258E-05	5.66476E-05	9.65492E-05	0.000169762	0.000187651	0.000213951	0.000236461
D_Al	Closure	Mean	0.04267564	0.036793206	0.034819204	0.017210066	0.050880887	0.14233537	0.124044456	0.058540117	0.05122713	0.027385106	0.040720921	0.057391215
D_As	Closure	Mean	0.001346111	0.001760798	0.002028415	0.001078794	0.000797801	0.001175225	0.001720445	0.002807433	0.004808634	0.005239219	0.005985709	0.00657226
D_B	Closure	Mean	0.032850888	0.048308313	0.057494178	0.030641837	0.020985838	0.031252742	0.049775701	0.086204715	0.15233238	0.168521717	0.192107618	0.212145448
D_Ba	Closure	Mean	0.005937385	0.005944469	0.006011172	0.004067992	0.004505326	0.004509395	0.003772316	0.005266815	0.006638432	0.007012662	0.006127153	0.005730724
D_Bi	Closure	Mean	2.46573E-05	2.31386E-05	2.3281E-05	1.48546E-05	1.74217E-05	2.18957E-05	2.08194E-05	2.3064E-05	2.42963E-05	2.23856E-05	2.49677E-05	2.46678E-05
D_Be	Closure	Mean	0.00012525	0.000162141	0.00018562	9.75847E-05	7.43245E-05	0.000112956	0.000158857	0.00024746	0.000428622	0.000470647	0.000537344	0.000591544
D_Ca	Closure	Mean	16.67338181	20.2448082	22.6980896	11.86147499	10.67370987	13.8339529	17.86761856	27.74088287	47.72638321	52.31403732	59.85630798	65.72550201
D_Cd	Closure	Mean	0.000145227	0.000225243	0.000272061	0.000145851	9.64447E-05	0.00014243	0.000236956	0.000423912	0.000752321	0.000833052	0.000948816	0.001048912
D_Co	Closure	Mean	0.00087933	0.001353186	0.001629967	0.000871352	0.000577469	0.000857372	0.001428145	0.002553675	0.004532385	0.005016892	0.005710219	0.006307202
D_Cr	Closure	Mean	0.000225243	0.000197019	0.00018884	0.00010654	0.000137476	0.000197653	0.000208585	0.000209083	0.000270145	0.000245125	0.000278608	0.000273923
D_Cu	Closure	Mean	0.000861168	0.001181914	0.001379781	0.000732373	0.000531313	0.000912642	0.001302631	0.001962799	0.003402057	0.003736171	0.004256732	0.004693941
D_Fe	Closure	Mean	0.068704672	0.060573779	0.056529582	0.030133201	0.049856205	0.084535167	0.072281271	0.074337438	0.086819842	0.068025298	0.070034422	0.069903687
D_Hg	Closure	Mean	3.60466E-05	5.50824E-05	6.69454E-05	3.68943E-05	2.33046E-05	3.35072E-05	5.08689E-05	8.52245E-05	0.000151012	0.000168775	0.000195196	0.000218706
D_K	Closure	Mean	5.941569328	9.172283173	11.12699699	6.062306881	3.908541918	5.485770702	8.808886528	15.55746365	27.66234589	30.8199482	35.39491272	39.40304565
D_Li	Closure	Mean	0.011625033	0.018005254	0.02172436	0.011619038	0.007744655	0.011441479	0.019042559	0.034073379	0.060539279	0.067097291	0.076406658	0.084423281
D_Mg	Closure	Mean	2.093751669	2.193966389	2.284160137	1.561434507	1.431699753	1.497115135	1.46913445	1.775549293	2.848073959	3.042154312	3.528911114	3.820925713
D_Mn	Closure	Mean	0.025152266	0.038045146	0.045682941	0.024493847	0.016393803	0.024472514	0.039717454	0.069670863	0.123226479	0.136380717	0.155364946	0.171721548
D_Mo	Closure	Mean	0.003682473	0.005453236	0.006507021	0.003478559	0.00242476	0.003413053	0.00542904	0.009558092	0.016935315	0.018778495	0.021432068	0.023704564
D_Na	Closure	Mean	3.473569632	3.726127386	3.985348225	2.153260708	1.997470379	2.582257032	2.89216876	3.876924276	6.39175272	6.88530302	7.925865173	8.643463135
D_Ni	Closure	Mean	0.001577502	0.002312687	0.002749273	0.001463553	0.000998907	0.001499201	0.002397152	0.004154863	0.007331762	0.008097999	0.009221936	0.010176674
D_P	Closure	Mean	0.071455687	0.055326045	0.050947361	0.025946137	0.014313196	0.020592745	0.018533917	0.025897652	0.073184833	0.033960093	0.129443273	0.137510061
D_Pb	Closure	Mean	8.22425E-05	0.000111959	0.00013056	6.95436E-05	5.00785E-05	7.43332E-05	0.000109083	0.000177619	0.000309522	0.000340481	0.000389164	0.000429891
D_S	Closure	Mean	0.31927231	0.512471616	0.673621714	0.47036159	0.396414459	0.297602594	0.219541267	0.24180977	0.299241692	0.450558394	0.296268672	0.263600916
D_Sb	Closure	Mean	0.017825883	0.028123215	0.034092721	0.018259127	0.012020899	0.017709898	0.029947642	0.054181188	0.096455276	0.106979713	0.121796027	0.13461037
D_Se	Closure	Mean	0.000335162	0.000501198	0.000598881	0.000319213	0.000227675	0.000334822	0.000527967	0.000912948	0.00161244	0.0017835	0.002029601	0.002241352
D_Si	Closure	Mean	6.21161747	5.941653252	5.919689178	3.799838305	3.842570305	4.098571301	3.990858316	5.315304756	6.002279758	5.695571899	6.284458637	6.20290041
D_Sn	Closure	Mean	4.93858E-05	4.63107E-05	4.65903E-05	2.98991E-05	3.50624E-05	4.38827E-05	4.17588E-05	4.63678E-05	4.88896E-05	4.51093E-05	5.02892E-05	4.94987E-05
D_Sr	Closure	Mean	0.104362249	0.120637611	0.132605538	0.068751618	0.062530741	0.080791406	0.099701032	0.148334593	0.252397716	0.275348961	0.3154791	0.345783919
D_Ti	Closure	Mean	0.002386295	0.001836647	0.001682126	0.000850701	0.000898708	0.001924271	0.001698746	0.001387085	0.002600899	0.00094744	0.004245782	0.004548115
D_Tl	Closure	Mean	0.000100516	0.000155196	0.00018709	0.000100023	6.97331E-05	0.000101534	0.000165661	0.000294092	0.000521429	0.000577503	0.000657421	0.000726223
D_U	Closure	Mean	0.000472253	0.000637252	0.000738811	0.000389971	0.000304439	0.000444356	0.000640583	0.00103688	0.001805037	0.001985392	0.002261616	0.002490781
D_V	Closure	Mean	0.003327653	0.00506279	0.006078872	0.003249242	0.002168971	0.003263398	0.005416278	0.009624656	0.016982853	0.018746283	0.021338137	0.02352827
D_Zn	Closure	Mean	0.007570254	0.011457964	0.013731467	0.00734534	0.005209227	0.007885724	0.012383232	0.021138217	0.037298396	0.041240107	0.046958629	0.051878605

Appendix A.2.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Mine Site Nodes, WMPond

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO3_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
NO2_N	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Br	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
Cl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
F	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
TDP	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
SO4	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_CN	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
WAD_CN	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ag	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Al	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_As	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_B	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ba	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Bi	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Be	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ca	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cd	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Co	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Cu	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Fe	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Hg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_K	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Li	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Mo	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Na	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ni	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_P	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Pb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_S	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Se	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Si	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Sr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Ti	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Tl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_U	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_V	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
T_Zn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ag	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Al	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_As	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_B	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ba	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Bi	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Be	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ca	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cd	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Co	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Cu	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Fe	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Hg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_K	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Li	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mg	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Mo	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Na	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ni	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_P	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Pb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_S	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sb	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Se	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Si	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Sr	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Ti	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Tl	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_U	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_V	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0
D_Zn	Post-Closure	Mean	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A.3.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ28

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.260773182	0.266558021	0.260086089	0.167335019	0.053234585	0.068039641	0.10927248	0.183586776	0.174018845	0.174348637	0.232416019	0.260350019
NO3_N	Closure	P95	0.061432604	0.054425772	0.054406982	0.073501378	0.053360399	0.06410715	0.081473634	0.051466241	0.057723973	0.046622906	0.050068848	0.065516569
NO2_N	Closure	P95	0.001158262	0.001142033	0.001221512	0.001187381	0.001265365	0.001392064	0.0014583	0.001309149	0.00121673	0.001147784	0.001145162	0.001261277
Br	Closure	P95	0.036575124	0.033831812	0.03257864	0.033611972	0.034175783	0.029350793	0.034396924	0.030201729	0.032852951	0.028754637	0.035587877	0.037009485
Cl	Closure	P95	2.313333273	2.596624374	2.7017591	1.108899593	0.651497781	0.642198741	1.040317178	1.678800225	1.165920496	1.10753715	1.905189037	1.939862728
F	Closure	P95	0.082242668	0.075253263	0.07271985	0.067252658	0.064919785	0.068073459	0.085037284	0.071005553	0.081386827	0.069872506	0.07004337	0.085716113
TDP	Closure	P95	0.008909483	0.009425816	0.010109317	0.009521239	0.009641615	0.012077153	0.010223051	0.009962611	0.009544366	0.009228527	0.008790499	0.00870954
SO4	Closure	P95	35.55423737	38.04128265	38.25802612	22.02734947	11.95482826	13.3169632	25.07863617	23.97437668	24.01218224	21.94543839	27.60443306	32.35257339
T_CN	Closure	P95	0.003971569	0.004045733	0.003797736	0.003307649	0.002876648	0.002921088	0.003219374	0.003428107	0.003613345	0.003494929	0.003982446	0.004134573
WAD_CN	Closure	P95	0.003221952	0.003064611	0.002881301	0.002494321	0.002835258	0.002744478	0.00286364	0.002764264	0.002956336	0.002530945	0.002825546	0.003229446
T_Ag	Closure	P95	2.10488E-05	1.88143E-05	1.95764E-05	2.10321E-05	2.38501E-05	2.54877E-05	3.19157E-05	2.0995E-05	2.19052E-05	1.93861E-05	1.92326E-05	2.34024E-05
T_Al	Closure	P95	0.066253327	0.058040693	0.052964557	0.03128574	0.289655298	0.290318459	0.307439119	0.077578217	0.058630001	0.059330329	0.076099351	0.076792568
T_As	Closure	P95	0.001125882	0.00105039	0.000961145	0.000852215	0.000868768	0.000785086	0.001143552	0.001152825	0.001168818	0.001037636	0.000982068	0.001157858
T_B	Closure	P95	0.01893501	0.017085323	0.013555928	0.01374774	0.011359264	0.012047135	0.022671642	0.017640693	0.019102294	0.016614076	0.016877118	0.021201305
T_Ba	Closure	P95	0.008281191	0.007955343	0.007805252	0.007398349	0.008224019	0.006038437	0.006425699	0.007172137	0.00819286	0.006112529	0.006929097	0.007807321
T_Bi	Closure	P95	3.22302E-05	3.06903E-05	2.88063E-05	2.49432E-05	2.83526E-05	2.74467E-05	2.86358E-05	2.76461E-05	2.95666E-05	2.53094E-05	2.8254E-05	3.22986E-05
T_Be	Closure	P95	9.64127E-05	8.85107E-05	8.08075E-05	7.09211E-05	7.30506E-05	7.04876E-05	9.85029E-05	8.6921E-05	9.38884E-05	7.93794E-05	8.47569E-05	9.95434E-05
T_Ca	Closure	P95	20.44446754	20.63016129	20.68423843	19.31617928	16.42360878	16.93516541	17.37088013	19.18976402	19.33306313	19.23937035	19.29017448	20.01501274
T_Cd	Closure	P95	6.98103E-05	5.90239E-05	4.63823E-05	5.40995E-05	4.03671E-05	4.91103E-05	9.4642E-05	6.49972E-05	7.28336E-05	6.21545E-05	6.38933E-05	8.3145E-05
T_Co	Closure	P95	0.000712432	0.000714237	0.000691288	0.000459096	0.000280331	0.000340305	0.000650867	0.000516432	0.000553343	0.000509155	0.00057252	0.000673749
T_Cr	Closure	P95	0.000338946	0.000310065	0.000301142	0.000259383	0.000302169	0.000304258	0.000332312	0.000319449	0.000341459	0.000345251	0.000346059	0.000337612
T_Cu	Closure	P95	0.00058291	0.000539325	0.000468683	0.000440698	0.00063219	0.000661683	0.000773083	0.000552032	0.000583884	0.000502658	0.000520289	0.000627178
T_Fe	Closure	P95	0.108884171	0.105737731	0.093052417	0.08010973	0.207747892	0.209065035	0.224874198	0.113548309	0.112578794	0.088373631	0.100805387	0.117672905
T_Hg	Closure	P95	1.74035E-05	1.55151E-05	1.30491E-05	1.88069E-05	1.2419E-05	1.22119E-05	2.28898E-05	1.51192E-05	1.6602E-05	1.43529E-05	1.50199E-05	1.97572E-05
T_K	Closure	P95	3.144417048	2.88372159	2.512468576	2.900982618	1.882222414	2.089635134	3.82818222	2.702326775	3.004561424	2.658307552	2.661941051	3.58302784
T_Li	Closure	P95	0.005864867	0.005018854	0.003936093	0.004372543	0.003196033	0.003976742	0.007599102	0.005421005	0.006062569	0.005106519	0.005333136	0.007228426
T_Mg	Closure	P95	4.340100288	4.380598068	4.415005684	4.056481838	3.46710062	3.913638592	3.909667492	4.270916939	4.285226345	4.296408176	4.311912537	4.32695055
T_Mn	Closure	P95	0.018635115	0.017640399	0.016752223	0.014664647	0.014009354	0.014892437	0.023249002	0.017557556	0.017859582	0.015438927	0.015272072	0.018283488
T_Mo	Closure	P95	0.003249967	0.00331522	0.003261303	0.002353587	0.001626042	0.001473502	0.002646883	0.002281141	0.00258253	0.002224219	0.002375235	0.003011185
T_Na	Closure	P95	10.5154829	11.89447021	12.0697298	6.154646397	4.227192879	3.800642967	5.049702168	8.094662666	6.365330696	5.972259521	8.240598679	9.174022675
T_Ni	Closure	P95	0.000910637	0.000818279	0.000656383	0.000663219	0.000549314	0.00063482	0.001099735	0.000870348	0.00092755	0.00080625	0.000839243	0.001022083
T_P	Closure	P95	0.022591691	0.023257703	0.023960613	0.021933421	0.020247456	0.023741031	0.023472369	0.024174266	0.022117792	0.021362128	0.021206792	0.021164672
T_Pb	Closure	P95	5.8403E-05	5.2902E-05	4.75812E-05	4.45332E-05	6.00872E-05	6.28826E-05	7.54932E-05	5.43755E-05	5.7919E-05	5.06581E-05	5.15325E-05	6.12923E-05
T_S	Closure	P95	1.127767324	1.139315128	1.146636486	1.065164804	0.911961317	1.093392968	0.955685437	1.073188305	1.089419723	1.118507504	1.118692875	1.136751294
T_Sb	Closure	P95	0.008521832	0.007123643	0.005394988	0.006307444	0.004423153	0.005705639	0.011401642	0.007816982	0.00882424	0.007382237	0.007484485	0.010295256
T_Se	Closure	P95	0.000233652	0.00021082	0.000223624	0.000216039	0.000145032	0.000154523	0.000243627	0.00019767	0.000221403	0.000190665	0.000190537	0.000233439
T_Si	Closure	P95	7.752902508	7.372529984	7.010566711	6.183758736	6.932692528	5.311861038	5.682584286	6.343073845	6.797773361	6.099647999	6.742415428	7.731978893
T_Sn	Closure	P95	6.46064E-05	6.14097E-05	5.77382E-05	4.98864E-05	5.69576E-05	5.49299E-05	5.74027E-05	5.54128E-05	5.92577E-05	5.06501E-05	5.66969E-05	6.48466E-05
T_Sr	Closure	P95	0.10612379	0.100819901	0.098656751	0.093552798	0.096036486	0.085188337	0.087157853	0.091734491	0.106366761	0.087942854	0.088128343	0.104656659
T_Ti	Closure	P95	0.004493691	0.003792122	0.003044425	0.002644049	0.00499382	0.00511017	0.005448482	0.00344743	0.002497724	0.004982601	0.004931269	0.00399779
T_Tl	Closure	P95	5.11948E-05	4.38384E-05	3.80601E-05	4.27389E-05	3.69509E-05	4.11673E-05	6.80091E-05	4.84632E-05	5.35159E-05	4.58321E-05	4.56635E-05	6.03311E-05
T_U	Closure	P95	0.000356487	0.000348874	0.000344307	0.000323705	0.000316489	0.000268907	0.000350284	0.000308089	0.000351148	0.000278169	0.000295227	0.000353628
T_V	Closure	P95	0.001743054	0.001511397	0.001168406	0.00127968	0.001061379	0.001246525	0.00237933	0.001781143	0.00189453	0.001641188	0.001685102	0.002139945
T_Zn	Closure	P95	0.004955882	0.004505281	0.003824443	0.003790232	0.003282609	0.003625967	0.006195123	0.004793341	0.005023847	0.004383125	0.004460005	0.005488472
D_Ag	Closure	P95	2.08409E-05	1.8707E-05	1.94014E-05	2.09471E-05	2.1765E-05	2.25868E-05	2.68806E-05	2.0628E-05	2.1558E-05	1.91199E-05	1.8722E-05	2.32707E-05
D_Al	Closure	P95	0.039499998	0.025900001	0.0207	0.021600001	0.206407428	0.144000009	0.100999996	0.056945756	0.042075485	0.043700136	0.060794577	0.053537123
D_As	Closure	P95	0.001076986	0.00099942	0.000941229	0.000835152	0.000797544	0.0007389	0.00107901	0.001094106	0.001138341	0.000984939	0.000922479	0.00109353
D_B	Closure	P95	0.018932857	0.017083069	0.01355379	0.013745755	0.011359264	0.012024823	0.02266629	0.017635521	0.01909828	0.016612083	0.016870793	0.021199672
D_Ba	Closure	P95	0.007908278	0.007447816	0.007420869	0.007108996	0.007849451	0.005589513	0.005899591	0.00695249	0.008086453	0.005777851	0.006574292	0.007518126
D_Bi	Closure	P95	3.22191E-05	3.06436E-05	2.88015E-05	2.49432E-05	2.83526E-05	2.74441E-05	2.86358E-05	2.76424E-05	2.95608E-05	2.53094E-05	2.82502E-05	3.22928E-05
D_Be	Closure	P95	9.64127E-05	8.85107E-05	8.08075E-05	7.09211E-05	7.30506E-05	7.04876E-05	9.85029E-05	8.6921E-05	9.38884E-05	7.93794E-05	8.47569E-05	9.95434E-05
D_Ca	Closure	P95	20.13459969	20.29292679	20.2188015	18.95878983	16.2331295	16.62935257	16.85086632	18.87895203	19.18334198	18.95114517	19.0508709	19.63087082
D_Cd	Closure	P95	7.02555E-05	5.94937E-05	4.68326E-05	5.40208E-05	3.9085E-05	4.92142E-05	9.5486E-05	6.57318E-05	7.20798E-05	6.24569E-05	6.34719E-05	8.53593E-05
D_Co	Closure	P95	0.000711911	0.000714103	0.000688343	0.00045577	0.000276332	0.00033528	0.000650232	0.000515408	0.000553038	0.000508329	0.000572078	0.000673495
D_Cr	Closure	P95	0.000241784	0.000229425	0.000220409	0.000179614	0.000234864	0.000239966	0.000260219	0.000260859	0.000246271	0.000269417	0.000262937	0.00026058
D_Cu	Closure	P95	0.000577678	0.000484344	0.000438281	0.000391575	0.000600456	0.000633926	0.00076153	0.000564413	0.000575079	0.00050629	0.000522529	0.000629036
D_Fe	Closure	P95	0.08490061	0.080805242	0.072744988	0.0523366	0.118183948	0.120359711	0.12955983	0.092905901	0.08429385	0.071084015	0.077720411	0.085478932
D_Hg	Closure	P95	1.73993E-05	1.55106E-05	1.30448E-05	1.88054E-05	1.26722E-05	1.16245E-05	2.3093E-05	1.48934E-05	1.65773E-05	1.4348E-05	1.5015E-05	1.9754E-05
D_K	Closure	P95	3.136202812	2.865300417	2.509683132	2.884669304	1.821967363	2.073771	3.814964771	2.677853823	2.99471426	2.620835543	2.657431602	3.574403524
D_Li	Closure	P95	0.00586485	0.005018835	0.003936075	0.00437253	0.00319598	0.003976596	0.007599033	0.005420966	0.006062541	0.005106478	0.00533312	0.007228421
D_Mg	Closure	P95	4.253458977	4.280021667	4.35227108	4.014501572	3.425474405	3.868363857	3.877664566	4.163676739	4.180338383	4.189025402	4.20962429	4.239455223
D_Mn	Closure	P95	0.013859236	0.012626252	0.010496188	0.01032728	0.007992676	0.009852285	0.01779782	0.014095179	0.014921268	0.01253251	0.012922437	0.016334938
D_Mo	Closure	P95	0.003191253	0.003254812	0.003214143	0.002301328	0.001597573	0.001452672	0.002634313	0.002251633	0.002587969	0.002193918	0.00236509	0.002968
D_Na	Closure	P95	10.42079163	11.78650856	11.99820232	6.105211735	4.170514107	3.735398293	5.02355814	8.014008522	6.337848186	5.938740253	8.075902939	9.107434273
D_Ni	Closure	P95	0.00091032	0.000817946	0.00065422	0.000658112	0.000533187	0.000630559	0.00109785	0.000869226	0.000926681	0.000805732	0.00083903	0.001021844
D_P	Closure	P95	0.132722065	0.101704754	0.069072776	0.052764226	0.039635602	0.044949792	0.03625603	0.082701594	0.042871121	0.149478048	0.145076424	0.109359428
D_Pb	Closure	P95	5.59499E-05	5.22543E-05	4.6844E-05	4.43699E-05	4.08772E-05	3.99839E-05	6.11411E-05	5.27365E-05	5.53587E-05	4.76966E-05	4.94593E-05	5.95546E-05
D_S	Closure	P95	1.149092913	1.163535953	1.163008094	1.076480865	0.913485229	1.050746322	0.991127014	1.108866811	1.132298231	1.144146085	1.142002463	1.146282077
D_Sb	Closure	P95	0.008521822	0.007123633	0.005394978	0.006307437	0.004423118	0.005705559	0.011401605	0.007816955	0.008824217	0.0073822	0.00748447	0.010295249
D_Se	Closure	P95	0.000210296	0.000180833	0.000203839	0.000205875	0.000150477	0.000149536	0.000246711	0.000189446	0.000210407	0.00016661	0.000157674	0.000217301
D_Si	Closure	P95	7.474212646	7.055977345	6.836003304	5.806243896	6.523041248	5.093063354	5.515165806	6.212664604	6.727392673	5.968576431	6.566210747	7.319675922
D_Sn	Closure	P95	6.46064E-05	6.14097E-05	5.77382E-05	4.98864E-05	5.69576E-05	5.49299E-05	5.74027E-05	5.54128E-05	5.92577E-05	5.06501E-05	5.66969E-05	6.48466E-05
D_Sr	Closure	P95	0.107243553	0.099687591	0.097325996	0.091311686	0.09654025	0.083755255	0.085485473	0.090574503	0.106826663	0.086593173	0.089696988	0.106337793
D_Ti	Closure	P95	0.004372345	0.003238774	0.002234693	0.001479727	0.002698116	0.002741672	0.002921008	0.002878111	0.001397946	0.004982601	0.00474311	0.003600006
D_Tl	Closure	P95	5.11939E-05	4.38375E-05	3.80592E-05	4.27315E-05	3.69509E-05	4.11565E-05	6.80062E-05	4.84616E-05	5.35146E-05	4.583E-05	4.56625E-05	6.03304E-05
D_U	Closure	P95	0.000344752	0.00033396	0.000327357	0.000307046	0.000297408	0.000255723	0.000338026	0.000297787	0.000347183	0.000269368	0.000285575	0.000342294
D_V	Closure	P95	0.001725851	0.001493337	0.001146584	0.001262632	0.00095362	0.001210306	0.002271742	0.001731057	0.001875032	0.001627532	0.001646737	0.002127958
D_Zn	Closure	P95	0.004228422	0.00360467	0.003254347	0.003418504	0.003188846	0.003298581	0.005709302	0.004119214	0.004116646	0.003521029	0.004110857	0.004627758

Appendix A.3.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ28

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	1.924325943	2.069887638	2.205886364	1.908458829	1.017044663	1.213787436	1.325430036	1.466398358	1.496380806	1.436741233	1.553956628	1.757644415
NO3_N	Post-Closure	P95	1.943999887	1.782335401	2.043910265	1.313419223	1.028623581	1.386645317	1.598963618	1.779023767	1.920934319	1.940582633	1.800900459	1.80174005
NO2_N	Post-Closure	P95	0.006086189	0.006230826	0.005866541	0.004503633	0.00437627	0.005771377	0.006080777	0.006247834	0.006429336	0.006555975	0.006320534	0.00619156
Br	Post-Closure	P95	0.086323969	0.079246446	0.078434885	0.066041797	0.052019522	0.059636436	0.056624487	0.069074683	0.077929333	0.070874475	0.08096008	0.08489693
Cl	Post-Closure	P95	21.03588104	21.84247208	22.76422882	20.12449265	19.3290329	19.25072861	18.87744522	20.02276611	20.56027603	21.18211746	20.75613976	20.13933563
F	Post-Closure	P95	0.430253834	0.437047213	0.437234223	0.442780972	0.29756704	0.408391416	0.466085464	0.489190638	0.472808778	0.428229213	0.440785319	0.43233031
TDP	Post-Closure	P95	0.029722132	0.028174566	0.029906072	0.026160073	0.022224111	0.030548668	0.033215284	0.034213133	0.034275059	0.030523853	0.031486932	0.028838295
SO4	Post-Closure	P95	407.2730103	415.0835266	422.5811462	383.0073547	409.8621826	398.526825	381.5252991	399.9032288	430.2795715	432.0482483	424.6111145	404.7883301
T_CN	Post-Closure	P95	0.01212702	0.012775565	0.013418942	0.011979213	0.007428453	0.009546653	0.010001814	0.010659866	0.01146481	0.010247711	0.01052503	0.011382156
WAD_CN	Post-Closure	P95	0.003212302	0.003047829	0.002977744	0.002483133	0.002718468	0.002691447	0.002616118	0.002590913	0.002445204	0.00244326	0.002554365	0.002480907
T_Ag	Post-Closure	P95	2.57849E-05	2.5729E-05	2.91239E-05	2.7086E-05	2.58667E-05	2.63278E-05	2.58446E-05	2.72723E-05	2.79601E-05	2.666E-05	2.55909E-05	2.69126E-05
T_Al	Post-Closure	P95	0.128916904	0.099524878	0.09323325	0.035984062	0.284065932	0.191884354	0.145258561	0.070711508	0.038860537	0.064926185	0.122989617	0.118607692
T_As	Post-Closure	P95	0.001162717	0.001154506	0.001152621	0.001256267	0.00087466	0.000818213	0.000956893	0.001123788	0.001127094	0.00105268	0.001099346	0.001148303
T_B	Post-Closure	P95	0.018925164	0.016915441	0.015248719	0.014834971	0.009935317	0.011249213	0.014220801	0.016390691	0.01718968	0.01784361	0.016484413	0.018656064
T_Ba	Post-Closure	P95	0.008258914	0.007776665	0.007738385	0.007386022	0.006259131	0.005562575	0.006175768	0.006519075	0.007368393	0.005830478	0.00631131	0.006341094
T_Bi	Post-Closure	P95	3.21318E-05	3.05251E-05	3.06727E-05	2.77018E-05	2.86126E-05	3.02344E-05	2.68758E-05	3.02906E-05	2.72009E-05	2.80462E-05	2.83267E-05	2.94709E-05
T_Be	Post-Closure	P95	9.62453E-05	8.80094E-05	7.95673E-05	7.79734E-05	7.20377E-05	7.2232E-05	8.05484E-05	8.8128E-05	8.90397E-05	8.28578E-05	8.10542E-05	8.40137E-05
T_Ca	Post-Closure	P95	104.9236832	105.6772766	106.2135391	95.66259766	109.7212601	105.83992	101.7663193	106.3046417	113.3247375	112.491333	108.8987656	104.9573288
T_Cd	Post-Closure	P95	0.000218239	0.000245917	0.000275945	0.000329149	9.51733E-05	0.000121176	0.00014495	0.000170464	0.000195875	0.000183774	0.000182231	0.000208098
T_Co	Post-Closure	P95	0.001676692	0.001747642	0.001825148	0.001849071	0.000878018	0.001135048	0.001330084	0.001484743	0.001575451	0.001404211	0.001440099	0.001599131
T_Cr	Post-Closure	P95	0.000336304	0.000303302	0.000312833	0.000258875	0.000301986	0.000275492	0.000317404	0.00027996	0.000270843	0.000282393	0.000291647	0.000265212
T_Cu	Post-Closure	P95	0.000582323	0.000532574	0.000514904	0.000599344	0.000629959	0.000469015	0.000575328	0.000565831	0.000574783	0.000512522	0.000508108	0.00053671
T_Fe	Post-Closure	P95	0.136040762	0.110199034	0.111956313	0.079766698	0.204979062	0.13571471	0.13505964	0.107378908	0.091801561	0.080820017	0.113729849	0.11932487
T_Hg	Post-Closure	P95	2.1586E-05	2.16476E-05	2.06841E-05	1.93516E-05	1.29895E-05	1.3825E-05	1.54427E-05	1.94274E-05	2.06863E-05	1.8653E-05	2.00691E-05	2.11094E-05
T_K	Post-Closure	P95	50.70626831	52.15437698	53.1254921	50.71902466	29.51462746	37.41732025	44.03977966	47.82530975	50.01464462	44.32595062	45.15658188	49.00356293
T_Li	Post-Closure	P95	0.075951882	0.076896496	0.076905556	0.075824723	0.054169483	0.066913649	0.078741595	0.083252504	0.084041454	0.073245078	0.073870756	0.074960977
T_Mg	Post-Closure	P95	7.256251812	7.416235924	7.558633804	7.413155556	4.524607182	5.642107487	6.460902214	6.986073971	7.31911087	6.578674793	6.684293747	6.981190681
T_Mn	Post-Closure	P95	0.49119553	0.514337122	0.534679115	0.553458273	0.317238092	0.401486963	0.45916447	0.490900427	0.504934311	0.442580074	0.48618409	0.471860826
T_Mo	Post-Closure	P95	0.004424015	0.005059272	0.005930664	0.006538616	0.001392212	0.001742321	0.002197567	0.002595418	0.002939902	0.002769656	0.003113148	0.003887746
T_Na	Post-Closure	P95	74.16674805	78.19168091	81.65522003	70.97561646	67.43608093	67.20471191	67.06552887	71.63865662	73.59307861	75.07246399	73.81970978	71.59120941
T_Ni	Post-Closure	P95	0.001713348	0.001750689	0.001795096	0.001798735	0.001205231	0.001508876	0.001685071	0.001781083	0.001788749	0.001627203	0.001650083	0.001671678
T_P	Post-Closure	P95	0.029453397	0.028096715	0.030720755	0.025619172	0.024894224	0.030705044	0.033599664	0.033669114	0.03420781	0.030650081	0.031376179	0.029201211
T_Pb	Post-Closure	P95	0.000122217	0.000126103	0.000137953	0.000160378	7.84991E-05	7.51486E-05	8.2713E-05	9.6338E-05	0.000110757	0.000107663	0.000107545	0.000117821
T_S	Post-Closure	P95	1.020350337	1.075268745	1.084555387	1.035629392	0.783696949	0.9958359	0.864720881	0.894189775	0.920433104	1.00961709	0.9114815	0.958116293
T_Sb	Post-Closure	P95	0.011335921	0.0107352	0.010570565	0.008890725	0.00658774	0.008696523	0.010215672	0.010954527	0.011369129	0.01189941	0.011138733	0.012093167
T_Se	Post-Closure	P95	0.000233511	0.000206872	0.000236319	0.000164833	0.000106019	0.000114322	0.000149425	0.000179429	0.000201407	0.000182634	0.000169491	0.000191183
T_Si	Post-Closure	P95	7.734353542	7.215990067	6.950342178	6.181369305	5.239476681	5.343307972	5.495300293	5.814313412	5.680382729	6.080533504	5.952707767	6.062481403
T_Sn	Post-Closure	P95	6.44091E-05	6.10741E-05	6.25967E-05	5.57336E-05	5.78218E-05	6.16872E-05	5.43256E-05	6.07476E-05	5.63445E-05	5.67882E-05	5.79034E-05	5.98718E-05
T_Sr	Post-Closure	P95	0.248619586	0.247470826	0.242395908	0.20744881	0.184194401	0.228406817	0.269766062	0.285027832	0.267081112	0.244058162	0.23931554	0.241685644
T_Ti	Post-Closure	P95	0.004187852	0.003139396	0.003186992	0.002569888	0.004939632	0.004289685	0.003554685	0.003281541	0.00243246	0.004681638	0.00424969	0.00305233
T_Tl	Post-Closure	P95	5.11818E-05	4.35603E-05	4.77294E-05	4.41496E-05	2.1871E-05	3.19158E-05	3.74935E-05	4.45056E-05	4.78363E-05	4.90919E-05	4.42889E-05	5.17681E-05
T_U	Post-Closure	P95	0.000356175	0.00034381	0.000339078	0.000280261	0.000209833	0.000218405	0.000264514	0.00028121	0.000301465	0.000256904	0.000267328	0.000265592
T_V	Post-Closure	P95	0.01985695	0.020053098	0.020149097	0.019867269	0.014195369	0.01747635	0.020483801	0.021710141	0.021866038	0.0190935	0.019267833	0.019620921
T_Zn	Post-Closure	P95	0.017639326	0.019058688	0.021423584	0.025344687	0.007732375	0.009124679	0.010887641	0.01296721	0.015141304	0.014595213	0.014397282	0.016770355
D_Ag	Post-Closure	P95	2.57224E-05	2.53951E-05	2.91239E-05	2.7086E-05	1.89805E-05	2.60445E-05	2.58397E-05	2.72621E-05	2.78362E-05	2.666E-05	2.54379E-05	2.69126E-05
D_Al	Post-Closure	P95	0.039499998	0.025900001	0.0207	0.021600001	0.202357516	0.144000009	0.100999996	0.051766247	0.025922453	0.050335798	0.095212214	0.070299998
D_As	Post-Closure	P95	0.001133805	0.001117376	0.001131286	0.001220176	0.000785387	0.000761435	0.000920516	0.001075256	0.001089421	0.001008133	0.001057944	0.001112503
D_B	Post-Closure	P95	0.018923018	0.016913183	0.015248719	0.014834971	0.009935315	0.011249212	0.014219939	0.016390486	0.017184662	0.01784361	0.016484413	0.018656064
D_Ba	Post-Closure	P95	0.007883728	0.007225991	0.007309964	0.007097974	0.005746297	0.005222937	0.00570762	0.00636017	0.007443693	0.005451053	0.005930649	0.006063388
D_Bi	Post-Closure	P95	3.21208E-05	3.0477E-05	3.06719E-05	2.77018E-05	2.86126E-05	3.02318E-05	2.68753E-05	3.029E-05	2.72009E-05	2.80462E-05	2.83261E-05	2.94709E-05
D_Be	Post-Closure	P95	9.62453E-05	8.80094E-05	7.95673E-05	7.79734E-05	7.20377E-05	7.2232E-05	8.05484E-05	8.8128E-05	8.90397E-05	8.28578E-05	8.10542E-05	8.40137E-05
D_Ca	Post-Closure	P95	104.8174744	105.528923	105.8865128	95.64529419	109.7103271	105.7893753	101.637825	106.297348	113.418869	112.2432861	108.8919144	104.9476166
D_Cd	Post-Closure	P95	0.000218158	0.000245624	0.000275647	0.00032849	9.40504E-05	0.000121063	0.000146115	0.000170342	0.000195112	0.000183613	0.000181908	0.000208555
D_Co	Post-Closure	P95	0.001676553	0.001747524	0.001824423	0.001845296	0.000877884	0.001132367	0.001330045	0.001484738	0.001575445	0.001403922	0.001439939	0.001598978
D_Cr	Post-Closure	P95	0.000233894	0.00022752	0.000231427	0.000190395	0.000234766	0.000227806	0.000237644	0.000241377	0.000205219	0.000225551	0.000219082	0.000209895
D_Cu	Post-Closure	P95	0.000577084	0.000475139	0.000505485	0.000594255	0.00059832	0.000488542	0.000565681	0.000570164	0.000565914	0.000508785	0.000512648	0.000536839
D_Fe	Post-Closure	P95	0.097089373	0.081842385	0.083942443	0.052109618	0.116985813	0.09076903	0.092196248	0.088546753	0.065731056	0.065258548	0.080049396	0.082927242
D_Hg	Post-Closure	P95	2.15898E-05	2.16645E-05	2.07043E-05	1.93516E-05	1.33409E-05	1.34561E-05	1.54442E-05	1.94398E-05	2.06868E-05	1.868E-05	2.00723E-05	2.11097E-05
D_K	Post-Closure	P95	50.70595932	52.15109253	53.12654495	50.7112999	29.52088547	37.41561127	44.03789902	47.81789017	50.01252747	44.31647491	45.15815353	49.00157547
D_Li	Post-Closure	P95	0.075951882	0.076896496	0.076905556	0.075824723	0.054169483	0.066913649	0.078741595	0.083252504	0.084041454	0.073245078	0.073870756	0.074960977
D_Mg	Post-Closure	P95	7.255549431	7.415673256	7.549219608	7.412414551	4.518233299	5.636500359	6.455075264	6.982765675	7.313393116	6.575604439	6.692698956	6.996977806
D_Mn	Post-Closure	P95	0.490741849	0.514096618	0.5344311	0.553281009	0.314000398	0.40030244	0.458732545	0.490425855	0.504566073	0.442217797	0.485851824	0.471366733
D_Mo	Post-Closure	P95	0.004377342	0.005017464	0.005905482	0.006526861	0.001384637	0.001735025	0.002202316	0.002585066	0.002941145	0.002750106	0.003112704	0.003860597
D_Na	Post-Closure	P95	74.15240479	78.12989807	81.6224823	70.92861938	67.38906097	67.10758209	67.03106689	71.58831787	73.57701874	75.02394104	73.70605469	71.57655334
D_Ni	Post-Closure	P95	0.001713093	0.001750472	0.001794511	0.001796975	0.001204936	0.001508698	0.001685058	0.001781078	0.001788734	0.001626974	0.001649819	0.001671378
D_P	Post-Closure	P95	0.107178241	0.089769036	0.068879552	0.046530358	0.039518923	0.0408751	0.039128788	0.073031597	0.038145106	0.140325055	0.123796158	0.047690373
D_Pb	Post-Closure	P95	0.000121941	0.000125865	0.000137024	0.000157437	6.45401E-05	7.47574E-05	8.26063E-05	9.54336E-05	0.000110537	0.00010673	0.000106955	0.000117499
D_S	Post-Closure	P95	1.042840362	1.088504195	1.104727387	1.035035133	0.809358895	0.98658365	0.889084578	0.863627613	0.946290433	0.920888603	0.934278727	0.912947834
D_Sb	Post-Closure	P95	0.011335921	0.0107352	0.010570565	0.008890725	0.00658774	0.008696523	0.010215672	0.010954526	0.011369129	0.01189941	0.011138733	0.012093167
D_Se	Post-Closure	P95	0.000210228	0.000177094	0.000231247	0.00016871	0.000106619	0.000107914	0.000152266	0.000170386	0.00019137	0.000163932	0.000149992	0.000186482
D_Si	Post-Closure	P95	7.456354618	6.905678749	6.772383213	5.804014206	4.914062977	5.150899887	5.337225914	5.645111561	5.686198235	5.9447999	5.806655884	5.800323009
D_Sn	Post-Closure	P95	6.44091E-05	6.10741E-05	6.25967E-05	5.57336E-05	5.78218E-05	6.16872E-05	5.43256E-05	6.07476E-05	5.63445E-05	5.67882E-05	5.79034E-05	5.98718E-05
D_Sr	Post-Closure	P95	0.248511031	0.246635616	0.241401881	0.207620844	0.183814377	0.228165999	0.269061774	0.285263479	0.267476708	0.243825093	0.240778089	0.242052719
D_Ti	Post-Closure	P95	0.003318384	0.002711284	0.002314516	0.0014098	0.002672775	0.00216846	0.001871006	0.002614243	0.001412753	0.004645805	0.004041385	0.002094159
D_Tl	Post-Closure	P95	5.11809E-05	4.35594E-05	4.77294E-05	4.41496E-05	2.1871E-05	3.19158E-05	3.74931E-05	4.45039E-05	4.7836E-05	4.90919E-05	4.42889E-05	5.17681E-05
D_U	Post-Closure	P95	0.000344536	0.000328957	0.000322196	0.000263989	0.000191593	0.00020398	0.00025236	0.000271525	0.000297575	0.000245222	0.000257315	0.000253323
D_V	Post-Closure	P95	0.019850556	0.020047635	0.020145742	0.019856816	0.014063044	0.017454151	0.020462273	0.021691678	0.021861594	0.019084029	0.019248208	0.019613538
D_Zn	Post-Closure	P95	0.017459905	0.018557724	0.021015083	0.02483058	0.007396361	0.008962658	0.010682691	0.01276244	0.014785623	0.014199077	0.014226467	0.016499311

Appendix A.3.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ27

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.260256946	0.266030163	0.259571254	0.164459825	0.053207643	0.06796138	0.10912136	0.183317065	0.173765942	0.174112558	0.232109338	0.259834051
NO3_N	Closure	P95	0.061310995	0.054317996	0.05414306	0.072787821	0.053341895	0.064049497	0.081225976	0.051404171	0.057647798	0.04655797	0.049998231	0.064371131
NO2_N	Closure	P95	0.001155969	0.001139772	0.001219094	0.001185898	0.001262269	0.001391108	0.001456911	0.00130754	0.001215034	0.001146246	0.001138758	0.001256137
Br	Closure	P95	0.036502719	0.033764824	0.032514147	0.033466902	0.034078233	0.029332478	0.034350052	0.03016974	0.032809589	0.028716672	0.035278834	0.036936224
Cl	Closure	P95	2.308753967	2.591491938	2.696410656	1.098226905	0.649383307	0.641321659	1.038635612	1.676365256	1.159447908	1.106048107	1.902671337	1.882324815
F	Closure	P95	0.082079865	0.075104244	0.072575897	0.06714724	0.064758979	0.067989647	0.084903412	0.070912167	0.081279427	0.0697795	0.06994696	0.085368209
TDP	Closure	P95	0.008891847	0.009407151	0.010137646	0.009615554	0.009638273	0.012073734	0.010211438	0.009952049	0.00953177	0.009217181	0.008778911	0.008692299
SO4	Closure	P95	35.4838562	37.96595383	38.18229294	21.4514904	11.95068264	13.30369377	25.0486145	23.93790245	23.97554016	21.91612434	27.56547165	31.48768044
T_CN	Closure	P95	0.003963707	0.004037721	0.003790218	0.003289573	0.002872776	0.002919902	0.003216633	0.003424199	0.003608429	0.003490294	0.003977191	0.004126319
WAD_CN	Closure	P95	0.003215574	0.003058543	0.002875597	0.002493205	0.002831594	0.002742913	0.002861063	0.002761476	0.002952433	0.002529639	0.002821816	0.003219627
T_Ag	Closure	P95	2.10071E-05	1.87771E-05	1.95376E-05	2.08215E-05	2.37905E-05	2.54337E-05	3.1875E-05	2.09728E-05	2.18763E-05	1.93594E-05	1.92058E-05	2.33561E-05
T_Al	Closure	P95	0.066122174	0.057925966	0.052859712	0.031088192	0.289583027	0.289878219	0.306824148	0.077496059	0.058552518	0.059572414	0.075998999	0.076640487
T_As	Closure	P95	0.001123653	0.00104831	0.000959243	0.00084138	0.000867409	0.000784613	0.00114231	0.001151533	0.001167276	0.001036351	0.000980977	0.001155566
T_B	Closure	P95	0.018897526	0.01705149	0.013529094	0.013487014	0.01133447	0.012038153	0.022646323	0.017622126	0.019077085	0.01659368	0.016854847	0.021159336
T_Ba	Closure	P95	0.008264799	0.00793959	0.007789802	0.007392391	0.008203476	0.006035829	0.006420917	0.007165179	0.008182048	0.006109315	0.006919934	0.007789408
T_Bi	Closure	P95	3.21664E-05	3.06295E-05	2.87493E-05	2.4932E-05	2.83159E-05	2.7431E-05	2.86101E-05	2.76182E-05	2.95276E-05	2.52964E-05	2.82167E-05	3.22004E-05
T_Be	Closure	P95	9.62219E-05	8.83355E-05	8.06475E-05	7.02386E-05	7.29466E-05	7.0425E-05	9.84071E-05	8.68359E-05	9.37645E-05	7.92727E-05	8.46451E-05	9.93463E-05
T_Ca	Closure	P95	20.40399551	20.58930969	20.6068306	19.25660133	16.41791534	16.92276001	17.35251236	19.16470528	19.30755043	19.21396255	19.26471901	19.9753933
T_Cd	Closure	P95	6.96721E-05	5.89071E-05	4.62905E-05	5.25923E-05	4.03531E-05	4.90616E-05	9.44835E-05	6.49191E-05	7.2717E-05	6.2078E-05	6.38016E-05	8.29804E-05
T_Co	Closure	P95	0.000711022	0.000712823	0.000689919	0.000447622	0.000280234	0.000339989	0.00065009	0.000515702	0.000552588	0.000508475	0.000571756	0.000672412
T_Cr	Closure	P95	0.000338275	0.000309451	0.000300546	0.000259255	0.000302333	0.000304065	0.000331919	0.000319112	0.000341073	0.000344849	0.000345689	0.000336943
T_Cu	Closure	P95	0.000581756	0.000538257	0.000467755	0.000434779	0.000632323	0.000660828	0.000772091	0.000551319	0.000583114	0.000501998	0.000519603	0.000625937
T_Fe	Closure	P95	0.108668633	0.105528347	0.092868224	0.079986587	0.20773755	0.208765596	0.224479169	0.113437332	0.112430133	0.088335641	0.100641377	0.11743997
T_Hg	Closure	P95	1.73691E-05	1.54843E-05	1.30233E-05	1.83845E-05	1.2393E-05	1.22048E-05	2.28489E-05	1.51032E-05	1.65801E-05	1.43233E-05	1.48924E-05	1.96977E-05
T_K	Closure	P95	3.138192654	2.878011465	2.507495165	2.836851597	1.877076507	2.08767128	3.822855949	2.699121237	3.000596523	2.654773951	2.658184052	3.512569666
T_Li	Closure	P95	0.005853258	0.005008915	0.003928301	0.00425921	0.003194925	0.003972954	0.007581579	0.005415299	0.006054117	0.005099704	0.00532562	0.007081655
T_Mg	Closure	P95	4.331508636	4.371923447	4.406265736	4.050156116	3.465898752	3.912530422	3.905321598	4.266403675	4.279569149	4.290734291	4.306222439	4.318385601
T_Mn	Closure	P95	0.018598229	0.017605515	0.016670268	0.014638644	0.014004351	0.014879252	0.023232616	0.017536938	0.017836014	0.015416795	0.015179374	0.018085836
T_Mo	Closure	P95	0.003243534	0.003308655	0.003254847	0.002305634	0.001620735	0.001472152	0.002643353	0.002275556	0.002579035	0.002221253	0.0023721	0.003005213
T_Na	Closure	P95	10.49466801	11.87096024	12.04583836	6.144766331	4.209832191	3.798291683	5.044710636	8.083726883	6.356416702	5.964325905	8.229712486	8.90100956
T_Ni	Closure	P95	0.000908834	0.000816659	0.000655084	0.000650879	0.000548282	0.000634337	0.001098512	0.000869432	0.000926326	0.00080526	0.000838076	0.00102006
T_P	Closure	P95	0.022546969	0.023211647	0.023907376	0.021903256	0.020240435	0.023734311	0.023455828	0.024139769	0.022085721	0.021333737	0.021178694	0.021122748
T_Pb	Closure	P95	5.82874E-05	5.27972E-05	4.74871E-05	4.39246E-05	6.01275E-05	6.27746E-05	7.53805E-05	5.43221E-05	5.78426E-05	5.05893E-05	5.14638E-05	6.1171E-05
T_S	Closure	P95	1.125534892	1.137059212	1.144366622	1.062990427	0.911645114	1.093040466	0.954777956	1.072054267	1.087981701	1.117030382	1.117216706	1.1345011
T_Sb	Closure	P95	0.008504963	0.007109537	0.005384308	0.006125473	0.004409555	0.005699735	0.011374153	0.007808755	0.008809926	0.007372375	0.007472961	0.010274876
T_Se	Closure	P95	0.00023319	0.000210403	0.000223182	0.000213777	0.000144684	0.000154398	0.000243306	0.000197461	0.00022111	0.000190403	0.000190285	0.000232977
T_Si	Closure	P95	7.737555504	7.357931137	6.996688366	6.179932594	6.91896677	5.31016016	5.678635597	6.336905479	6.788768768	6.095092297	6.733506203	7.716670036
T_Sn	Closure	P95	6.44785E-05	6.12881E-05	5.76239E-05	4.98641E-05	5.68808E-05	5.48984E-05	5.73508E-05	5.53568E-05	5.91795E-05	5.06276E-05	5.6622E-05	6.4648E-05
T_Sr	Closure	P95	0.105913721	0.100620262	0.098461457	0.093239926	0.095780596	0.085164227	0.087077275	0.091637552	0.10622634	0.087826453	0.08801204	0.104308806
T_Ti	Closure	P95	0.004484796	0.003784613	0.003038398	0.002641537	0.004992511	0.005108574	0.005443961	0.003444162	0.0024945	0.004978744	0.004924762	0.003989875
T_Tl	Closure	P95	5.10934E-05	4.37516E-05	3.79847E-05	4.22194E-05	3.68306E-05	4.11283E-05	6.79123E-05	4.84122E-05	5.34452E-05	4.5771E-05	4.56028E-05	6.02117E-05
T_U	Closure	P95	0.000355781	0.000348183	0.000343626	0.000320261	0.000315192	0.000268618	0.000349922	0.000307738	0.000350684	0.000277822	0.000294837	0.000352928
T_V	Closure	P95	0.001739604	0.001508404	0.001166093	0.001249401	0.001059457	0.001245552	0.002376639	0.00177904	0.00189203	0.001639187	0.001682766	0.002103802
T_Zn	Closure	P95	0.004946071	0.004496359	0.003816873	0.003730112	0.003275516	0.003623277	0.006188235	0.004788275	0.005017218	0.00437715	0.004454119	0.005477607
D_Ag	Closure	P95	2.07996E-05	1.86699E-05	1.9363E-05	2.07367E-05	2.16974E-05	2.25435E-05	2.68447E-05	2.06061E-05	2.15296E-05	1.90936E-05	1.86972E-05	2.32246E-05
D_Al	Closure	P95	0.0372	0.0244	0.018200001	0.020852802	0.199000001	0.137999997	0.099399999	0.056885455	0.042019881	0.044005334	0.060751747	0.053431105
D_As	Closure	P95	0.001074854	0.000997441	0.000939366	0.00082311	0.000795987	0.000738446	0.001077817	0.001092875	0.001136839	0.000983713	0.000921413	0.001091366
D_B	Closure	P95	0.018895378	0.01704924	0.013526959	0.0134851	0.01133447	0.012015873	0.022640977	0.017616957	0.019073075	0.016591689	0.016848531	0.021157708
D_Ba	Closure	P95	0.007892624	0.007433069	0.007406179	0.007103756	0.007828814	0.005586371	0.005895713	0.006945751	0.008075782	0.005775643	0.006565604	0.007503243
D_Bi	Closure	P95	3.21553E-05	3.05829E-05	2.87445E-05	2.4932E-05	2.83159E-05	2.74285E-05	2.861E-05	2.76145E-05	2.95218E-05	2.52964E-05	2.82129E-05	3.21946E-05
D_Be	Closure	P95	9.62219E-05	8.83355E-05	8.06475E-05	7.02386E-05	7.29466E-05	7.0425E-05	9.84071E-05	8.68359E-05	9.37645E-05	7.92727E-05	8.46451E-05	9.93463E-05
D_Ca	Closure	P95	20.09474373	20.25274277	20.14163399	18.89793396	16.22750092	16.617136	16.8330822	18.85669899	19.15749168	18.92611885	19.02573013	19.59201241
D_Cd	Closure	P95	7.01164E-05	5.93759E-05	4.67399E-05	5.2516E-05	3.90714E-05	4.91652E-05	9.53246E-05	6.56627E-05	7.19847E-05	6.238E-05	6.33817E-05	8.51903E-05
D_Co	Closure	P95	0.000710502	0.000712689	0.000686981	0.000443888	0.000276236	0.00033497	0.000649455	0.00051468	0.000552283	0.00050765	0.000571314	0.000672159
D_Cr	Closure	P95	0.000241305	0.000228971	0.000219973	0.000181027	0.000234807	0.00023983	0.000259873	0.000260584	0.000245994	0.000269119	0.000262656	0.000260064
D_Cu	Closure	P95	0.000576534	0.000483385	0.000437414	0.000387145	0.000600192	0.000632833	0.000760092	0.000563677	0.00057432	0.000505605	0.00052184	0.000627791
D_Fe	Closure	P95	0.08473254	0.080645233	0.072600983	0.052266043	0.118138149	0.120211758	0.129348546	0.092811048	0.084182575	0.071052678	0.077516988	0.085309722
D_Hg	Closure	P95	1.73648E-05	1.54799E-05	1.3019E-05	1.8383E-05	1.2639E-05	1.16143E-05	2.30517E-05	1.48662E-05	1.65554E-05	1.43184E-05	1.48864E-05	1.96945E-05
D_K	Closure	P95	3.129994154	2.85962677	2.504715204	2.821142673	1.816902637	2.071815491	3.809644461	2.674679518	2.990762472	2.61735177	2.653680086	3.503380299
D_Li	Closure	P95	0.00585324	0.005008897	0.003928284	0.004259197	0.003194872	0.003972807	0.007581509	0.00541526	0.006054089	0.005099663	0.005325603	0.00708165
D_Mg	Closure	P95	4.245038986	4.271546841	4.343656063	4.008271217	3.424287081	3.867268801	3.873350143	4.159277439	4.174818993	4.183473587	4.204068661	4.231063366
D_Mn	Closure	P95	0.013831802	0.012601249	0.01047541	0.010071009	0.007989906	0.009843391	0.017773626	0.014080344	0.014901577	0.012515325	0.012904271	0.016015466
D_Mo	Closure	P95	0.003184936	0.003248367	0.00320778	0.002254339	0.00159229	0.001451337	0.002630753	0.002246839	0.002584464	0.002190992	0.002361969	0.002962113
D_Na	Closure	P95	10.4001646	11.7632103	11.97445107	6.095379829	4.156561375	3.732923031	5.018643856	8.003201485	6.328984737	5.930850506	8.065234184	8.844705582
D_Ni	Closure	P95	0.000908518	0.000816326	0.000652925	0.000645927	0.000533002	0.000630083	0.001096628	0.000868311	0.000925458	0.000804743	0.000837863	0.001019822
D_P	Closure	P95	0.132459342	0.101503357	0.068936042	0.052736614	0.03962186	0.04493707	0.036233045	0.082702756	0.042910948	0.149362311	0.144885018	0.109142907
D_Pb	Closure	P95	5.58392E-05	5.21508E-05	4.67512E-05	4.37673E-05	4.081E-05	3.99414E-05	6.1079E-05	5.26847E-05	5.52856E-05	4.76372E-05	4.93941E-05	5.94367E-05
D_S	Closure	P95	1.146818161	1.161231875	1.160705805	1.070697188	0.91316855	1.05040884	0.990178108	1.107694983	1.130804062	1.142634988	1.1404953	1.144013047
D_Sb	Closure	P95	0.008504953	0.007109527	0.005384299	0.006125466	0.00440952	0.005699655	0.011374116	0.007808728	0.008809903	0.007372337	0.007472946	0.010274869
D_Se	Closure	P95	0.00020988	0.000180475	0.000203435	0.000203941	0.000149995	0.000149389	0.000246365	0.000189245	0.00021013	0.00016638	0.000157465	0.000216871
D_Si	Closure	P95	7.459416866	7.042005062	6.822471142	5.802386284	6.510240555	5.091243267	5.51168108	6.206623554	6.718479633	5.96411705	6.557535172	7.305182934
D_Sn	Closure	P95	6.44785E-05	6.12881E-05	5.76239E-05	4.98641E-05	5.68808E-05	5.48984E-05	5.73508E-05	5.53568E-05	5.91795E-05	5.06276E-05	5.6622E-05	6.4648E-05
D_Sr	Closure	P95	0.107031263	0.099490196	0.097133338	0.091061123	0.09627796	0.083731547	0.085406855	0.090478785	0.106685631	0.086478315	0.088829979	0.105971903
D_Ti	Closure	P95	0.00436369	0.003232361	0.00223027	0.001504511	0.002715421	0.002746401	0.002922177	0.002876475	0.001398	0.004978744	0.004736851	0.003592878
D_Tl	Closure	P95	5.10925E-05	4.37507E-05	3.79838E-05	4.22121E-05	3.68306E-05	4.11164E-05	6.79094E-05	4.84106E-05	5.34439E-05	4.57688E-05	4.56018E-05	6.0211E-05
D_U	Closure	P95	0.000344069	0.000333299	0.000326709	0.000304176	0.000296075	0.000255419	0.000337674	0.000297411	0.000346725	0.000269033	0.000285198	0.000341616
D_V	Closure	P95	0.001722435	0.00149038	0.001144315	0.001232868	0.000953289	0.001209224	0.002268568	0.001729005	0.001872558	0.001625548	0.001643888	0.002086907
D_Zn	Closure	P95	0.004220052	0.003597532	0.003247905	0.003386462	0.003182115	0.003296159	0.005702777	0.004114862	0.004111214	0.003516229	0.004105386	0.004618597

Appendix A.3.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ27

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	1.851632714	1.988743186	2.117611647	1.779070616	0.994377077	1.192238092	1.294133544	1.414704084	1.437619925	1.398117423	1.499600291	1.695068002
NO3_N	Post-Closure	P95	1.834271431	1.695737362	1.92450285	1.246168256	0.999271274	1.358136654	1.544175029	1.734912395	1.836879373	1.869414449	1.761712432	1.699645758
NO2_N	Post-Closure	P95	0.005710706	0.005939854	0.005599886	0.004253528	0.004270309	0.005633089	0.005928481	0.006044612	0.006052777	0.00631948	0.005823123	0.005794032
Br	Post-Closure	P95	0.083536714	0.077697471	0.075827084	0.062852249	0.051870249	0.059497252	0.055520661	0.067705914	0.075650409	0.069873616	0.078113079	0.081723936
Cl	Post-Closure	P95	18.45215225	18.62902832	18.5583477	18.52225876	18.82288361	18.79401207	18.49094391	19.40519905	19.80086136	20.32229614	19.67539597	18.15342712
F	Post-Closure	P95	0.414504945	0.420388699	0.421835899	0.418694735	0.291492969	0.398437977	0.453347027	0.473403782	0.45947665	0.414612532	0.429625779	0.416559398
TDP	Post-Closure	P95	0.029254114	0.027368195	0.029448472	0.025744593	0.021892009	0.029975625	0.032152198	0.033398546	0.033259943	0.029605769	0.030761249	0.028318096
SO4	Post-Closure	P95	358.3598328	360.9339294	354.4729004	352.3482056	399.0000305	388.9320374	372.2253418	381.8026123	382.980011	398.3474121	384.7582397	359.2912903
T_CN	Post-Closure	P95	0.011663971	0.012272794	0.012873651	0.011444224	0.007348399	0.009392087	0.009799749	0.010414912	0.011139914	0.009969181	0.010235487	0.010969468
WAD_CN	Post-Closure	P95	0.003205725	0.003039161	0.002926308	0.002481758	0.002715042	0.002689335	0.002613461	0.002584608	0.002442929	0.002441943	0.002547209	0.002477024
T_Ag	Post-Closure	P95	2.49652E-05	2.48652E-05	2.60197E-05	2.41398E-05	2.55474E-05	2.58831E-05	2.49441E-05	2.631E-05	2.70282E-05	2.49764E-05	2.48271E-05	2.51291E-05
T_Al	Post-Closure	P95	0.121425115	0.094851889	0.087304182	0.035237174	0.284070373	0.191413328	0.144239396	0.070211753	0.038353272	0.066174969	0.12159957	0.113453753
T_As	Post-Closure	P95	0.001134077	0.001125936	0.001110359	0.00117194	0.000872321	0.000816319	0.00094917	0.001109923	0.001106745	0.001041804	0.00107461	0.001110864
T_B	Post-Closure	P95	0.018562159	0.016537681	0.013482894	0.011884119	0.009844212	0.011080509	0.014003699	0.016103074	0.016803456	0.016812349	0.01539505	0.017006332
T_Ba	Post-Closure	P95	0.008242089	0.007742021	0.007685273	0.007380235	0.006255656	0.005554107	0.006171749	0.006552648	0.007391378	0.005831833	0.006237803	0.006304762
T_Bi	Post-Closure	P95	3.2066E-05	3.04381E-05	3.0455E-05	2.76714E-05	2.85923E-05	3.02007E-05	2.68342E-05	3.01891E-05	2.70702E-05	2.80029E-05	2.8124E-05	2.91854E-05
T_Be	Post-Closure	P95	9.6039E-05	8.72626E-05	7.85396E-05	7.57235E-05	7.1876E-05	7.21298E-05	7.96642E-05	8.71045E-05	8.79367E-05	8.01272E-05	7.941E-05	8.09754E-05
T_Ca	Post-Closure	P95	93.706604	94.22916412	92.84415436	90.46520996	106.92202	103.0921707	99.54824829	101.5543594	102.8910675	104.2663879	100.1727295	93.81607819
T_Cd	Post-Closure	P95	0.000207118	0.000230182	0.000257417	0.000300898	9.32358E-05	0.000117794	0.000139332	0.000160964	0.000184828	0.000176629	0.00017549	0.000198206
T_Co	Post-Closure	P95	0.001592892	0.00165645	0.001726538	0.001554415	0.00085936	0.001106548	0.001278765	0.001397789	0.001483885	0.001351254	0.001382778	0.00152216
T_Cr	Post-Closure	P95	0.000335608	0.000301316	0.000304272	0.000258729	0.0003026	0.00027529	0.000316575	0.000277817	0.000269666	0.000282935	0.000289506	0.000265209
T_Cu	Post-Closure	P95	0.000579662	0.000523613	0.000496712	0.00057192	0.000630288	0.000468216	0.000574727	0.000557272	0.000562047	0.000512877	0.000496402	0.000516032
T_Fe	Post-Closure	P95	0.130124137	0.10776747	0.106253989	0.079622567	0.205086455	0.135591775	0.134353414	0.106961712	0.091339476	0.081685185	0.113096751	0.117060944
T_Hg	Post-Closure	P95	2.05867E-05	2.08957E-05	1.97651E-05	1.631E-05	1.29702E-05	1.36043E-05	1.51463E-05	1.86589E-05	2.00752E-05	1.82691E-05	1.91949E-05	2.00066E-05
T_K	Post-Closure	P95	47.79937363	49.12387085	50.16765976	46.66431427	28.65005302	36.44235992	42.28031921	45.12638474	47.20272064	42.19045258	43.06306076	46.25805283
T_Li	Post-Closure	P95	0.071926437	0.072243251	0.072282687	0.070187159	0.052579276	0.065131731	0.075270191	0.079558015	0.080069594	0.070110574	0.071369924	0.071563601
T_Mg	Post-Closure	P95	6.946576118	7.104157925	7.255765915	7.011284828	4.416654587	5.517433643	6.27608633	6.736504555	7.07365799	6.316755295	6.456180096	6.668258667
T_Mn	Post-Closure	P95	0.467661262	0.489721656	0.507220387	0.515898645	0.310038596	0.391185164	0.444873601	0.467386752	0.481024981	0.42166093	0.46795693	0.44999975
T_Mo	Post-Closure	P95	0.003774043	0.004192698	0.004729083	0.004868339	0.001367239	0.001714537	0.002118136	0.002538495	0.002821212	0.002565934	0.002820432	0.0034241
T_Na	Post-Closure	P95	65.07901001	65.74107361	65.52189636	65.90972137	65.67305756	65.44290924	65.27394104	69.49090576	70.76738739	72.44160461	71.07180023	64.21659851
T_Ni	Post-Closure	P95	0.001642121	0.001673825	0.001712872	0.001687919	0.001184313	0.001475867	0.001634704	0.001699646	0.001725268	0.001580823	0.001604619	0.001614061
T_P	Post-Closure	P95	0.028736264	0.026978035	0.029852416	0.024829892	0.024791205	0.030111374	0.032622755	0.032825556	0.033296537	0.029764149	0.0304965	0.028353479
T_Pb	Post-Closure	P95	0.000116976	0.000120441	0.000130768	0.00014992	7.83183E-05	7.40979E-05	8.04314E-05	9.42082E-05	0.000106132	0.000103816	0.000104486	0.00011311
T_S	Post-Closure	P95	1.017867804	1.07276392	1.081802726	1.033096075	0.780196846	0.990489006	0.855639458	0.890661597	0.917654693	0.997081161	0.886382639	0.933744967
T_Sb	Post-Closure	P95	0.009694456	0.008984882	0.008695899	0.007985944	0.0064385	0.00853331	0.00970656	0.010445357	0.010496991	0.010960332	0.010102071	0.010628146
T_Se	Post-Closure	P95	0.00022948	0.000202643	0.000213546	0.000127741	0.000105337	0.0001118	0.000147343	0.000174758	0.00019521	0.000170073	0.000163484	0.00017483
T_Si	Post-Closure	P95	7.718576908	7.173403263	6.90921545	6.177478313	5.233377457	5.341449738	5.493731022	5.812298775	5.677405834	6.070543766	5.946118832	6.071855545
T_Sn	Post-Closure	P95	6.42771E-05	6.09E-05	6.21286E-05	5.56696E-05	5.77786E-05	6.16327E-05	5.42391E-05	6.05483E-05	5.60427E-05	5.66963E-05	5.74299E-05	5.90452E-05
T_Sr	Post-Closure	P95	0.242641196	0.241196424	0.235573933	0.199873224	0.179671377	0.223366931	0.262914181	0.276161164	0.261357725	0.237380117	0.232125178	0.235620096
T_Ti	Post-Closure	P95	0.004196577	0.003162978	0.003242705	0.00262859	0.004939415	0.004290965	0.00357626	0.003304975	0.00245567	0.004685725	0.004267736	0.003064715
T_Tl	Post-Closure	P95	4.99981E-05	4.23598E-05	4.04802E-05	3.29749E-05	2.16389E-05	3.12291E-05	3.67749E-05	4.35204E-05	4.64948E-05	4.55809E-05	4.05969E-05	4.59863E-05
T_U	Post-Closure	P95	0.000353027	0.000339311	0.000334732	0.000278854	0.000209432	0.000218098	0.000262505	0.000278327	0.00029698	0.000253054	0.000263627	0.00025641
T_V	Post-Closure	P95	0.018863892	0.018956013	0.018990571	0.018333308	0.013791606	0.017019697	0.019595973	0.020694168	0.020867577	0.018348154	0.018639477	0.018734088
T_Zn	Post-Closure	P95	0.016792748	0.01779641	0.019960582	0.023274673	0.007590796	0.008906348	0.010515459	0.012431483	0.014399011	0.014047378	0.013915163	0.016001107
D_Ag	Post-Closure	P95	2.45733E-05	2.45323E-05	2.57722E-05	2.40602E-05	1.86608E-05	2.5646E-05	2.48962E-05	2.62211E-05	2.6902E-05	2.49319E-05	2.41919E-05	2.46537E-05
D_Al	Post-Closure	P95	0.0372	0.0244	0.018200001	0.021479391	0.199000001	0.137999997	0.099399999	0.051436674	0.025554683	0.051313918	0.093471885	0.064400002
D_As	Post-Closure	P95	0.001099571	0.001093547	0.001088735	0.001129965	0.000782699	0.000750879	0.000912374	0.001061194	0.001069377	0.000995392	0.00103291	0.001074854
D_B	Post-Closure	P95	0.018560063	0.016535491	0.013482894	0.011884119	0.009844041	0.011080508	0.014002855	0.016102877	0.016798601	0.016812349	0.01539505	0.017006332
D_Ba	Post-Closure	P95	0.007867685	0.007203816	0.007289433	0.0070928	0.005731117	0.005217752	0.00570634	0.006378066	0.007458786	0.005445982	0.005889331	0.006047274
D_Bi	Post-Closure	P95	3.2055E-05	3.03903E-05	3.04542E-05	2.76714E-05	2.85923E-05	3.01981E-05	2.68337E-05	3.01885E-05	2.70702E-05	2.80029E-05	2.81235E-05	2.91854E-05
D_Be	Post-Closure	P95	9.6039E-05	8.72626E-05	7.85396E-05	7.57235E-05	7.1876E-05	7.21298E-05	7.96642E-05	8.71045E-05	8.79367E-05	8.01272E-05	7.941E-05	8.09754E-05
D_Ca	Post-Closure	P95	93.55982208	94.12969208	92.68024445	90.4966507	106.9063873	103.0353317	99.45428467	101.5146255	102.9664612	104.015007	100.1184311	93.79769897
D_Cd	Post-Closure	P95	0.000207024	0.000229859	0.000257086	0.000300277	9.20443E-05	0.000117674	0.000140289	0.000160863	0.000184114	0.000176351	0.000175152	0.000198641
D_Co	Post-Closure	P95	0.001592743	0.001656324	0.001725804	0.0015539	0.000859007	0.001103936	0.001278762	0.001397784	0.00148388	0.001351033	0.001382632	0.001521984
D_Cr	Post-Closure	P95	0.000233418	0.000225804	0.000228323	0.000191861	0.00023468	0.000227605	0.000236904	0.00024031	0.000204865	0.000225069	0.00021813	0.000209761
D_Cu	Post-Closure	P95	0.000574439	0.000469351	0.000487923	0.000567224	0.000597951	0.000487694	0.00056344	0.000559312	0.000553515	0.000503833	0.000500771	0.000515987
D_Fe	Post-Closure	P95	0.093594722	0.080243513	0.079553455	0.052047893	0.116866633	0.090687007	0.091735475	0.088176884	0.065453276	0.066060916	0.079609372	0.081599198
D_Hg	Post-Closure	P95	2.05903E-05	2.08995E-05	1.97843E-05	1.63343E-05	1.33162E-05	1.30947E-05	1.5145E-05	1.86684E-05	2.00813E-05	1.83048E-05	1.91957E-05	2.00069E-05
D_K	Post-Closure	P95	47.79917908	49.12076187	50.16865158	46.6578064	28.6556778	36.44026947	42.27784729	45.12005997	47.20181656	42.18022919	43.0639534	46.25635529
D_Li	Post-Closure	P95	0.071926437	0.072243251	0.072282687	0.070187159	0.052579276	0.065131731	0.075270191	0.079558015	0.080069594	0.070110574	0.071369924	0.071563601
D_Mg	Post-Closure	P95	6.940014362	7.10402298	7.222377777	7.013376236	4.409945011	5.511739254	6.270114422	6.730587959	7.065076828	6.311863422	6.462665558	6.686436176
D_Mn	Post-Closure	P95	0.467143863	0.489444703	0.506972373	0.51569289	0.306614608	0.38996774	0.444396287	0.466888875	0.480621666	0.421225548	0.467540205	0.449367642
D_Mo	Post-Closure	P95	0.003717266	0.00414425	0.004697423	0.004850365	0.001359317	0.001707227	0.002120268	0.002527439	0.002819313	0.00255085	0.002818255	0.00339204
D_Na	Post-Closure	P95	65.02698517	65.69372559	65.46829987	65.85933685	65.6305542	65.35617828	65.24130249	69.44243622	70.74035645	72.39051819	70.99377441	64.18782043
D_Ni	Post-Closure	P95	0.001641992	0.001673618	0.001712288	0.001686579	0.00118314	0.001475692	0.001634664	0.001699632	0.001725251	0.001580602	0.001604491	0.00161391
D_P	Post-Closure	P95	0.107743077	0.090534016	0.073191255	0.05766147	0.039813858	0.041190565	0.042929456	0.074797548	0.041991308	0.14045313	0.124234892	0.050511319
D_Pb	Post-Closure	P95	0.00011659	0.000120111	0.000129513	0.000147046	6.36408E-05	7.36487E-05	8.0253E-05	9.33305E-05	0.000105828	0.000102905	0.000103693	0.000112656
D_S	Post-Closure	P95	1.040021896	1.085605502	1.102228642	1.025778294	0.80572176	0.982325733	0.879637659	0.858284831	0.943905532	0.896008253	0.910028219	0.883587778
D_Sb	Post-Closure	P95	0.009694456	0.008984882	0.008695899	0.007985944	0.006438499	0.00853331	0.00970656	0.010445356	0.01049699	0.010960332	0.010102071	0.010628146
D_Se	Post-Closure	P95	0.000207045	0.000172325	0.000200719	0.000134737	0.000105457	0.000105187	0.000149631	0.000166676	0.000185353	0.00015285	0.000143118	0.000171186
D_Si	Post-Closure	P95	7.441150188	6.866576672	6.731832981	5.800000668	4.908721447	5.14850378	5.335578918	5.644088268	5.679159164	5.932649136	5.802236557	5.802524567
D_Sn	Post-Closure	P95	6.42771E-05	6.09E-05	6.21286E-05	5.56696E-05	5.77786E-05	6.16327E-05	5.42391E-05	6.05483E-05	5.60427E-05	5.66963E-05	5.74299E-05	5.90452E-05
D_Sr	Post-Closure	P95	0.24223882	0.240374982	0.234357268	0.200097486	0.179264382	0.22312285	0.262164235	0.276324958	0.261698574	0.237045169	0.233785138	0.236024186
D_Ti	Post-Closure	P95	0.003341633	0.002741315	0.0025422	0.001987894	0.002693203	0.002177088	0.001921252	0.002688305	0.001538243	0.004648751	0.004058643	0.002147779
D_Tl	Post-Closure	P95	4.99972E-05	4.23589E-05	4.04802E-05	3.29749E-05	2.16389E-05	3.11847E-05	3.67746E-05	4.35188E-05	4.64945E-05	4.55809E-05	4.05969E-05	4.59863E-05
D_U	Post-Closure	P95	0.000341128	0.000324921	0.00031816	0.00026292	0.000191132	0.000203639	0.000250375	0.000268499	0.000294655	0.000242787	0.000253663	0.000246946
D_V	Post-Closure	P95	0.018858492	0.018951453	0.018986635	0.01831802	0.013653702	0.016992729	0.019567113	0.02067204	0.02086265	0.018328033	0.018609943	0.018717648
D_Zn	Post-Closure	P95	0.016615802	0.017303076	0.01952179	0.02276865	0.007262274	0.00874906	0.010302381	0.012193342	0.014061263	0.01365555	0.013714919	0.01571119

Appendix A.3.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ26

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.2149923	0.218604803	0.208965719	0.128425598	0.049964428	0.063151523	0.093869962	0.142579615	0.140089601	0.141916975	0.184850127	0.208573982
NO3_N	Closure	P95	0.051168576	0.046531808	0.048648518	0.057293277	0.048310511	0.059645239	0.067545533	0.041594181	0.044523004	0.037576608	0.039510582	0.050251987
NO2_N	Closure	P95	0.001014586	0.000984898	0.001047109	0.001048491	0.001172028	0.001327394	0.001330779	0.001151536	0.001064704	0.000993553	0.001004778	0.001063488
Br	Closure	P95	0.033055406	0.03116505	0.029791439	0.031215429	0.032078244	0.028722256	0.032252457	0.028680135	0.030668655	0.027563592	0.031174211	0.032658599
Cl	Closure	P95	1.771861792	2.101762295	2.027960777	0.94678539	0.593905032	0.607733607	0.918528557	1.362592936	0.983314097	0.988522768	1.450473905	1.33539772
F	Closure	P95	0.072860308	0.067359485	0.065534979	0.062231287	0.06079305	0.064764313	0.077154025	0.064909391	0.071493708	0.064050898	0.063291736	0.072598182
TDP	Closure	P95	0.010986201	0.010648899	0.013411341	0.013552666	0.009508477	0.011950626	0.009520694	0.009818077	0.008727151	0.008693353	0.009595546	0.01085082
SO4	Closure	P95	27.44551849	29.69218636	28.15019989	16.09602547	11.29276752	12.32939434	21.68787193	19.64129829	19.23293114	18.16611671	21.86563873	23.27264977
T_CN	Closure	P95	0.003554558	0.003588934	0.003571115	0.003014417	0.002783936	0.002872593	0.003103507	0.003239889	0.003332622	0.003291906	0.003647079	0.00366716
WAD_CN	Closure	P95	0.003025008	0.002897957	0.002727302	0.002472689	0.00274596	0.002705338	0.002769816	0.002674764	0.002807855	0.0025137	0.002713139	0.002974044
T_Ag	Closure	P95	1.70677E-05	1.53324E-05	1.58695E-05	1.76428E-05	2.22713E-05	2.31734E-05	2.81669E-05	1.79906E-05	1.81703E-05	1.65075E-05	1.64349E-05	1.83291E-05
T_Al	Closure	P95	0.054094695	0.04852324	0.041333117	0.030171856	0.288275659	0.272873074	0.253964841	0.069372281	0.051151119	0.069105908	0.076314554	0.066094473
T_As	Closure	P95	0.001069545	0.000999071	0.00093636	0.000959972	0.000890667	0.000798896	0.001122156	0.001123398	0.001126734	0.001013991	0.000962032	0.001073918
T_B	Closure	P95	0.01528513	0.013640685	0.011301829	0.010670197	0.01077172	0.011484474	0.020109845	0.015034632	0.016213788	0.014257611	0.014679858	0.016561862
T_Ba	Closure	P95	0.008081959	0.00787458	0.007747674	0.007596895	0.007801894	0.005973631	0.006610126	0.007216349	0.008076801	0.006282805	0.006666353	0.007376845
T_Bi	Closure	P95	3.02585E-05	2.9014E-05	2.72684E-05	2.47269E-05	2.74596E-05	2.70523E-05	2.76977E-05	2.67504E-05	2.8081E-05	2.5137E-05	2.71295E-05	2.97446E-05
T_Be	Closure	P95	8.53753E-05	7.8763E-05	7.16635E-05	6.37761E-05	7.0341E-05	6.82333E-05	9.14053E-05	7.94747E-05	8.36712E-05	7.34091E-05	7.77199E-05	8.69279E-05
T_Ca	Closure	P95	18.98552132	19.38585663	19.59852409	18.36670876	15.77148914	16.34614372	16.56577682	17.66986465	18.21560097	17.84376335	17.97809219	18.52136803
T_Cd	Closure	P95	5.08027E-05	4.35172E-05	3.50352E-05	3.79905E-05	3.84649E-05	4.55276E-05	8.1629E-05	5.26498E-05	5.69859E-05	5.09126E-05	5.21266E-05	5.8406E-05
T_Co	Closure	P95	0.000553909	0.00055329	0.000506748	0.000329989	0.000266905	0.000317351	0.000563889	0.000427739	0.00044833	0.000421207	0.000454891	0.00050896
T_Cr	Closure	P95	0.000312889	0.000281082	0.000276034	0.000253177	0.000311852	0.00029824	0.000304589	0.000289968	0.000309298	0.000326797	0.000322962	0.000305872
T_Cu	Closure	P95	0.000502905	0.000461752	0.000406375	0.00037549	0.00064401	0.000646948	0.000691694	0.000487842	0.000506129	0.000511422	0.000468354	0.000522241
T_Fe	Closure	P95	0.094271325	0.088080071	0.075424157	0.076855451	0.20770447	0.197826877	0.189282298	0.10559921	0.100657381	0.098179221	0.097685657	0.10548678
T_Hg	Closure	P95	1.31104E-05	1.18839E-05	1.03088E-05	1.21387E-05	1.18874E-05	1.15975E-05	1.97072E-05	1.23666E-05	1.34247E-05	1.19775E-05	1.24764E-05	1.43617E-05
T_K	Closure	P95	2.452252865	2.23317647	1.956907153	2.002130747	1.69445622	1.949742317	3.343180895	2.263328791	2.46928978	2.224771738	2.202821016	2.586559296
T_Li	Closure	P95	0.004341657	0.003774234	0.003045523	0.00312476	0.003035733	0.003701064	0.006580086	0.004455673	0.004816925	0.004229942	0.004388455	0.005006689
T_Mg	Closure	P95	4.101324081	4.15490675	4.218081474	3.860750437	3.333755493	3.772542	3.662246943	3.964888811	4.02804184	3.958021402	4.021785736	3.987819433
T_Mn	Closure	P95	0.014742136	0.014340536	0.01367304	0.012322208	0.013959782	0.014376792	0.020271352	0.015117334	0.015068552	0.014424484	0.0135638	0.014843388
T_Mo	Closure	P95	0.002643127	0.002659277	0.002563515	0.001812991	0.001463407	0.001380378	0.002342679	0.001960087	0.002163989	0.001898289	0.001944929	0.002361451
T_Na	Closure	P95	8.729224205	9.961126328	9.6854105	5.648902893	3.957358599	3.69529891	4.791601658	6.953886032	5.688140869	5.483828545	6.651272297	6.828186035
T_Ni	Closure	P95	0.000740322	0.000656288	0.000549971	0.000522745	0.000525467	0.000604103	0.000976563	0.000743785	0.000789475	0.000697466	0.000723201	0.000803036
T_P	Closure	P95	0.019204866	0.020146307	0.020327164	0.0187867	0.020058533	0.022977477	0.021320038	0.021183731	0.019386619	0.019655814	0.018711321	0.018120846
T_Pb	Closure	P95	5.03648E-05	4.66522E-05	4.10286E-05	3.83105E-05	6.18019E-05	5.98631E-05	6.82197E-05	4.84685E-05	4.98716E-05	4.45046E-05	4.6048E-05	5.17107E-05
T_S	Closure	P95	1.072707295	1.092038393	1.061091661	1.042595744	0.875487268	1.060105681	0.882779598	0.984881639	1.034862161	1.055631042	1.011558533	1.039863586
T_Sb	Closure	P95	0.006083397	0.005207743	0.004013785	0.004297351	0.004136206	0.005258153	0.009768183	0.006293422	0.006847505	0.005990145	0.006061678	0.007116836
T_Se	Closure	P95	0.000190391	0.000168911	0.000176634	0.000174537	0.000132964	0.000144958	0.000216741	0.000167598	0.00017983	0.000158227	0.000166596	0.000186071
T_Si	Closure	P95	7.405421257	7.071493149	6.690494537	6.192206383	6.530413628	5.298068523	5.715984344	6.283627987	6.59266758	6.091841698	6.568901062	7.320232868
T_Sn	Closure	P95	6.06322E-05	5.80514E-05	5.46261E-05	4.94538E-05	5.51354E-05	5.41309E-05	5.55012E-05	5.35916E-05	5.62556E-05	5.03073E-05	5.44126E-05	5.95953E-05
T_Sr	Closure	P95	0.100634791	0.09721829	0.097787723	0.091719761	0.088543713	0.082803257	0.084560789	0.088432319	0.100404091	0.083124064	0.084134556	0.095653571
T_Ti	Closure	P95	0.004009478	0.003460835	0.002902743	0.003637387	0.004974923	0.005072389	0.005313529	0.003680795	0.003030582	0.004942154	0.004878887	0.004188541
T_Tl	Closure	P95	3.85878E-05	3.31296E-05	2.94899E-05	3.12353E-05	3.31025E-05	3.82833E-05	5.85376E-05	3.9578E-05	4.29576E-05	3.80742E-05	3.7807E-05	4.35731E-05
T_U	Closure	P95	0.000305242	0.000303967	0.000313747	0.000277578	0.000288708	0.00025675	0.000318139	0.000268433	0.000308765	0.000244556	0.000265998	0.000295853
T_V	Closure	P95	0.001356376	0.00116003	0.000929701	0.000987671	0.001024805	0.001188886	0.002128181	0.001467247	0.001562816	0.001340143	0.001461263	0.001574596
T_Zn	Closure	P95	0.00409391	0.003972832	0.003190499	0.003054174	0.00317964	0.003449878	0.005506755	0.004102054	0.00430778	0.00380184	0.003875037	0.004366369
D_Ag	Closure	P95	1.69513E-05	1.51739E-05	1.56521E-05	1.76428E-05	1.97057E-05	2.05937E-05	2.34792E-05	1.75116E-05	1.80361E-05	1.63083E-05	1.60851E-05	1.82373E-05
D_Al	Closure	P95	0.0262	0.013900001	0.0106	0.01896308	0.180500001	0.125666678	0.077	0.050824426	0.034899998	0.044225991	0.057538323	0.045551419
D_As	Closure	P95	0.001020637	0.000953382	0.000911395	0.000930434	0.000817868	0.000749453	0.001052989	0.001059179	0.00109278	0.000956233	0.000912839	0.001021954
D_B	Closure	P95	0.015277643	0.013634733	0.011301161	0.01065408	0.010764206	0.011464131	0.020105196	0.015031853	0.01620972	0.014246396	0.014675269	0.01655161
D_Ba	Closure	P95	0.007696064	0.007361587	0.007435849	0.007406443	0.007269159	0.005501116	0.00612915	0.007031937	0.007936985	0.005780859	0.006282113	0.007154461
D_Bi	Closure	P95	3.02498E-05	2.89777E-05	2.7265E-05	2.47269E-05	2.74596E-05	2.70514E-05	2.76976E-05	2.67475E-05	2.80766E-05	2.5137E-05	2.71267E-05	2.97403E-05
D_Be	Closure	P95	8.53753E-05	7.8763E-05	7.16635E-05	6.37761E-05	7.0341E-05	6.82333E-05	9.14053E-05	7.94747E-05	8.36712E-05	7.34091E-05	7.77199E-05	8.69279E-05
D_Ca	Closure	P95	18.67179108	18.93694878	19.10010338	18.05127335	15.58225918	16.05511093	16.05519104	17.42227936	17.99642181	17.50219727	17.70577431	18.22023392
D_Cd	Closure	P95	5.09701E-05	4.38348E-05	3.53676E-05	3.77558E-05	3.70252E-05	4.55146E-05	8.23289E-05	5.33246E-05	5.6742E-05	5.12326E-05	5.16277E-05	5.97903E-05
D_Co	Closure	P95	0.000553623	0.000552962	0.000504659	0.000327269	0.000262808	0.000312728	0.000563337	0.000426903	0.000448161	0.000420534	0.000454547	0.000508833
D_Cr	Closure	P95	0.000218983	0.000210921	0.000199131	0.000177084	0.000233844	0.000236359	0.00024079	0.000237389	0.000229177	0.000253085	0.000246376	0.000234554
D_Cu	Closure	P95	0.000498803	0.000416533	0.000384612	0.000340027	0.000593734	0.000594327	0.000681068	0.000490457	0.000512816	0.000455101	0.000467406	0.000523575
D_Fe	Closure	P95	0.071346633	0.066044331	0.057096384	0.05001691	0.116431445	0.11456804	0.112572871	0.084811687	0.07492236	0.074424006	0.07119552	0.075806707
D_Hg	Closure	P95	1.31065E-05	1.18757E-05	1.03057E-05	1.21378E-05	1.17005E-05	1.09043E-05	1.9867E-05	1.23475E-05	1.34146E-05	1.19602E-05	1.24715E-05	1.43586E-05
D_K	Closure	P95	2.440768719	2.216347218	1.956038594	1.991428256	1.641885757	1.934519887	3.334733725	2.245450974	2.458855391	2.190326929	2.209240198	2.582963467
D_Li	Closure	P95	0.004341633	0.003774229	0.00304551	0.003124679	0.003035683	0.00370093	0.006580045	0.00445564	0.004816895	0.004229908	0.004388442	0.005006668
D_Mg	Closure	P95	4.015203476	4.067724228	4.134007931	3.813409805	3.293489456	3.727228403	3.658670664	3.882042646	3.946871042	3.870899916	3.929039955	3.930263758
D_Mn	Closure	P95	0.011080964	0.009957835	0.008381405	0.007846233	0.007674556	0.009264997	0.01583242	0.011984386	0.012529059	0.011258608	0.010971414	0.012073553
D_Mo	Closure	P95	0.002585462	0.002593234	0.002502646	0.001777521	0.001433399	0.001359409	0.002329188	0.001930433	0.002155913	0.001857843	0.001926307	0.002313465
D_Na	Closure	P95	8.652902603	9.880055428	9.624622345	5.584209442	3.924133301	3.626779079	4.780692577	6.861842632	5.652764797	5.433470726	6.558861256	6.798632622
D_Ni	Closure	P95	0.00073984	0.000655916	0.000548367	0.000519191	0.000516162	0.000600233	0.000974924	0.000743323	0.000788501	0.000697021	0.000723026	0.000802778
D_P	Closure	P95	0.119897775	0.096883595	0.073210068	0.096149355	0.055102549	0.050157711	0.053186174	0.091247991	0.067888029	0.148409218	0.144371763	0.118259117
D_Pb	Closure	P95	4.85007E-05	4.49147E-05	4.05184E-05	3.73843E-05	3.90024E-05	3.83568E-05	5.58853E-05	4.71559E-05	4.84913E-05	4.30237E-05	4.48085E-05	5.0048E-05
D_S	Closure	P95	1.023121595	1.086547375	1.103497624	1.000362635	0.87677747	1.009269595	0.904395759	1.014041543	1.065651655	1.03005743	1.064226866	1.009236574
D_Sb	Closure	P95	0.00608338	0.00520774	0.004013777	0.004297307	0.004136174	0.00525808	0.009768157	0.006293399	0.006847486	0.005990114	0.006061666	0.007116823
D_Se	Closure	P95	0.000169997	0.00013823	0.000166208	0.00016481	0.00013633	0.000140498	0.000214339	0.000155854	0.000172842	0.000136151	0.000133563	0.000162688
D_Si	Closure	P95	7.169109344	6.789869785	6.521072388	5.778701305	6.112485886	5.077902794	5.566063881	6.144520283	6.489376068	5.932946682	6.371632576	6.885770798
D_Sn	Closure	P95	6.06322E-05	5.80514E-05	5.46261E-05	4.94538E-05	5.51354E-05	5.41309E-05	5.55012E-05	5.35916E-05	5.62556E-05	5.03073E-05	5.44126E-05	5.95953E-05
D_Sr	Closure	P95	0.101025835	0.095885247	0.09555465	0.090240248	0.088782214	0.081374221	0.083667718	0.087950945	0.100155324	0.081524797	0.082288466	0.096383721
D_Ti	Closure	P95	0.003866918	0.003023334	0.002284082	0.003076854	0.003136273	0.002972048	0.003270456	0.003195609	0.002228732	0.004942154	0.004730291	0.003898101
D_Tl	Closure	P95	3.85849E-05	3.31293E-05	2.94892E-05	3.12294E-05	3.31025E-05	3.82724E-05	5.85358E-05	3.9576E-05	4.29561E-05	3.80724E-05	3.78059E-05	4.35707E-05
D_U	Closure	P95	0.000295867	0.000290791	0.00029833	0.000260223	0.000267037	0.00024336	0.000306876	0.000259413	0.000301134	0.000233848	0.000256521	0.000284331
D_V	Closure	P95	0.001314555	0.001147383	0.00091353	0.000930596	0.000911606	0.001134081	0.001980728	0.001421086	0.00149605	0.001329373	0.001371694	0.001489607
D_Zn	Closure	P95	0.003342363	0.003219008	0.00270986	0.002769411	0.002981556	0.003149909	0.005092024	0.003490872	0.003535063	0.003035115	0.003406484	0.003445876

Appendix A.3.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ26

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	1.626517534	1.749084234	1.866465569	1.331976056	0.920362294	1.089520812	1.152968526	1.188081503	1.239787698	1.230217457	1.238993764	1.489471197
NO3_N	Post-Closure	P95	1.501245499	1.509808779	1.609705567	1.048615694	0.904929638	1.224953055	1.358293891	1.606243253	1.625223041	1.692493081	1.606098175	1.443454623
NO2_N	Post-Closure	P95	0.004961924	0.005283585	0.004954693	0.003780838	0.00392482	0.005074519	0.005322395	0.005421211	0.00559017	0.005816562	0.005352042	0.005085043
Br	Post-Closure	P95	0.074863628	0.071044236	0.070822962	0.048788249	0.050896779	0.057074815	0.052122984	0.063300893	0.068387255	0.064184509	0.070831053	0.073961936
Cl	Post-Closure	P95	16.15355873	16.81304741	16.36847878	14.88083172	17.1726284	17.23246956	16.95639992	17.98684502	18.18261719	18.62680626	18.20029068	15.92056465
F	Post-Closure	P95	0.372263104	0.363952249	0.372771442	0.356724232	0.266926765	0.36346975	0.402798742	0.405931801	0.399216384	0.360166728	0.376496762	0.361994088
TDP	Post-Closure	P95	0.027557543	0.025372576	0.028123809	0.024251822	0.020497952	0.027937291	0.029117767	0.030323436	0.029090058	0.026497081	0.027894279	0.026542867
SO4	Post-Closure	P95	318.5197144	321.7818604	310.8029175	290.3794556	363.5552979	353.6142578	338.927948	351.2848816	347.534668	349.7335815	350.7996521	316.1280518
T_CN	Post-Closure	P95	0.010359327	0.010908321	0.011365167	0.009808649	0.006934666	0.008688113	0.009019969	0.009440714	0.009972768	0.008806703	0.009364035	0.009748138
WAD_CN	Post-Closure	P95	0.003027016	0.002893853	0.002788311	0.002475639	0.00267869	0.002667924	0.002585064	0.002546332	0.002432649	0.002436247	0.002517808	0.002459102
T_Ag	Post-Closure	P95	2.19013E-05	2.1905E-05	2.31262E-05	2.05388E-05	2.42355E-05	2.34939E-05	2.23812E-05	2.2772E-05	2.34949E-05	2.20347E-05	2.17925E-05	2.20442E-05
T_Al	Post-Closure	P95	0.094480351	0.075783975	0.065876327	0.033488039	0.283839524	0.187313974	0.125452876	0.064831771	0.036188971	0.072612368	0.112832017	0.094848141
T_As	Post-Closure	P95	0.001056066	0.001043583	0.001030719	0.000967299	0.000852396	0.000792821	0.000912782	0.001019185	0.001030598	0.000977615	0.00099244	0.001024822
T_B	Post-Closure	P95	0.015131576	0.013403175	0.010946874	0.008780439	0.009572449	0.010193303	0.01251299	0.013976603	0.014286091	0.013633737	0.013000137	0.013169151
T_Ba	Post-Closure	P95	0.008072482	0.007731964	0.007724193	0.007576088	0.006209826	0.005521043	0.006388502	0.006748079	0.007468415	0.006021852	0.006142722	0.006303143
T_Bi	Post-Closure	P95	3.0277E-05	2.89745E-05	2.92015E-05	2.74291E-05	2.84563E-05	2.98111E-05	2.65144E-05	2.95212E-05	2.65062E-05	2.75624E-05	2.74253E-05	2.79656E-05
T_Be	Post-Closure	P95	8.45729E-05	7.6844E-05	7.00573E-05	6.70271E-05	7.0636E-05	7.04176E-05	7.3931E-05	8.0662E-05	8.14219E-05	7.41827E-05	7.4126E-05	7.42872E-05
T_Ca	Post-Closure	P95	84.59305573	85.57209015	83.15573883	77.26795197	97.83370972	94.1272049	91.82848358	94.3497467	94.02579498	93.13314819	92.33712769	82.93955994
T_Cd	Post-Closure	P95	0.000176969	0.000196803	0.000214554	0.000207931	8.52731E-05	0.000106313	0.000121477	0.000137088	0.000156848	0.000151443	0.000149251	0.00016982
T_Co	Post-Closure	P95	0.001372546	0.001428744	0.001455244	0.001200116	0.000783778	0.001006954	0.001122889	0.001206452	0.00125823	0.00116595	0.001198799	0.001310226
T_Cr	Post-Closure	P95	0.000311458	0.000273299	0.000278518	0.000251354	0.000310778	0.00027286	0.00029315	0.000257116	0.0002599	0.000278818	0.000281937	0.000254538
T_Cu	Post-Closure	P95	0.000498562	0.000452272	0.000452169	0.000465586	0.000641622	0.0004733	0.000530839	0.000494575	0.000493345	0.000520181	0.000448361	0.000452663
T_Fe	Post-Closure	P95	0.106532283	0.090820983	0.086729139	0.075898454	0.205973387	0.133697674	0.118402071	0.101458222	0.085330315	0.091137744	0.109143779	0.106698677
T_Hg	Post-Closure	P95	1.86128E-05	1.86075E-05	1.75448E-05	1.2223E-05	1.28911E-05	1.24843E-05	1.37963E-05	1.63304E-05	1.75896E-05	1.65375E-05	1.6865E-05	1.7645E-05
T_K	Post-Closure	P95	40.36423492	41.57043457	41.72074509	37.35546494	25.90297699	33.04393387	36.85461426	38.43341827	39.37699509	36.37146759	38.11085129	39.31744003
T_Li	Post-Closure	P95	0.061874483	0.061752327	0.062160324	0.058795407	0.047521334	0.05896873	0.065742902	0.067267381	0.067561574	0.060584422	0.062891446	0.060738701
T_Mg	Post-Closure	P95	6.296946049	6.441626072	6.592588902	6.195207596	4.08473444	5.108166218	5.816221237	6.063105106	6.367139816	5.687372684	5.961293221	5.983587265
T_Mn	Post-Closure	P95	0.398090094	0.416125506	0.428845376	0.414313346	0.28064394	0.355056256	0.397602946	0.41086337	0.413271785	0.371943235	0.417589962	0.385342866
T_Mo	Post-Closure	P95	0.002674567	0.00289241	0.003077913	0.002422662	0.001268769	0.001575314	0.00191629	0.00220312	0.002484162	0.00226547	0.002230353	0.002508778
T_Na	Post-Closure	P95	57.99367905	60.06961441	58.00541306	52.79377747	59.96036148	59.97267914	59.91373062	64.5691452	64.61112213	66.13899994	65.89379883	57.14427948
T_Ni	Post-Closure	P95	0.001440681	0.001477063	0.001486465	0.001389187	0.001095838	0.001359528	0.001468611	0.001517618	0.001529239	0.001406392	0.001453733	0.00142706
T_P	Post-Closure	P95	0.025938032	0.024251351	0.027172411	0.022177288	0.024235159	0.02790994	0.029646786	0.029487871	0.029410662	0.027396055	0.027055576	0.025736183
T_Pb	Post-Closure	P95	0.000103626	0.000106879	0.00011315	0.00010923	7.75083E-05	7.01924E-05	7.43675E-05	8.26584E-05	9.30747E-05	9.13716E-05	9.12616E-05	0.000100148
T_S	Post-Closure	P95	0.978543103	1.042687535	1.011847854	1.024993777	0.742569327	0.965192676	0.783381224	0.829621851	0.89192766	0.944111109	0.786353648	0.863396227
T_Sb	Post-Closure	P95	0.007420414	0.007281621	0.007138358	0.006413002	0.00583814	0.007700743	0.008439275	0.00853406	0.008826486	0.008069452	0.007652451	0.007596361
T_Se	Post-Closure	P95	0.000188515	0.000165846	0.000170967	0.000104086	0.00010022	0.000103498	0.000131982	0.000153007	0.000153129	0.000141304	0.000143921	0.000150269
T_Si	Post-Closure	P95	7.388798714	6.938131332	6.636760235	6.176078796	5.186646461	5.328599453	5.552118778	5.865159512	5.739961624	6.069962025	5.946845531	6.108999252
T_Sn	Post-Closure	P95	6.06681E-05	5.79683E-05	5.94488E-05	5.51589E-05	5.75347E-05	6.07686E-05	5.35596E-05	5.92574E-05	5.46925E-05	5.57452E-05	5.58397E-05	5.64895E-05
T_Sr	Post-Closure	P95	0.223251432	0.224499702	0.218505859	0.175936833	0.165486664	0.206141815	0.237670004	0.246963933	0.236354515	0.213598236	0.211993247	0.217536122
T_Ti	Post-Closure	P95	0.003826535	0.003000147	0.003106122	0.003965974	0.004940787	0.004336531	0.003821313	0.003544399	0.002939546	0.004710129	0.004377914	0.003488091
T_Tl	Post-Closure	P95	3.82306E-05	3.23238E-05	2.83872E-05	2.61962E-05	2.06402E-05	2.78757E-05	3.11057E-05	3.55017E-05	3.7255E-05	3.4813E-05	3.21589E-05	3.37404E-05
T_U	Post-Closure	P95	0.000303239	0.000299647	0.000308666	0.000264426	0.000206004	0.00021351	0.000240001	0.000252426	0.000270093	0.00022737	0.000233614	0.000229512
T_V	Post-Closure	P95	0.016123788	0.016136456	0.016263483	0.015401543	0.012517964	0.015446519	0.017171841	0.017562572	0.017584709	0.015877442	0.016476881	0.015921779
T_Zn	Post-Closure	P95	0.014470476	0.015568323	0.016767984	0.016427675	0.007038331	0.00815991	0.009356387	0.010657791	0.012359216	0.012052165	0.011965426	0.013831927
D_Ag	Post-Closure	P95	2.16284E-05	2.16747E-05	2.29736E-05	2.03747E-05	1.73633E-05	2.34306E-05	2.22479E-05	2.27412E-05	2.34121E-05	2.16433E-05	2.14921E-05	2.17209E-05
D_Al	Post-Closure	P95	0.0262	0.013900001	0.0106	0.02079259	0.180500001	0.125666678	0.077	0.047384184	0.024333628	0.050405044	0.077500001	0.047400001
D_As	Post-Closure	P95	0.00102622	0.001012853	0.00100465	0.00091794	0.000761434	0.000721957	0.000864619	0.000963183	0.000994888	0.00092736	0.000955645	0.000991166
D_B	Post-Closure	P95	0.015124163	0.013397329	0.010945332	0.008780437	0.009572292	0.010193303	0.012512458	0.013971167	0.014282303	0.013633737	0.012997603	0.013169151
D_Ba	Post-Closure	P95	0.00768456	0.007192121	0.007390456	0.007382649	0.005600904	0.005179616	0.005961969	0.006562055	0.007466079	0.005505388	0.005791487	0.006089509
D_Bi	Post-Closure	P95	3.02684E-05	2.89375E-05	2.92008E-05	2.74291E-05	2.84563E-05	2.98088E-05	2.6514E-05	2.95207E-05	2.65062E-05	2.75623E-05	2.74248E-05	2.79655E-05
D_Be	Post-Closure	P95	8.45729E-05	7.6844E-05	7.00573E-05	6.70271E-05	7.0636E-05	7.04176E-05	7.3931E-05	8.0662E-05	8.14219E-05	7.41827E-05	7.4126E-05	7.42872E-05
D_Ca	Post-Closure	P95	84.53894806	85.45573425	82.90519714	77.26908112	97.81152344	94.05659485	91.65225983	94.27127075	93.9895401	92.89788818	92.21034241	82.93924713
D_Cd	Post-Closure	P95	0.000176894	0.000196525	0.000214238	0.000207369	8.38124E-05	0.000106062	0.000122234	0.000137029	0.000156232	0.000151224	0.000148965	0.00017015
D_Co	Post-Closure	P95	0.001372451	0.001428664	0.001454711	0.001199478	0.000782929	0.001004588	0.001122838	0.001206424	0.001258167	0.001165713	0.001198672	0.001310075
D_Cr	Post-Closure	P95	0.000214908	0.000206533	0.000206413	0.000184295	0.000233582	0.000225428	0.000224146	0.000221417	0.000200234	0.000221616	0.000214149	0.00020029
D_Cu	Post-Closure	P95	0.000494487	0.000424092	0.000444537	0.000462122	0.000593518	0.000472903	0.00051799	0.000491238	0.000498191	0.0004577	0.000451925	0.000452429
D_Fe	Post-Closure	P95	0.075477757	0.066549651	0.063269235	0.049305677	0.115429096	0.089027993	0.083115518	0.082320958	0.060812507	0.069303498	0.075339943	0.074034907
D_Hg	Post-Closure	P95	1.8616E-05	1.86109E-05	1.75468E-05	1.22288E-05	1.30794E-05	1.1808E-05	1.37952E-05	1.63365E-05	1.76045E-05	1.65696E-05	1.68679E-05	1.76452E-05
D_K	Post-Closure	P95	40.36609268	41.56748199	41.72087097	37.34714508	25.90693855	33.04117966	36.85264206	38.42809296	39.37434769	36.36122513	38.11592102	39.32138062
D_Li	Post-Closure	P95	0.061874483	0.061752327	0.062160324	0.058795407	0.047521334	0.05896873	0.065742902	0.067267381	0.067561574	0.060584422	0.062891446	0.060738701
D_Mg	Post-Closure	P95	6.278815746	6.440011024	6.525399685	6.190422535	4.076365471	5.098656654	5.832638741	6.062108994	6.357577324	5.681421757	5.956799507	6.018893719
D_Mn	Post-Closure	P95	0.397445381	0.415742606	0.42847389	0.413847774	0.276460886	0.353520542	0.397051573	0.410186827	0.412608355	0.370858997	0.416993529	0.384505481
D_Mo	Post-Closure	P95	0.002624343	0.002827837	0.003016882	0.002413232	0.001257606	0.001566435	0.001914382	0.002185521	0.002475134	0.002239534	0.00222033	0.002462663
D_Na	Post-Closure	P95	57.94934464	60.02599716	57.97103882	52.72198868	59.93744659	59.87733841	59.89305878	64.51448059	64.57852936	66.09244537	65.82868958	57.13618088
D_Ni	Post-Closure	P95	0.001440568	0.001477055	0.001485957	0.001387638	0.001094778	0.00135937	0.001468493	0.001517587	0.001529224	0.00140619	0.00145352	0.001426945
D_P	Post-Closure	P95	0.102135532	0.088881306	0.075738244	0.112152196	0.050486971	0.047324494	0.056401968	0.086861186	0.068571597	0.141172051	0.127738655	0.077529825
D_Pb	Post-Closure	P95	0.000103295	0.000106595	0.00011142	0.000107418	5.99433E-05	6.86753E-05	7.39706E-05	8.21833E-05	9.29272E-05	9.06034E-05	9.09323E-05	9.97597E-05
D_S	Post-Closure	P95	0.893004298	1.013469934	1.057574391	0.956401706	0.76636672	0.94270426	0.804546535	0.804805577	0.905246317	0.786910117	0.847439289	0.749974728
D_Sb	Post-Closure	P95	0.007420413	0.007281621	0.007138357	0.006413002	0.00583814	0.007700743	0.008439274	0.008534059	0.008826486	0.008069452	0.007652451	0.007596361
D_Se	Post-Closure	P95	0.000168504	0.000134159	0.000161923	0.000107984	0.000100403	9.82934E-05	0.000126896	0.000142248	0.000146494	0.000126461	0.000120842	0.000138011
D_Si	Post-Closure	P95	7.15360117	6.661977768	6.463772774	5.776546001	4.84691906	5.132975578	5.417994976	5.695640564	5.697257996	5.897656441	5.786315918	5.789803505
D_Sn	Post-Closure	P95	6.06681E-05	5.79683E-05	5.94488E-05	5.51589E-05	5.75347E-05	6.07686E-05	5.35596E-05	5.92574E-05	5.46925E-05	5.57452E-05	5.58397E-05	5.64895E-05
D_Sr	Post-Closure	P95	0.222712904	0.223538637	0.216811031	0.17628181	0.164878055	0.205800444	0.237451136	0.247646764	0.236299515	0.213003963	0.212804615	0.217578769
D_Ti	Post-Closure	P95	0.00313556	0.002674348	0.002526345	0.003763176	0.002934461	0.00245871	0.002422305	0.003032923	0.002200733	0.004668966	0.004192286	0.002736323
D_Tl	Post-Closure	P95	3.82291E-05	3.23235E-05	2.83865E-05	2.61962E-05	2.06401E-05	2.78387E-05	3.11054E-05	3.55011E-05	3.72549E-05	3.4813E-05	3.21568E-05	3.3739E-05
D_U	Post-Closure	P95	0.000293908	0.000286203	0.000293314	0.000248035	0.000186149	0.000198983	0.000228763	0.000240531	0.000265649	0.000216494	0.000225046	0.000219023
D_V	Post-Closure	P95	0.01609692	0.016129399	0.016254121	0.015363704	0.012351375	0.015395644	0.017104182	0.017544623	0.017550554	0.015860245	0.01641872	0.015866127
D_Zn	Post-Closure	P95	0.014252754	0.015079235	0.016355412	0.016069308	0.006717118	0.008015155	0.009160716	0.010441996	0.012038976	0.011744361	0.011670004	0.013440989

Appendix A.3.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ7

			Concentration (mg/L)											
Parameter	Phase	Metric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NH3_N	Closure	P95	0.169228032	0.183171958	0.168960199	0.093306728	0.045972757	0.058292117	0.082239047	0.117802776	0.121265687	0.123134799	0.147766531	0.173263788
NO3_N	Closure	P95	0.044644337	0.042124826	0.040380504	0.045172531	0.042844281	0.056041375	0.058587648	0.035580859	0.036076758	0.032300271	0.032008942	0.04148452
NO2_N	Closure	P95	0.000904591	0.001084093	0.000943287	0.001038505	0.001104772	0.001306004	0.001242521	0.001060871	0.000978999	0.000926915	0.00092735	0.001049475
Br	Closure	P95	0.031280961	0.029861435	0.028275097	0.029619535	0.031229349	0.028269999	0.030862117	0.027842481	0.029469326	0.026859939	0.029422132	0.030755436
Cl	Closure	P95	1.436690807	1.708390713	1.619054914	0.802376568	0.565981805	0.581322968	0.826190114	1.133392692	0.886031866	0.893686771	1.128718019	1.122615099
F	Closure	P95	0.066583522	0.062525146	0.062580287	0.060040247	0.05902496	0.063136131	0.072588027	0.061525613	0.066134848	0.061156265	0.06067482	0.066620469
TDP	Closure	P95	0.010781873	0.009085534	0.015171928	0.013247195	0.009165038	0.011727579	0.009014416	0.010056926	0.007927864	0.008139624	0.008352281	0.009114547
SO4	Closure	P95	22.13068581	24.04338646	22.44446945	12.96138954	10.45083046	11.31833363	18.9369297	16.40727425	16.49661255	15.74620247	17.7659626	18.89806366
T_CN	Closure	P95	0.003359088	0.003376377	0.003389577	0.002851154	0.002751374	0.002840532	0.003031781	0.003121874	0.003167063	0.003187494	0.003417196	0.00343466
WAD_CN	Closure	P95	0.002917313	0.002822153	0.002675983	0.002480438	0.002710152	0.002684878	0.002716609	0.00263377	0.002740605	0.0025125	0.002668251	0.002865667
T_Ag	Closure	P95	1.43582E-05	1.3181E-05	1.34663E-05	1.72271E-05	2.16934E-05	2.19117E-05	2.51805E-05	1.56163E-05	1.55271E-05	1.45648E-05	1.45053E-05	1.75167E-05
T_Al	Closure	P95	0.04766351	0.043526534	0.035225172	0.030305296	0.317353964	0.261571974	0.214029968	0.064845465	0.045326721	0.061382029	0.07359387	0.058799736
T_As	Closure	P95	0.000941308	0.000888794	0.000812122	0.000715247	0.000865247	0.000779146	0.001048991	0.0010249	0.001021044	0.000897148	0.000855227	0.000935491
T_B	Closure	P95	0.013054972	0.011803051	0.009797398	0.007980202	0.010301917	0.010884813	0.018081019	0.012988851	0.013828481	0.0124943	0.013013205	0.01320482
T_Ba	Closure	P95	0.008038528	0.008013012	0.00801496	0.008229941	0.008014744	0.005990525	0.006725013	0.007417067	0.008141302	0.006482165	0.006634377	0.007496738
T_Bi	Closure	P95	2.91798E-05	2.82493E-05	2.67564E-05	2.48044E-05	2.71015E-05	2.68479E-05	2.71657E-05	2.63398E-05	2.7408E-05	2.5125E-05	2.66827E-05	2.86599E-05
T_Be	Closure	P95	7.78124E-05	7.29798E-05	6.67146E-05	5.89328E-05	6.83006E-05	6.6511E-05	8.58353E-05	7.28618E-05	7.63173E-05	6.96604E-05	7.26834E-05	7.83856E-05
T_Ca	Closure	P95	18.15303993	18.62491608	19.10654449	17.38892174	15.13740158	15.80674171	15.91406059	16.90593338	17.6911335	17.12940979	16.98438072	17.6575222
T_Cd	Closure	P95	4.06654E-05	3.67739E-05	2.82152E-05	2.70228E-05	3.64354E-05	4.21502E-05	7.18173E-05	4.34146E-05	4.66919E-05	4.26927E-05	4.44579E-05	4.62246E-05
T_Co	Closure	P95	0.000446167	0.000452506	0.000403726	0.000257894	0.000258591	0.00029475	0.000494881	0.000363555	0.000373235	0.000353776	0.000368604	0.000410017
T_Cr	Closure	P95	0.000285539	0.000264806	0.0002517	0.000245097	0.000365849	0.000300428	0.000289703	0.000266576	0.00027868	0.000292883	0.000310128	0.000285019
T_Cu	Closure	P95	0.000448824	0.000420158	0.000370253	0.000337967	0.000696062	0.000648984	0.000664959	0.000435855	0.000459645	0.000469022	0.000429572	0.000459248
T_Fe	Closure	P95	0.097909525	0.095819809	0.082870439	0.121189445	0.252578884	0.197350219	0.176379368	0.118634582	0.113239869	0.109346844	0.110420987	0.111202762
T_Hg	Closure	P95	1.08215E-05	9.75727E-06	8.4842E-06	8.71031E-06	1.15536E-05	1.08588E-05	1.75438E-05	1.04949E-05	1.11741E-05	1.04652E-05	1.07556E-05	1.1581E-05
T_K	Closure	P95	2.025762558	1.87616539	1.629078031	1.57489562	1.581806064	1.807536244	2.924963236	1.94417572	2.083673954	1.889327288	1.885249496	2.103936672
T_Li	Closure	P95	0.003526585	0.003019469	0.00245788	0.002229196	0.002829093	0.003418538	0.005775841	0.003710286	0.003947655	0.003523514	0.003717084	0.003924439
T_Mg	Closure	P95	3.954220533	4.027990818	4.135874748	3.827084064	3.215250015	3.649053097	3.499891043	3.802602768	3.927720785	3.80484724	3.825423717	3.837216139
T_Mn	Closure	P95	0.014783503	0.014430599	0.014826004	0.013960446	0.015182279	0.014265368	0.019099675	0.014538825	0.014739662	0.014772853	0.013563024	0.015437387
T_Mo	Closure	P95	0.002224919	0.002284762	0.002165193	0.001505512	0.001329095	0.001284822	0.002083828	0.001748792	0.001901753	0.001661776	0.001637237	0.001995327
T_Na	Closure	P95	7.474195957	8.623650551	8.288468361	5.172485352	3.805454254	3.615350962	4.569010735	6.19644022	5.379059315	5.171243668	5.775507927	6.072674274
T_Ni	Closure	P95	0.000632431	0.000569891	0.000478426	0.000420504	0.000533852	0.000572959	0.000880271	0.000643714	0.000674727	0.00061263	0.000641533	0.000667817
T_P	Closure	P95	0.016790291	0.017768983	0.017952887	0.017018816	0.020316791	0.022476373	0.02004201	0.01956933	0.017950388	0.018502645	0.017199341	0.015836159
T_Pb	Closure	P95	4.49392E-05	4.21466E-05	3.73987E-05	3.45131E-05	7.46674E-05	5.95973E-05	6.26431E-05	4.38942E-05	4.46677E-05	4.1385E-05	4.23491E-05	4.55279E-05
T_S	Closure	P95	1.008053899	1.035654068	1.011317849	1.004130006	0.839810312	1.010708809	0.823050082	0.920317233	0.929940283	1.010681033	0.915487766	0.972047091
T_Sb	Closure	P95	0.004769789	0.003977244	0.003113139	0.00292277	0.003803077	0.004797968	0.008482764	0.005135521	0.00552759	0.004866299	0.005028703	0.005421045
T_Se	Closure	P95	0.000161646	0.000146753	0.000149732	0.000143641	0.000126026	0.000139129	0.000198274	0.000145684	0.000151774	0.000146689	0.000149463	0.000155365
T_Si	Closure	P95	7.169881821	6.892071247	6.642388821	6.168755531	6.358858109	5.267389297	5.753752708	6.302213669	6.50083065	6.156906605	6.524623394	7.11990881
T_Sn	Closure	P95	5.84511E-05	5.65177E-05	5.35814E-05	4.96088E-05	5.43879E-05	5.37193E-05	5.44161E-05	5.27504E-05	5.48891E-05	5.02772E-05	5.34742E-05	5.74016E-05
T_Sr	Closure	P95	0.097412102	0.095649347	0.096629716	0.091112807	0.084479637	0.08000394	0.082184345	0.086811259	0.098202854	0.081612945	0.08207462	0.092595249
T_Ti	Closure	P95	0.003694413	0.003121145	0.002488608	0.00388023	0.006507536	0.005013351	0.005248431	0.003955131	0.003002594	0.004951173	0.004903728	0.003961571
T_Tl	Closure	P95	3.1364E-05	2.68184E-05	2.37432E-05	2.59716E-05	3.04957E-05	3.62376E-05	5.14588E-05	3.31691E-05	3.50811E-05	3.18255E-05	3.2171E-05	3.71365E-05
T_U	Closure	P95	0.0002741	0.000279349	0.00030096	0.000260897	0.000272637	0.000246768	0.000290449	0.000237918	0.000274475	0.000221045	0.000241554	0.000263021
T_V	Closure	P95	0.001123127	0.000953965	0.000772007	0.000812094	0.001048218	0.00114481	0.001948482	0.001326043	0.001348311	0.001179531	0.001309438	0.001306616
T_Zn	Closure	P95	0.003511155	0.00341337	0.002790259	0.002530433	0.003091737	0.003304706	0.004968185	0.003584326	0.003716372	0.003397808	0.003467116	0.003665529
D_Ag	Closure	P95	1.42676E-05	1.30856E-05	1.32471E-05	1.72271E-05	1.8234E-05	2.00432E-05	2.10359E-05	1.50744E-05	1.54208E-05	1.43907E-05	1.41955E-05	1.7447E-05
D_Al	Closure	P95	0.0167	0.012399999	0.0088	0.017882619	0.178965196	0.124220841	0.069774166	0.045144275	0.0233	0.040485598	0.052190974	0.037999999
D_As	Closure	P95	0.000887882	0.00083977	0.0007857	0.000682955	0.000760907	0.000724438	0.000978394	0.000971266	0.00097992	0.000839572	0.000797055	0.000878084
D_B	Closure	P95	0.013050145	0.011798301	0.009796679	0.007902625	0.010295022	0.010866159	0.01807696	0.012984753	0.013825277	0.012484909	0.01300853	0.013201057
D_Ba	Closure	P95	0.007698741	0.007549868	0.007740464	0.007835135	0.006898371	0.005456163	0.006305293	0.007260717	0.008029182	0.006175991	0.006326369	0.007297808
D_Bi	Closure	P95	2.91729E-05	2.822E-05	2.67538E-05	2.48044E-05	2.71015E-05	2.68471E-05	2.71657E-05	2.63376E-05	2.74046E-05	2.5125E-05	2.66816E-05	2.86566E-05
D_Be	Closure	P95	7.78124E-05	7.29798E-05	6.67146E-05	5.89328E-05	6.83006E-05	6.6511E-05	8.58353E-05	7.28618E-05	7.63173E-05	6.96604E-05	7.26834E-05	7.83856E-05
D_Ca	Closure	P95	17.87363052	18.32380867	18.55644989	17.19167328	14.86194038	15.56114769	15.41390133	16.6518631	17.51364517	16.72824287	16.68902779	17.38140106
D_Cd	Closure	P95	4.07547E-05	3.43135E-05	2.84219E-05	2.65778E-05	3.46187E-05	4.19381E-05	7.24181E-05	4.38141E-05	4.5578E-05	4.29513E-05	4.37442E-05	4.71367E-05
D_Co	Closure	P95	0.000445942	0.000452239	0.000402105	0.000254368	0.00024545	0.000289503	0.000494398	0.000363036	0.000372898	0.000353403	0.000368329	0.000407762
D_Cr	Closure	P95	0.000202764	0.000196678	0.000188162	0.000172662	0.000232574	0.000231574	0.000223043	0.000220206	0.000210257	0.000229743	0.000229531	0.000214644
D_Cu	Closure	P95	0.00044561	0.000384671	0.000353613	0.000307016	0.000596886	0.000588975	0.000651013	0.000442406	0.000455498	0.000422267	0.000429565	0.000460279
D_Fe	Closure	P95	0.071486689	0.067319825	0.058011111	0.072967768	0.116512232	0.110637017	0.109846108	0.088871039	0.083601423	0.081041254	0.078904249	0.076144107
D_Hg	Closure	P95	1.08147E-05	9.75407E-06	8.47802E-06	8.70389E-06	1.08042E-05	1.02181E-05	1.74486E-05	1.04851E-05	1.11684E-05	1.01706E-05	1.07516E-05	1.17427E-05
D_K	Closure	P95	2.019134045	1.856687188	1.616500497	1.557392359	1.53640151	1.793669581	2.91587925	1.93110764	2.075264692	1.863282442	1.897883654	2.088391304
D_Li	Closure	P95	0.00352656	0.00301945	0.002457874	0.002229132	0.002829048	0.003418415	0.005775806	0.003710258	0.003947639	0.003523486	0.003717073	0.00392441
D_Mg	Closure	P95	3.885942698	3.985532045	4.054050446	3.801301718	3.173301935	3.605024576	3.480015993	3.737824678	3.849050045	3.697847843	3.714735746	3.769746542
D_Mn	Closure	P95	0.011756876	0.010721878	0.009850843	0.01114628	0.007525423	0.008947984	0.014843869	0.011488502	0.011990958	0.011517462	0.011002588	0.012601044
D_Mo	Closure	P95	0.002178303	0.002216769	0.002099091	0.001471268	0.001299929	0.001263134	0.002067864	0.001712283	0.001895941	0.001622861	0.001614983	0.001943763
D_Na	Closure	P95	7.426120281	8.527686119	8.250923157	5.090028286	3.772723436	3.544690847	4.559010506	6.121876717	5.341105938	5.108063221	5.702254772	6.066465855
D_Ni	Closure	P95	0.000632177	0.000569596	0.000477338	0.000417535	0.000494484	0.000572668	0.000878296	0.000643285	0.000673959	0.000612035	0.000641389	0.000657845
D_P	Closure	P95	0.098663241	0.081954375	0.062287159	0.057491578	0.050365429	0.052565731	0.048496481	0.102387823	0.072168127	0.148692146	0.145398289	0.094436884
D_Pb	Closure	P95	4.34735E-05	4.07342E-05	3.6917E-05	3.31066E-05	3.74323E-05	3.73652E-05	5.17671E-05	4.22717E-05	4.37463E-05	4.01317E-05	4.12727E-05	4.42494E-05
D_S	Closure	P95	0.926298916	1.051261663	1.070973873	0.943288386	0.840771973	0.96967274	0.84262526	0.927062392	1.006079435	1.007946253	0.998099804	0.948146999
D_Sb	Closure	P95	0.004769763	0.00397723	0.003113136	0.002925073	0.003803048	0.0047979	0.008482742	0.005135501	0.005527579	0.004866273	0.005028693	0.005421024
D_Se	Closure	P95	0.000145666	0.00012181	0.000134344	0.000135912	0.00012642	0.000134203	0.00019102	0.000137802	0.000142791	0.000126843	0.000117683	0.000136796
D_Si	Closure	P95	7.003979206	6.706094265	6.441436768	5.774917126	5.897744656	5.051045895	5.607491016	6.140438557	6.426296711	5.922418118	6.310441494	6.746684551
D_Sn	Closure	P95	5.84511E-05	5.65177E-05	5.35814E-05	4.96088E-05	5.43879E-05	5.37193E-05	5.44161E-05	5.27504E-05	5.48891E-05	5.02772E-05	5.34742E-05	5.74016E-05
D_Sr	Closure	P95	0.098792851	0.095868498	0.093181357	0.090087347	0.084127486	0.07896819	0.081555203	0.086227715	0.098007962	0.080221646	0.079839997	0.09271244
D_Ti	Closure	P95	0.003046396	0.0024265	0.001805332	0.001769254	0.003039477	0.002803415	0.002822212	0.003544786	0.002320659	0.004951173	0.004778964	0.003084131
D_Tl	Closure	P95	3.13624E-05	2.68169E-05	2.37372E-05	2.59666E-05	2.99521E-05	3.62276E-05	5.14572E-05	3.31674E-05	3.50804E-05	3.1824E-05	3.21701E-05	3.71352E-05
D_U	Closure	P95	0.000265655	0.000268336	0.000284641	0.000243732	0.000246606	0.000232728	0.000280748	0.000229279	0.000268795	0.000211002	0.00023252	0.000249312
D_V	Closure	P95	0.001089162	0.00094324	0.00076099	0.000669102	0.000865628	0.00105661	0.001776936	0.00126452	0.001233763	0.001114989	0.001178382	0.001188604
D_Zn	Closure	P95	0.002942892	0.002814409	0.002425308	0.002188919	0.00281593	0.002998532	0.004542322	0.002965639	0.002932049	0.002575861	0.002945489	0.002904136

Appendix A.3.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ7

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	1.425274491	1.527761698	1.627364516	1.02145648	0.848129272	0.996501625	1.034597635	1.07079947	1.118182659	1.096802711	1.086619854	1.312169075
NO3_N	Post-Closure	P95	1.311858654	1.350526333	1.395948172	0.846573353	0.799654484	1.100858569	1.224871516	1.493487597	1.485095739	1.549495101	1.480139852	1.263633609
NO2_N	Post-Closure	P95	0.004494341	0.004851586	0.004408191	0.003170944	0.003536169	0.004630838	0.004817191	0.005069314	0.005171204	0.0053623	0.004971124	0.004587745
Br	Post-Closure	P95	0.068102777	0.065153822	0.066333503	0.046543017	0.049804024	0.054540996	0.049586382	0.060077816	0.063051634	0.060340602	0.065256447	0.067806356
Cl	Post-Closure	P95	14.40607262	15.0877943	14.53804302	12.36603642	15.31396961	15.8338356	15.72148895	16.72161102	16.61764145	17.05808258	16.77601814	14.37805271
F	Post-Closure	P95	0.339400917	0.326938063	0.336575925	0.307153493	0.24076274	0.333993971	0.367708653	0.367597103	0.354994684	0.334764212	0.341048598	0.332034886
TDP	Post-Closure	P95	0.025727645	0.023025149	0.026952663	0.022309644	0.019336242	0.026096832	0.02666273	0.028393239	0.026019674	0.024439551	0.025174133	0.024228657
SO4	Post-Closure	P95	291.9887085	289.0910645	277.232666	240.8140259	323.5598755	323.6046448	313.5266418	326.3389587	317.2311096	322.3560486	322.6070557	289.0384521
T_CN	Post-Closure	P95	0.009302405	0.009767365	0.010131529	0.008013935	0.006499586	0.008022613	0.008357394	0.008726512	0.009128313	0.008148138	0.008653286	0.008790429
WAD_CN	Post-Closure	P95	0.002919402	0.002819533	0.002711986	0.002486488	0.002658132	0.002654837	0.002572676	0.002535336	0.002443374	0.002448267	0.002512485	0.002467171
T_Ag	Post-Closure	P95	1.98552E-05	1.97751E-05	2.08882E-05	1.95983E-05	2.32544E-05	2.26349E-05	2.0518E-05	2.07679E-05	2.0928E-05	2.02004E-05	2.00862E-05	2.1113E-05
T_Al	Post-Closure	P95	0.081637628	0.066644669	0.057708509	0.032242354	0.303128719	0.187283859	0.113984399	0.061537512	0.034019515	0.065641612	0.104463719	0.083683535
T_As	Post-Closure	P95	0.000987171	0.000967632	0.000962628	0.000822107	0.000843238	0.000772897	0.000879754	0.000965896	0.000978521	0.000921684	0.000928855	0.000956296
T_B	Post-Closure	P95	0.012948446	0.011650333	0.009568589	0.007487422	0.0093415	0.009565443	0.011360629	0.012260516	0.012657394	0.011769444	0.011800879	0.011275629
T_Ba	Post-Closure	P95	0.008031186	0.007890305	0.008041793	0.008197783	0.006555468	0.005562008	0.006514495	0.006970649	0.007622777	0.006163437	0.00620255	0.006545986
T_Bi	Post-Closure	P95	2.91995E-05	2.82245E-05	2.85259E-05	2.70023E-05	2.82911E-05	2.93852E-05	2.63135E-05	2.91013E-05	2.62726E-05	2.7277E-05	2.70967E-05	2.747E-05
T_Be	Post-Closure	P95	7.7234E-05	7.1534E-05	6.65392E-05	6.22592E-05	6.95943E-05	6.88811E-05	7.06711E-05	7.75137E-05	7.6479E-05	7.0927E-05	7.05565E-05	7.03978E-05
T_Ca	Post-Closure	P95	78.33074951	78.26598358	76.05209351	66.55393219	87.65816498	86.62615204	86.00549316	88.45226288	87.04497528	86.76815796	85.78887939	76.72301483
T_Cd	Post-Closure	P95	0.000150931	0.000168909	0.000179409	0.000147456	7.81497E-05	9.64E-05	0.000108334	0.000119834	0.000135399	0.000131868	0.00013384	0.000145548
T_Co	Post-Closure	P95	0.001176263	0.001222281	0.001251335	0.001002779	0.000717753	0.000920273	0.001004993	0.001074082	0.001089569	0.001030217	0.001068145	0.001142453
T_Cr	Post-Closure	P95	0.00028453	0.000258853	0.0002507	0.000243517	0.000353805	0.000276331	0.000280746	0.000244241	0.000248793	0.000263692	0.000279754	0.000247221
T_Cu	Post-Closure	P95	0.000445793	0.000415456	0.000421017	0.00040862	0.0006809	0.000488054	0.000525648	0.000462191	0.00045732	0.000481695	0.000417907	0.00041968
T_Fe	Post-Closure	P95	0.107752606	0.097764775	0.092602342	0.122650236	0.233251244	0.138138309	0.119303286	0.112452358	0.098467954	0.10081514	0.114479415	0.110803708
T_Hg	Post-Closure	P95	1.67185E-05	1.65374E-05	1.58671E-05	9.86701E-06	1.27265E-05	1.17087E-05	1.28467E-05	1.45593E-05	1.56738E-05	1.52044E-05	1.52399E-05	1.57732E-05
T_K	Post-Closure	P95	34.59830475	35.51845551	36.19883728	31.2792244	22.90047073	30.09889221	33.00536728	34.13882065	34.40099335	32.00024414	34.30752945	33.6972847
T_Li	Post-Closure	P95	0.054978348	0.055262558	0.055099994	0.049239777	0.04196335	0.053668838	0.05887498	0.060293596	0.059258163	0.054137088	0.055698723	0.054779429
T_Mg	Post-Closure	P95	5.863432884	5.979963779	6.165266514	5.791420937	3.753031254	4.773393154	5.439151764	5.70179987	5.997857571	5.335921764	5.609077454	5.601341724
T_Mn	Post-Closure	P95	0.358803213	0.370397925	0.378127843	0.349149585	0.251780212	0.324206203	0.359745085	0.370066822	0.363105237	0.342481643	0.369597465	0.352778077
T_Mo	Post-Closure	P95	0.002216487	0.002274552	0.002343305	0.001777646	0.001166335	0.00144944	0.001745478	0.001989528	0.002237194	0.002053702	0.002054131	0.002186742
T_Na	Post-Closure	P95	52.03439331	54.16941833	51.98703003	44.26649857	53.5837059	55.11175156	55.89973068	60.19613647	59.5104599	60.86753845	60.95059204	51.26507568
T_Ni	Post-Closure	P95	0.001319576	0.001331486	0.001340893	0.001202236	0.001044527	0.001256917	0.001348353	0.001380904	0.001368441	0.001299939	0.00133249	0.001307589
T_P	Post-Closure	P95	0.02392517	0.022308012	0.024979489	0.019407289	0.024181401	0.02654928	0.027556911	0.027318882	0.026872493	0.025892386	0.024962744	0.023911854
T_Pb	Post-Closure	P95	9.24008E-05	9.49648E-05	9.86322E-05	8.3985E-05	8.40495E-05	6.90708E-05	6.93048E-05	7.52715E-05	8.46726E-05	8.37595E-05	8.4176E-05	8.9798E-05
T_S	Post-Closure	P95	0.925292432	0.993533969	0.970196128	0.987302184	0.697625041	0.932603717	0.729154229	0.780295789	0.80236733	0.911771536	0.714556158	0.823696315
T_Sb	Post-Closure	P95	0.006696465	0.006540453	0.006303328	0.005365995	0.005295062	0.006870565	0.007441843	0.007615302	0.00757722	0.006936993	0.00688623	0.006835594
T_Se	Post-Closure	P95	0.000160761	0.000144188	0.000145823	9.57651E-05	9.71286E-05	0.000101076	0.000124514	0.000137048	0.000131872	0.00013396	0.000133355	0.000134889
T_Si	Post-Closure	P95	7.157768726	6.790890694	6.598052502	6.162662029	5.212477207	5.29295969	5.609069824	5.943830967	5.809020042	6.108362198	6.026204109	6.161088467
T_Sn	Post-Closure	P95	5.84896E-05	5.64647E-05	5.80293E-05	5.42545E-05	5.71738E-05	5.99116E-05	5.32682E-05	5.84429E-05	5.40604E-05	5.51087E-05	5.50487E-05	5.54218E-05
T_Sr	Post-Closure	P95	0.209337175	0.21004875	0.203966781	0.161507711	0.150267571	0.191121593	0.21923241	0.226851404	0.218479261	0.199585691	0.197394103	0.20388253
T_Ti	Post-Closure	P95	0.003571624	0.002748084	0.002529366	0.00402719	0.005898453	0.004362854	0.003998503	0.003810408	0.002932957	0.004757135	0.004484021	0.003432672
T_Tl	Post-Closure	P95	3.10758E-05	2.63518E-05	2.32624E-05	2.44211E-05	2.00824E-05	2.65211E-05	2.72525E-05	3.04552E-05	3.13435E-05	2.9255E-05	2.79876E-05	3.05461E-05
T_U	Post-Closure	P95	0.000272806	0.000275426	0.000297042	0.000256108	0.000203225	0.00020831	0.000219733	0.000228495	0.000250519	0.000207886	0.000215258	0.00021624
T_V	Post-Closure	P95	0.014401468	0.014487982	0.014452782	0.012962804	0.011193236	0.014107736	0.01545221	0.015750317	0.015473681	0.014201886	0.014676481	0.014417168
T_Zn	Post-Closure	P95	0.012535091	0.013539209	0.014299173	0.011942284	0.006537041	0.007519336	0.008533654	0.009568016	0.010968397	0.010640817	0.010767106	0.012016257
D_Ag	Post-Closure	P95	1.96775E-05	1.95932E-05	2.07543E-05	1.94638E-05	1.61483E-05	2.25338E-05	2.04062E-05	2.07026E-05	2.08391E-05	1.99214E-05	1.9852E-05	2.07771E-05
D_Al	Post-Closure	P95	0.0167	0.012399999	0.0088	0.019891927	0.178916425	0.124239422	0.06937883	0.042842131	0.022637647	0.053600002	0.069208786	0.037999999
D_As	Post-Closure	P95	0.000952602	0.000934387	0.00093614	0.000778082	0.000740686	0.000699975	0.000828614	0.000918254	0.000938276	0.000870319	0.000885881	0.00091673
D_B	Post-Closure	P95	0.012943675	0.011645653	0.009567888	0.00744749	0.009341353	0.009565442	0.011359696	0.012255982	0.012656895	0.011769444	0.011796579	0.011275629
D_Ba	Post-Closure	P95	0.007689585	0.007421888	0.007744337	0.007817735	0.005513434	0.005169424	0.006104932	0.006808051	0.007619623	0.005752557	0.005895243	0.006347269
D_Bi	Post-Closure	P95	2.91926E-05	2.81945E-05	2.8524E-05	2.70023E-05	2.82911E-05	2.93831E-05	2.63132E-05	2.91009E-05	2.62726E-05	2.72769E-05	2.70963E-05	2.747E-05
D_Be	Post-Closure	P95	7.7234E-05	7.1534E-05	6.65392E-05	6.22592E-05	6.95943E-05	6.88811E-05	7.06711E-05	7.75137E-05	7.6479E-05	7.0927E-05	7.05565E-05	7.03978E-05
D_Ca	Post-Closure	P95	78.27433014	78.21800995	75.73829651	66.60232544	87.60597229	86.61126709	85.79525757	88.3813324	87.01183319	86.48838043	85.63451385	76.7123642
D_Cd	Post-Closure	P95	0.000150867	0.0001667	0.000179213	0.000146673	7.62454E-05	9.59718E-05	0.000109052	0.000119766	0.000134723	0.000131682	0.00013339	0.000145829
D_Co	Post-Closure	P95	0.001176186	0.001222213	0.001250628	0.001001392	0.000706851	0.000917066	0.001004948	0.001074056	0.001089519	0.001030009	0.001068017	0.001140886
D_Cr	Post-Closure	P95	0.000201631	0.000193379	0.000195818	0.000180463	0.000232355	0.000223069	0.000213383	0.000208829	0.00019252	0.000213835	0.000209542	0.000191449
D_Cu	Post-Closure	P95	0.000442588	0.000399309	0.000414558	0.000398662	0.000595859	0.000479027	0.000509588	0.000461214	0.000457316	0.000428142	0.00041899	0.000419667
D_Fe	Post-Closure	P95	0.074843064	0.067648038	0.063150786	0.073374897	0.115568683	0.08871977	0.085604057	0.086524718	0.070077315	0.074871063	0.07902962	0.074598044
D_Hg	Post-Closure	P95	1.67214E-05	1.65404E-05	1.58689E-05	9.88337E-06	1.2661E-05	1.1098E-05	1.26994E-05	1.45645E-05	1.56846E-05	1.50397E-05	1.52425E-05	1.58644E-05
D_K	Post-Closure	P95	34.60155487	35.51478195	36.19530106	31.26614952	22.89267731	30.09645844	33.00167465	34.1346283	34.3984375	31.9924202	34.31637192	33.69559479
D_Li	Post-Closure	P95	0.054978348	0.055262558	0.055099994	0.049239777	0.04196335	0.053668838	0.05887498	0.060293596	0.059258163	0.054137088	0.055698723	0.054779429
D_Mg	Post-Closure	P95	5.849653721	6.007732391	6.103373528	5.79326582	3.737248659	4.762940884	5.451357365	5.699252129	5.981281281	5.299852848	5.576753139	5.614577293
D_Mn	Post-Closure	P95	0.358156592	0.369988948	0.377388358	0.348329931	0.246050149	0.322190821	0.358896255	0.369277656	0.362114459	0.341528654	0.368788242	0.351770282
D_Mo	Post-Closure	P95	0.002191062	0.002239695	0.002305429	0.001768856	0.001154404	0.001438585	0.001740215	0.001964439	0.002229079	0.002027734	0.002041681	0.002157999
D_Na	Post-Closure	P95	52.00325394	54.11571503	51.96102142	44.1816864	53.5538559	54.99168396	55.87901688	60.1453743	59.47431946	60.81231689	60.88273621	51.2508316
D_Ni	Post-Closure	P95	0.001319435	0.001331368	0.001340315	0.001200947	0.001010125	0.001260106	0.001348284	0.001380869	0.001368428	0.001299866	0.001332299	0.001303646
D_P	Post-Closure	P95	0.085935943	0.075829536	0.064251386	0.066699035	0.048116893	0.051592644	0.052422538	0.095200613	0.07281851	0.142575324	0.131578654	0.06132799
D_Pb	Post-Closure	P95	9.20303E-05	9.46514E-05	9.70738E-05	8.27342E-05	5.66283E-05	6.4462E-05	6.89472E-05	7.46327E-05	8.43469E-05	8.29947E-05	8.36547E-05	8.93594E-05
D_S	Post-Closure	P95	0.816420138	0.989483416	1.033387661	0.919976771	0.719389856	0.906126082	0.747840762	0.738380492	0.865687609	0.797033012	0.806304634	0.731261671
D_Sb	Post-Closure	P95	0.006696465	0.006540453	0.006303327	0.005368049	0.005295062	0.006870564	0.007441843	0.007615301	0.007577219	0.006936993	0.006886229	0.006835594
D_Se	Post-Closure	P95	0.000145077	0.000119339	0.000132103	9.87514E-05	9.5039E-05	9.58027E-05	0.000115349	0.000129719	0.000124179	0.000119708	0.000108501	0.000122978
D_Si	Post-Closure	P95	6.992415428	6.607164383	6.392623901	5.772845268	4.830956459	5.103941441	5.470588684	5.763530254	5.780422688	5.892691135	5.850322247	5.86607933
D_Sn	Post-Closure	P95	5.84896E-05	5.64647E-05	5.80293E-05	5.42545E-05	5.71738E-05	5.99116E-05	5.32682E-05	5.84429E-05	5.40604E-05	5.51087E-05	5.50487E-05	5.54218E-05
D_Sr	Post-Closure	P95	0.209372625	0.209907696	0.201873645	0.161753982	0.1494717	0.190768942	0.219007403	0.227309719	0.218431234	0.199116647	0.19759576	0.203784525
D_Ti	Post-Closure	P95	0.002518688	0.002158083	0.002090763	0.002189056	0.002897686	0.002383582	0.002197067	0.003377352	0.002279348	0.004719099	0.004332813	0.002334352
D_Tl	Post-Closure	P95	3.10742E-05	2.63502E-05	2.32565E-05	2.44211E-05	1.98476E-05	2.6488E-05	2.72521E-05	3.04551E-05	3.13434E-05	2.9254E-05	2.79863E-05	3.05449E-05
D_U	Post-Closure	P95	0.000264389	0.000264247	0.000280836	0.000239697	0.000180943	0.000193316	0.000209717	0.000219364	0.00024597	0.000197663	0.000206244	0.000204342
D_V	Post-Closure	P95	0.014383815	0.014481536	0.014446506	0.012876139	0.010932244	0.014023485	0.015362257	0.015718538	0.01540619	0.014155935	0.014575263	0.014354344
D_Zn	Post-Closure	P95	0.012349839	0.013098423	0.013925954	0.011542907	0.006180041	0.007389222	0.008226121	0.00921548	0.010565005	0.010179077	0.01042837	0.011638719

Appendix A.3.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ9

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.04658287	0.053118065	0.03676825	0.024584128	0.013625101	0.015884008	0.01888142	0.030737225	0.04003036	0.037482735	0.036641967	0.034059584
NO3_N	Closure	P95	0.06817124	0.076367326	0.079740331	0.053223789	0.052725945	0.03207545	0.026582954	0.022671964	0.020911541	0.019571505	0.067863367	0.073879801
NO2_N	Closure	P95	0.001198608	0.002209511	0.001098779	0.001092509	0.00149865	0.001315365	0.001142123	0.001066601	0.001054828	0.001015699	0.001378904	0.001424124
Br	Closure	P95	0.026083482	0.025695628	0.025422232	0.025588347	0.02581967	0.02552481	0.025809761	0.025368424	0.025649123	0.025534675	0.025769899	0.025828406
Cl	Closure	P95	0.560074747	0.579208612	0.482862532	0.380100876	0.32359913	0.341141582	0.417351663	0.416494101	0.431600243	0.433618337	0.444812238	0.419008136
F	Closure	P95	0.061422244	0.060464986	0.065426864	0.06224151	0.059908435	0.059959836	0.060444292	0.058077201	0.060889833	0.062211502	0.060700946	0.066377044
TDP	Closure	P95	0.015452691	0.011704485	0.0157272	0.016900625	0.013164655	0.010036056	0.008698777	0.00959504	0.007896618	0.008391129	0.010259435	0.014574287
SO4	Closure	P95	8.122061729	9.04683876	7.175644875	5.238955975	4.432312489	4.790989399	5.754296303	5.964706898	6.571659088	6.174381256	6.822474003	6.430133343
T_CN	Closure	P95	0.002672774	0.002736958	0.002653391	0.002547891	0.002540209	0.002548904	0.002562437	0.002615504	0.002657148	0.002659876	0.002659775	0.00264051
WAD_CN	Closure	P95	0.002564494	0.002542709	0.002522914	0.002498068	0.002529354	0.002530982	0.002516971	0.002518441	0.002538579	0.002504781	0.002535202	0.002555661
T_Ag	Closure	P95	1.02186E-05	9.31701E-06	2.05845E-05	1.54391E-05	1.44389E-05	1.60397E-05	1.33085E-05	1.1499E-05	1.06414E-05	1.10693E-05	1.11398E-05	1.35227E-05
T_Al	Closure	P95	0.034250256	0.028476939	0.041586466	0.047761619	0.093966067	0.07992734	0.067058735	0.049307212	0.039470524	0.047215894	0.04810106	0.036502268
T_As	Closure	P95	0.000666579	0.000635176	0.000604917	0.000613484	0.000651316	0.000625641	0.00064461	0.000658982	0.000677916	0.000641195	0.00065627	0.000649736
T_B	Closure	P95	0.006454586	0.006443829	0.005078477	0.005495982	0.005580241	0.005392401	0.007050688	0.006556637	0.006651012	0.006687329	0.006749521	0.005812403
T_Ba	Closure	P95	0.006816242	0.006986103	0.006939591	0.006885442	0.006156705	0.006050139	0.006178711	0.006178881	0.006880393	0.006891096	0.00642856	0.006349409
T_Bi	Closure	P95	2.57143E-05	2.55215E-05	2.5293E-05	2.50484E-05	2.53305E-05	2.53124E-05	2.51771E-05	2.51848E-05	2.53861E-05	2.50487E-05	2.53521E-05	2.5652E-05
T_Be	Closure	P95	5.47977E-05	5.44553E-05	5.25843E-05	5.24177E-05	5.21469E-05	5.28846E-05	5.58375E-05	5.4406E-05	5.48909E-05	5.46623E-05	5.51838E-05	5.45446E-05
T_Ca	Closure	P95	20.6665554	21.83831787	20.94591331	19.3496933	18.46935081	18.02168083	17.95956802	19.29354668	18.98535347	20.26308632	19.31033325	21.80911636
T_Cd	Closure	P95	1.15031E-05	1.24908E-05	1.02722E-05	1.05694E-05	8.56009E-06	1.08986E-05	1.61442E-05	1.27023E-05	1.28421E-05	1.38867E-05	1.41736E-05	1.17393E-05
T_Co	Closure	P95	0.000135637	0.000149218	0.000105887	8.82322E-05	7.52286E-05	8.82493E-05	0.000120286	0.000110892	0.00012483	0.00011584	0.000124236	0.000106925
T_Cr	Closure	P95	0.000183535	0.00017296	0.00018945	0.000189705	0.000214317	0.000219572	0.000196573	0.000174162	0.000180389	0.000209219	0.000191483	0.000184145
T_Cu	Closure	P95	0.000302937	0.00030059	0.000295209	0.000341589	0.000416315	0.000340691	0.000397943	0.000320502	0.000318904	0.000321342	0.00031195	0.000299581
T_Fe	Closure	P95	0.087632142	0.097628221	0.123170018	0.114245817	0.111503243	0.099026509	0.089139797	0.093738124	0.108041629	0.111515276	0.10807015	0.087150551
T_Hg	Closure	P95	4.30956E-06	4.41421E-06	3.59086E-06	3.99493E-06	4.12844E-06	4.36268E-06	5.18906E-06	4.32964E-06	4.48785E-06	4.516E-06	4.58658E-06	4.12148E-06
T_K	Closure	P95	1.117820382	1.114528418	1.01795435	1.082924008	0.889701307	0.941503406	1.071597338	1.025336623	1.068653941	1.064793944	1.066643715	1.036293626
T_Li	Closure	P95	0.001119582	0.001142138	0.000840761	0.0008674	0.000767375	0.000956724	0.001314019	0.001182893	0.001221832	0.001220863	0.001336829	0.001095965
T_Mg	Closure	P95	4.786157131	4.840049744	4.921785355	4.495087147	4.339214325	4.194942474	4.216492653	4.451100826	4.483814716	4.561283588	4.441953182	4.852041721
T_Mn	Closure	P95	0.0179478	0.016333984	0.018222308	0.021111408	0.017939299	0.014978377	0.015244128	0.016324176	0.017657509	0.017703569	0.04494014	0.019286193
T_Mo	Closure	P95	0.000929561	0.001004282	0.00084936	0.000728948	0.000598939	0.000649511	0.000755148	0.000781809	0.000884677	0.000789749	0.000802916	0.000792408
T_Na	Closure	P95	4.562593937	4.69294405	4.464035511	3.728110552	3.500746012	3.334486485	3.466712236	3.793602467	3.957914591	4.026337147	3.915956736	4.152014256
T_Ni	Closure	P95	0.000322356	0.000322747	0.000284839	0.000290268	0.000282701	0.000302483	0.000349228	0.000330983	0.000334482	0.000334029	0.0003372	0.000313822
T_P	Closure	P95	0.028846666	0.027968837	0.033687145	0.030895131	0.025785958	0.024221502	0.021152504	0.020164384	0.018949956	0.020227203	0.029088113	0.028096104
T_Pb	Closure	P95	3.33687E-05	3.3886E-05	3.33598E-05	3.53661E-05	5.9635E-05	4.41242E-05	4.01133E-05	3.62267E-05	3.52012E-05	3.56323E-05	3.48691E-05	3.32257E-05
T_S	Closure	P95	1.309873819	1.347144842	1.244851589	1.547763467	1.200901985	1.115303159	1.145392299	1.268747568	1.112676859	1.349484205	1.129235864	1.346321583
T_Sb	Closure	P95	0.001027431	0.001068415	0.0005753	0.000636009	0.00048854	0.000781722	0.001345332	0.001140887	0.001206147	0.001202177	0.001272965	0.000927187
T_Se	Closure	P95	0.000102757	0.000100176	0.000138175	9.70029E-05	8.6433E-05	8.7744E-05	9.79383E-05	9.40692E-05	9.05908E-05	9.69772E-05	9.66283E-05	9.56037E-05
T_Si	Closure	P95	5.16584301	5.158951283	5.023391724	4.965165615	4.779714584	4.538531303	4.428301334	4.44621563	4.469344616	4.846200466	4.931747913	5.088570118
T_Sn	Closure	P95	5.13178E-05	5.08649E-05	5.04662E-05	4.99629E-05	5.06134E-05	5.06306E-05	5.03516E-05	5.0378E-05	5.07838E-05	5.0102E-05	5.07252E-05	5.11267E-05
T_Sr	Closure	P95	0.103830725	0.104214735	0.102650888	0.093662761	0.094209954	0.088677175	0.087953314	0.092763253	0.097717501	0.092827722	0.094382264	0.104096942
T_Ti	Closure	P95	0.003508104	0.002596812	0.002728361	0.003533789	0.003437547	0.002743091	0.003829493	0.003480537	0.002885229	0.004990033	0.00497824	0.003835473
T_Tl	Closure	P95	1.29532E-05	1.25895E-05	1.42604E-05	1.71364E-05	1.3674E-05	1.82435E-05	1.55492E-05	1.43121E-05	1.3904E-05	1.42264E-05	1.47123E-05	1.60533E-05
T_U	Closure	P95	0.000131771	0.000142375	0.000137184	0.000146293	0.000112217	0.000114834	0.000122375	0.000118587	0.000129485	0.000127842	0.000123968	0.000118399
T_V	Closure	P95	0.000466734	0.000456651	0.000442279	0.000459999	0.000462424	0.000472871	0.00062446	0.00053914	0.000589864	0.000510586	0.000573097	0.00048285
T_Zn	Closure	P95	0.00201077	0.002137763	0.001973161	0.002022035	0.002027082	0.002081372	0.002256666	0.002061647	0.002063951	0.002067148	0.002139517	0.001886328
D_Ag	Closure	P95	9.66068E-06	8.95736E-06	1.25396E-05	1.54391E-05	1.22783E-05	1.57004E-05	1.16383E-05	1.06533E-05	1.00712E-05	1.04071E-05	1.04588E-05	1.28848E-05
D_Al	Closure	P95	0.00435	0.0037	0.0029	0.018000001	0.055333335	0.038999997	0.029000001	0.0147	0.016249999	0.0142	0.0208	0.008300001
D_As	Closure	P95	0.000609428	0.000588577	0.00056384	0.000566944	0.000601854	0.000572777	0.000584529	0.000603619	0.000636579	0.000593576	0.000587493	0.000591306
D_B	Closure	P95	0.006448571	0.006435405	0.005003927	0.005481943	0.005577331	0.005371234	0.007049988	0.006552489	0.006645469	0.006686918	0.006745685	0.005811928
D_Ba	Closure	P95	0.006679017	0.006509443	0.006384011	0.006390646	0.005795252	0.005659537	0.005778117	0.006072999	0.006619494	0.006453644	0.006037216	0.006096003
D_Bi	Closure	P95	2.56448E-05	2.5427E-05	2.52284E-05	2.49807E-05	2.52935E-05	2.53097E-05	2.51697E-05	2.51843E-05	2.53856E-05	2.50477E-05	2.53518E-05	2.55566E-05
D_Be	Closure	P95	5.47977E-05	5.44553E-05	5.25843E-05	5.24177E-05	5.21469E-05	5.28846E-05	5.58375E-05	5.4406E-05	5.48909E-05	5.46623E-05	5.51838E-05	5.45446E-05
D_Ca	Closure	P95	21.2571373	21.07078171	20.52292061	18.77338028	17.78726768	17.79078484	17.99858475	19.03422546	19.20940399	18.95972633	19.07496071	20.09823799
D_Cd	Closure	P95	1.1885E-05	1.18835E-05	9.80092E-06	1.0172E-05	9.71096E-06	1.17483E-05	1.73739E-05	1.38963E-05	1.36614E-05	1.47261E-05	1.46157E-05	1.24146E-05
D_Co	Closure	P95	0.000134976	0.000148686	0.000104796	8.60238E-05	7.38472E-05	8.407E-05	0.000120262	0.000110148	0.000123821	0.000114628	0.000123399	0.000104347
D_Cr	Closure	P95	0.000117267	0.000111678	0.000121189	0.00013873	0.00016077	0.000151696	0.000143239	0.000130001	0.000132446	0.000152347	0.000137758	0.000132182
D_Cu	Closure	P95	0.000307896	0.000334229	0.000285312	0.000291726	0.000385437	0.000340783	0.000421082	0.000330649	0.000324266	0.000327731	0.000321487	0.000317785
D_Fe	Closure	P95	0.052575812	0.051944748	0.057995394	0.054648329	0.059996482	0.055114109	0.054853138	0.056604624	0.06470038	0.063062511	0.057390343	0.05377464
D_Hg	Closure	P95	4.28566E-06	4.40286E-06	3.58908E-06	3.9805E-06	4.09485E-06	4.12722E-06	5.08967E-06	4.28906E-06	4.4599E-06	4.40654E-06	4.54785E-06	4.12154E-06
D_K	Closure	P95	1.100148678	1.094352007	1.002265215	1.061531663	0.877424121	0.895693421	1.032135487	0.982715189	1.042161345	0.99931109	1.077253342	1.032727361
D_Li	Closure	P95	0.00111951	0.001142066	0.000840244	0.000867049	0.000767118	0.00095655	0.001313934	0.001182798	0.001221756	0.001220785	0.001336739	0.001095887
D_Mg	Closure	P95	5.015705585	4.780481815	5.028495789	4.437722206	4.30645752	4.045842648	4.216246128	4.336426258	4.42184639	4.516096592	4.288618565	4.636296272
D_Mn	Closure	P95	0.010267191	0.010728274	0.01069063	0.01281985	0.005486777	0.006452686	0.00803193	0.008781615	0.011664139	0.010283522	0.011512729	0.010409187
D_Mo	Closure	P95	0.000884917	0.000952151	0.000817213	0.000687722	0.000555953	0.000625199	0.00075254	0.000749854	0.000877947	0.000733679	0.000766091	0.000733953
D_Na	Closure	P95	4.587501049	4.616949558	4.419749737	3.66123724	3.475592613	3.276746273	3.465862513	3.769479275	3.920144796	3.86798811	3.822326422	4.051034451
D_Ni	Closure	P95	0.000321083	0.000322033	0.000281569	0.000285942	0.000278434	0.000302434	0.000348744	0.000329782	0.000332713	0.000332082	0.000336025	0.000306473
D_P	Closure	P95	0.057592001	0.052484605	0.048714906	0.052309215	0.048516702	0.03501796	0.057473172	0.105505012	0.065769956	0.149729684	0.149218097	0.062001593
D_Pb	Closure	P95	2.84127E-05	2.83148E-05	2.69422E-05	2.70105E-05	2.63954E-05	2.71958E-05	2.92019E-05	2.83727E-05	2.84896E-05	2.84708E-05	2.87806E-05	2.81422E-05
D_S	Closure	P95	1.206597567	1.392266989	1.362195134	1.264087915	1.132641912	1.113346577	1.201697946	1.214225531	1.164185643	1.269201756	1.231716156	1.335451365
D_Sb	Closure	P95	0.001027335	0.001068325	0.000575014	0.000637677	0.000488528	0.000781628	0.001345326	0.001140783	0.001206068	0.001202092	0.001272876	0.000927122
D_Se	Closure	P95	0.000127537	9.60709E-05	0.000134023	9.34547E-05	8.35901E-05	7.95026E-05	9.37479E-05	9.59576E-05	9.07623E-05	9.04852E-05	9.09724E-05	9.01582E-05
D_Si	Closure	P95	5.091794968	4.958250046	4.89436388	4.731377125	4.523593903	4.277709961	4.205915928	4.259969711	4.320216179	4.665157795	4.846747875	4.982735157
D_Sn	Closure	P95	5.13178E-05	5.08649E-05	5.04662E-05	4.99629E-05	5.06134E-05	5.06306E-05	5.03516E-05	5.0378E-05	5.07838E-05	5.0102E-05	5.07252E-05	5.11267E-05
D_Sr	Closure	P95	0.103916027	0.104162827	0.102927797	0.092235774	0.093139708	0.08611384	0.088030979	0.092356786	0.097393334	0.091052942	0.091019928	0.099806152
D_Ti	Closure	P95	0.00146234	0.001296554	0.001205185	0.001468522	0.001540628	0.001323398	0.00107059	0.003315199	0.001853281	0.004990033	0.004963813	0.001714201
D_Tl	Closure	P95	1.29243E-05	1.25657E-05	1.42342E-05	1.71363E-05	1.35661E-05	1.82415E-05	1.55454E-05	1.43076E-05	1.39019E-05	1.42229E-05	1.47071E-05	1.6026E-05
D_U	Closure	P95	0.000125376	0.000134478	0.000127623	0.000135805	0.00010307	0.000106809	0.000115749	0.000114092	0.000123077	0.000119926	0.000115952	0.000110832
D_V	Closure	P95	0.000437293	0.000436603	0.000323286	0.000366281	0.000330301	0.000393985	0.000504358	0.000469808	0.000456785	0.00046979	0.000508209	0.000428002
D_Zn	Closure	P95	0.001574452	0.001431547	0.001523061	0.001641276	0.001628809	0.001764389	0.001725703	0.001480016	0.00141615	0.001513028	0.001586326	0.001235031

Appendix A.3.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ9

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.376017958	0.437697321	0.293252885	0.250787914	0.123998702	0.121048406	0.176923424	0.257058591	0.369269639	0.281343192	0.319561899	0.283997118
NO3_N	Post-Closure	P95	0.484417439	0.587504387	0.313797206	0.272718757	0.128184289	0.194242448	0.228554517	0.322577477	0.570558608	0.494210571	0.486950547	0.394319445
NO2_N	Post-Closure	P95	0.00223757	0.002961491	0.001819297	0.001651451	0.00166283	0.001737117	0.001727202	0.001909372	0.002501714	0.002461287	0.002414506	0.002360939
Br	Post-Closure	P95	0.034115195	0.036763452	0.032907117	0.035083577	0.03219403	0.027929571	0.028831283	0.035025928	0.033300295	0.037290193	0.03272957	0.032519236
Cl	Post-Closure	P95	6.236428738	6.545601368	3.609774828	4.094766617	2.144364834	2.945029497	3.440254211	4.349152565	6.630675793	6.428662777	5.419744015	4.332067013
F	Post-Closure	P95	0.16137813	0.167437389	0.13048929	0.108557612	0.078914784	0.095598347	0.113559067	0.135428414	0.152803212	0.138674766	0.139411315	0.146105587
TDP	Post-Closure	P95	0.018720165	0.01482619	0.017484821	0.0175811	0.012671058	0.011278504	0.011332644	0.013374713	0.012745435	0.012045016	0.014004563	0.017883392
SO4	Post-Closure	P95	120.5299683	125.8284454	72.83983612	82.3734436	42.6895752	58.24197769	67.79271698	88.93401337	128.269577	128.0384216	108.8790817	89.93961334
T_CN	Post-Closure	P95	0.004000326	0.004295093	0.003809039	0.003725654	0.002961745	0.003138849	0.003368337	0.003722261	0.00433968	0.004023624	0.004192462	0.004133972
WAD_CN	Post-Closure	P95	0.002566446	0.002538717	0.002528176	0.002497862	0.002523342	0.002529633	0.002505451	0.002504904	0.002491229	0.002490347	0.002499109	0.002494987
T_Ag	Post-Closure	P95	1.2628E-05	1.25962E-05	2.10371E-05	1.61777E-05	1.49177E-05	1.6122E-05	1.29356E-05	1.29345E-05	1.28781E-05	1.27473E-05	1.32255E-05	1.49831E-05
T_Al	Post-Closure	P95	0.038506873	0.034139432	0.042855214	0.047701083	0.09345042	0.079203144	0.056025852	0.044792172	0.036594879	0.045040254	0.047829684	0.039006591
T_As	Post-Closure	P95	0.000698045	0.000681151	0.000644327	0.000673986	0.000652478	0.000604401	0.000621108	0.000697165	0.000701101	0.000685247	0.000669053	0.000660856
T_B	Post-Closure	P95	0.006568891	0.00666738	0.005243689	0.005876421	0.0060837	0.005350942	0.006198981	0.007070648	0.007105849	0.006719426	0.0068901	0.006089362
T_Ba	Post-Closure	P95	0.006815817	0.006990774	0.006942965	0.00688695	0.006063439	0.00601855	0.006176134	0.006163702	0.006797888	0.006758452	0.006411409	0.00632611
T_Bi	Post-Closure	P95	2.57314E-05	2.54719E-05	2.55892E-05	2.59774E-05	2.57988E-05	2.55143E-05	2.52149E-05	2.63151E-05	2.52819E-05	2.57074E-05	2.53579E-05	2.5414E-05
T_Be	Post-Closure	P95	5.64635E-05	5.63959E-05	5.33616E-05	5.45186E-05	5.50704E-05	5.31177E-05	5.39338E-05	5.8886E-05	5.69835E-05	5.66583E-05	5.62987E-05	5.51102E-05
T_Ca	Post-Closure	P95	44.20650101	46.07934189	34.8876152	35.58977127	26.6319313	29.81990051	32.15749741	37.68204117	45.87477493	46.14818192	41.48395538	38.68165588
T_Cd	Post-Closure	P95	5.52752E-05	5.65565E-05	3.72645E-05	2.91477E-05	1.89306E-05	1.87554E-05	2.33578E-05	3.2895E-05	4.06809E-05	3.72587E-05	3.67085E-05	3.58634E-05
T_Co	Post-Closure	P95	0.000468153	0.000473207	0.000297431	0.00025035	0.00014286	0.000170119	0.000218017	0.000296073	0.000356606	0.000322934	0.000326744	0.000312347
T_Cr	Post-Closure	P95	0.000183514	0.000172754	0.000194907	0.000194753	0.000212384	0.000218729	0.000191579	0.000175044	0.000178819	0.000208132	0.000188032	0.00017897
T_Cu	Post-Closure	P95	0.000308795	0.000308901	0.000301384	0.000344739	0.000419432	0.000338926	0.000384323	0.000354225	0.000331625	0.00032963	0.00031433	0.000305485
T_Fe	Post-Closure	P95	0.087972164	0.096740469	0.121287577	0.114153661	0.109517947	0.09816511	0.086337417	0.093095668	0.104608014	0.106377222	0.108087264	0.087164678
T_Hg	Post-Closure	P95	6.81899E-06	6.91485E-06	5.50334E-06	6.42266E-06	5.63507E-06	4.32233E-06	4.44072E-06	6.1498E-06	5.83781E-06	6.39564E-06	5.61396E-06	5.42763E-06
T_K	Post-Closure	P95	14.16957855	14.35201168	8.883034706	6.81422472	3.182579041	4.62520647	6.360077858	9.062871933	10.88549232	9.851047516	9.958424568	9.952467918
T_Li	Post-Closure	P95	0.02213905	0.022764239	0.01392678	0.0103918	0.005025579	0.007699639	0.010924626	0.0157253	0.019086903	0.016300665	0.017772093	0.017331466
T_Mg	Post-Closure	P95	5.198214054	5.2403965	5.235385895	4.626450062	4.355288982	4.340674877	4.467821598	4.813042641	4.906915665	4.731448174	4.669011593	5.079031944
T_Mn	Post-Closure	P95	0.151527345	0.154067293	0.098180555	0.085786708	0.043490715	0.053647596	0.071426712	0.099865071	0.119535096	0.10563013	0.130609453	0.108734705
T_Mo	Post-Closure	P95	0.001155828	0.00119377	0.00092762	0.000829814	0.000595423	0.000651174	0.000712249	0.000891018	0.001037531	0.000922283	0.000889132	0.000927461
T_Na	Post-Closure	P95	23.61541367	25.2504406	14.90412807	16.2387104	9.583119392	12.15165615	13.964571	17.444067	24.99790192	24.49746895	20.49713898	17.30032921
T_Ni	Post-Closure	P95	0.000668174	0.000683574	0.000495301	0.00047211	0.000359402	0.000389652	0.000449984	0.00053429	0.000603305	0.000558928	0.000566627	0.000554181
T_P	Post-Closure	P95	0.028858704	0.027831433	0.033651501	0.030934937	0.025797797	0.024026461	0.022141011	0.021906016	0.020496288	0.020302963	0.02918957	0.028207434
T_Pb	Post-Closure	P95	5.05056E-05	5.14824E-05	4.33708E-05	4.22184E-05	6.21334E-05	4.58699E-05	4.19002E-05	4.25621E-05	4.68592E-05	4.49242E-05	4.53394E-05	4.35216E-05
T_S	Post-Closure	P95	1.297716379	1.342179537	1.240401745	1.556174994	1.149184704	1.097657442	1.13659656	1.230133414	1.086919069	1.325309038	1.094184637	1.317455173
T_Sb	Post-Closure	P95	0.002578389	0.002752964	0.001573316	0.001484241	0.000942611	0.001058793	0.001466506	0.002018775	0.00244042	0.002110298	0.002299513	0.002115838
T_Se	Post-Closure	P95	0.000102649	0.000100313	0.000137953	9.20363E-05	8.73007E-05	8.67287E-05	9.02282E-05	9.68796E-05	8.94393E-05	9.70958E-05	9.40756E-05	9.23323E-05
T_Si	Post-Closure	P95	5.165696144	5.154943466	5.080104828	5.084347725	4.636160851	4.541887283	4.414409637	4.554541588	4.478081226	4.886641979	4.851138592	5.011732578
T_Sn	Post-Closure	P95	5.13537E-05	5.09928E-05	5.12812E-05	5.18508E-05	5.17565E-05	5.10513E-05	5.05154E-05	5.27253E-05	5.08842E-05	5.15931E-05	5.07984E-05	5.08472E-05
T_Sr	Post-Closure	P95	0.137862861	0.139411256	0.128223896	0.107312717	0.098340608	0.102898389	0.111686662	0.12539725	0.137897655	0.124554545	0.126349032	0.136944577
T_Ti	Post-Closure	P95	0.003466149	0.002562127	0.002700479	0.003517998	0.003391731	0.002747588	0.003732922	0.003483938	0.002821713	0.004950474	0.004938293	0.003690677
T_Tl	Post-Closure	P95	1.29344E-05	1.2639E-05	1.42031E-05	1.70795E-05	1.41129E-05	1.67029E-05	1.3151E-05	1.51384E-05	1.42988E-05	1.43953E-05	1.43402E-05	1.56734E-05
T_U	Post-Closure	P95	0.000131771	0.000142637	0.000137748	0.000146859	0.000116748	0.000114916	0.000109848	0.000128753	0.000132697	0.000129609	0.000122579	0.000117868
T_V	Post-Closure	P95	0.005893046	0.006049051	0.003790356	0.002905868	0.001576034	0.002208173	0.003061432	0.004299123	0.005173608	0.004407029	0.004788232	0.004654089
T_Zn	Post-Closure	P95	0.005388821	0.005540698	0.003999587	0.00338884	0.002672556	0.002632776	0.002837766	0.003590185	0.004178938	0.003877847	0.003914903	0.003758273
D_Ag	Post-Closure	P95	1.21863E-05	1.22397E-05	1.40493E-05	1.60737E-05	1.18583E-05	1.60897E-05	1.19125E-05	1.22252E-05	1.22905E-05	1.20386E-05	1.26305E-05	1.44171E-05
D_Al	Post-Closure	P95	0.00435	0.0037	0.0029	0.018000001	0.055333335	0.038999997	0.029000001	0.0147	0.016249999	0.0142	0.0208	0.008300001
D_As	Post-Closure	P95	0.000650234	0.000640724	0.000609006	0.000626388	0.00059658	0.000553252	0.000575711	0.000642045	0.000668372	0.000643172	0.000606087	0.000610513
D_B	Post-Closure	P95	0.00656889	0.006667379	0.005175204	0.005867772	0.00608366	0.005333089	0.006198934	0.007070643	0.007105849	0.006719426	0.006890099	0.006089362
D_Ba	Post-Closure	P95	0.006679254	0.006517198	0.006400825	0.006384281	0.005683832	0.005625412	0.005767711	0.006059106	0.006565957	0.006331627	0.006012363	0.006073764
D_Bi	Post-Closure	P95	2.56628E-05	2.5387E-05	2.55708E-05	2.59414E-05	2.57842E-05	2.54869E-05	2.52026E-05	2.63091E-05	2.52819E-05	2.57074E-05	2.53578E-05	2.53829E-05
D_Be	Post-Closure	P95	5.64635E-05	5.63959E-05	5.33616E-05	5.45186E-05	5.50704E-05	5.31177E-05	5.39338E-05	5.8886E-05	5.69835E-05	5.66583E-05	5.62987E-05	5.51102E-05
D_Ca	Post-Closure	P95	44.57388687	45.39410782	34.55743027	35.29066467	26.09779549	29.56980896	32.12301636	37.48276138	45.96870041	45.17486191	41.28606415	37.42663193
D_Cd	Post-Closure	P95	5.55415E-05	5.62148E-05	3.70226E-05	2.90215E-05	1.85191E-05	1.96766E-05	2.4549E-05	3.38914E-05	4.12167E-05	3.76464E-05	3.7188E-05	3.66102E-05
D_Co	Post-Closure	P95	0.000467635	0.000472769	0.000296495	0.000247817	0.000139998	0.000166491	0.00021705	0.000294985	0.000355716	0.000321936	0.000325788	0.000310241
D_Cr	Post-Closure	P95	0.000120118	0.000118786	0.000130463	0.000152968	0.000163719	0.000151657	0.000144835	0.000137789	0.000135503	0.000161728	0.000139144	0.000132814
D_Cu	Post-Closure	P95	0.000311583	0.000335728	0.000296171	0.000302255	0.00039179	0.000337582	0.000392989	0.000356339	0.000334238	0.000329405	0.000322679	0.000321029
D_Fe	Post-Closure	P95	0.052487489	0.051603295	0.059215494	0.054613486	0.059192002	0.054494098	0.053454116	0.056359984	0.062818423	0.062093887	0.056714077	0.05183325
D_Hg	Post-Closure	P95	6.81057E-06	6.91037E-06	5.48875E-06	6.41005E-06	5.65607E-06	4.11596E-06	4.34485E-06	6.08848E-06	5.81421E-06	6.34416E-06	5.5908E-06	5.43447E-06
D_K	Post-Closure	P95	14.16104794	14.34148788	8.869205475	6.788478374	3.173404455	4.5898242	6.319968224	9.026145935	10.86626244	9.802785873	9.971950531	9.950024605
D_Li	Post-Closure	P95	0.022139024	0.022764124	0.013926393	0.010391533	0.00502519	0.007699516	0.010924602	0.015725253	0.019086827	0.016300621	0.017772038	0.017331423
D_Mg	Post-Closure	P95	5.296479225	5.21507597	5.299407959	4.585012436	4.314306259	4.195184231	4.452981472	4.718080044	4.856097698	4.684816837	4.537751198	4.924434185
D_Mn	Post-Closure	P95	0.147742406	0.150612399	0.093252011	0.081386603	0.032705132	0.046252012	0.065459795	0.093601607	0.114753544	0.100066677	0.10498026	0.103053428
D_Mo	Post-Closure	P95	0.001117328	0.001144291	0.000897641	0.000806202	0.000558584	0.000628234	0.000715462	0.000864518	0.001032204	0.000873105	0.000857131	0.000874772
D_Na	Post-Closure	P95	23.64367867	25.18753433	14.8624382	16.18324089	9.547945023	12.08675289	13.95962429	17.42086411	24.96582794	24.3574295	20.40498352	17.2199955
D_Ni	Post-Closure	P95	0.0006675	0.00068277	0.000491405	0.000466463	0.000350756	0.00038957	0.000449503	0.000533784	0.000601851	0.000557917	0.00056626	0.000549193
D_P	Post-Closure	P95	0.056052517	0.052035641	0.048864	0.051355228	0.047125399	0.034920376	0.056123193	0.105655432	0.064545721	0.148536816	0.148139492	0.058023103
D_Pb	Post-Closure	P95	4.83613E-05	4.87443E-05	3.92639E-05	3.74135E-05	3.14683E-05	3.10224E-05	3.28812E-05	3.79655E-05	4.16725E-05	3.98464E-05	3.98897E-05	3.92461E-05
D_S	Post-Closure	P95	1.193421483	1.383814931	1.360676646	1.263464808	1.104763269	1.099123836	1.191660404	1.164030671	1.125934482	1.23382616	1.193038225	1.298242569
D_Sb	Post-Closure	P95	0.00257835	0.002752886	0.001573078	0.00148438	0.000942398	0.00105872	0.001466431	0.002018693	0.002440366	0.002110234	0.002299448	0.00211579
D_Se	Post-Closure	P95	0.00012747	9.60301E-05	0.000133832	9.2405E-05	8.26311E-05	7.80694E-05	8.55944E-05	9.41422E-05	8.97103E-05	9.2054E-05	8.89578E-05	8.72934E-05
D_Si	Post-Closure	P95	5.091612339	4.954807281	4.922925949	4.856460094	4.402314186	4.294309616	4.222450256	4.378053188	4.320442677	4.723566055	4.765520573	4.916605473
D_Sn	Post-Closure	P95	5.13537E-05	5.09928E-05	5.12812E-05	5.18508E-05	5.17565E-05	5.10513E-05	5.05154E-05	5.27253E-05	5.08842E-05	5.15931E-05	5.07984E-05	5.08472E-05
D_Sr	Post-Closure	P95	0.137842655	0.139359251	0.128281116	0.10599307	0.097319297	0.100520104	0.110976048	0.125347301	0.13793546	0.123331815	0.124854527	0.133592784
D_Ti	Post-Closure	P95	0.001417643	0.001271775	0.001216378	0.001481965	0.001640432	0.001335605	0.001086021	0.003318424	0.001834553	0.004943672	0.004930188	0.001691064
D_Tl	Post-Closure	P95	1.29055E-05	1.26153E-05	1.4177E-05	1.70795E-05	1.4017E-05	1.66971E-05	1.31488E-05	1.51347E-05	1.42955E-05	1.43935E-05	1.43365E-05	1.56507E-05
D_U	Post-Closure	P95	0.000125387	0.000134746	0.000128108	0.000136496	0.000107565	0.000106856	0.000103577	0.000122505	0.00012691	0.000121788	0.000114262	0.000109957
D_V	Post-Closure	P95	0.005873443	0.006036366	0.003691957	0.002837572	0.001440556	0.002130499	0.002970065	0.004219912	0.005078245	0.004364483	0.004731391	0.00460426
D_Zn	Post-Closure	P95	0.004990015	0.004991289	0.003648195	0.002999394	0.002145825	0.002288065	0.002392906	0.003054604	0.003587538	0.003408415	0.003413117	0.003188888

Appendix A.3.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ13

			Concentration (mg/L)											
Parameter	Phase	Metric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NH3_N	Closure	P95	0.04419224	0.04884138	0.03536915	0.024018202	0.013511747	0.01572247	0.018575858	0.029937675	0.038345728	0.035833735	0.035143003	0.033067539
NO3_N	Closure	P95	0.068290144	0.076094054	0.079385698	0.053006951	0.05193378	0.031084154	0.026036358	0.022005219	0.020150224	0.018591492	0.067538194	0.073523961
NO2_N	Closure	P95	0.001198639	0.002201078	0.001087218	0.001091379	0.00146908	0.00130687	0.001128028	0.001055276	0.001047875	0.001039379	0.001364513	0.001422349
Br	Closure	P95	0.026051361	0.025675375	0.02540971	0.025574079	0.025804831	0.025509525	0.025795126	0.025362318	0.025633873	0.025504142	0.025733257	0.025803197
Cl	Closure	P95	0.535312057	0.549792826	0.474736303	0.374226391	0.3212758	0.338529617	0.41267997	0.406723589	0.422579765	0.421922296	0.434359789	0.411745608
F	Closure	P95	0.061348934	0.060442723	0.065361604	0.062185392	0.059711859	0.059774008	0.060331561	0.057975709	0.060836412	0.061982006	0.060675774	0.066144899
TDP	Closure	P95	0.015386793	0.01166725	0.015594966	0.016883021	0.013108684	0.009914673	0.008588733	0.009590572	0.00790255	0.00833034	0.010181495	0.014454546
SO4	Closure	P95	7.812300682	8.632201195	7.071474075	5.193151474	4.405638695	4.735107899	5.682246208	5.850035191	6.422837734	6.066444397	6.6334095	6.323610306
T_CN	Closure	P95	0.002667341	0.002720769	0.0026469	0.002546179	0.002539396	0.002547718	0.002560895	0.002610085	0.002649412	0.002651007	0.002650962	0.002635503
WAD_CN	Closure	P95	0.00256115	0.002541447	0.002522226	0.002498084	0.002528822	0.002530038	0.00251669	0.00251817	0.00253765	0.002504705	0.002533571	0.002553866
T_Ag	Closure	P95	9.9553E-06	9.08345E-06	2.03452E-05	1.51414E-05	1.42656E-05	1.60059E-05	1.31034E-05	1.13213E-05	1.04334E-05	1.07564E-05	1.08458E-05	1.3199E-05
T_Al	Closure	P95	0.035039231	0.028050452	0.041129585	0.048082747	0.095346831	0.079649381	0.066265322	0.048581664	0.039015792	0.04668184	0.047828387	0.036108531
T_As	Closure	P95	0.000665483	0.000633192	0.000604444	0.000613665	0.000649597	0.000624156	0.00064531	0.000659256	0.000678008	0.00064178	0.000652976	0.000648419
T_B	Closure	P95	0.006383795	0.00635049	0.005075998	0.005477288	0.005561133	0.005341456	0.006993272	0.006489228	0.00657055	0.006623635	0.006644764	0.005785935
T_Ba	Closure	P95	0.006845363	0.00697766	0.006971793	0.006969248	0.006187117	0.006070597	0.006202133	0.006218576	0.006913683	0.00690781	0.00647979	0.006388373
T_Bi	Closure	P95	2.56779E-05	2.55061E-05	2.52842E-05	2.50476E-05	2.53239E-05	2.53029E-05	2.51741E-05	2.51821E-05	2.53768E-05	2.50479E-05	2.53358E-05	2.5631E-05
T_Be	Closure	P95	5.45752E-05	5.41823E-05	5.25039E-05	5.23463E-05	5.21027E-05	5.27863E-05	5.5674E-05	5.42138E-05	5.47545E-05	5.44857E-05	5.49236E-05	5.43963E-05
T_Ca	Closure	P95	20.66973877	21.80955124	20.92958069	19.35371017	18.40287209	18.00143433	17.96093559	19.28473663	18.98956871	20.24524498	19.29221916	21.78264236
T_Cd	Closure	P95	1.10751E-05	1.19613E-05	9.89367E-06	1.02961E-05	8.41047E-06	1.07006E-05	1.58315E-05	1.22599E-05	1.23949E-05	1.36264E-05	1.34761E-05	1.14702E-05
T_Co	Closure	P95	0.000129311	0.000140918	0.000103936	8.66446E-05	7.43922E-05	8.6964E-05	0.000118318	0.000108112	0.000121321	0.000113415	0.000120786	0.000104932
T_Cr	Closure	P95	0.000182492	0.000170523	0.000185512	0.000189315	0.00021422	0.000218005	0.000195456	0.000173397	0.000178998	0.000207198	0.000189512	0.000182169
T_Cu	Closure	P95	0.000300444	0.000302095	0.00029344	0.000340485	0.000419514	0.000341603	0.000398664	0.000322889	0.000319155	0.000317659	0.000308233	0.000300608
T_Fe	Closure	P95	0.094334304	0.100675486	0.125366986	0.116185494	0.113573544	0.099756062	0.089724123	0.096016012	0.111244678	0.115013339	0.111444868	0.088757686
T_Hg	Closure	P95	4.22029E-06	4.26851E-06	3.5528E-06	3.94975E-06	4.08579E-06	4.30178E-06	5.11371E-06	4.24981E-06	4.39304E-06	4.43043E-06	4.46102E-06	4.08605E-06
T_K	Closure	P95	1.105440021	1.089661121	1.015826702	1.082550764	0.886471272	0.933550477	1.061938763	1.014676213	1.05499506	1.054067373	1.046140909	1.026556134
T_Li	Closure	P95	0.001089013	0.001088254	0.00082888	0.000856583	0.000758599	0.000941371	0.001291227	0.001153154	0.001186622	0.001193633	0.001287181	0.001072718
T_Mg	Closure	P95	4.784816742	4.834944248	4.920964241	4.495918751	4.331732273	4.190907955	4.213228703	4.449399948	4.482982159	4.554561615	4.442139626	4.84554863
T_Mn	Closure	P95	0.018559234	0.016417243	0.018349741	0.021399276	0.01800248	0.015089995	0.015383488	0.016811935	0.018092832	0.018394796	0.044875246	0.019425781
T_Mo	Closure	P95	0.00090668	0.000970906	0.000841925	0.000727517	0.000596834	0.000645092	0.000750641	0.000775849	0.000874854	0.000784753	0.000791181	0.000785574
T_Na	Closure	P95	4.514236927	4.591679573	4.436692715	3.718510151	3.487842083	3.321038485	3.461850405	3.771612406	3.933417082	3.990173817	3.883877754	4.126999855
T_Ni	Closure	P95	0.00031882	0.000316643	0.000283624	0.000289088	0.000281618	0.000300864	0.00034645	0.000327465	0.000330364	0.000330848	0.000331959	0.000311234
T_P	Closure	P95	0.028796416	0.027928766	0.033486482	0.030895645	0.025756938	0.024098804	0.021042624	0.019990318	0.018871637	0.020089641	0.029012274	0.028028553
T_Pb	Closure	P95	3.3119E-05	3.34387E-05	3.30678E-05	3.50246E-05	5.92839E-05	4.354E-05	3.97608E-05	3.58387E-05	3.4829E-05	3.52082E-05	3.44024E-05	3.29462E-05
T_S	Closure	P95	1.310523629	1.351040006	1.244025707	1.546198726	1.1982795	1.115249157	1.144790053	1.266260862	1.111901283	1.351946235	1.130775094	1.346427202
T_Sb	Closure	P95	0.000978967	0.00099351	0.000556987	0.000618774	0.000474164	0.000757049	0.001309065	0.001093377	0.001149751	0.001158658	0.001199496	0.000893026
T_Se	Closure	P95	0.000101744	9.86921E-05	0.000134755	9.58618E-05	8.607E-05	8.68288E-05	9.77262E-05	9.31838E-05	9.0106E-05	9.68967E-05	9.51729E-05	9.46056E-05
T_Si	Closure	P95	5.166440964	5.1522789	5.028176308	4.969497204	4.773196697	4.524561882	4.423336506	4.433604717	4.46101284	4.847117901	4.940845013	5.090222359
T_Sn	Closure	P95	5.1249E-05	5.08394E-05	5.04522E-05	4.99632E-05	5.06022E-05	5.06114E-05	5.03458E-05	5.03724E-05	5.07649E-05	5.00985E-05	5.06916E-05	5.10904E-05
T_Sr	Closure	P95	0.103924759	0.104196154	0.102668151	0.093668528	0.093899772	0.088571064	0.087950841	0.092808492	0.097804382	0.092862576	0.094413914	0.104030244
T_Ti	Closure	P95	0.003536838	0.002606906	0.002754738	0.003572464	0.003463406	0.002746487	0.003833249	0.003465911	0.002893704	0.004990307	0.004979261	0.003812062
T_Tl	Closure	P95	1.2591E-05	1.21261E-05	1.38859E-05	1.67848E-05	1.35167E-05	1.81332E-05	1.53032E-05	1.39075E-05	1.34965E-05	1.385E-05	1.41357E-05	1.56319E-05
T_U	Closure	P95	0.000131157	0.000139438	0.000136887	0.000146078	0.000112007	0.000114317	0.000121495	0.000117869	0.000128005	0.000126669	0.000122456	0.000117923
T_V	Closure	P95	0.000458917	0.000443631	0.000435577	0.000464189	0.000467302	0.000472561	0.000623362	0.00053828	0.000582782	0.000500016	0.000554063	0.000473788
T_Zn	Closure	P95	0.001986413	0.002117006	0.001958551	0.002004419	0.002011918	0.002064801	0.002235962	0.002057629	0.00203868	0.00204564	0.002101623	0.001872184
D_Ag	Closure	P95	9.49736E-06	8.77715E-06	1.22337E-05	1.51413E-05	1.21449E-05	1.56815E-05	1.1586E-05	1.0486E-05	9.90042E-06	1.01292E-05	1.01994E-05	1.2585E-05
D_Al	Closure	P95	0.004343896	0.0036	0.0027	0.017851077	0.055028677	0.037500001	0.026000001	0.014587565	0.007	0.011899999	0.020400001	0.008250122
D_As	Closure	P95	0.000608073	0.000585466	0.000561243	0.000566002	0.000599763	0.000570584	0.000584955	0.000605566	0.000636509	0.000591269	0.000585115	0.000590306
D_B	Closure	P95	0.006378128	0.006342802	0.005003755	0.005463798	0.005558325	0.005294764	0.006992592	0.006485298	0.006565291	0.006623237	0.006641191	0.005785478
D_Ba	Closure	P95	0.006711375	0.006521895	0.006425495	0.006453147	0.005804745	0.00566581	0.00579706	0.006098212	0.006654231	0.006471694	0.006078714	0.006140488
D_Bi	Closure	P95	2.56113E-05	2.54144E-05	2.52216E-05	2.49808E-05	2.52882E-05	2.53003E-05	2.51669E-05	2.51816E-05	2.53763E-05	2.50469E-05	2.53355E-05	2.55386E-05
D_Be	Closure	P95	5.45752E-05	5.41823E-05	5.25039E-05	5.23463E-05	5.21027E-05	5.27863E-05	5.5674E-05	5.42138E-05	5.47545E-05	5.44857E-05	5.49236E-05	5.43963E-05
D_Ca	Closure	P95	21.27252197	21.05916214	20.5093956	18.78806877	17.74427986	17.76042747	17.99423218	19.03125191	19.21474838	18.9556179	19.03750038	20.06246376
D_Cd	Closure	P95	1.14431E-05	1.12922E-05	9.35093E-06	9.91224E-06	9.47108E-06	1.15182E-05	1.69583E-05	1.34009E-05	1.30686E-05	1.42635E-05	1.38931E-05	1.20131E-05
D_Co	Closure	P95	0.000128696	0.000140431	0.000102883	8.4527E-05	7.30581E-05	8.26452E-05	0.000118294	0.000107402	0.00012036	0.000112249	0.000119987	0.000102444
D_Cr	Closure	P95	0.000118287	0.000108738	0.000118681	0.000137257	0.000160299	0.000151217	0.000142068	0.000128693	0.000130797	0.000152242	0.000136441	0.000129533
D_Cu	Closure	P95	0.000305167	0.000331458	0.000284024	0.000290113	0.00038658	0.000338505	0.000416304	0.000328743	0.000321971	0.000324528	0.000317299	0.000318012
D_Fe	Closure	P95	0.053384263	0.053081341	0.057883143	0.055462316	0.060461342	0.055290341	0.055583637	0.058297284	0.066297576	0.06453751	0.059358723	0.054932036
D_Hg	Closure	P95	4.19759E-06	4.25792E-06	3.55108E-06	3.93568E-06	4.05324E-06	4.07146E-06	5.01711E-06	4.21111E-06	4.36635E-06	4.32881E-06	4.42464E-06	4.08615E-06
D_K	Closure	P95	1.089509487	1.07135427	0.996418774	1.059595585	0.874525011	0.888251662	1.022768974	0.973313451	1.028236628	0.991232932	1.058919072	1.022767186
D_Li	Closure	P95	0.001088944	0.001088188	0.000828381	0.000856242	0.000758351	0.000941203	0.001291146	0.001153063	0.001186549	0.001193557	0.001287096	0.001072643
D_Mg	Closure	P95	5.012459755	4.778553963	5.026778221	4.439468384	4.295773983	4.040818214	4.214718819	4.334449768	4.420246124	4.505627155	4.283910751	4.632514954
D_Mn	Closure	P95	0.010958729	0.011136143	0.01094575	0.013166659	0.005612865	0.006658978	0.008136927	0.009283321	0.012110342	0.010769079	0.012269251	0.010917369
D_Mo	Closure	P95	0.000861543	0.000920325	0.000809384	0.000686248	0.000554415	0.000620411	0.000747534	0.000743161	0.000867317	0.000727841	0.000755136	0.000727939
D_Na	Closure	P95	4.532269001	4.526332855	4.387147903	3.649123192	3.46418047	3.270226002	3.461025	3.743559599	3.891766548	3.835163116	3.795241594	4.02846384
D_Ni	Closure	P95	0.000317604	0.000315989	0.000279923	0.000284881	0.000277498	0.000300839	0.00034598	0.000326309	0.00032868	0.000328978	0.000330852	0.000304249
D_P	Closure	P95	0.056994997	0.053390928	0.04974224	0.053174511	0.048143607	0.034533873	0.058215033	0.105111189	0.066993475	0.149737135	0.149240628	0.062478781
D_Pb	Closure	P95	2.82509E-05	2.81058E-05	2.68251E-05	2.69505E-05	2.63667E-05	2.7121E-05	2.90842E-05	2.82268E-05	2.83472E-05	2.83396E-05	2.85546E-05	2.80424E-05
D_S	Closure	P95	1.205240369	1.38984549	1.368280292	1.26522398	1.131114364	1.112528682	1.200949788	1.209535599	1.16465652	1.270665407	1.228076935	1.333274722
D_Sb	Closure	P95	0.000978876	0.00099345	0.000556711	0.000620381	0.000474152	0.000756819	0.00130906	0.001093278	0.001149677	0.001158576	0.001199412	0.000892963
D_Se	Closure	P95	0.000126341	9.41067E-05	0.000130002	9.23308E-05	8.24427E-05	7.92561E-05	9.29792E-05	9.46735E-05	8.97177E-05	8.89864E-05	8.96961E-05	8.95544E-05
D_Si	Closure	P95	5.08869648	4.949653625	4.89273119	4.730256081	4.519981861	4.265450954	4.199485302	4.252110481	4.311120987	4.655970573	4.851033688	4.981110096
D_Sn	Closure	P95	5.1249E-05	5.08394E-05	5.04522E-05	4.99632E-05	5.06022E-05	5.06114E-05	5.03458E-05	5.03724E-05	5.07649E-05	5.00985E-05	5.06916E-05	5.10904E-05
D_Sr	Closure	P95	0.10409566	0.104145609	0.103037104	0.092267163	0.092881627	0.086018421	0.088019356	0.092372179	0.097438984	0.091079466	0.09106344	0.0997722
D_Ti	Closure	P95	0.001441739	0.001329481	0.001248326	0.001497296	0.001532229	0.001311462	0.001099868	0.003300326	0.001870234	0.004990307	0.004965011	0.001729128
D_Tl	Closure	P95	1.25631E-05	1.21033E-05	1.38606E-05	1.67846E-05	1.34107E-05	1.81312E-05	1.52995E-05	1.39033E-05	1.34944E-05	1.38467E-05	1.41308E-05	1.56057E-05
D_U	Closure	P95	0.000124598	0.000131784	0.000127495	0.0001354	0.000102863	0.000106231	0.000115028	0.000113398	0.000121746	0.000118946	0.000114384	0.000110246
D_V	Closure	P95	0.000428507	0.000424658	0.000321015	0.000362316	0.000327325	0.000389066	0.000497231	0.00046369	0.000448333	0.000460825	0.000493009	0.00042109
D_Zn	Closure	P95	0.001552649	0.001405324	0.001482852	0.001608024	0.001624624	0.001738313	0.001691521	0.001452233	0.001374582	0.00148172	0.001521585	0.001209824

Appendix A.3.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ13

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.355146348	0.416073352	0.283437848	0.243293703	0.120302171	0.116759904	0.172521919	0.247798979	0.356214464	0.272789508	0.304556102	0.27615577
NO3_N	Post-Closure	P95	0.468849599	0.553561985	0.305030555	0.264229715	0.12439654	0.187143072	0.222722799	0.31409058	0.546316266	0.474481612	0.468033224	0.385092109
NO2_N	Post-Closure	P95	0.002200869	0.00293439	0.001781748	0.001631479	0.001624609	0.001709179	0.001695552	0.001868993	0.002423283	0.002407032	0.002350055	0.002332052
Br	Post-Closure	P95	0.033745818	0.03611188	0.032564487	0.034865454	0.032068044	0.027792484	0.028751507	0.034690961	0.032989781	0.036960676	0.032368403	0.032247752
Cl	Post-Closure	P95	6.047326565	6.138609886	3.506658792	3.963490009	2.081517935	2.830805302	3.363919258	4.193656445	6.402688026	6.158146381	5.176817417	4.21410799
F	Post-Closure	P95	0.155773818	0.161844864	0.127051428	0.107019	0.077997155	0.093763538	0.11201594	0.13232103	0.149761185	0.135942534	0.136184499	0.143589556
TDP	Post-Closure	P95	0.018537456	0.014681886	0.017175024	0.017515758	0.01262464	0.011069975	0.011141109	0.013255487	0.012600797	0.011902437	0.013749821	0.017562842
SO4	Post-Closure	P95	116.8429565	117.9597397	70.73800659	79.81664276	41.38114166	55.90597916	66.15977478	85.84150696	122.7618408	122.6242294	103.9704056	87.21875
T_CN	Post-Closure	P95	0.003946766	0.004216985	0.003775952	0.003693488	0.002946804	0.003114324	0.003345885	0.003679755	0.004276157	0.003973389	0.004129117	0.004085376
WAD_CN	Post-Closure	P95	0.00256297	0.002537811	0.002526915	0.002497874	0.002522667	0.002528571	0.002505384	0.0025048	0.002491428	0.002490643	0.002499218	0.002495148
T_Ag	Post-Closure	P95	1.23614E-05	1.23026E-05	2.07789E-05	1.57998E-05	1.47836E-05	1.60726E-05	1.27891E-05	1.26356E-05	1.26403E-05	1.24992E-05	1.28545E-05	1.47105E-05
T_Al	Post-Closure	P95	0.038856503	0.033555456	0.042433538	0.048023008	0.09461274	0.078938156	0.055638179	0.044358198	0.036265481	0.04456754	0.047526699	0.038585927
T_As	Post-Closure	P95	0.00069532	0.000676575	0.000642079	0.000672834	0.000651148	0.000603184	0.000622073	0.000696646	0.000700348	0.000684623	0.000666344	0.000659293
T_B	Post-Closure	P95	0.006508304	0.006562213	0.0052361	0.005846396	0.006068731	0.005303137	0.006165239	0.007007383	0.007020296	0.006673463	0.006816871	0.006059987
T_Ba	Post-Closure	P95	0.006846271	0.006982103	0.006973536	0.006970694	0.006077368	0.006036433	0.006201203	0.006202734	0.006845289	0.006809716	0.006465598	0.006355866
T_Bi	Post-Closure	P95	2.56938E-05	2.54578E-05	2.55663E-05	2.5956E-05	2.5787E-05	2.5502E-05	2.52124E-05	2.62841E-05	2.52732E-05	2.56955E-05	2.53424E-05	2.54022E-05
T_Be	Post-Closure	P95	5.61304E-05	5.60757E-05	5.32442E-05	5.43913E-05	5.50003E-05	5.30173E-05	5.38232E-05	5.8636E-05	5.6737E-05	5.64675E-05	5.60543E-05	5.49302E-05
T_Ca	Post-Closure	P95	43.46960831	44.43004608	34.44569397	35.08148575	26.27246857	29.26225853	31.78339386	36.92078018	44.70026398	45.32889938	40.3975029	38.08942032
T_Cd	Post-Closure	P95	5.2194E-05	5.33891E-05	3.56917E-05	2.83403E-05	1.84684E-05	1.81953E-05	2.2867E-05	3.17497E-05	3.91069E-05	3.60522E-05	3.53062E-05	3.47043E-05
T_Co	Post-Closure	P95	0.000445019	0.000450662	0.000286539	0.000243427	0.000139637	0.000164822	0.000213543	0.000286475	0.000346195	0.000312803	0.000315415	0.000304765
T_Cr	Post-Closure	P95	0.000182474	0.000170203	0.000191205	0.000194383	0.000212343	0.000217188	0.000190839	0.000173892	0.000177738	0.000206692	0.000186296	0.000177185
T_Cu	Post-Closure	P95	0.000305779	0.000309796	0.000299632	0.000343556	0.000422529	0.000340231	0.000385022	0.000356211	0.000331419	0.000327021	0.00031174	0.000306055
T_Fe	Post-Closure	P95	0.092563771	0.0993338	0.123422652	0.116093457	0.111400642	0.098840572	0.087009959	0.095291927	0.108241431	0.11022339	0.112050064	0.08892487
T_Hg	Post-Closure	P95	6.59258E-06	6.67576E-06	5.36867E-06	6.33161E-06	5.56701E-06	4.24279E-06	4.40087E-06	6.04099E-06	5.72122E-06	6.28735E-06	5.48168E-06	5.34394E-06
T_K	Post-Closure	P95	13.43700409	13.63128853	8.561239243	6.614891529	3.101276398	4.452239037	6.210400581	8.751615524	10.5645647	9.513608932	9.579751968	9.687638283
T_Li	Post-Closure	P95	0.020957028	0.021610269	0.013515486	0.010079743	0.004873862	0.007371259	0.010647658	0.015157548	0.018476238	0.015796358	0.017066084	0.016781237
T_Mg	Post-Closure	P95	5.172281265	5.209189415	5.220200062	4.626708031	4.335704803	4.321302414	4.452096939	4.793819904	4.888701916	4.717791557	4.660617352	5.060414791
T_Mn	Post-Closure	P95	0.144789934	0.147052214	0.095163025	0.084338941	0.042728554	0.052132711	0.070093356	0.097211599	0.116169102	0.102530889	0.126839146	0.106081389
T_Mo	Post-Closure	P95	0.001124684	0.001160486	0.00091443	0.000825802	0.000593806	0.000645301	0.000709104	0.000881937	0.001024176	0.000911855	0.000875822	0.000917241
T_Na	Post-Closure	P95	22.99201584	23.84468269	14.55978107	15.77631187	9.359743118	11.76448631	13.68510437	16.91412735	24.19429016	23.590271	19.7814312	16.90332413
T_Ni	Post-Closure	P95	0.000645287	0.000661079	0.000485398	0.000465462	0.000356765	0.000383713	0.000444671	0.000523325	0.000589774	0.000547493	0.000553675	0.00054539
T_P	Post-Closure	P95	0.028805951	0.027785826	0.033480689	0.030938165	0.025720108	0.023900678	0.021893423	0.021649184	0.020329783	0.020237869	0.029037295	0.02813478
T_Pb	Post-Closure	P95	4.90228E-05	4.99842E-05	4.26109E-05	4.17883E-05	6.17821E-05	4.51546E-05	4.15718E-05	4.20569E-05	4.59702E-05	4.40815E-05	4.45206E-05	4.2953E-05
T_S	Post-Closure	P95	1.298627615	1.346173286	1.239888072	1.554502606	1.147304416	1.098020434	1.136057258	1.227474093	1.086623311	1.330155849	1.096673846	1.318414211
T_Sb	Post-Closure	P95	0.002441104	0.002609514	0.001526655	0.001440932	0.000928642	0.00101419	0.001428852	0.001944586	0.002349102	0.002031724	0.002214709	0.00205523
T_Se	Post-Closure	P95	0.000101643	9.88228E-05	0.000134252	9.10921E-05	8.69441E-05	8.59552E-05	9.02423E-05	9.60527E-05	8.88473E-05	9.70165E-05	9.27884E-05	9.15523E-05
T_Si	Post-Closure	P95	5.166299343	5.148308754	5.082985878	5.085295677	4.635248184	4.527404308	4.411213875	4.537478924	4.470236778	4.886221886	4.862771511	5.016188145
T_Sn	Post-Closure	P95	5.12825E-05	5.09674E-05	5.12319E-05	5.18246E-05	5.1734E-05	5.10263E-05	5.05092E-05	5.26648E-05	5.08567E-05	5.15666E-05	5.07685E-05	5.0823E-05
T_Sr	Post-Closure	P95	0.136787683	0.137827232	0.127548337	0.106999449	0.097752161	0.102057122	0.111049302	0.124296248	0.136789486	0.123626418	0.125229508	0.135943785
T_Ti	Post-Closure	P95	0.003495431	0.002574336	0.002729273	0.003556658	0.003414562	0.002750708	0.003737729	0.003468008	0.002828208	0.004952332	0.004940075	0.003672703
T_Tl	Post-Closure	P95	1.25735E-05	1.22223E-05	1.38313E-05	1.66304E-05	1.397E-05	1.66365E-05	1.29482E-05	1.48276E-05	1.3941E-05	1.40099E-05	1.3878E-05	1.5317E-05
T_U	Post-Closure	P95	0.000131158	0.000139686	0.000137449	0.000146721	0.000116347	0.000114397	0.000109426	0.000127992	0.000131517	0.000128826	0.000121249	0.000117403
T_V	Post-Closure	P95	0.005587513	0.005748461	0.003681905	0.00283442	0.001542315	0.002131244	0.002995637	0.00415811	0.005005064	0.004257959	0.004602802	0.004510083
T_Zn	Post-Closure	P95	0.005161275	0.005296211	0.003886577	0.003322496	0.002646058	0.002586823	0.002802029	0.003528866	0.004072378	0.00378293	0.003808913	0.003672888
D_Ag	Post-Closure	P95	1.19347E-05	1.19592E-05	1.37319E-05	1.56992E-05	1.17701E-05	1.60417E-05	1.18339E-05	1.19521E-05	1.20586E-05	1.18132E-05	1.22814E-05	1.416E-05
D_Al	Post-Closure	P95	0.004345289	0.0036	0.0027	0.017873991	0.055060647	0.037500001	0.026000001	0.01459864	0.007	0.011899999	0.020400001	0.008254386
D_As	Post-Closure	P95	0.000646502	0.000635021	0.000603855	0.000624648	0.000595068	0.000550963	0.00057619	0.0006427	0.0006672	0.000640022	0.000603443	0.000608734
D_B	Post-Closure	P95	0.006508304	0.006562212	0.005169742	0.005838055	0.006068691	0.005260703	0.006165192	0.007007378	0.007020296	0.006673463	0.006816871	0.006059986
D_Ba	Post-Closure	P95	0.00671153	0.006528909	0.006437844	0.006446848	0.005691799	0.005638084	0.005791979	0.00608478	0.006608104	0.006387034	0.006053617	0.006107701
D_Bi	Post-Closure	P95	2.56281E-05	2.53779E-05	2.55487E-05	2.59203E-05	2.57726E-05	2.54752E-05	2.52003E-05	2.62782E-05	2.52731E-05	2.56955E-05	2.53422E-05	2.53719E-05
D_Be	Post-Closure	P95	5.61304E-05	5.60757E-05	5.32442E-05	5.43913E-05	5.50003E-05	5.30173E-05	5.38232E-05	5.8636E-05	5.6737E-05	5.64675E-05	5.60543E-05	5.49302E-05
D_Ca	Post-Closure	P95	43.85942459	43.78899002	34.11338043	34.80223083	25.75395966	29.01234436	31.73520088	36.72270584	44.80327606	44.37002563	40.15215683	36.82426071
D_Cd	Post-Closure	P95	5.24448E-05	5.29651E-05	3.54606E-05	2.81254E-05	1.81729E-05	1.90784E-05	2.3948E-05	3.27078E-05	3.96199E-05	3.62449E-05	3.5667E-05	3.53212E-05
D_Co	Post-Closure	P95	0.000444527	0.000450246	0.000285642	0.000240982	0.000136874	0.000160986	0.000212602	0.000285429	0.000345335	0.000311841	0.000314498	0.000302719
D_Cr	Post-Closure	P95	0.00012127	0.000115895	0.000127436	0.000151839	0.000163252	0.000151181	0.000144055	0.00013654	0.000133598	0.000161397	0.000137879	0.00013
D_Cu	Post-Closure	P95	0.000308426	0.000333772	0.000294468	0.000301156	0.000393192	0.000335124	0.000391301	0.000353096	0.000331637	0.000326803	0.000319753	0.000321158
D_Fe	Post-Closure	P95	0.053288601	0.052777939	0.059066728	0.055427466	0.059494331	0.054680172	0.05411268	0.058049619	0.064790785	0.063653573	0.058284871	0.053232931
D_Hg	Post-Closure	P95	6.58457E-06	6.67151E-06	5.35467E-06	6.31766E-06	5.5735E-06	4.0448E-06	4.29316E-06	5.98173E-06	5.69845E-06	6.2373E-06	5.45952E-06	5.355E-06
D_K	Post-Closure	P95	13.43001652	13.6213007	8.543036461	6.587416649	3.09252286	4.417080879	6.170586586	8.715755463	10.54491234	9.459927559	9.594575882	9.684998512
D_Li	Post-Closure	P95	0.020957006	0.021610159	0.01351511	0.010079485	0.004873486	0.007371144	0.010647634	0.015157501	0.018476183	0.015796317	0.017066032	0.016781198
D_Mg	Post-Closure	P95	5.270831108	5.188564777	5.282796383	4.586209774	4.29449892	4.179664135	4.443991184	4.697218418	4.835858822	4.666004181	4.518624306	4.90692091
D_Mn	Post-Closure	P95	0.140729919	0.143610865	0.090092212	0.079886056	0.031909849	0.044728655	0.064109571	0.090914994	0.111361191	0.096773878	0.101736672	0.100483268
D_Mo	Post-Closure	P95	0.001085446	0.001111906	0.000883848	0.000801684	0.000557326	0.000621814	0.000711683	0.000854628	0.001019715	0.000861517	0.000844292	0.000865099
D_Na	Post-Closure	P95	23.01644516	23.78906822	14.51998234	15.7168932	9.327394485	11.70289993	13.68028641	16.8882885	24.16036797	23.45194817	19.68979645	16.82401085
D_Ni	Post-Closure	P95	0.000644649	0.000660316	0.000481667	0.000459987	0.000348429	0.000383637	0.000444202	0.000522837	0.000588414	0.000546518	0.000553324	0.000540547
D_P	Post-Closure	P95	0.055474587	0.05273911	0.049948923	0.052064698	0.046800271	0.034399625	0.057188619	0.105206899	0.065424636	0.14859122	0.148192689	0.058543492
D_Pb	Post-Closure	P95	4.69963E-05	4.73077E-05	3.8617E-05	3.70606E-05	3.13076E-05	3.07765E-05	3.26769E-05	3.74866E-05	4.10588E-05	3.93012E-05	3.92355E-05	3.86778E-05
D_S	Post-Closure	P95	1.192419291	1.381440639	1.367889762	1.265581846	1.103260994	1.098756075	1.190979004	1.160016537	1.127456784	1.237110257	1.1913234	1.297116041
D_Sb	Post-Closure	P95	0.002441066	0.002609441	0.001526424	0.001441066	0.000928433	0.001013937	0.00142878	0.001944507	0.00234905	0.00203166	0.002214646	0.002055183
D_Se	Post-Closure	P95	0.000126277	9.39722E-05	0.000129828	9.13112E-05	8.18244E-05	7.77557E-05	8.50818E-05	9.32901E-05	8.85841E-05	9.05883E-05	8.77612E-05	8.68261E-05
D_Si	Post-Closure	P95	5.088523865	4.946187496	4.91972971	4.853618622	4.401394367	4.282713413	4.217782974	4.366281033	4.314608097	4.71544838	4.772799015	4.917153358
D_Sn	Post-Closure	P95	5.12825E-05	5.09674E-05	5.12319E-05	5.18246E-05	5.1734E-05	5.10263E-05	5.05092E-05	5.26648E-05	5.08567E-05	5.15666E-05	5.07685E-05	5.0823E-05
D_Sr	Post-Closure	P95	0.136869758	0.137777478	0.127685875	0.105761461	0.096807241	0.099645235	0.110341705	0.124171868	0.136788324	0.122389831	0.123693988	0.132579848
D_Ti	Post-Closure	P95	0.001399607	0.001304819	0.001259031	0.001503379	0.001627238	0.001322122	0.00111073	0.003304953	0.001846966	0.004945775	0.004932245	0.001705563
D_Tl	Post-Closure	P95	1.25457E-05	1.22044E-05	1.38062E-05	1.66304E-05	1.38756E-05	1.66309E-05	1.29474E-05	1.4824E-05	1.39375E-05	1.40083E-05	1.38744E-05	1.5295E-05
D_U	Post-Closure	P95	0.000124609	0.000132037	0.000127972	0.000136239	0.000107176	0.000106277	0.000103276	0.000121849	0.000125599	0.000121124	0.000112895	0.000109394
D_V	Post-Closure	P95	0.005566199	0.005736428	0.003586518	0.002758924	0.001400619	0.002047402	0.002897797	0.004074685	0.004923732	0.004220214	0.004548265	0.004461885
D_Zn	Post-Closure	P95	0.004762052	0.004749761	0.00351038	0.002919934	0.002121824	0.002224995	0.00234393	0.002971989	0.003460769	0.003292213	0.003285202	0.003087291

Appendix A.3.7: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Midway

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.026580738	0.025547571	0.023226038	0.018508429	0.011773981	0.013509862	0.015467127	0.021497993	0.023722444	0.021791862	0.022264671	0.022081355
NO3_N	Closure	P95	0.069800995	0.072516017	0.074437216	0.050436962	0.041336879	0.022536216	0.019801099	0.015574382	0.013408971	0.012301384	0.061637636	0.068945333
NO2_N	Closure	P95	0.001199031	0.002091987	0.000933345	0.001071596	0.001300484	0.001210753	0.000985859	0.000909571	0.000950796	0.00121789	0.001178772	0.001401135
Br	Closure	P95	0.025633665	0.025442641	0.025267085	0.025395423	0.025605714	0.025326742	0.025607036	0.025279645	0.02544493	0.025248302	0.025399847	0.025517426
Cl	Closure	P95	0.383289874	0.390592992	0.375889927	0.31933865	0.295289189	0.306667238	0.377438605	0.359982699	0.341470599	0.335122555	0.347095072	0.345439821
F	Closure	P95	0.06033935	0.06016127	0.06434419	0.061550759	0.057382431	0.057985395	0.059201047	0.057140034	0.060379662	0.059942853	0.060436051	0.064251997
TDP	Closure	P95	0.014548839	0.011193991	0.013487598	0.016680297	0.012268892	0.00898544	0.007754288	0.009551324	0.007956486	0.007873745	0.009400566	0.012744009
SO4	Closure	P95	5.875473022	6.020711899	5.763800621	4.717307091	4.083580017	4.126218319	4.840045929	4.748792648	5.029748917	4.851166248	5.091804028	5.260883331
T_CN	Closure	P95	0.00259219	0.002603237	0.002581579	0.002528131	0.002525437	0.002533155	0.002542605	0.002568537	0.002581288	0.002572295	0.002578804	0.002582171
WAD_CN	Closure	P95	0.002537961	0.002527017	0.002514424	0.002498321	0.002521685	0.002519528	0.002513219	0.002514052	0.00252622	0.002502841	0.002518585	0.002533965
T_Ag	Closure	P95	7.95445E-06	7.67515E-06	1.70059E-05	1.39678E-05	1.21893E-05	1.56386E-05	1.10775E-05	9.16889E-06	8.46668E-06	8.45055E-06	8.23255E-06	1.01911E-05
T_Al	Closure	P95	0.044068955	0.024070289	0.036482777	0.052499443	0.11020761	0.0765073	0.057559714	0.041916411	0.033978812	0.039834645	0.044336773	0.031697031
T_As	Closure	P95	0.000653019	0.000618702	0.00059918	0.000615959	0.000627338	0.000607352	0.000652397	0.000661819	0.000678893	0.000649334	0.000629445	0.000633848
T_B	Closure	P95	0.005805681	0.005709056	0.005048332	0.0052891	0.005374032	0.004799563	0.006322215	0.005822589	0.005983279	0.005933848	0.00586189	0.005503499
T_Ba	Closure	P95	0.00735896	0.006918133	0.007256034	0.00785388	0.006440334	0.006332587	0.006530267	0.006661613	0.007289533	0.007371725	0.007082191	0.006809943
T_Bi	Closure	P95	2.54314E-05	2.53299E-05	2.51846E-05	2.50367E-05	2.52381E-05	2.51967E-05	2.51338E-05	2.51412E-05	2.52624E-05	2.50312E-05	2.51859E-05	2.53978E-05
T_Be	Closure	P95	5.29394E-05	5.24675E-05	5.16012E-05	5.14179E-05	5.15311E-05	5.17217E-05	5.37634E-05	5.24677E-05	5.31567E-05	5.26662E-05	5.26555E-05	5.27538E-05
T_Ca	Closure	P95	20.70895958	21.41792488	20.75471878	19.41698837	17.78764153	17.72334862	17.98705673	19.15501213	19.06568718	20.00739288	19.10621262	21.40600586
T_Cd	Closure	P95	7.64779E-06	8.26467E-06	7.09491E-06	7.34546E-06	6.84773E-06	8.65117E-06	1.22074E-05	7.91198E-06	8.46005E-06	1.08835E-05	8.19318E-06	8.78634E-06
T_Co	Closure	P95	9.11408E-05	9.00008E-05	7.92622E-05	7.34056E-05	6.53284E-05	7.29696E-05	9.53165E-05	8.25222E-05	8.94275E-05	8.41636E-05	8.6394E-05	8.27588E-05
T_Cr	Closure	P95	0.000169395	0.000140499	0.000164108	0.000186071	0.000213041	0.000201676	0.00018314	0.000161004	0.000164818	0.000183784	0.000171297	0.000160702
T_Cu	Closure	P95	0.000278498	0.000313455	0.000276498	0.000322764	0.000487604	0.000353076	0.000407707	0.000360371	0.000321656	0.000289637	0.000280344	0.00031091
T_Fe	Closure	P95	0.143156812	0.120008446	0.144505739	0.157521099	0.135678127	0.109673537	0.100518137	0.120870784	0.145410299	0.161540121	0.156839222	0.104309112
T_Hg	Closure	P95	3.47931E-06	3.37886E-06	3.11566E-06	3.40918E-06	3.55947E-06	3.63262E-06	4.2333E-06	3.49713E-06	3.58455E-06	3.68189E-06	3.48699E-06	3.73171E-06
T_K	Closure	P95	0.999600053	0.957875729	0.990856409	1.076715231	0.845357955	0.846908987	0.949038386	0.913537204	0.939254403	0.946376562	0.887656271	0.932294786
T_Li	Closure	P95	0.000831611	0.000792223	0.000695528	0.00073003	0.000670817	0.000774827	0.001024851	0.000846415	0.000902683	0.000897594	0.000907453	0.000849725
T_Mg	Closure	P95	4.770802975	4.779613972	4.911309242	4.514212608	4.227984428	4.123324871	4.163559914	4.424363136	4.472026825	4.493749142	4.444438934	4.76680088
T_Mn	Closure	P95	0.024048049	0.01768888	0.020771971	0.026675198	0.018781455	0.016635606	0.017075654	0.022675937	0.024536965	0.026399566	0.043922439	0.021183241
T_Mo	Closure	P95	0.000761586	0.000767161	0.000745662	0.000712466	0.000569324	0.000596978	0.000698006	0.000720229	0.000788418	0.000731247	0.000672513	0.000708486
T_Na	Closure	P95	4.194611549	4.101763248	4.110016346	3.628129244	3.334509134	3.22440505	3.404538393	3.613516808	3.72541976	3.693187237	3.616275311	3.909085035
T_Ni	Closure	P95	0.000288845	0.000283335	0.000269947	0.00027393	0.000272094	0.000283451	0.00031398	0.000291644	0.000298289	0.000296925	0.00029161	0.000287937
T_P	Closure	P95	0.028121127	0.027410256	0.030483793	0.030903883	0.02541486	0.023214806	0.019568151	0.018233238	0.018065011	0.018995339	0.027945284	0.027336759
T_Pb	Closure	P95	2.9848E-05	3.033E-05	2.99533E-05	3.25135E-05	5.43929E-05	3.81817E-05	3.59495E-05	3.21034E-05	3.10087E-05	3.09014E-05	3.02341E-05	2.99352E-05
T_S	Closure	P95	1.319336653	1.403642893	1.236606956	1.531989098	1.160192847	1.114645839	1.1357162	1.229650378	1.101672173	1.407893896	1.17290628	1.347608089
T_Sb	Closure	P95	0.000567374	0.000506383	0.000352968	0.000417502	0.000323198	0.000488412	0.000885196	0.000602439	0.000688057	0.000684291	0.00063119	0.00056632
T_Se	Closure	P95	9.24038E-05	8.75598E-05	0.00010727	8.54737E-05	8.27838E-05	7.9923E-05	9.52634E-05	8.40514E-05	8.43884E-05	9.60905E-05	8.48932E-05	8.31995E-05
T_Si	Closure	P95	5.173772812	5.076787949	5.066384792	5.026041508	4.711905479	4.366622925	4.360846996	4.277959347	4.366452217	4.85652256	5.026817322	5.108580589
T_Sn	Closure	P95	5.07701E-05	5.05471E-05	5.02935E-05	4.99677E-05	5.04531E-05	5.0397E-05	5.02695E-05	5.02885E-05	5.05327E-05	5.00612E-05	5.03825E-05	5.06875E-05
T_Sr	Closure	P95	0.104986526	0.1039728	0.102905966	0.093763433	0.090607412	0.087412752	0.087912008	0.09343145	0.098613642	0.093403533	0.094818413	0.103366822
T_Ti	Closure	P95	0.004306428	0.0027683	0.003083527	0.004032572	0.003845468	0.002785851	0.003875291	0.003314469	0.003049211	0.004993466	0.004988802	0.003591623
T_Tl	Closure	P95	9.52712E-06	9.05041E-06	1.01606E-05	1.41551E-05	1.12208E-05	1.699E-05	1.23437E-05	1.05835E-05	1.03691E-05	1.02184E-05	1.00435E-05	1.15235E-05
T_U	Closure	P95	0.000125845	0.000121514	0.000133554	0.000143684	0.000109291	0.000108829	0.000111215	0.000110585	0.00011651	0.000114749	0.000110952	0.000112782
T_V	Closure	P95	0.000394509	0.000356095	0.000360934	0.000511749	0.000520797	0.00046938	0.000610493	0.000530168	0.000516249	0.000396267	0.000416702	0.00039225
T_Zn	Closure	P95	0.001789875	0.001899089	0.001794065	0.001829108	0.001878444	0.001873666	0.002009717	0.002017741	0.001830339	0.001824209	0.001815412	0.001736077
D_Ag	Closure	P95	7.69154E-06	7.52148E-06	9.33829E-06	1.39672E-05	1.04629E-05	1.5442E-05	1.0617E-05	8.76587E-06	8.11493E-06	8.19435E-06	8.08217E-06	9.81072E-06
D_Al	Closure	P95	0.004261179	0.003067983	0.002581757	0.016033864	0.051109724	0.035777997	0.025377296	0.012975348	0.007	0.011899999	0.016798763	0.007540619
D_As	Closure	P95	0.000597036	0.000563592	0.000532042	0.000557116	0.000572699	0.000543271	0.00058996	0.000628295	0.000635835	0.000566518	0.000565547	0.00057885
D_B	Closure	P95	0.005805089	0.005708923	0.005002046	0.005281057	0.005373445	0.004496814	0.006321768	0.005820438	0.005983001	0.005933848	0.005861606	0.005503419
D_Ba	Closure	P95	0.006976968	0.006612391	0.006874909	0.007081165	0.005928266	0.005838471	0.006149101	0.006367516	0.007024325	0.006985615	0.006484604	0.006639594
D_Bi	Closure	P95	2.5379E-05	2.52701E-05	2.51438E-05	2.49832E-05	2.52168E-05	2.51952E-05	2.51322E-05	2.51405E-05	2.52621E-05	2.50284E-05	2.51858E-05	2.53396E-05
D_Be	Closure	P95	5.29394E-05	5.24675E-05	5.16012E-05	5.14179E-05	5.15311E-05	5.17217E-05	5.37634E-05	5.24677E-05	5.31567E-05	5.26662E-05	5.26555E-05	5.27538E-05
D_Ca	Closure	P95	21.45269585	20.91371727	20.36536789	19.25937843	17.24393272	17.51255608	17.93056679	18.98750877	19.29896927	18.90902328	18.67175102	19.70014
D_Cd	Closure	P95	7.95659E-06	7.34234E-06	6.75554E-06	7.11898E-06	7.30015E-06	9.25378E-06	1.20969E-05	8.52126E-06	9.05101E-06	9.25695E-06	8.67344E-06	8.49787E-06
D_Co	Closure	P95	9.06147E-05	8.95891E-05	7.86564E-05	7.17546E-05	6.43373E-05	6.71315E-05	9.53011E-05	8.22071E-05	8.89498E-05	8.35253E-05	8.6002E-05	8.11532E-05
D_Cr	Closure	P95	0.000129765	8.726E-05	9.37072E-05	0.000121967	0.000153757	0.000145818	0.000130181	0.000118002	0.000112244	0.000151235	0.0001242	0.000100339
D_Cu	Closure	P95	0.000282415	0.000314689	0.000271554	0.000280529	0.000406484	0.000318301	0.000362146	0.000308957	0.000298357	0.000293698	0.000285784	0.000320673
D_Fe	Closure	P95	0.060357466	0.063359685	0.056828249	0.075413845	0.066796266	0.057249695	0.063910879	0.077138782	0.091022797	0.081278495	0.072967507	0.068292484
D_Hg	Closure	P95	3.47205E-06	3.37772E-06	3.11635E-06	3.40019E-06	3.53652E-06	3.47162E-06	4.16933E-06	3.45932E-06	3.56725E-06	3.55223E-06	3.47373E-06	3.73238E-06
D_K	Closure	P95	0.99532932	0.95141536	0.931396008	1.030468106	0.837415814	0.807190061	0.913285255	0.884360611	0.910553932	0.910150707	0.91740036	0.926726401
D_Li	Closure	P95	0.000831559	0.000791876	0.000695203	0.00072978	0.000670667	0.0007747	0.001024798	0.000846375	0.000902648	0.000897554	0.000907392	0.000849694
D_Mg	Closure	P95	4.967864037	4.756266117	5.002981186	4.471440792	4.192595005	3.96688199	4.191500664	4.305028439	4.398581028	4.41342783	4.233955383	4.585868835
D_Mn	Closure	P95	0.016473619	0.01386086	0.013170707	0.020215619	0.007170218	0.009046867	0.009987463	0.015684722	0.018574592	0.017705649	0.019879714	0.015543719
D_Mo	Closure	P95	0.000713157	0.000719983	0.000708745	0.000670859	0.000534318	0.000568278	0.000689057	0.000680589	0.000774175	0.000667694	0.000645306	0.000660925
D_Na	Closure	P95	4.191007137	4.090047359	4.090171337	3.515708208	3.323088884	3.202012539	3.40399909	3.575867414	3.635157824	3.562084913	3.56503582	3.832710743
D_Ni	Closure	P95	0.000288374	0.000283315	0.000267999	0.000271864	0.00026765	0.000283596	0.000313671	0.000291345	0.000297646	0.00029576	0.00029128	0.000284234
D_P	Closure	P95	0.048862137	0.069420509	0.064220637	0.065024734	0.043093495	0.029145887	0.075634331	0.100460008	0.07619223	0.149823233	0.14950262	0.068757303
D_Pb	Closure	P95	2.69738E-05	2.67222E-05	2.61443E-05	2.62091E-05	2.59949E-05	2.63107E-05	2.77089E-05	2.68228E-05	2.71779E-05	2.69518E-05	2.69045E-05	2.69094E-05
D_S	Closure	P95	1.188634634	1.359054685	1.463993907	1.314728379	1.109268785	1.10125041	1.189218998	1.152771354	1.170367241	1.296931386	1.182244658	1.31221962
D_Sb	Closure	P95	0.000567294	0.000506191	0.000352788	0.000418488	0.000323193	0.000486695	0.000885192	0.000602383	0.000688006	0.00068425	0.000631144	0.000566285
D_Se	Closure	P95	0.00011464	7.99402E-05	0.000101066	8.19018E-05	7.28552E-05	7.65502E-05	8.36855E-05	8.4476E-05	7.89E-05	7.87785E-05	8.08669E-05	8.22969E-05
D_Si	Closure	P95	5.053676605	4.852238655	4.874209404	4.718905449	4.473417282	4.143387794	4.121906281	4.157160282	4.236114025	4.562323093	4.891504765	4.963119507
D_Sn	Closure	P95	5.07701E-05	5.05471E-05	5.02935E-05	4.99677E-05	5.04531E-05	5.0397E-05	5.02695E-05	5.02885E-05	5.05327E-05	5.00612E-05	5.03825E-05	5.06875E-05
D_Sr	Closure	P95	0.105895258	0.103942946	0.104310632	0.09373688	0.090035066	0.084625974	0.087851278	0.092589542	0.098175049	0.091525845	0.091776572	0.099295788
D_Ti	Closure	P95	0.00118575	0.001901913	0.001747346	0.001904304	0.001459823	0.001137057	0.001631336	0.003118895	0.002243784	0.004993466	0.004977109	0.001939595
D_Tl	Closure	P95	9.5058E-06	9.02758E-06	1.01415E-05	1.4155E-05	1.11391E-05	1.69883E-05	1.23394E-05	1.05791E-05	1.03669E-05	1.02168E-05	1.00415E-05	1.14984E-05
D_U	Closure	P95	0.000117769	0.000114879	0.000126062	0.000130886	0.000100205	0.000100071	0.000106596	0.000106646	0.000111962	0.000108986	0.000102525	0.00010401
D_V	Closure	P95	0.00035621	0.000343809	0.000295482	0.000317049	0.000300234	0.000339715	0.000413954	0.000404329	0.000378642	0.000373248	0.000381329	0.000358558
D_Zn	Closure	P95	0.001395281	0.001224001	0.001144123	0.001427907	0.001569962	0.001450864	0.001312359	0.001213788	0.001060798	0.001149711	0.001069516	0.000949385

Appendix A.3.7: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Midway

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.199618638	0.225236982	0.177825764	0.15912427	0.078465044	0.079342745	0.119778611	0.155609816	0.218718186	0.185601696	0.169763759	0.184714153
NO3_N	Post-Closure	P95	0.341417521	0.29022187	0.213761613	0.175128475	0.082252137	0.113423049	0.153160572	0.21369426	0.30884254	0.280066222	0.282736093	0.275922328
NO2_N	Post-Closure	P95	0.001867635	0.002599037	0.001340729	0.001422234	0.001293625	0.00142116	0.001341252	0.001484011	0.001718036	0.001923556	0.001658498	0.002012601
Br	Post-Closure	P95	0.030071437	0.030641651	0.02939851	0.032377351	0.030451927	0.027020998	0.027722187	0.031093128	0.029756973	0.033047095	0.029115289	0.029498199
Cl	Post-Closure	P95	4.073072433	3.159802914	2.298984528	2.624307871	1.409011483	1.708112717	2.377279997	2.905282021	3.740339994	3.846892834	3.178751469	2.854099035
F	Post-Closure	P95	0.114687145	0.115399137	0.102758333	0.089567587	0.067186609	0.076062217	0.093616351	0.100587875	0.116742156	0.104181021	0.104464412	0.113026276
TDP	Post-Closure	P95	0.01647065	0.013253456	0.013911867	0.016967418	0.011961887	0.008968897	0.008957611	0.011908937	0.010961421	0.010223495	0.011017066	0.013908987
SO4	Post-Closure	P95	79.13739777	62.33539581	46.64147949	51.32711411	27.31287956	32.94560623	46.36364746	55.97096634	69.69502258	77.38143921	63.7182579	58.71586609
T_CN	Post-Closure	P95	0.003484971	0.003492489	0.003342109	0.003288631	0.002781474	0.00287971	0.003075701	0.003264125	0.003597873	0.00344916	0.003469754	0.003531883
WAD_CN	Post-Closure	P95	0.002538521	0.002526584	0.002518038	0.002498141	0.002517087	0.00251732	0.002504417	0.002503462	0.002493895	0.002493975	0.002500124	0.00249693
T_Ag	Post-Closure	P95	9.59896E-06	9.19411E-06	1.75036E-05	1.40364E-05	1.27882E-05	1.5584E-05	1.08633E-05	9.91895E-06	9.92253E-06	9.74486E-06	9.49404E-06	1.12707E-05
T_Al	Post-Closure	P95	0.043741327	0.025444707	0.037606556	0.052451372	0.109507784	0.075975269	0.051308617	0.040479384	0.033102822	0.040074956	0.044596527	0.033227749
T_As	Post-Closure	P95	0.000668676	0.000640287	0.000620047	0.000658105	0.000632734	0.000591919	0.000634669	0.000689573	0.000692375	0.000676994	0.00063659	0.000642121
T_B	Post-Closure	P95	0.005932035	0.005827446	0.005150816	0.005553829	0.005854797	0.004769478	0.005771067	0.006347531	0.006173972	0.006100004	0.005985787	0.0057119
T_Ba	Post-Closure	P95	0.007356707	0.006920378	0.007255551	0.007853532	0.006367072	0.006282027	0.006517117	0.00662409	0.007278052	0.007347155	0.007013982	0.006750233
T_Bi	Post-Closure	P95	2.54344E-05	2.53184E-05	2.53325E-05	2.57514E-05	2.56481E-05	2.53505E-05	2.5176E-05	2.59269E-05	2.51756E-05	2.55372E-05	2.51936E-05	2.52649E-05
T_Be	Post-Closure	P95	5.31771E-05	5.30813E-05	5.20072E-05	5.30231E-05	5.39992E-05	5.19115E-05	5.26152E-05	5.59546E-05	5.42109E-05	5.4238E-05	5.33489E-05	5.31795E-05
T_Ca	Post-Closure	P95	35.9903183	32.6890564	29.40019035	29.24141502	22.19800758	23.78121758	27.52913857	30.2748661	33.38460541	35.40594101	31.75458717	31.90318871
T_Cd	Post-Closure	P95	2.67627E-05	2.84303E-05	2.08091E-05	1.94695E-05	1.37084E-05	1.26893E-05	1.70902E-05	2.00046E-05	2.41238E-05	2.41435E-05	2.1741E-05	2.35125E-05
T_Co	Post-Closure	P95	0.000248555	0.00025466	0.000185783	0.000176033	0.00010726	0.00011376	0.000160235	0.000189595	0.000231942	0.000204888	0.000205312	0.000217093
T_Cr	Post-Closure	P95	0.000169397	0.000139704	0.000166833	0.000189656	0.000211788	0.000201166	0.000181659	0.000162307	0.000164878	0.000188089	0.000170131	0.000157659
T_Cu	Post-Closure	P95	0.000283193	0.000317404	0.000280452	0.000326879	0.000484791	0.000354727	0.000396442	0.000376097	0.000329149	0.000300599	0.000283815	0.000312621
T_Fe	Post-Closure	P95	0.139290854	0.118713841	0.143127576	0.155547261	0.133450449	0.107918248	0.09770944	0.117249519	0.142115027	0.159082785	0.151223347	0.104142457
T_Hg	Post-Closure	P95	4.60566E-06	4.60525E-06	4.08526E-06	5.15304E-06	4.89881E-06	3.5819E-06	3.77366E-06	4.84557E-06	4.46676E-06	5.01794E-06	4.1194E-06	4.50088E-06
T_K	Post-Closure	P95	7.218340397	7.399533272	5.607731342	4.59260273	2.225610733	2.785155296	4.425189018	5.55569458	6.965632439	5.929548264	5.803429127	6.502162933
T_Li	Post-Closure	P95	0.011846102	0.011977863	0.008651023	0.006670087	0.003226637	0.004344274	0.007344227	0.009475803	0.012012515	0.010186088	0.01015529	0.011125155
T_Mg	Post-Closure	P95	4.959434986	4.965340614	5.07594347	4.630076885	4.142112732	4.13620472	4.278152466	4.59723711	4.704825401	4.578929901	4.575442314	4.893962383
T_Mn	Post-Closure	P95	0.087356396	0.084919192	0.067095228	0.067952231	0.034385391	0.037530832	0.054191176	0.070175447	0.083932944	0.076441884	0.089518912	0.076419167
T_Mo	Post-Closure	P95	0.000867258	0.00087931	0.000793936	0.000779326	0.000571896	0.000587193	0.0006717	0.000789476	0.000888338	0.000804129	0.000740218	0.000798183
T_Na	Post-Closure	P95	16.59205437	13.24611378	10.6036911	11.33925343	6.997950554	7.959052086	10.33031273	12.53026295	15.34971619	15.55048847	13.24273682	12.34409142
T_Ni	Post-Closure	P95	0.000458636	0.000462756	0.000397467	0.000389607	0.000330336	0.000326766	0.000381297	0.00041252	0.000461816	0.000431167	0.000428354	0.000441298
T_P	Post-Closure	P95	0.027994961	0.027229795	0.030513285	0.03096843	0.025165074	0.022831477	0.019613972	0.018891934	0.018675113	0.019478614	0.027533036	0.027383886
T_Pb	Post-Closure	P95	3.71185E-05	3.75134E-05	3.54282E-05	3.6391E-05	5.67799E-05	3.87177E-05	3.74149E-05	3.62975E-05	3.75622E-05	3.72405E-05	3.57277E-05	3.60816E-05
T_S	Post-Closure	P95	1.311593175	1.397661686	1.234300256	1.531147122	1.119762659	1.103497624	1.127871633	1.192539811	1.08238709	1.395335674	1.151491046	1.329427123
T_Sb	Post-Closure	P95	0.001415317	0.001395867	0.000987733	0.000962269	0.00073546	0.000590747	0.000989518	0.001197918	0.001502725	0.001294232	0.001329025	0.001319434
T_Se	Post-Closure	P95	9.23416E-05	8.74288E-05	0.000106936	8.31743E-05	8.34663E-05	7.87928E-05	9.03909E-05	8.70688E-05	8.25013E-05	9.61953E-05	8.28072E-05	8.17297E-05
T_Si	Post-Closure	P95	5.173683643	5.073622704	5.100587368	5.097884178	4.622928619	4.366382599	4.366012096	4.388868809	4.366889	4.88111639	4.98384285	5.063435078
T_Sn	Post-Closure	P95	5.07795E-05	5.06604E-05	5.07398E-05	5.1516E-05	5.14114E-05	5.07181E-05	5.04186E-05	5.19508E-05	5.05294E-05	5.12111E-05	5.04578E-05	5.05417E-05
T_Sr	Post-Closure	P95	0.127616942	0.125147849	0.119290069	0.103246003	0.091814011	0.094123848	0.103447735	0.113773599	0.124224663	0.112985417	0.113502525	0.124336965
T_Ti	Post-Closure	P95	0.004187235	0.002727817	0.003063986	0.00400303	0.0038358	0.002787262	0.003785064	0.003318341	0.002993427	0.004971638	0.004959162	0.003509894
T_Tl	Post-Closure	P95	9.79297E-06	9.31392E-06	1.03199E-05	1.41494E-05	1.19813E-05	1.60145E-05	1.12278E-05	1.16112E-05	1.062E-05	1.01648E-05	1.01269E-05	1.16822E-05
T_U	Post-Closure	P95	0.000125847	0.000121481	0.000134031	0.000145209	0.000112994	0.000108881	0.000104209	0.000119837	0.000118078	0.00011912	0.000110946	0.000112423
T_V	Post-Closure	P95	0.003226897	0.003233741	0.00239651	0.002041367	0.00118173	0.001396229	0.002210893	0.002731493	0.003363994	0.002781173	0.002795813	0.003015929
T_Zn	Post-Closure	P95	0.003285516	0.003348102	0.002815148	0.002690568	0.002283272	0.002164281	0.002389933	0.002902132	0.003030309	0.002853878	0.002809271	0.00284046
D_Ag	Post-Closure	P95	9.40597E-06	9.0448E-06	1.0283E-05	1.40139E-05	1.04531E-05	1.55725E-05	1.06725E-05	9.59208E-06	9.56254E-06	9.32689E-06	9.14857E-06	1.09175E-05
D_Al	Post-Closure	P95	0.004277445	0.003119716	0.002600245	0.01603391	0.051501002	0.035884283	0.024796495	0.013114823	0.007	0.011899999	0.016851254	0.007593099
D_As	Post-Closure	P95	0.000615764	0.000587695	0.000549916	0.000602411	0.000574131	0.000532174	0.000582437	0.000649762	0.000654702	0.00060312	0.000576136	0.000590962
D_B	Post-Closure	P95	0.005932034	0.005827446	0.005108351	0.005550343	0.005854766	0.004494674	0.005771036	0.006347528	0.006173972	0.006100004	0.005985786	0.0057119
D_Ba	Post-Closure	P95	0.006977092	0.006613029	0.006874886	0.007076528	0.005831387	0.005801076	0.006130451	0.006354788	0.00701574	0.006960414	0.006427953	0.006579375
D_Bi	Post-Closure	P95	2.53852E-05	2.52657E-05	2.53222E-05	2.57291E-05	2.56286E-05	2.53314E-05	2.51663E-05	2.59223E-05	2.51756E-05	2.55372E-05	2.51916E-05	2.5245E-05
D_Be	Post-Closure	P95	5.31771E-05	5.30813E-05	5.20072E-05	5.30231E-05	5.39992E-05	5.19115E-05	5.26152E-05	5.59546E-05	5.42109E-05	5.4238E-05	5.33489E-05	5.31795E-05
D_Ca	Post-Closure	P95	36.61465836	32.36748886	29.04744148	29.26508904	21.86137009	23.53306961	27.3541832	30.21025276	33.57517242	34.62326431	31.1339798	30.5183506
D_Cd	Post-Closure	P95	2.6885E-05	2.73102E-05	2.06656E-05	1.92813E-05	1.32531E-05	1.30988E-05	1.70045E-05	2.05626E-05	2.42988E-05	2.25626E-05	2.19427E-05	2.30495E-05
D_Co	Post-Closure	P95	0.0002483	0.000254446	0.000185164	0.00017437	0.000105406	0.000107921	0.000159603	0.00018886	0.00023134	0.000204334	0.00020471	0.000215751
D_Cr	Post-Closure	P95	0.000132808	8.96501E-05	9.75139E-05	0.000134495	0.000156613	0.000145822	0.000133241	0.000122578	0.000114281	0.000157538	0.000126117	0.000102846
D_Cu	Post-Closure	P95	0.000285202	0.000321032	0.000276992	0.000288551	0.000411275	0.000313132	0.000361798	0.000325579	0.000301473	0.000301201	0.000289081	0.000322577
D_Fe	Post-Closure	P95	0.060303152	0.063293464	0.057215247	0.074642442	0.065449305	0.056777824	0.062545478	0.07524436	0.089356929	0.08022137	0.071945511	0.067315757
D_Hg	Post-Closure	P95	4.60137E-06	4.60311E-06	4.0772E-06	5.14333E-06	4.89483E-06	3.40416E-06	3.6883E-06	4.81747E-06	4.45548E-06	4.98468E-06	4.104E-06	4.50677E-06
D_K	Post-Closure	P95	7.217655659	7.394140244	5.553283215	4.548064709	2.221556664	2.752119303	4.388898849	5.528815269	6.942193985	5.899621487	5.831210613	6.497367382
D_Li	Post-Closure	P95	0.011846075	0.0119777	0.008650768	0.00666994	0.00322646	0.004344193	0.007344211	0.00947575	0.012012494	0.01018606	0.010155259	0.011125142
D_Mg	Post-Closure	P95	5.117186546	4.95986414	5.151867867	4.601587772	4.105113506	4.026504517	4.33036232	4.483934402	4.635242939	4.495490551	4.337925434	4.746906757
D_Mn	Post-Closure	P95	0.080949351	0.081596412	0.060622953	0.062901907	0.023364106	0.030041872	0.048006441	0.063695133	0.078967921	0.069206581	0.069661893	0.072151579
D_Mo	Post-Closure	P95	0.000821964	0.000838348	0.000757868	0.000749328	0.000539794	0.000557835	0.000667218	0.000753825	0.000874075	0.000741283	0.000713483	0.000753364
D_Na	Post-Closure	P95	16.56618118	13.24332333	10.58445358	11.23636913	6.994519234	7.930057049	10.32704544	12.48641491	15.25559425	15.42368031	13.18749523	12.2767725
D_Ni	Post-Closure	P95	0.000458412	0.000462481	0.000395668	0.000386053	0.000323231	0.000326434	0.000380981	0.000411673	0.000461127	0.000430101	0.000427818	0.000438036
D_P	Post-Closure	P95	0.047497932	0.068367392	0.06407313	0.063687794	0.042302348	0.028627757	0.075374268	0.100243449	0.074733526	0.149158955	0.148764208	0.065777868
D_Pb	Post-Closure	P95	3.57352E-05	3.59389E-05	3.24885E-05	3.28549E-05	2.96229E-05	2.84124E-05	3.02223E-05	3.22705E-05	3.44519E-05	3.38552E-05	3.32239E-05	3.35749E-05
D_S	Post-Closure	P95	1.180574536	1.352641344	1.458928108	1.310583472	1.087665319	1.092460632	1.180634975	1.110775828	1.148084998	1.276288033	1.155511856	1.28417778
D_Sb	Post-Closure	P95	0.001415267	0.001395774	0.000987647	0.000962389	0.000735295	0.000588764	0.000989468	0.00119786	0.001502692	0.001294201	0.001328992	0.001319406
D_Se	Post-Closure	P95	0.0001146	7.93708E-05	0.000101027	8.04051E-05	7.43523E-05	7.49751E-05	8.00949E-05	8.57913E-05	7.67804E-05	7.89863E-05	7.95403E-05	8.09682E-05
D_Si	Post-Closure	P95	5.053593159	4.849079132	4.88719511	4.815266132	4.389023304	4.153942585	4.151679993	4.246716499	4.246315956	4.620106697	4.844882488	4.922986031
D_Sn	Post-Closure	P95	5.07795E-05	5.06604E-05	5.07398E-05	5.1516E-05	5.14114E-05	5.07181E-05	5.04186E-05	5.19508E-05	5.05294E-05	5.12111E-05	5.04578E-05	5.05417E-05
D_Sr	Post-Closure	P95	0.12833938	0.125120372	0.120428041	0.10331928	0.09152244	0.09135744	0.102810189	0.112935588	0.123684585	0.111468129	0.111538455	0.120830432
D_Ti	Post-Closure	P95	0.0011438	0.001865796	0.001754379	0.001876498	0.00150174	0.001161944	0.00158683	0.003117581	0.002188334	0.004967684	0.00495418	0.001905925
D_Tl	Post-Closure	P95	9.7718E-06	9.29508E-06	1.03037E-05	1.41493E-05	1.19078E-05	1.60129E-05	1.12239E-05	1.16096E-05	1.06179E-05	1.01638E-05	1.01254E-05	1.16613E-05
D_U	Post-Closure	P95	0.000117777	0.00011485	0.000126425	0.000133581	0.000104022	0.000100173	9.95469E-05	0.000114805	0.000112951	0.000112854	0.000102584	0.000103507
D_V	Post-Closure	P95	0.003191222	0.003222929	0.002335854	0.001866441	0.000960462	0.001255409	0.002035844	0.002619424	0.003233185	0.002758893	0.002763439	0.002985154
D_Zn	Post-Closure	P95	0.002884466	0.0028125	0.002203785	0.002113297	0.001885355	0.00174047	0.001755118	0.002123217	0.002235274	0.00210393	0.002080397	0.002089905

Appendix A.3.8: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Outlet

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	P95	0.022208689	0.021485111	0.020475961	0.017075591	0.011017028	0.012887239	0.014506919	0.019771321	0.020559918	0.018783616	0.019469084	0.019196587
NO3_N	Closure	P95	0.070361286	0.071254402	0.072556563	0.049874134	0.038024817	0.019950924	0.018302063	0.014267588	0.011433722	0.010733132	0.059579838	0.067539833
NO2_N	Closure	P95	0.001199162	0.002054343	0.000887486	0.001065542	0.001236274	0.001189898	0.000937978	0.000863615	0.000927219	0.001256048	0.001110445	0.001395486
Br	Closure	P95	0.02553408	0.025372948	0.025224756	0.02533388	0.025522849	0.025273174	0.025521385	0.025249232	0.025382997	0.025194678	0.025338132	0.025433458
Cl	Closure	P95	0.362128913	0.368534833	0.355491787	0.306174278	0.288325995	0.298659056	0.363442898	0.347982287	0.324155122	0.317636073	0.331052572	0.328836203
F	Closure	P95	0.059967443	0.060043864	0.064079113	0.061298009	0.056753229	0.057485554	0.058796417	0.056842901	0.060231797	0.059325129	0.060393959	0.063734487
TDP	Closure	P95	0.0142538	0.011034224	0.012584341	0.016573012	0.011927645	0.008746908	0.007487831	0.009542158	0.007968265	0.007730588	0.009108418	0.012074576
SO4	Closure	P95	5.57342577	5.714401245	5.50533247	4.587182045	3.974784613	3.965522528	4.583189964	4.479765415	4.699141026	4.583846092	4.772553444	5.005018711
T_CN	Closure	P95	0.002576612	0.002583226	0.002564136	0.002523239	0.002521441	0.002528438	0.002537392	0.002557119	0.002564462	0.00255632	0.002562921	0.002568447
WAD_CN	Closure	P95	0.002531833	0.002522724	0.002512121	0.002498419	0.002519107	0.00251646	0.002512249	0.002512261	0.002522508	0.002502336	0.002515186	0.002528274
T_Ag	Closure	P95	7.47984E-06	7.29052E-06	1.57368E-05	1.35418E-05	1.1576E-05	1.55369E-05	1.0596E-05	8.68177E-06	7.964E-06	7.95146E-06	7.80998E-06	9.39791E-06
T_Al	Closure	P95	0.046355672	0.022981446	0.035282712	0.054828119	0.11498785	0.075565904	0.055341855	0.040348154	0.032736968	0.0380264	0.043583646	0.03041896
T_As	Closure	P95	0.000649335	0.00061587	0.000597661	0.000616759	0.000619649	0.000602361	0.000654747	0.000662433	0.000679108	0.000651298	0.000623943	0.000629949
T_B	Closure	P95	0.005673531	0.005594735	0.005040346	0.005240566	0.005327553	0.004646998	0.006117588	0.005680481	0.005828547	0.005758095	0.005702585	0.005421384
T_Ba	Closure	P95	0.007460437	0.006907779	0.007319146	0.008095399	0.006538804	0.00640346	0.006642031	0.006784197	0.007388736	0.007506196	0.00721557	0.006926347
T_Bi	Closure	P95	2.53619E-05	2.52775E-05	2.51552E-05	2.5033E-05	2.52042E-05	2.51658E-05	2.51225E-05	2.51232E-05	2.52253E-05	2.50256E-05	2.5152E-05	2.53312E-05
T_Be	Closure	P95	5.23765E-05	5.20694E-05	5.13387E-05	5.11416E-05	5.13339E-05	5.14564E-05	5.31808E-05	5.20245E-05	5.26406E-05	5.21713E-05	5.21276E-05	5.22874E-05
T_Ca	Closure	P95	20.72172546	21.30543137	20.71071243	19.45980644	17.57526779	17.64738083	17.99679184	19.10220337	19.09010124	19.92217827	19.04290581	21.21154785
T_Cd	Closure	P95	6.63024E-06	7.49781E-06	6.37726E-06	6.73218E-06	6.44571E-06	8.08933E-06	1.11772E-05	6.96637E-06	7.52611E-06	1.01388E-05	7.13878E-06	8.12557E-06
T_Co	Closure	P95	8.3706E-05	8.2925E-05	7.44606E-05	6.97541E-05	6.29441E-05	6.92749E-05	8.8303E-05	7.64586E-05	8.22449E-05	7.79211E-05	7.86063E-05	7.68769E-05
T_Cr	Closure	P95	0.000166414	0.000133106	0.000158459	0.000184991	0.000212672	0.00019665	0.00017922	0.000158484	0.00016086	0.000177564	0.00016707	0.000154685
T_Cu	Closure	P95	0.000274114	0.00031581	0.000272015	0.000318325	0.000508148	0.000358588	0.000410718	0.000369999	0.000322288	0.000282351	0.000274188	0.00031354
T_Fe	Closure	P95	0.15082629	0.123078324	0.148696199	0.172045961	0.143370748	0.113150328	0.104319856	0.128034294	0.153030246	0.175928384	0.166433349	0.108478561
T_Hg	Closure	P95	3.31885E-06	3.22583E-06	3.015E-06	3.23827E-06	3.41016E-06	3.44264E-06	3.96493E-06	3.30292E-06	3.40167E-06	3.48581E-06	3.29601E-06	3.6461E-06
T_K	Closure	P95	0.977683604	0.933021665	0.983724833	1.073100328	0.826760709	0.824617803	0.918720901	0.889024973	0.913910329	0.919420242	0.855401576	0.908374906
T_Li	Closure	P95	0.000777256	0.000745126	0.000663549	0.000684975	0.00064842	0.000732281	0.000943625	0.000785761	0.000839187	0.000826549	0.000824952	0.00079202
T_Mg	Closure	P95	4.766073704	4.761584282	4.908294678	4.530079365	4.170882225	4.097377777	4.142434597	4.414171219	4.467736721	4.47595787	4.445191383	4.745348454
T_Mn	Closure	P95	0.025248799	0.01799687	0.021450091	0.028979305	0.019067114	0.017172642	0.017695874	0.024277642	0.026028091	0.028564401	0.043535754	0.021811314
T_Mo	Closure	P95	0.000733957	0.000739015	0.00072688	0.00070841	0.00055969	0.00058349	0.000681969	0.000707038	0.000766849	0.000718474	0.000645703	0.000688204
T_Na	Closure	P95	4.131899357	4.018447399	4.040504932	3.603205919	3.286685705	3.195827246	3.385363102	3.58548665	3.679229021	3.63283515	3.568493843	3.851990938
T_Ni	Closure	P95	0.00028247	0.00027796	0.000266683	0.000269254	0.000269254	0.000279032	0.000304078	0.000284397	0.000290681	0.000287926	0.000283911	0.000281805
T_P	Closure	P95	0.027876034	0.027230902	0.029728388	0.030907711	0.025246991	0.022861149	0.019136399	0.017742941	0.017811887	0.018831966	0.027535718	0.027097441
T_Pb	Closure	P95	2.91194E-05	2.95708E-05	2.91726E-05	3.20194E-05	5.25342E-05	3.67204E-05	3.46466E-05	3.11767E-05	3.02432E-05	2.97985E-05	2.92368E-05	2.91172E-05
T_S	Closure	P95	1.322508097	1.424909115	1.2345016	1.522541165	1.144928217	1.114489436	1.132604599	1.214748025	1.098128319	1.427569151	1.188434482	1.347931743
T_Sb	Closure	P95	0.000484567	0.000432837	0.000303423	0.000345494	0.000287292	0.000419889	0.000755942	0.000502758	0.000587411	0.000571413	0.000523581	0.000482027
T_Se	Closure	P95	9.05301E-05	8.43986E-05	0.000100802	8.22027E-05	8.14251E-05	7.84627E-05	9.45185E-05	8.20782E-05	8.26166E-05	9.58855E-05	8.17898E-05	7.97062E-05
T_Si	Closure	P95	5.176131725	5.05463171	5.075000286	5.044587612	4.695266724	4.319196701	4.339759827	4.235556602	4.338639736	4.85898447	5.047291756	5.113838196
T_Sn	Closure	P95	5.06458E-05	5.04602E-05	5.02466E-05	4.99696E-05	5.03993E-05	5.03345E-05	5.02498E-05	5.02517E-05	5.04573E-05	5.00509E-05	5.03121E-05	5.05723E-05
T_Sr	Closure	P95	0.105265468	0.103902452	0.103003867	0.093808487	0.089718655	0.08715798	0.087892607	0.093650244	0.099066854	0.093596734	0.094966613	0.103177764
T_Ti	Closure	P95	0.004478516	0.002825146	0.003173462	0.004208275	0.003976996	0.002797829	0.003886728	0.003268719	0.003091017	0.004994431	0.004991046	0.003526335
T_Tl	Closure	P95	8.83674E-06	8.46767E-06	9.43696E-06	1.37935E-05	1.05522E-05	1.6684E-05	1.14997E-05	9.75031E-06	9.53664E-06	9.4132E-06	9.13407E-06	1.04904E-05
T_U	Closure	P95	0.000124668	0.000118551	0.000132581	0.000142993	0.000108353	0.000107331	0.000108083	0.000109031	0.000113751	0.000111661	0.000108548	0.000111406
T_V	Closure	P95	0.000379323	0.000338432	0.000342788	0.000529293	0.000536356	0.000468556	0.000606557	0.000528213	0.000501794	0.000374921	0.000385633	0.000368807
T_Zn	Closure	P95	0.00173642	0.001834823	0.001746072	0.001791058	0.001837005	0.001815511	0.001938061	0.002007566	0.00178373	0.001768457	0.001754167	0.001697008
D_Ag	Closure	P95	7.30202E-06	7.15902E-06	8.5969E-06	1.35413E-05	9.87608E-06	1.53726E-05	1.03087E-05	8.34735E-06	7.62728E-06	7.73529E-06	7.54594E-06	9.08743E-06
D_Al	Closure	P95	0.00423093	0.002865654	0.002468365	0.015236349	0.049768738	0.034602027	0.02403559	0.012345751	0.007	0.01154915	0.015823472	0.007264505
D_As	Closure	P95	0.000594299	0.000559781	0.000523027	0.000554935	0.000563852	0.000535061	0.000591498	0.000634313	0.000635672	0.000560127	0.000560886	0.00057557
D_B	Closure	P95	0.005673039	0.005594623	0.005001624	0.005233483	0.005327034	0.004297301	0.006117212	0.005678782	0.005828313	0.005758095	0.005702356	0.005421317
D_Ba	Closure	P95	0.007033898	0.006627975	0.006978255	0.007236092	0.005977525	0.005888908	0.006272911	0.006447132	0.007120549	0.007136236	0.006574975	0.006769537
D_Bi	Closure	P95	2.53175E-05	2.52272E-05	2.51208E-05	2.49842E-05	2.51911E-05	2.51645E-05	2.51225E-05	2.51226E-05	2.5225E-05	2.50234E-05	2.51518E-05	2.52827E-05
D_Be	Closure	P95	5.23765E-05	5.20694E-05	5.13387E-05	5.11416E-05	5.13339E-05	5.14564E-05	5.31808E-05	5.20245E-05	5.26406E-05	5.21713E-05	5.21276E-05	5.22874E-05
D_Ca	Closure	P95	21.50777435	20.86606789	20.32652855	19.46037292	17.07091141	17.43403435	17.90686417	18.96969604	19.3319149	18.89604378	18.53967285	19.56671333
D_Cd	Closure	P95	6.9638E-06	6.64518E-06	6.05978E-06	6.53112E-06	6.7696E-06	8.59852E-06	1.0741E-05	7.68348E-06	8.05962E-06	8.07768E-06	7.53377E-06	7.52912E-06
D_Co	Closure	P95	8.31505E-05	8.2399E-05	7.39538E-05	6.83565E-05	6.23822E-05	6.31502E-05	8.829E-05	7.62053E-05	8.1773E-05	7.74003E-05	7.82577E-05	7.54778E-05
D_Cr	Closure	P95	0.000133818	8.18539E-05	8.78445E-05	0.000118806	0.000151276	0.000144207	0.000125982	0.000114892	0.000107231	0.000150991	0.00012134	9.28382E-05
D_Cu	Closure	P95	0.000277461	0.000312482	0.000269111	0.000278102	0.00041407	0.00031259	0.00035256	0.000303209	0.000291004	0.000285622	0.000278732	0.000321457
D_Fe	Closure	P95	0.061684281	0.065127619	0.056573667	0.081040427	0.068742238	0.057824083	0.06690748	0.082630076	0.096537352	0.085771292	0.076351449	0.07198979
D_Hg	Closure	P95	3.31281E-06	3.22368E-06	3.01558E-06	3.23605E-06	3.40399E-06	3.3052E-06	3.91089E-06	3.27257E-06	3.3923E-06	3.3534E-06	3.28545E-06	3.64903E-06
D_K	Closure	P95	0.976127207	0.92726469	0.915544927	1.021269917	0.820468605	0.784454763	0.882416129	0.862871289	0.885819435	0.88948679	0.888177395	0.902202725
D_Li	Closure	P95	0.000777212	0.000744835	0.000663276	0.000684775	0.000648289	0.000732174	0.00094358	0.000785729	0.000839158	0.000826488	0.000824925	0.000791994
D_Mg	Closure	P95	4.950973988	4.749401569	4.994019032	4.495200634	4.139336586	3.948578119	4.181594372	4.2924757	4.390552521	4.385457993	4.214894772	4.570468426
D_Mn	Closure	P95	0.017371733	0.014317036	0.013658472	0.022582995	0.007612254	0.009602306	0.01071055	0.017325845	0.020160545	0.019641694	0.021420894	0.016616311
D_Mo	Closure	P95	0.000685035	0.000688843	0.000689745	0.000666754	0.000527287	0.000553689	0.000671236	0.000665713	0.000750017	0.000652238	0.000620064	0.00064292
D_Na	Closure	P95	4.113069057	4.015202999	4.027038097	3.480551958	3.281227827	3.180047512	3.384685755	3.545749426	3.576492786	3.507806301	3.51339817	3.780876875
D_Ni	Closure	P95	0.000282079	0.000277944	0.000265054	0.000267594	0.000265351	0.000279163	0.000303818	0.00028416	0.000290144	0.000287147	0.000283647	0.000278704
D_P	Closure	P95	0.045581441	0.073949397	0.068697773	0.06946189	0.041227844	0.027675834	0.081708632	0.099171124	0.078545302	0.14984946	0.149601057	0.071426645
D_Pb	Closure	P95	2.66495E-05	2.64444E-05	2.59569E-05	2.59737E-05	2.58667E-05	2.60872E-05	2.72896E-05	2.65105E-05	2.68414E-05	2.65843E-05	2.653E-05	2.65875E-05
D_S	Closure	P95	1.184141994	1.350093603	1.4923383	1.342141628	1.101548195	1.098291993	1.184428573	1.13112855	1.172222495	1.306156397	1.168549538	1.305467963
D_Sb	Closure	P95	0.00048449	0.000432676	0.000303273	0.0003463	0.000287288	0.000417944	0.000755939	0.000502695	0.000587368	0.000571365	0.000523543	0.000481998
D_Se	Closure	P95	0.000111909	7.55766E-05	9.51828E-05	7.88253E-05	7.04141E-05	7.57835E-05	8.05416E-05	8.22663E-05	7.57382E-05	7.67727E-05	7.89908E-05	8.00057E-05
D_Si	Closure	P95	5.043397427	4.823595047	4.868741989	4.715568542	4.457413197	4.107789993	4.097314835	4.130823612	4.215654373	4.537988186	4.901134491	4.957981586
D_Sn	Closure	P95	5.06458E-05	5.04602E-05	5.02466E-05	4.99696E-05	5.03993E-05	5.03345E-05	5.02498E-05	5.02517E-05	5.04573E-05	5.00509E-05	5.03121E-05	5.05723E-05
D_Sr	Closure	P95	0.106785052	0.103883378	0.104715362	0.094578974	0.089219004	0.08434584	0.087784179	0.092676729	0.098442987	0.091695756	0.09203285	0.099117659
D_Ti	Closure	P95	0.001086283	0.00207047	0.001889781	0.002050252	0.001439938	0.001087009	0.001809556	0.003068783	0.002329301	0.004994431	0.004980915	0.002030357
D_Tl	Closure	P95	8.81462E-06	8.4481E-06	9.41923E-06	1.37934E-05	1.04793E-05	1.66826E-05	1.14959E-05	9.74663E-06	9.53602E-06	9.41194E-06	9.13365E-06	1.0466E-05
D_U	Closure	P95	0.000116227	0.000112239	0.000125647	0.000129584	9.93475E-05	9.83809E-05	0.000104027	0.000105318	0.000109367	0.000106407	9.98372E-05	0.000102313
D_V	Closure	P95	0.000336856	0.000325983	0.000288045	0.000305797	0.000292436	0.000326631	0.000388569	0.000388864	0.000360544	0.000351635	0.000356807	0.00034065
D_Zn	Closure	P95	0.001349645	0.001182819	0.001069033	0.001401145	0.001550834	0.001387383	0.001205236	0.001156273	0.000986011	0.001086009	0.000984884	0.000877185

Appendix A.3.8: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Outlet

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	P95	0.171970472	0.186084807	0.148610324	0.134654656	0.06752491	0.068646394	0.103212997	0.133428708	0.1815712	0.159352854	0.141372696	0.155621216
NO3_N	Post-Closure	P95	0.310463488	0.24448739	0.189852253	0.152109489	0.06973879	0.09376321	0.131017968	0.182675794	0.249970526	0.227460742	0.23588115	0.24218145
NO2_N	Post-Closure	P95	0.00177489	0.002487602	0.001203751	0.00136134	0.001236819	0.001347507	0.001248043	0.001370409	0.001542761	0.00181529	0.001488855	0.001915523
Br	Post-Closure	P95	0.029106531	0.029445054	0.028593788	0.031558141	0.029850651	0.026812056	0.027368292	0.030083932	0.028897759	0.031830885	0.028267713	0.028750343
Cl	Post-Closure	P95	3.551847458	2.611944914	1.985988855	2.241684914	1.218145847	1.428744316	2.060216188	2.523485422	3.06024313	3.254356146	2.702509403	2.455332756
F	Post-Closure	P95	0.105039343	0.104382567	0.096606947	0.084439576	0.06419342	0.07163959	0.087874807	0.092969768	0.107357353	0.095788866	0.096499681	0.10479667
TDP	Post-Closure	P95	0.015892677	0.012803609	0.013139739	0.016848603	0.011718767	0.008606986	0.008302745	0.011515267	0.010480052	0.009707364	0.010257898	0.012895503
SO4	Post-Closure	P95	67.99196625	51.39719391	39.99438477	43.67104721	23.35131836	27.2321434	40.16695786	48.42775345	58.61404419	65.20645905	53.88879776	50.35017776
T_CN	Post-Closure	P95	0.003347556	0.003328201	0.003195017	0.003147603	0.002734272	0.00282264	0.003010527	0.003156133	0.003411597	0.003297007	0.003294551	0.003365681
WAD_CN	Post-Closure	P95	0.002532204	0.002522901	0.002515346	0.002498314	0.00251524	0.002514265	0.002504031	0.002503003	0.00249484	0.002494951	0.002500269	0.00249744
T_Ag	Post-Closure	P95	8.84391E-06	8.6363E-06	1.62378E-05	1.3636E-05	1.19563E-05	1.54658E-05	1.04924E-05	9.32964E-06	9.16574E-06	9.08124E-06	8.6763E-06	1.04176E-05
T_Al	Post-Closure	P95	0.046055995	0.023682913	0.036297321	0.054399662	0.113834649	0.075099528	0.049838308	0.039379861	0.032156333	0.038714737	0.043942414	0.031657584
T_As	Post-Closure	P95	0.000661874	0.000632708	0.000614498	0.00065309	0.000626326	0.000589392	0.000639073	0.00068694	0.000690205	0.000674372	0.000629375	0.000637242
T_B	Post-Closure	P95	0.005797207	0.005699543	0.005125716	0.005467457	0.005770956	0.00461807	0.005651082	0.006175532	0.005989394	0.005919906	0.005814161	0.005604648
T_Ba	Post-Closure	P95	0.007458567	0.006909536	0.007318686	0.008091587	0.006491805	0.00635324	0.006624223	0.006741225	0.007378493	0.007487679	0.007158376	0.006871812
T_Bi	Post-Closure	P95	2.53633E-05	2.52742E-05	2.52715E-05	2.56891E-05	2.55981E-05	2.53013E-05	2.51611E-05	2.5813E-05	2.51464E-05	2.54793E-05	2.51577E-05	2.52234E-05
T_Be	Post-Closure	P95	5.26743E-05	5.24224E-05	5.16775E-05	5.25893E-05	5.36069E-05	5.15957E-05	5.23207E-05	5.51644E-05	5.35271E-05	5.36E-05	5.27268E-05	5.26969E-05
T_Ca	Post-Closure	P95	33.62639618	30.62523842	27.980896	27.64937401	20.99706459	22.41731262	26.195364	28.59886169	31.23060989	32.75701904	29.52947426	30.08245087
T_Cd	Post-Closure	P95	2.1499E-05	2.3189E-05	1.73148E-05	1.68386E-05	1.27623E-05	1.13366E-05	1.53192E-05	1.69276E-05	2.0362E-05	2.11898E-05	1.80083E-05	2.04172E-05
T_Co	Post-Closure	P95	0.000206513	0.000211897	0.00016366	0.000156474	9.73431E-05	0.000101328	0.000144006	0.000165253	0.000202125	0.000179821	0.000177153	0.000189843
T_Cr	Post-Closure	P95	0.000166391	0.000132456	0.000160369	0.00018805	0.000211583	0.000196689	0.000178284	0.000160207	0.00016102	0.000182211	0.000166496	0.000152763
T_Cu	Post-Closure	P95	0.000277307	0.000319026	0.000275638	0.000322429	0.000504571	0.000358898	0.000400995	0.000381422	0.000328493	0.000292789	0.000277661	0.000314596
T_Fe	Post-Closure	P95	0.147674233	0.122101352	0.14755486	0.170152515	0.141087592	0.11169745	0.101424403	0.124112278	0.150160685	0.173426241	0.161879152	0.107992917
T_Hg	Post-Closure	P95	4.16705E-06	4.15756E-06	3.78745E-06	4.83796E-06	4.6446E-06	3.44041E-06	3.61929E-06	4.47185E-06	4.09958E-06	4.62959E-06	3.78367E-06	4.2836E-06
T_K	Post-Closure	P95	6.128623962	6.178305149	4.827221394	4.01896286	1.972887874	2.374444962	3.86801815	4.743182182	5.957194328	5.085711956	4.887962818	5.604529858
T_Li	Post-Closure	P95	0.00988704	0.009758618	0.007405688	0.005687839	0.002761674	0.003602606	0.006325882	0.007946016	0.010108511	0.008574322	0.00842281	0.009456819
T_Mg	Post-Closure	P95	4.927567959	4.920603752	5.045349121	4.631264687	4.100497723	4.08333683	4.240564823	4.543550491	4.658773422	4.548135281	4.55338192	4.844933033
T_Mn	Post-Closure	P95	0.076061077	0.072036542	0.060074098	0.063149191	0.032034591	0.033975966	0.049228422	0.063100174	0.075244471	0.069768563	0.080122583	0.067903712
T_Mo	Post-Closure	P95	0.000813889	0.000819431	0.000765295	0.000765291	0.000564017	0.000573332	0.000660399	0.000765191	0.000848377	0.00077657	0.000705062	0.000763049
T_Na	Post-Closure	P95	14.7834568	11.44135475	9.532463074	10.07578278	6.315125465	7.012113094	9.275035858	11.21739674	13.04101563	13.55208015	11.61487865	10.99997137
T_Ni	Post-Closure	P95	0.000422887	0.000422813	0.000372101	0.000367327	0.000321689	0.000313322	0.000361519	0.00038425	0.000427531	0.000401669	0.000396017	0.000409817
T_P	Post-Closure	P95	0.027764464	0.027051512	0.029732835	0.030975418	0.025040226	0.022467336	0.018929778	0.018258059	0.01828395	0.019207513	0.027174197	0.027068613
T_Pb	Post-Closure	P95	3.48991E-05	3.50844E-05	3.36904E-05	3.51154E-05	5.48237E-05	3.72169E-05	3.60742E-05	3.46845E-05	3.53739E-05	3.5306E-05	3.3728E-05	3.42446E-05
T_S	Post-Closure	P95	1.315814495	1.419105887	1.232514501	1.521774411	1.108598471	1.105401158	1.124390841	1.181298375	1.080719471	1.41846776	1.17061615	1.33271122
T_Sb	Post-Closure	P95	0.001178892	0.001142602	0.000832076	0.000828638	0.000668172	0.000484877	0.000850676	0.000997466	0.001261088	0.001094203	0.001077304	0.001120173
T_Se	Post-Closure	P95	9.0473E-05	8.40961E-05	0.000100747	8.12814E-05	8.24228E-05	7.70925E-05	9.04283E-05	8.46805E-05	8.08312E-05	9.59783E-05	8.00626E-05	7.8646E-05
T_Si	Post-Closure	P95	5.176057339	5.051832199	5.103138924	5.102377892	4.618426323	4.31932497	4.348545074	4.333934307	4.33561182	4.879487514	5.013711929	5.07643652
T_Sn	Post-Closure	P95	5.06516E-05	5.05631E-05	5.06151E-05	5.13918E-05	5.12836E-05	5.06176E-05	5.03823E-05	5.17175E-05	5.04344E-05	5.10809E-05	5.03752E-05	5.04567E-05
T_Sr	Post-Closure	P95	0.124752842	0.122266777	0.116718456	0.102054462	0.090025328	0.092167512	0.101237088	0.11083965	0.120560288	0.109984435	0.110363334	0.121062957
T_Ti	Post-Closure	P95	0.004378221	0.002778896	0.003163431	0.004175585	0.003960719	0.002798576	0.003811838	0.003273147	0.003036251	0.004976763	0.004964659	0.003456768
T_Tl	Post-Closure	P95	9.14405E-06	8.71733E-06	9.59546E-06	1.37881E-05	1.1229E-05	1.5862E-05	1.07008E-05	1.06827E-05	9.81143E-06	9.39419E-06	9.24885E-06	1.06859E-05
T_U	Post-Closure	P95	0.000124669	0.000118497	0.000133011	0.00014468	0.00011181	0.000107375	0.000102796	0.000117292	0.000115167	0.00011586	0.000108726	0.00011109
T_V	Post-Closure	P95	0.002720886	0.002657993	0.002068548	0.001808195	0.001082281	0.001216552	0.001969935	0.002364146	0.002876588	0.002362424	0.002332868	0.002581602
T_Zn	Post-Closure	P95	0.002897813	0.0029483	0.002576069	0.002506117	0.00219943	0.002053623	0.002265644	0.002736338	0.002761308	0.002617048	0.002556568	0.00261804
D_Ag	Post-Closure	P95	8.66264E-06	8.5068E-06	9.56578E-06	1.36059E-05	9.87123E-06	1.54573E-05	1.04675E-05	8.96765E-06	8.91175E-06	8.74251E-06	8.45474E-06	1.01401E-05
D_Al	Post-Closure	P95	0.004250618	0.002925632	0.002490849	0.01525471	0.050276622	0.034735233	0.023653116	0.01251486	0.007	0.011756436	0.015920298	0.007329303
D_As	Post-Closure	P95	0.00060942	0.000577617	0.000535337	0.000594847	0.000566858	0.000526623	0.000584624	0.000651692	0.000651275	0.000591835	0.000569458	0.000586014
D_B	Post-Closure	P95	0.005797207	0.005699543	0.005088531	0.005464512	0.005770928	0.004330239	0.005651056	0.00617553	0.005989394	0.005919906	0.005814161	0.005604648
D_Ba	Post-Closure	P95	0.007033965	0.006628443	0.006977675	0.007236845	0.00589744	0.005847582	0.006245548	0.006429197	0.007112654	0.007109544	0.006519815	0.006713894
D_Bi	Post-Closure	P95	2.5322E-05	2.52289E-05	2.52632E-05	2.56687E-05	2.5574E-05	2.52847E-05	2.51524E-05	2.58089E-05	2.51463E-05	2.54793E-05	2.51558E-05	2.52066E-05
D_Be	Post-Closure	P95	5.26743E-05	5.24224E-05	5.16775E-05	5.25893E-05	5.36069E-05	5.15957E-05	5.23207E-05	5.51644E-05	5.35271E-05	5.36E-05	5.27268E-05	5.26969E-05
D_Ca	Post-Closure	P95	34.27019119	30.33539772	27.61734772	27.74193573	20.71198654	22.16960716	25.96749687	28.57517052	31.46900558	32.0208168	28.82294846	28.66864777
D_Cd	Post-Closure	P95	2.15947E-05	2.19434E-05	1.71985E-05	1.66602E-05	1.2215E-05	1.16624E-05	1.4858E-05	1.72425E-05	2.04861E-05	1.91553E-05	1.8133E-05	1.96075E-05
D_Co	Post-Closure	P95	0.00020631	0.000211728	0.000163141	0.000155068	9.58633E-05	9.54109E-05	0.00014355	0.000164666	0.000201589	0.000179277	0.00017666	0.000188663
D_Cr	Post-Closure	P95	0.00013582	8.41574E-05	9.01715E-05	0.000129084	0.000154025	0.00014422	0.00012916	0.000119329	0.000108629	0.000156366	0.000123279	9.55638E-05
D_Cu	Post-Closure	P95	0.000279765	0.000318032	0.000273171	0.000284998	0.000415901	0.000308068	0.000353561	0.000317586	0.000293587	0.000294249	0.000281834	0.000322979
D_Fe	Post-Closure	P95	0.061641965	0.065076493	0.056821052	0.080257706	0.067620471	0.057404596	0.065338865	0.080586381	0.094997495	0.084780276	0.075245827	0.071079075
D_Hg	Post-Closure	P95	4.16361E-06	4.15588E-06	3.78623E-06	4.82796E-06	4.64106E-06	3.27523E-06	3.55362E-06	4.45474E-06	4.09251E-06	4.60146E-06	3.77144E-06	4.28858E-06
D_K	Post-Closure	P95	6.131322384	6.173708916	4.751266479	3.969475269	1.970106483	2.34422183	3.832827568	4.717061043	5.931482315	5.05817318	4.918189526	5.599034786
D_Li	Post-Closure	P95	0.009887016	0.009758568	0.007405472	0.005687643	0.002761527	0.003602541	0.006325869	0.007945972	0.01010849	0.0085743	0.008422784	0.009456808
D_Mg	Post-Closure	P95	5.085459232	4.922189236	5.123705387	4.606912136	4.061507702	3.992436886	4.293968201	4.428844929	4.58299017	4.44119978	4.29498291	4.704782963
D_Mn	Post-Closure	P95	0.069556333	0.068573661	0.053270612	0.057923764	0.021000147	0.026465742	0.042981036	0.056575712	0.070190452	0.062087338	0.061587598	0.063789368
D_Mo	Post-Closure	P95	0.000767351	0.000780752	0.000729076	0.000733508	0.000533257	0.000542778	0.000653564	0.000727312	0.000832311	0.000712958	0.000679571	0.000719941
D_Na	Post-Closure	P95	14.7684164	11.44767857	9.520122528	9.962802887	6.320477962	6.99122858	9.272256851	11.16688347	12.93600273	13.42968273	11.56800842	10.93607044
D_Ni	Post-Closure	P95	0.000422707	0.000422711	0.000370527	0.000364383	0.000316048	0.000312629	0.000361217	0.000383431	0.000426953	0.000400955	0.000395578	0.000407113
D_P	Post-Closure	P95	0.044454705	0.073103443	0.068121552	0.068171069	0.040597603	0.027247621	0.08117833	0.098682947	0.077314124	0.149310306	0.148929372	0.068894774
D_Pb	Post-Closure	P95	3.34055E-05	3.35725E-05	3.1024E-05	3.17152E-05	2.92024E-05	2.7755E-05	2.95133E-05	3.08347E-05	3.28597E-05	3.24575E-05	3.16761E-05	3.20734E-05
D_S	Post-Closure	P95	1.176721931	1.343467116	1.487915874	1.332514167	1.081834435	1.088935375	1.176234365	1.091470957	1.154110193	1.289264321	1.14227736	1.280318856
D_Sb	Post-Closure	P95	0.001178849	0.001142525	0.000831942	0.000828742	0.000668024	0.000482355	0.000850619	0.000997417	0.001261061	0.001094178	0.001077277	0.001120149
D_Se	Post-Closure	P95	0.00011187	7.50868E-05	9.52685E-05	7.7596E-05	7.19787E-05	7.43565E-05	7.84122E-05	8.32572E-05	7.44108E-05	7.6653E-05	7.76182E-05	7.90225E-05
D_Si	Post-Closure	P95	5.043334961	4.820720196	4.878703117	4.801296711	4.384529591	4.116370678	4.126089096	4.217360497	4.222302914	4.590872288	4.863994122	4.924598217
D_Sn	Post-Closure	P95	5.06516E-05	5.05631E-05	5.06151E-05	5.13918E-05	5.12836E-05	5.06176E-05	5.03823E-05	5.17175E-05	5.04344E-05	5.10809E-05	5.03752E-05	5.04567E-05
D_Sr	Post-Closure	P95	0.125791386	0.122243032	0.118159704	0.102612138	0.089987002	0.089329988	0.100633979	0.109775722	0.119916365	0.10838186	0.108284868	0.117471196
D_Ti	Post-Closure	P95	0.001048174	0.002039963	0.001891563	0.002028357	0.001471394	0.001101602	0.001767313	0.003059083	0.00228232	0.004973512	0.004960447	0.001997074
D_Tl	Post-Closure	P95	9.12573E-06	8.70108E-06	9.58002E-06	1.3788E-05	1.11635E-05	1.58607E-05	1.06996E-05	1.06813E-05	9.80958E-06	9.39353E-06	9.24757E-06	1.06652E-05
D_U	Post-Closure	P95	0.000116234	0.000112191	0.000125966	0.000132593	0.000102836	9.85646E-05	9.85277E-05	0.00011286	0.000109952	0.000110097	0.00010011	0.000102008
D_V	Post-Closure	P95	0.002682804	0.002652538	0.00201716	0.001609273	0.000839829	0.001061017	0.001773642	0.002238191	0.002737004	0.002343836	0.002310989	0.002555661
D_Zn	Post-Closure	P95	0.002496757	0.002420386	0.001911188	0.001900178	0.001825267	0.00161914	0.001576494	0.001893627	0.001931152	0.001828109	0.001770167	0.001819561

Appendix A.4.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ28

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.141002268	0.14380309	0.139689714	0.072168611	0.023957113	0.029124724	0.051927242	0.080881603	0.088190548	0.087951243	0.119087525	0.135114044
NO3_N	Closure	Mean	0.044062816	0.040171441	0.043407913	0.038277254	0.030553019	0.037936639	0.04381521	0.043222006	0.045402724	0.036275353	0.039651316	0.046289369
NO2_N	Closure	Mean	0.001017117	0.001027762	0.00109773	0.001063808	0.000732876	0.001138973	0.001151905	0.001165339	0.001095883	0.000963463	0.00101396	0.001047275
Br	Closure	Mean	0.026826907	0.026154932	0.026934829	0.026803922	0.025829665	0.026292156	0.028235752	0.026364755	0.026994582	0.026967272	0.027509017	0.026823724
Cl	Closure	Mean	1.586961389	1.594189644	1.537411928	0.820707202	0.44561258	0.482878298	0.71234113	0.928159535	1.031858206	1.023885608	1.326983929	1.486682296
F	Closure	Mean	0.069371857	0.06643007	0.067549132	0.052614529	0.040023044	0.049242795	0.062209792	0.067250811	0.073527239	0.062771305	0.06766104	0.072281875
TDP	Closure	Mean	0.008280752	0.008815726	0.009273491	0.007780787	0.008659785	0.009546866	0.008569539	0.009093073	0.00825503	0.008243642	0.008059497	0.007999099
SO4	Closure	Mean	25.18395233	23.7595768	22.08891869	12.42796326	7.605704308	7.912068844	13.79157925	18.02176476	20.65976143	16.8450985	25.54820251	26.75926399
T_CN	Closure	Mean	0.00283506	0.002797975	0.002714383	0.002565312	0.002545506	0.002605729	0.002587871	0.002616593	0.002653129	0.002610008	0.002784163	0.002812939
WAD_CN	Closure	Mean	0.002594623	0.002554229	0.002479484	0.00245142	0.002515303	0.002558574	0.002510661	0.002481273	0.002494453	0.002457591	0.002533495	0.002574584
T_Ag	Closure	Mean	1.60929E-05	1.44398E-05	1.552E-05	1.58395E-05	2.16604E-05	1.8356E-05	1.7422E-05	1.831E-05	1.87218E-05	1.58957E-05	1.64865E-05	1.81726E-05
T_Al	Closure	Mean	0.038987871	0.034307372	0.027994741	0.025563112	0.231184676	0.121920697	0.10175696	0.059301425	0.037148837	0.048515961	0.059117943	0.051356051
T_As	Closure	Mean	0.000842715	0.000791592	0.000726519	0.00063805	0.00058093	0.000637341	0.000800437	0.000905347	0.000917849	0.000823968	0.00082926	0.000905693
T_B	Closure	Mean	0.012473522	0.010597383	0.008477299	0.006722201	0.007267196	0.007633135	0.011760451	0.013298065	0.014450314	0.012753716	0.012927786	0.014655028
T_Ba	Closure	Mean	0.006451885	0.006330355	0.006200518	0.006835154	0.005538528	0.005248585	0.005823846	0.006182646	0.006685693	0.005746664	0.005888101	0.006135602
T_Bi	Closure	Mean	2.59749E-05	2.55807E-05	2.48392E-05	2.45347E-05	2.51657E-05	2.56151E-05	2.51215E-05	2.482E-05	2.49457E-05	2.45772E-05	2.53414E-05	2.574E-05
T_Be	Closure	Mean	7.2178E-05	6.66218E-05	6.13945E-05	5.47945E-05	5.55045E-05	5.91273E-05	6.86695E-05	7.32847E-05	7.63689E-05	7.08245E-05	7.27073E-05	7.77856E-05
T_Ca	Closure	Mean	19.19654274	19.4946785	19.51834106	15.07780552	9.111662865	11.67370415	14.41582966	17.642416	18.27257729	18.05051804	18.27829361	19.17392921
T_Cd	Closure	Mean	4.11152E-05	3.24427E-05	2.66394E-05	1.93882E-05	2.44508E-05	2.57076E-05	3.90538E-05	4.77414E-05	5.32546E-05	4.50095E-05	4.55339E-05	5.19454E-05
T_Co	Closure	Mean	0.000491199	0.00044234	0.000390865	0.000225094	0.000174074	0.000190721	0.000326683	0.000409567	0.000456362	0.000380837	0.000415641	0.000528942
T_Cr	Closure	Mean	0.000218729	0.000199354	0.000187147	0.000227238	0.000269727	0.000225521	0.000250468	0.000225131	0.000233133	0.000246412	0.000248174	0.000229106
T_Cu	Closure	Mean	0.000435273	0.000395137	0.000357607	0.000299548	0.000575584	0.000390993	0.000466305	0.00045731	0.000476845	0.000430715	0.000442485	0.000479322
T_Fe	Closure	Mean	0.072739169	0.068472274	0.057921823	0.072042003	0.175460637	0.099506177	0.098654576	0.086850196	0.07993526	0.072113618	0.076558694	0.084883943
T_Hg	Closure	Mean	1.15363E-05	9.8592E-06	8.4921E-06	6.62273E-06	8.29702E-06	8.0294E-06	1.01439E-05	1.16334E-05	1.27855E-05	1.10418E-05	1.15262E-05	1.35575E-05
T_K	Closure	Mean	2.269899607	1.994060993	1.760794044	1.234226108	1.12957418	1.220886827	1.783768535	2.238452196	2.467447519	2.071828842	2.520467997	2.695697546
T_Li	Closure	Mean	0.003522757	0.002812542	0.002250951	0.001607101	0.001872834	0.002033797	0.003264202	0.004006472	0.004422448	0.003730234	0.00441999	0.004678455
T_Mg	Closure	Mean	4.132976055	4.18366909	4.184934616	3.021281958	1.638378382	2.41560483	2.764198542	3.925765514	4.086118698	4.009818554	4.071272373	4.135516167
T_Mn	Closure	Mean	0.015449981	0.014453358	0.01371868	0.008349199	0.011502892	0.011547971	0.014983294	0.016138615	0.016305914	0.012896273	0.016918177	0.016142249
T_Mo	Closure	Mean	0.002326762	0.002147726	0.001970647	0.001274156	0.000941708	0.000909879	0.001420733	0.001869705	0.002153552	0.001721059	0.00185402	0.002425912
T_Na	Closure	Mean	7.862402916	7.945453644	7.786343575	4.687084675	2.678971767	3.159085035	4.317411423	5.468313694	5.820436001	5.777448654	6.473266602	7.284971237
T_Ni	Closure	Mean	0.000611728	0.000523028	0.000430528	0.000329888	0.000355574	0.000418488	0.00058269	0.000668502	0.000715525	0.000629989	0.000645642	0.000717416
T_P	Closure	Mean	0.020846013	0.021541566	0.021915309	0.012797774	0.016282817	0.016578585	0.018084265	0.022247056	0.020568762	0.019309277	0.01938987	0.019556886
T_Pb	Closure	Mean	4.41306E-05	4.07683E-05	3.93609E-05	3.04664E-05	5.56547E-05	4.43199E-05	4.97083E-05	4.73332E-05	4.81446E-05	4.31146E-05	4.46843E-05	4.79466E-05
T_S	Closure	Mean	1.060402393	1.072610617	1.072135806	0.871509373	0.476828694	0.664480865	0.658799052	0.989762962	1.035297871	1.045505285	1.040961862	1.071179748
T_Sb	Closure	Mean	0.004843762	0.003719364	0.00284057	0.001983103	0.002414996	0.002535623	0.004461381	0.005654166	0.006315266	0.005223336	0.005257323	0.006262285
T_Se	Closure	Mean	0.000173269	0.000147909	0.000161042	0.000107588	9.22303E-05	0.000104734	0.000132427	0.000162729	0.000179435	0.000153923	0.00015608	0.000175214
T_Si	Closure	Mean	5.473380089	5.158987999	4.835386276	5.589644909	4.598254681	4.616269112	5.044343948	5.111554623	5.124337673	5.218865871	5.303935528	5.639181614
T_Sn	Closure	Mean	5.19113E-05	5.10907E-05	4.9672E-05	4.91309E-05	5.03367E-05	5.12018E-05	5.0272E-05	4.96892E-05	4.9975E-05	4.92329E-05	5.07459E-05	5.15213E-05
T_Sr	Closure	Mean	0.092567876	0.092060238	0.093380995	0.083528645	0.053817932	0.061573721	0.076622196	0.086597666	0.096471049	0.082965411	0.084285296	0.08862786
T_Ti	Closure	Mean	0.002932679	0.002952802	0.002669803	0.002163026	0.004376852	0.003424464	0.002723724	0.002646158	0.002242797	0.003803362	0.003743779	0.002487504
T_Tl	Closure	Mean	3.2727E-05	2.69296E-05	2.48173E-05	2.10546E-05	2.0414E-05	2.41785E-05	3.00854E-05	3.7917E-05	4.0861E-05	3.42605E-05	3.46406E-05	4.0052E-05
T_U	Closure	Mean	0.000238588	0.000212417	0.000201592	0.000219489	0.000185433	0.000176251	0.000208983	0.000223426	0.000259694	0.000216823	0.000226351	0.000253716
T_V	Closure	Mean	0.001105447	0.000913446	0.000732799	0.000531999	0.000684576	0.000747108	0.001131103	0.001289195	0.001371245	0.001174215	0.001388623	0.001419056
T_Zn	Closure	Mean	0.003474917	0.003028648	0.002775475	0.002095995	0.002592811	0.002650096	0.003401154	0.003841044	0.003978257	0.003511481	0.003574489	0.003990825
D_Ag	Closure	Mean	1.57158E-05	1.40289E-05	1.51005E-05	1.5725E-05	1.19013E-05	1.58471E-05	1.41618E-05	1.76423E-05	1.82272E-05	1.55763E-05	1.60769E-05	1.78559E-05
D_Al	Closure	Mean	0.025252303	0.020591917	0.017858811	0.017420737	0.164578587	0.096295252	0.063892156	0.040960073	0.024313375	0.034513719	0.045535974	0.032712255
D_As	Closure	Mean	0.000810781	0.00074612	0.000701587	0.000578954	0.000494497	0.00057005	0.000756474	0.000847498	0.000882889	0.000771346	0.000772484	0.000861076
D_B	Closure	Mean	0.012438559	0.010556421	0.008431191	0.006709649	0.007257248	0.007606557	0.01174531	0.013264291	0.014425714	0.012736025	0.012909316	0.014625517
D_Ba	Closure	Mean	0.006151729	0.005893295	0.005907159	0.006555457	0.005031156	0.004796292	0.005448877	0.005989458	0.006595736	0.005420485	0.005567277	0.00593575
D_Bi	Closure	Mean	2.59333E-05	2.55297E-05	2.47822E-05	2.45081E-05	2.51514E-05	2.55832E-05	2.51031E-05	2.48068E-05	2.49361E-05	2.45682E-05	2.53344E-05	2.57334E-05
D_Be	Closure	Mean	7.2178E-05	6.66218E-05	6.13945E-05	5.47945E-05	5.55045E-05	5.91273E-05	6.86695E-05	7.32847E-05	7.63689E-05	7.08245E-05	7.27073E-05	7.77856E-05
D_Ca	Closure	Mean	18.81696892	18.99545479	19.08927536	15.03304386	9.08106041	11.42576694	14.10101032	17.26265144	18.13192558	17.71444321	17.99708557	18.78956223
D_Cd	Closure	Mean	4.18308E-05	3.32834E-05	2.72701E-05	1.92844E-05	2.32513E-05	2.52949E-05	4.1371E-05	4.81613E-05	5.30125E-05	4.565E-05	4.57947E-05	5.41484E-05
D_Co	Closure	Mean	0.000490404	0.000441407	0.000387965	0.000222116	0.000171369	0.000186465	0.000326149	0.000408132	0.000455358	0.000380125	0.000414861	0.000528221
D_Cr	Closure	Mean	0.000149024	0.00014809	0.000134958	0.000158454	0.000210092	0.000183853	0.000172556	0.000169808	0.00015936	0.000182214	0.00017878	0.000183514
D_Cu	Closure	Mean	0.000437217	0.000362802	0.000344745	0.000283102	0.000549233	0.000405781	0.000464644	0.000460184	0.000481211	0.000440252	0.000452646	0.000488308
D_Fe	Closure	Mean	0.052790571	0.046604883	0.038742941	0.046364442	0.100992315	0.067643367	0.066716805	0.06374564	0.05492321	0.05451829	0.055810433	0.057358593
D_Hg	Closure	Mean	1.15177E-05	9.83957E-06	8.47277E-06	6.61467E-06	8.79649E-06	7.65625E-06	1.01858E-05	1.15823E-05	1.27553E-05	1.1023E-05	1.15069E-05	1.35392E-05
D_K	Closure	Mean	2.251299858	1.966108084	1.743750811	1.205178857	1.105113149	1.207833409	1.774870872	2.211144924	2.447428465	2.031634569	2.508192778	2.673518658
D_Li	Closure	Mean	0.003522714	0.002812496	0.002250584	0.001606923	0.001872767	0.002033605	0.003264094	0.004006394	0.004422389	0.003730196	0.004419948	0.004678416
D_Mg	Closure	Mean	4.049072266	4.086296082	4.119352818	2.985836744	1.617836118	2.381269932	2.737365246	3.838492155	3.99500227	3.917551994	3.983268499	4.051447392
D_Mn	Closure	Mean	0.009597054	0.008412275	0.007161628	0.00481863	0.005192365	0.006307115	0.009149463	0.010777794	0.011572714	0.009676793	0.013139797	0.012130549
D_Mo	Closure	Mean	0.002273976	0.002099347	0.001933934	0.001243138	0.00092237	0.000887375	0.001413807	0.001841358	0.002147956	0.001689011	0.001841206	0.002387299
D_Na	Closure	Mean	7.816185474	7.869915962	7.738031864	4.650448799	2.637414455	3.043478966	4.285209656	5.400871754	5.793435097	5.732176781	6.354525089	7.242533207
D_Ni	Closure	Mean	0.000610815	0.000521722	0.000427884	0.000314637	0.00034911	0.00041454	0.000580968	0.000667258	0.000714499	0.000629299	0.000644831	0.000716696
D_P	Closure	Mean	0.066848956	0.059857674	0.050325193	0.027814519	0.028073652	0.02842401	0.030590585	0.055650838	0.034562286	0.103139199	0.098821305	0.052879386
D_Pb	Closure	Mean	4.14644E-05	3.76748E-05	3.42635E-05	2.91693E-05	2.90108E-05	3.15093E-05	3.92462E-05	4.2567E-05	4.45157E-05	4.07047E-05	4.18872E-05	4.55354E-05
D_S	Closure	Mean	1.08797133	1.102099776	1.094257593	0.80691123	0.449565649	0.655610144	0.669098973	1.015139103	1.072557092	1.05273962	1.064756036	1.089057922
D_Sb	Closure	Mean	0.004843708	0.003719262	0.002840354	0.001982999	0.002414959	0.002535516	0.004461319	0.005654085	0.006315194	0.005223286	0.00525727	0.006262236
D_Se	Closure	Mean	0.000159302	0.000133884	0.00015619	0.000105048	9.48707E-05	9.83713E-05	0.000134776	0.000158003	0.000171286	0.000131506	0.000136828	0.000165514
D_Si	Closure	Mean	5.247000217	4.934578896	4.725743771	5.276512623	4.317146778	4.459020615	4.891180038	4.922637939	5.038397312	5.069563866	5.136111259	5.269694805
D_Sn	Closure	Mean	5.19113E-05	5.10907E-05	4.9672E-05	4.91309E-05	5.03367E-05	5.12018E-05	5.0272E-05	4.96892E-05	4.9975E-05	4.92329E-05	5.07459E-05	5.15213E-05
D_Sr	Closure	Mean	0.091925755	0.089845888	0.090847462	0.084106907	0.053554229	0.060482662	0.075107746	0.086030386	0.096614003	0.081412725	0.08376047	0.089179881
D_Ti	Closure	Mean	0.001938763	0.001671579	0.001319413	0.000965105	0.002336054	0.001715021	0.001363697	0.001885323	0.000734426	0.003269617	0.003098423	0.001629909
D_Tl	Closure	Mean	3.27137E-05	2.69132E-05	2.47989E-05	2.10496E-05	2.04101E-05	2.41681E-05	3.00795E-05	3.79128E-05	4.0858E-05	3.42584E-05	3.46383E-05	4.00499E-05
D_U	Closure	Mean	0.00022917	0.000201464	0.000190329	0.000205669	0.000173023	0.000166111	0.000200081	0.000216064	0.000255347	0.000208697	0.000218175	0.00024447
D_V	Closure	Mean	0.001083172	0.000888854	0.000704861	0.000506021	0.00058314	0.000669059	0.00105952	0.001237471	0.00134551	0.001156497	0.001345353	0.001398819
D_Zn	Closure	Mean	0.002816064	0.002251314	0.002215379	0.001929807	0.002032326	0.00225734	0.002892672	0.003261748	0.00321061	0.00270252	0.003209072	0.003178361

Appendix A.4.1: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ28

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.943269789	1.009665132	1.066399693	0.574311674	0.440138519	0.644608021	0.826661825	0.977903605	0.961612463	0.812665761	0.922438622	0.88680625
NO3_N	Post-Closure	Mean	1.218592882	0.98499763	1.101849914	0.575107992	0.268531173	0.667489946	1.057249188	1.100608706	1.113304138	1.050027609	1.044907928	1.114679098
NO2_N	Post-Closure	Mean	0.004505332	0.004264145	0.004104652	0.002601932	0.001637878	0.003428862	0.00464792	0.005000832	0.004875608	0.004264948	0.004445897	0.004683432
Br	Post-Closure	Mean	0.049534481	0.05016131	0.046552885	0.042158645	0.041005444	0.036351945	0.043892752	0.051448327	0.05213052	0.046100236	0.053339005	0.053810585
Cl	Post-Closure	Mean	16.99276733	17.10017014	17.37709999	10.09886074	6.528745174	12.48896503	16.51133728	16.80496788	17.32889175	16.65846443	17.18082619	16.52378082
F	Post-Closure	Mean	0.395984977	0.398811132	0.399012536	0.196813568	0.112512253	0.23262459	0.359123349	0.394270033	0.388131112	0.320960402	0.354599804	0.388731807
TDP	Post-Closure	Mean	0.01822656	0.016559472	0.014979436	0.010372385	0.009814237	0.016999898	0.022880718	0.023936737	0.018981421	0.017065443	0.018109063	0.018472394
SO4	Post-Closure	Mean	347.2289124	346.5178833	347.2646484	200.7913971	134.8119354	263.2359314	345.8031006	357.9763794	366.881073	342.5884399	354.943512	343.2945862
T_CN	Post-Closure	Mean	0.004025297	0.003919391	0.004262929	0.00366981	0.003121278	0.003834598	0.004010036	0.003932949	0.004009835	0.004053449	0.004014372	0.003839348
WAD_CN	Post-Closure	Mean	0.002469581	0.00247978	0.002401217	0.002400129	0.002352756	0.002255442	0.001918191	0.001786999	0.001659884	0.001717582	0.001694511	0.001529123
T_Ag	Post-Closure	Mean	2.36143E-05	2.37518E-05	2.53043E-05	1.90718E-05	2.15133E-05	2.16245E-05	2.18063E-05	2.36661E-05	2.38097E-05	2.06368E-05	2.18799E-05	2.33354E-05
T_Al	Post-Closure	Mean	0.036956795	0.032977019	0.030727159	0.024601102	0.210899025	0.112428926	0.06176874	0.046766743	0.02666463	0.037801456	0.047555316	0.036785226
T_As	Post-Closure	Mean	0.000929826	0.000924823	0.000910531	0.00081773	0.000723771	0.000682672	0.000838778	0.000953638	0.000944116	0.000917959	0.000896055	0.000943302
T_B	Post-Closure	Mean	0.012418278	0.011285187	0.010584864	0.007548764	0.007650444	0.008335299	0.011815928	0.013178988	0.013532495	0.011926925	0.011852346	0.01223527
T_Ba	Post-Closure	Mean	0.006246787	0.006191758	0.006066848	0.006785743	0.00533268	0.00489649	0.005036423	0.00521007	0.005342558	0.004795558	0.004751321	0.004582743
T_Bi	Post-Closure	Mean	2.58944E-05	2.53655E-05	2.4703E-05	2.4039E-05	2.54713E-05	2.55868E-05	2.44959E-05	2.56041E-05	2.41624E-05	2.45887E-05	2.4753E-05	2.48272E-05
T_Be	Post-Closure	Mean	7.20547E-05	6.97063E-05	6.81909E-05	6.01691E-05	6.05589E-05	6.46447E-05	7.08882E-05	7.66096E-05	7.58572E-05	7.16486E-05	7.16258E-05	7.28913E-05
T_Ca	Post-Closure	Mean	92.15805054	91.17307281	93.4520874	59.01214218	38.85333252	71.28533936	93.34475708	97.2412262	100.0020905	92.59458923	95.11849213	90.93234253
T_Cd	Post-Closure	Mean	0.000175668	0.000185682	0.000190037	0.000102216	4.70877E-05	7.48359E-05	0.000107377	0.000126161	0.000143197	0.00012209	0.000133052	0.000161891
T_Co	Post-Closure	Mean	0.001363859	0.001445863	0.001484693	0.000678768	0.000387837	0.000684845	0.001005003	0.001153872	0.001176335	0.000965488	0.001095879	0.001266956
T_Cr	Post-Closure	Mean	0.000216414	0.000196654	0.000201207	0.000225387	0.000258436	0.000222906	0.000233655	0.000213164	0.000214674	0.000227192	0.000226724	0.000207367
T_Cu	Post-Closure	Mean	0.000435491	0.000395375	0.000392519	0.000337007	0.000550178	0.000365393	0.000447059	0.000465137	0.000467147	0.000426483	0.000424451	0.000435793
T_Fe	Post-Closure	Mean	0.069175027	0.066018626	0.055666979	0.071347535	0.160253972	0.089832135	0.072620951	0.065894008	0.055762526	0.053071231	0.056047168	0.054665413
T_Hg	Post-Closure	Mean	1.5137E-05	1.57039E-05	1.54365E-05	9.61018E-06	1.09836E-05	9.5656E-06	1.27404E-05	1.55317E-05	1.565E-05	1.28898E-05	1.4935E-05	1.51439E-05
T_K	Post-Closure	Mean	42.55210876	44.92658234	45.7845459	19.13630104	9.641172409	21.04781342	33.14420319	38.41359329	37.79996872	30.51445007	34.79401779	39.78575134
T_Li	Post-Closure	Mean	0.07018251	0.071605712	0.071452484	0.030356808	0.017086983	0.038812388	0.061119273	0.069645055	0.067471705	0.053920861	0.061253741	0.068131842
T_Mg	Post-Closure	Mean	6.432420254	6.642098427	6.79697752	4.022111893	2.052037477	3.450265169	5.182132721	5.938837051	6.051082611	5.03588438	5.452826977	6.083815575
T_Mn	Post-Closure	Mean	0.434697121	0.453506738	0.465579957	0.223101735	0.11000704	0.22254099	0.332994878	0.384050786	0.384500533	0.321761757	0.364843577	0.411369413
T_Mo	Post-Closure	Mean	0.002557459	0.002631265	0.002694944	0.001604162	0.000791329	0.001194863	0.001697373	0.002010745	0.002298358	0.001935513	0.002032818	0.002448545
T_Na	Post-Closure	Mean	60.33852386	60.93802643	62.008564	36.92364502	23.21980476	44.05212021	58.52173996	59.61359024	61.54704666	59.10896301	60.7858696	58.86605453
T_Ni	Post-Closure	Mean	0.001547153	0.001581246	0.001584069	0.000919554	0.000659694	0.000998614	0.001364141	0.001511195	0.001493824	0.001274062	0.001389469	0.001504202
T_P	Post-Closure	Mean	0.018138863	0.016674992	0.017205687	0.0111631	0.015138702	0.018388405	0.024191335	0.023733938	0.019215358	0.017639151	0.01838428	0.018997209
T_Pb	Post-Closure	Mean	0.000104423	0.00010924	0.000111493	6.75346E-05	6.53485E-05	5.73813E-05	7.07345E-05	7.8855E-05	8.84032E-05	8.22973E-05	8.54317E-05	9.94749E-05
T_S	Post-Closure	Mean	0.860325634	0.963955164	0.946699262	0.821472764	0.375003994	0.546013951	0.483946353	0.588999152	0.597811043	0.676507115	0.481787741	0.570004582
T_Sb	Post-Closure	Mean	0.008098465	0.008065169	0.007872717	0.003890773	0.00285526	0.005337708	0.007976742	0.008858378	0.008623391	0.006804427	0.007521026	0.008083602
T_Se	Post-Closure	Mean	0.000170541	0.000145946	0.00016514	9.27325E-05	7.19336E-05	9.56004E-05	0.000127712	0.000149175	0.000155237	0.000133572	0.00013202	0.000135054
T_Si	Post-Closure	Mean	5.420377254	5.087118626	4.918411255	5.552126884	4.527513504	4.624367237	4.884895325	4.969130039	4.872059822	5.009981155	4.98993206	5.033821583
T_Sn	Post-Closure	Mean	5.17471E-05	5.06592E-05	5.00537E-05	4.80311E-05	5.01143E-05	5.14108E-05	4.9475E-05	5.02021E-05	4.96531E-05	4.9312E-05	4.98001E-05	4.96352E-05
T_Sr	Post-Closure	Mean	0.214169815	0.205367535	0.197062537	0.126568899	0.080087736	0.146713689	0.222033605	0.240492269	0.235118225	0.193885192	0.207131207	0.218530685
T_Ti	Post-Closure	Mean	0.002604075	0.002237825	0.002115014	0.002036716	0.004155968	0.003342483	0.002453369	0.002610087	0.001769872	0.003320108	0.003209734	0.002098936
T_Tl	Post-Closure	Mean	3.23142E-05	2.66654E-05	2.89791E-05	2.08062E-05	1.39395E-05	2.48087E-05	2.95546E-05	3.50739E-05	3.55638E-05	2.9477E-05	2.92926E-05	3.01808E-05
T_U	Post-Closure	Mean	0.000235971	0.000209088	0.000222725	0.000217377	0.000168908	0.000173726	0.000203272	0.000216094	0.000233893	0.000199559	0.000202973	0.000208706
T_V	Post-Closure	Mean	0.018275991	0.018660549	0.01862317	0.008108318	0.004784929	0.010209167	0.015986141	0.018156724	0.017596243	0.01413037	0.015997754	0.017742615
T_Zn	Post-Closure	Mean	0.014022757	0.014915492	0.015313892	0.008456407	0.004526548	0.006164595	0.008283769	0.009839478	0.011203759	0.009846579	0.010644835	0.0129793
D_Ag	Post-Closure	Mean	2.32759E-05	2.34605E-05	2.50349E-05	1.86366E-05	1.16542E-05	2.12211E-05	2.15006E-05	2.34168E-05	2.33825E-05	2.00556E-05	2.14603E-05	2.29364E-05
D_Al	Post-Closure	Mean	0.024048304	0.019688766	0.016590346	0.016918378	0.150389895	0.090703055	0.04337712	0.033120617	0.018155837	0.027541332	0.037269786	0.023912316
D_As	Post-Closure	Mean	0.00092116	0.000909417	0.000909982	0.000779982	0.000625392	0.000636393	0.000801614	0.000903874	0.000926938	0.000884349	0.00085083	0.000923093
D_B	Post-Closure	Mean	0.012384949	0.011285187	0.010584864	0.007548764	0.007650443	0.008335298	0.011806167	0.013158804	0.0135182	0.011916799	0.011843085	0.012220407
D_Ba	Post-Closure	Mean	0.005960337	0.005764466	0.005781286	0.006509545	0.004861538	0.0044893	0.004749384	0.005074816	0.005295848	0.004564628	0.004527244	0.004467721
D_Bi	Post-Closure	Mean	2.58543E-05	2.53153E-05	2.46797E-05	2.40242E-05	2.54713E-05	2.55624E-05	2.44842E-05	2.56004E-05	2.41592E-05	2.45846E-05	2.47522E-05	2.4826E-05
D_Be	Post-Closure	Mean	7.20547E-05	6.97063E-05	6.81909E-05	6.01691E-05	6.05589E-05	6.46447E-05	7.08882E-05	7.66096E-05	7.58572E-05	7.16486E-05	7.16258E-05	7.28913E-05
D_Ca	Post-Closure	Mean	92.07411957	91.06663513	93.18410492	59.08364487	38.8471756	71.2068634	93.24243927	97.20825958	100.0514984	92.43027496	95.07798767	90.91433716
D_Cd	Post-Closure	Mean	0.000175544	0.000185572	0.000189934	0.00010136	4.54259E-05	7.46528E-05	0.000108765	0.000125992	0.000142313	0.000121914	0.000132699	0.000162675
D_Co	Post-Closure	Mean	0.001363724	0.001445748	0.001483289	0.000675894	0.000387582	0.000679729	0.001004871	0.001153764	0.001176169	0.000965252	0.001095713	0.0012668
D_Cr	Post-Closure	Mean	0.000175801	0.000172321	0.0001676	0.000163363	0.000203777	0.000186194	0.000178384	0.000181911	0.000173252	0.000182065	0.000188147	0.000185541
D_Cu	Post-Closure	Mean	0.000436892	0.000371993	0.000381044	0.000326332	0.000525485	0.00039239	0.000447413	0.00046503	0.000466912	0.000430579	0.000428989	0.000439193
D_Fe	Post-Closure	Mean	0.050218575	0.044763308	0.037197746	0.046034787	0.092501812	0.061162136	0.051752489	0.049412329	0.038694438	0.040462334	0.041179676	0.036941748
D_Hg	Post-Closure	Mean	1.51405E-05	1.57127E-05	1.54382E-05	9.61327E-06	1.13387E-05	8.85238E-06	1.27103E-05	1.55246E-05	1.56438E-05	1.288E-05	1.49233E-05	1.51288E-05
D_K	Post-Closure	Mean	42.55273438	44.92146683	45.78749084	19.09923172	9.650617599	21.04676437	33.14199829	38.40454483	37.79715347	30.49972343	34.79610443	39.78358841
D_Li	Post-Closure	Mean	0.07018251	0.071605712	0.071452484	0.030356808	0.017086983	0.038812388	0.061119273	0.069645055	0.067471705	0.053920861	0.061253741	0.068131842
D_Mg	Post-Closure	Mean	6.431267262	6.641108513	6.778767109	4.015486717	2.043584347	3.438905001	5.1749506	5.93497467	6.046058655	5.030450821	5.468533039	6.103802681
D_Mn	Post-Closure	Mean	0.434095562	0.453182489	0.465242565	0.222196192	0.105170399	0.220288977	0.332159311	0.383192271	0.383696407	0.32110405	0.364202648	0.4106552
D_Mo	Post-Closure	Mean	0.002531347	0.002609505	0.00267182	0.001587713	0.000778342	0.001183211	0.00170198	0.001999513	0.002298421	0.00191704	0.002028452	0.002430106
D_Na	Post-Closure	Mean	60.30203629	60.88486099	61.96895981	36.87979889	23.16596031	43.92717743	58.48535919	59.56076813	61.51472473	59.04944992	60.70882034	58.83100891
D_Ni	Post-Closure	Mean	0.001547019	0.001581128	0.001583274	0.000912163	0.00065923	0.000998414	0.001363974	0.001511063	0.001493652	0.001273816	0.001389289	0.001504048
D_P	Post-Closure	Mean	0.053241491	0.050101705	0.042700913	0.023083797	0.02553327	0.023742789	0.03139554	0.048970606	0.024435742	0.072370388	0.066832364	0.025099525
D_Pb	Post-Closure	Mean	0.000103763	0.000108674	0.000110966	6.66604E-05	4.56048E-05	5.66003E-05	7.01309E-05	7.83558E-05	8.75746E-05	8.11209E-05	8.46153E-05	9.86844E-05
D_S	Post-Closure	Mean	0.826302469	0.941204488	0.959464014	0.747323155	0.36839512	0.537618577	0.483617425	0.514281571	0.588918626	0.446003973	0.452914447	0.449609637
D_Sb	Post-Closure	Mean	0.008098465	0.008065169	0.007872717	0.003890773	0.00285526	0.005337708	0.007976742	0.008858377	0.00862339	0.006804427	0.007521026	0.008083601
D_Se	Post-Closure	Mean	0.000156984	0.000132352	0.000158807	9.755E-05	7.63735E-05	8.53666E-05	0.000127867	0.000143889	0.000147967	0.000116261	0.000116818	0.000128057
D_Si	Post-Closure	Mean	5.197811127	4.8668046	4.802370071	5.242515564	4.272400856	4.46911478	4.752826691	4.811050415	4.792050838	4.876020432	4.861943245	4.818569183
D_Sn	Post-Closure	Mean	5.17471E-05	5.06592E-05	5.00537E-05	4.80311E-05	5.01143E-05	5.14108E-05	4.9475E-05	5.02021E-05	4.96531E-05	4.9312E-05	4.98001E-05	4.96352E-05
D_Sr	Post-Closure	Mean	0.214053541	0.204634398	0.19626309	0.127379626	0.079548076	0.146224529	0.221105233	0.240737751	0.235644609	0.193564519	0.209411189	0.218847319
D_Ti	Post-Closure	Mean	0.001530466	0.001340771	0.001370887	0.00101865	0.002231475	0.001700852	0.001315693	0.001817412	0.001031165	0.002717684	0.002571303	0.001420506
D_Tl	Post-Closure	Mean	3.23012E-05	2.66492E-05	2.89791E-05	2.08014E-05	1.39383E-05	2.48087E-05	2.95509E-05	3.50711E-05	3.55619E-05	2.94756E-05	2.92915E-05	3.01796E-05
D_U	Post-Closure	Mean	0.000226534	0.000198255	0.000210805	0.000203704	0.00015338	0.000163458	0.000194453	0.000208054	0.000228165	0.000191071	0.000194636	0.00019971
D_V	Post-Closure	Mean	0.018264741	0.01865159	0.018611984	0.008073591	0.004605861	0.010177976	0.015956549	0.018131077	0.017583184	0.014114729	0.015970727	0.017730059
D_Zn	Post-Closure	Mean	0.013717896	0.014568157	0.015152348	0.008207676	0.003969329	0.005935045	0.007965215	0.009527837	0.01074499	0.00926442	0.010454112	0.012535151

Appendix A.4.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ27

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.140717655	0.143517852	0.139270023	0.071149558	0.023876779	0.02908247	0.051854756	0.08077243	0.088064812	0.087803036	0.118590549	0.134823889
NO3_N	Closure	Mean	0.043974701	0.040091749	0.043296725	0.038027342	0.030428974	0.037890848	0.043737248	0.043164887	0.045338463	0.036224212	0.039430164	0.04588576
NO2_N	Closure	Mean	0.001015085	0.001025725	0.001094968	0.001058098	0.00073148	0.001138017	0.001150625	0.001163896	0.001094386	0.000962052	0.0010104	0.001040385
Br	Closure	Mean	0.026773831	0.026103146	0.026875587	0.02674938	0.025819618	0.026282948	0.028211445	0.026336426	0.026959401	0.026929352	0.027453531	0.026767151
Cl	Closure	Mean	1.583751559	1.591020942	1.532970309	0.812719584	0.445000708	0.48244223	0.711435914	0.926950514	1.03040421	1.022196293	1.321651816	1.472954869
F	Closure	Mean	0.069233313	0.066298231	0.067389093	0.052459307	0.039943174	0.049205307	0.062136352	0.067170992	0.073427692	0.062691107	0.067417867	0.071799882
TDP	Closure	Mean	0.008264711	0.008798311	0.009264718	0.007891907	0.008653786	0.009544121	0.008560612	0.009083307	0.008243777	0.008232061	0.008051204	0.007985311
SO4	Closure	Mean	25.13303947	23.7123394	22.02485847	12.29695034	7.57682848	7.900653362	13.771101	17.99730682	20.63057327	16.82196617	25.43466377	26.49260521
T_CN	Closure	Mean	0.002829448	0.002792445	0.002708999	0.002561873	0.002544667	0.002604851	0.002585968	0.002613859	0.002649683	0.002606961	0.00277946	0.002804588
WAD_CN	Closure	Mean	0.00258949	0.002549172	0.002474618	0.002449352	0.002514559	0.002557761	0.002508897	0.002478739	0.002491226	0.002454542	0.00252987	0.002569317
T_Ag	Closure	Mean	1.60606E-05	1.44111E-05	1.54787E-05	1.57336E-05	2.16224E-05	1.83325E-05	1.73935E-05	1.82867E-05	1.86957E-05	1.58742E-05	1.64117E-05	1.81337E-05
T_Al	Closure	Mean	0.038910735	0.034239423	0.027931524	0.025503723	0.231260285	0.121865682	0.10161861	0.059233759	0.037097309	0.048523169	0.059049498	0.051249214
T_As	Closure	Mean	0.000841036	0.000790022	0.000724863	0.000636434	0.000580727	0.000636997	0.000799674	0.000904332	0.000916626	0.000822944	0.000826561	0.000903778
T_B	Closure	Mean	0.012448587	0.010576354	0.008457384	0.006703592	0.007255635	0.007626804	0.011746035	0.013281612	0.014430413	0.012736524	0.012871333	0.014623798
T_Ba	Closure	Mean	0.006439146	0.006317828	0.006189237	0.006830241	0.005538094	0.005246689	0.00582008	0.006176835	0.006677265	0.005740056	0.005879227	0.006123022
T_Bi	Closure	Mean	2.59235E-05	2.553E-05	2.47904E-05	2.45138E-05	2.51583E-05	2.56069E-05	2.51038E-05	2.47947E-05	2.49134E-05	2.45467E-05	2.53005E-05	2.56873E-05
T_Be	Closure	Mean	7.20345E-05	6.64897E-05	6.12626E-05	5.47105E-05	5.5476E-05	5.90998E-05	6.86046E-05	7.32017E-05	7.62668E-05	7.07359E-05	7.24918E-05	7.76232E-05
T_Ca	Closure	Mean	19.15818596	19.45599174	19.47306442	15.03948021	9.088298798	11.66554928	14.40131187	17.62165642	18.24790192	18.0228138	18.24825668	19.13352203
T_Cd	Closure	Mean	4.10325E-05	3.23783E-05	2.65629E-05	1.9175E-05	2.43901E-05	2.56671E-05	3.89896E-05	4.76758E-05	5.31742E-05	4.49453E-05	4.53603E-05	5.18331E-05
T_Co	Closure	Mean	0.000490208	0.000441461	0.000389739	0.000222833	0.000173599	0.000190459	0.000326183	0.00040899	0.000455718	0.000380308	0.000413384	0.000527024
T_Cr	Closure	Mean	0.000218298	0.000198959	0.000186813	0.000227291	0.000269857	0.000225466	0.000250256	0.000224897	0.000232831	0.000246142	0.000247654	0.000228642
T_Cu	Closure	Mean	0.000434406	0.000394353	0.000356805	0.000298912	0.000575695	0.000390836	0.000465892	0.00045677	0.000476199	0.000430369	0.000440935	0.000478313
T_Fe	Closure	Mean	0.072595552	0.068336688	0.057799764	0.071854301	0.175525576	0.099468045	0.098547809	0.086760521	0.079832278	0.07204137	0.076458462	0.084709078
T_Hg	Closure	Mean	1.15132E-05	9.8396E-06	8.46901E-06	6.57045E-06	8.29595E-06	8.02414E-06	1.01256E-05	1.16093E-05	1.27506E-05	1.10137E-05	1.1467E-05	1.35116E-05
T_K	Closure	Mean	2.265333414	1.990098	1.755964994	1.223908544	1.126224637	1.21932888	1.780603409	2.234395266	2.462688923	2.068081379	2.50851512	2.669392347
T_Li	Closure	Mean	0.003515683	0.002806954	0.002244829	0.001593951	0.001867041	0.002030859	0.003259165	0.004001166	0.004416224	0.003724924	0.004398464	0.004631537
T_Mg	Closure	Mean	4.124710083	4.175364494	4.175195217	3.013481617	1.634545803	2.413954973	2.761737108	3.921068668	4.080569267	4.003633976	4.06451273	4.126748085
T_Mn	Closure	Mean	0.015418843	0.014424597	0.013678775	0.00827125	0.011506744	0.011537024	0.014961272	0.016118066	0.016283186	0.012879195	0.016852001	0.015998637
T_Mo	Closure	Mean	0.002322085	0.002143461	0.001965506	0.001267406	0.000938388	0.000908778	0.001418808	0.001867218	0.002150582	0.001718731	0.001850736	0.002420579
T_Na	Closure	Mean	7.846585274	7.929675102	7.765937328	4.663803577	2.670811176	3.155981779	4.312854767	5.461702824	5.812526703	5.768539906	6.449879646	7.228915691
T_Ni	Closure	Mean	0.000610506	0.000521991	0.000429515	0.000329023	0.000355197	0.000418105	0.000581978	0.000667674	0.00071454	0.000629142	0.000642873	0.000714602
T_P	Closure	Mean	0.020804161	0.02149874	0.021858633	0.012742955	0.016287476	0.016567625	0.018063003	0.022218749	0.020540167	0.019279547	0.019358311	0.019515567
T_Pb	Closure	Mean	4.40427E-05	4.06875E-05	3.92703E-05	3.0398E-05	5.56797E-05	4.42861E-05	4.96431E-05	4.72772E-05	4.80793E-05	4.30593E-05	4.45281E-05	4.78458E-05
T_S	Closure	Mean	1.058291316	1.0704844	1.069680572	0.872604012	0.475646228	0.664004266	0.658097506	0.98863709	1.033910751	1.043993115	1.039165378	1.068921328
T_Sb	Closure	Mean	0.004834012	0.00371197	0.002832287	0.001960199	0.002405441	0.002531079	0.004453527	0.005646454	0.006305942	0.005215705	0.005225591	0.006240292
T_Se	Closure	Mean	0.000172922	0.000147616	0.000160617	0.000106671	9.19689E-05	0.00010463	0.000132263	0.00016252	0.000179186	0.000153705	0.000155804	0.000174838
T_Si	Closure	Mean	5.462596416	5.148787498	4.826778889	5.588583469	4.597186089	4.615497112	5.041286469	5.10658741	5.117807865	5.212914944	5.297445774	5.627743244
T_Sn	Closure	Mean	5.18085E-05	5.09896E-05	4.95742E-05	4.9088E-05	5.03217E-05	5.11855E-05	5.02366E-05	4.96385E-05	4.99104E-05	4.91717E-05	5.06635E-05	5.14158E-05
T_Sr	Closure	Mean	0.092384093	0.091877811	0.093190588	0.08345031	0.053693738	0.06153772	0.076554418	0.086505033	0.096344948	0.082845457	0.084154509	0.08823932
T_Ti	Closure	Mean	0.002926962	0.002946974	0.002666831	0.002195573	0.004377174	0.003424719	0.002723307	0.002644174	0.00224016	0.003799126	0.003738792	0.002482753
T_Tl	Closure	Mean	3.26613E-05	2.68761E-05	2.47486E-05	2.09045E-05	2.03427E-05	2.41453E-05	3.00417E-05	3.78669E-05	4.08035E-05	3.4212E-05	3.45813E-05	3.99657E-05
T_U	Closure	Mean	0.000238114	0.000211997	0.000201211	0.000219265	0.00018524	0.000176165	0.000208759	0.000223177	0.000259349	0.000216544	0.000225555	0.000253183
T_V	Closure	Mean	0.00110323	0.000911632	0.000730911	0.000528598	0.000684146	0.000746399	0.001129659	0.001287538	0.001369328	0.001172668	0.001383786	0.001407867
T_Zn	Closure	Mean	0.003467974	0.00302264	0.002768783	0.002089612	0.002589458	0.0026477	0.003397034	0.003836312	0.003972791	0.003506799	0.003563571	0.003982348
D_Ag	Closure	Mean	1.56843E-05	1.4001E-05	1.50603E-05	1.562E-05	1.18642E-05	1.58301E-05	1.41397E-05	1.76199E-05	1.82019E-05	1.55552E-05	1.60117E-05	1.78178E-05
D_Al	Closure	Mean	0.024646915	0.020166855	0.016698943	0.017377149	0.163820371	0.094248809	0.063640438	0.040831342	0.024280902	0.034542724	0.045479741	0.032645449
D_As	Closure	Mean	0.000809165	0.00074464	0.000699958	0.00057739	0.000493915	0.000569769	0.000755739	0.000846544	0.000881712	0.000770356	0.000769919	0.000859255
D_B	Closure	Mean	0.012413696	0.010535476	0.008411416	0.006691145	0.007245692	0.007600241	0.01173091	0.013247883	0.014405848	0.012718858	0.012852949	0.014594348
D_Ba	Closure	Mean	0.006139589	0.005881639	0.005896538	0.006551647	0.005028109	0.004794898	0.005445616	0.005983957	0.006587415	0.005414189	0.005559175	0.005923638
D_Bi	Closure	Mean	2.5882E-05	2.54792E-05	2.47336E-05	2.44875E-05	2.5144E-05	2.55751E-05	2.50854E-05	2.47815E-05	2.49038E-05	2.45377E-05	2.52935E-05	2.56807E-05
D_Be	Closure	Mean	7.20345E-05	6.64897E-05	6.12626E-05	5.47105E-05	5.5476E-05	5.90998E-05	6.86046E-05	7.32017E-05	7.62668E-05	7.07359E-05	7.24918E-05	7.76232E-05
D_Ca	Closure	Mean	18.77935982	18.95775223	19.04470634	15.00130272	9.056817055	11.41779423	14.08671856	17.24241066	18.10772133	17.68720245	17.96717072	18.75000191
D_Cd	Closure	Mean	4.17467E-05	3.32172E-05	2.7192E-05	1.90762E-05	2.31802E-05	2.52547E-05	4.13007E-05	4.80961E-05	5.29341E-05	4.55839E-05	4.56641E-05	5.40313E-05
D_Co	Closure	Mean	0.000489414	0.00044053	0.000386849	0.000219908	0.000170871	0.000186211	0.00032565	0.000407556	0.000454715	0.000379597	0.000412608	0.000526299
D_Cr	Closure	Mean	0.000148732	0.000147797	0.000134752	0.000158911	0.000210069	0.000183806	0.000172401	0.000169646	0.000159158	0.000182007	0.000178529	0.000183142
D_Cu	Closure	Mean	0.000436346	0.000362083	0.000343992	0.00028263	0.000549109	0.000405443	0.000464022	0.00045964	0.000480559	0.000439685	0.000451049	0.000487278
D_Fe	Closure	Mean	0.052686334	0.046512671	0.038662694	0.04630198	0.100961752	0.067615934	0.066650324	0.063682005	0.054853104	0.054464784	0.055734258	0.057240844
D_Hg	Closure	Mean	1.14945E-05	9.82001E-06	8.44972E-06	6.56249E-06	8.79166E-06	7.64621E-06	1.01674E-05	1.15584E-05	1.27204E-05	1.0995E-05	1.14479E-05	1.34933E-05
D_K	Closure	Mean	2.246771097	1.962200522	1.738958955	1.195561171	1.101865053	1.206268191	1.771697521	2.20710659	2.442671299	2.027912617	2.496247292	2.647452593
D_Li	Closure	Mean	0.003515641	0.002806908	0.002244462	0.001593775	0.001866974	0.002030667	0.003259058	0.004001088	0.004416164	0.003724886	0.004398421	0.004631499
D_Mg	Closure	Mean	4.040969849	4.078185558	4.109353065	2.978867531	1.614027143	2.379651785	2.734923363	3.833899975	3.989573479	3.911505938	3.976649046	4.042878151
D_Mn	Closure	Mean	0.009577767	0.008395556	0.007142146	0.004777247	0.005181128	0.00629982	0.009136951	0.010764205	0.011556612	0.009663542	0.013084101	0.012015703
D_Mo	Closure	Mean	0.002269401	0.002095177	0.001928848	0.001236506	0.000919041	0.000886293	0.001411825	0.001838879	0.002144987	0.001686708	0.001837942	0.002382039
D_Na	Closure	Mean	7.800455093	7.854287624	7.717697144	4.626242161	2.629933357	3.041167736	4.28074646	5.394357681	5.785570621	5.723305225	6.331457138	7.188702583
D_Ni	Closure	Mean	0.000609595	0.000520686	0.00042688	0.000313922	0.000348618	0.000414162	0.000580258	0.000666432	0.000713515	0.000628454	0.000642066	0.000713881
D_P	Closure	Mean	0.066720203	0.059740093	0.050325859	0.029288471	0.028563006	0.028564576	0.030666105	0.055623692	0.034530044	0.103026599	0.098694362	0.052773092
D_Pb	Closure	Mean	4.13818E-05	3.76001E-05	3.41868E-05	2.91115E-05	2.89932E-05	3.14901E-05	3.92056E-05	4.25174E-05	4.44556E-05	4.06526E-05	4.17456E-05	4.54396E-05
D_S	Closure	Mean	1.085798979	1.099913001	1.091929555	0.805877924	0.448592335	0.655144989	0.668354094	1.013926864	1.071122408	1.051055193	1.062919497	1.086694121
D_Sb	Closure	Mean	0.004833959	0.003711868	0.002832072	0.001960097	0.002405404	0.002530972	0.004453465	0.005646372	0.006305871	0.005215655	0.005225538	0.006240243
D_Se	Closure	Mean	0.000158983	0.000133618	0.000155769	0.000104384	9.45594E-05	9.82617E-05	0.000134589	0.000157802	0.000171047	0.000131324	0.000136596	0.000165164
D_Si	Closure	Mean	5.236663818	4.92482233	4.717265606	5.274529934	4.316239357	4.45814085	4.888221741	4.917880058	5.031975746	5.063766956	5.130311012	5.259000778
D_Sn	Closure	Mean	5.18085E-05	5.09896E-05	4.95742E-05	4.9088E-05	5.03217E-05	5.11855E-05	5.02366E-05	4.96385E-05	4.99104E-05	4.91717E-05	5.06635E-05	5.14158E-05
D_Sr	Closure	Mean	0.091742925	0.089667886	0.090658613	0.084031157	0.053424295	0.060447603	0.075040258	0.085937925	0.09648744	0.081294045	0.083519243	0.088758722
D_Ti	Closure	Mean	0.00193506	0.001668304	0.001320552	0.001013067	0.00234209	0.001717848	0.001365468	0.001884363	0.000739286	0.003266089	0.003099002	0.001626656
D_Tl	Closure	Mean	3.2648E-05	2.68597E-05	2.47303E-05	2.08996E-05	2.03387E-05	2.41331E-05	3.00358E-05	3.78626E-05	4.08005E-05	3.421E-05	3.4579E-05	3.99636E-05
D_U	Closure	Mean	0.000228714	0.000201066	0.000189973	0.000205599	0.000172797	0.000166017	0.000199863	0.000215821	0.000255007	0.000208431	0.000217422	0.000243954
D_V	Closure	Mean	0.001081	0.000887089	0.00070305	0.000503099	0.000581731	0.000668229	0.001058018	0.001235866	0.00134363	0.001154887	0.001339129	0.001385619
D_Zn	Closure	Mean	0.002810454	0.002246849	0.002209315	0.001924799	0.002029298	0.002255403	0.00288891	0.003257767	0.003206223	0.00269897	0.003200885	0.003171652

Appendix A.4.2: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ27

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.902564645	0.958964884	1.011383176	0.517382562	0.43458724	0.631301522	0.801930249	0.938744247	0.921096563	0.782617033	0.886149883	0.851725459
NO3_N	Post-Closure	Mean	1.158064246	0.941999495	1.046243191	0.55446893	0.263845503	0.65368861	1.031544209	1.063251019	1.076666594	1.017882228	1.012658954	1.074778795
NO2_N	Post-Closure	Mean	0.004341822	0.004093968	0.003928561	0.002526014	0.001619026	0.003364573	0.004524603	0.004845709	0.004730148	0.004148522	0.004323573	0.004531247
Br	Post-Closure	Mean	0.048331026	0.048827633	0.045399696	0.041856356	0.040857036	0.036114439	0.04334287	0.050432738	0.051084913	0.04539524	0.052143022	0.052430376
Cl	Post-Closure	Mean	16.2332859	16.32824516	16.33881187	9.160806656	6.429988861	12.23528194	16.11315346	16.24254799	16.74648666	16.14217949	16.60001183	15.91909313
F	Post-Closure	Mean	0.381030232	0.38216877	0.381405234	0.190628558	0.111138605	0.228045821	0.349791825	0.382148445	0.37636596	0.312970251	0.344399214	0.375591725
TDP	Post-Closure	Mean	0.018141588	0.016402984	0.015153446	0.01046435	0.009752436	0.01678881	0.022347942	0.023402404	0.018524108	0.016754182	0.017901056	0.018385757
SO4	Post-Closure	Mean	332.9238586	330.7768555	326.7902527	180.6786652	132.7104034	257.816925	337.3706665	345.8477478	351.3563538	331.874115	341.3043823	330.644928
T_CN	Post-Closure	Mean	0.00384348	0.003734587	0.003954045	0.003507871	0.003106163	0.003803682	0.003967978	0.003876549	0.003950777	0.003979118	0.003931195	0.00375154
WAD_CN	Post-Closure	Mean	0.002464711	0.002475651	0.002398466	0.002400133	0.002352719	0.002256067	0.001924765	0.001798502	0.001677564	0.00173113	0.001713222	0.001555849
T_Ag	Post-Closure	Mean	2.26351E-05	2.26822E-05	2.40835E-05	1.83485E-05	2.13623E-05	2.12935E-05	2.13071E-05	2.30124E-05	2.30683E-05	2.01077E-05	2.1259E-05	2.24784E-05
T_Al	Post-Closure	Mean	0.036767926	0.03275859	0.029583488	0.024536269	0.211367697	0.112508744	0.061575118	0.046588331	0.026519932	0.039239869	0.048634771	0.036912911
T_As	Post-Closure	Mean	0.000908488	0.000900565	0.000885286	0.000808734	0.000722012	0.000678838	0.000831892	0.000943299	0.000930413	0.000905946	0.000880733	0.000923242
T_B	Post-Closure	Mean	0.01230591	0.010566708	0.009775539	0.007076448	0.00761657	0.008259706	0.011713192	0.013004512	0.013310891	0.011760129	0.011659202	0.011948507
T_Ba	Post-Closure	Mean	0.006238806	0.006185337	0.006073949	0.006785547	0.005335261	0.004893926	0.005048872	0.005254537	0.005409809	0.004815653	0.004756512	0.004617708
T_Bi	Post-Closure	Mean	2.58308E-05	2.53071E-05	2.47001E-05	2.40379E-05	2.54762E-05	2.55767E-05	2.44893E-05	2.55642E-05	2.41737E-05	2.45818E-05	2.47316E-05	2.48077E-05
T_Be	Post-Closure	Mean	7.16513E-05	6.85414E-05	6.70396E-05	5.95049E-05	6.0428E-05	6.43398E-05	7.03249E-05	7.56981E-05	7.51494E-05	7.08919E-05	7.07304E-05	7.17856E-05
T_Ca	Post-Closure	Mean	86.69655609	85.81654358	84.72679901	54.64929581	38.31366348	69.90847015	91.26890564	94.27378082	96.32065582	89.92139435	92.09495544	86.15146637
T_Cd	Post-Closure	Mean	0.000166488	0.000175231	0.000178813	8.96162E-05	4.65715E-05	7.32927E-05	0.000104319	0.000121755	0.000137557	0.000117976	0.000128165	0.00015445
T_Co	Post-Closure	Mean	0.001294472	0.001366229	0.001398864	0.000654527	0.000383131	0.000670971	0.000976238	0.001114744	0.001131743	0.000933892	0.001057081	0.001209458
T_Cr	Post-Closure	Mean	0.000216023	0.00019812	0.000202517	0.000225953	0.00025901	0.000223017	0.000233433	0.000213014	0.00021462	0.000228819	0.000226817	0.000210265
T_Cu	Post-Closure	Mean	0.00043249	0.000390091	0.000385105	0.000326917	0.000550877	0.000365373	0.000447661	0.000459406	0.000461389	0.000429061	0.000419388	0.000428295
T_Fe	Post-Closure	Mean	0.069029056	0.065769903	0.055394538	0.071024753	0.160620287	0.089885198	0.072568446	0.066189781	0.056273859	0.05427631	0.057102025	0.055379368
T_Hg	Post-Closure	Mean	1.4345E-05	1.45407E-05	1.39237E-05	9.42107E-06	1.09614E-05	9.50737E-06	1.24591E-05	1.50087E-05	1.50867E-05	1.25202E-05	1.44428E-05	1.44993E-05
T_K	Post-Closure	Mean	40.33728409	42.38618851	43.08213043	18.38091469	9.487704277	20.58383179	32.14971542	37.08118057	36.52173233	29.64369583	33.69159698	38.06784821
T_Li	Post-Closure	Mean	0.067275845	0.068330042	0.067959636	0.029162768	0.016808428	0.037949938	0.059288565	0.067231268	0.065195397	0.052399043	0.059330888	0.065618739
T_Mg	Post-Closure	Mean	6.252435207	6.43651247	6.571253777	3.951380968	2.036135435	3.393086672	5.076200962	5.800466537	5.930698395	4.935738564	5.323687553	5.920402527
T_Mn	Post-Closure	Mean	0.416620284	0.43269515	0.442774951	0.21449618	0.108398288	0.217751771	0.323530138	0.370787531	0.371512234	0.312863439	0.353339285	0.396112651
T_Mo	Post-Closure	Mean	0.002458825	0.002522787	0.002531498	0.001394902	0.00078395	0.001174993	0.001660096	0.001962612	0.002237152	0.001882799	0.001971743	0.002359719
T_Na	Post-Closure	Mean	57.94853973	58.28785706	58.34323883	33.53807068	22.87277603	43.16238785	57.15295029	57.68865585	59.55732727	57.33017731	58.77648926	56.77001572
T_Ni	Post-Closure	Mean	0.00149286	0.001519813	0.001518247	0.000894658	0.00065439	0.000982332	0.001331229	0.001467181	0.001451444	0.001245497	0.001353295	0.001457417
T_P	Post-Closure	Mean	0.017733684	0.016295854	0.017059661	0.011079495	0.015159004	0.018146472	0.023680909	0.023161843	0.018847167	0.017342759	0.018034294	0.018604366
T_Pb	Post-Closure	Mean	0.000100213	0.000104431	0.000106286	6.27334E-05	6.53716E-05	5.67093E-05	6.94407E-05	7.70406E-05	8.58798E-05	8.02891E-05	8.31433E-05	9.59233E-05
T_S	Post-Closure	Mean	0.858572662	0.961830974	0.942385077	0.824524701	0.373985589	0.544314086	0.480610132	0.59057343	0.602238297	0.675781906	0.475034565	0.566570938
T_Sb	Post-Closure	Mean	0.007686952	0.00762967	0.007454906	0.003750704	0.002815859	0.005223933	0.007740801	0.00854974	0.008286427	0.006615216	0.007248701	0.007726865
T_Se	Post-Closure	Mean	0.000168949	0.000144632	0.000156431	9.1505E-05	7.15298E-05	9.52812E-05	0.000126549	0.000146802	0.000152503	0.000130986	0.000129042	0.000131607
T_Si	Post-Closure	Mean	5.41459465	5.087518692	4.970915794	5.559371948	4.527460098	4.626475334	4.892627239	4.982664108	4.908661842	5.027430058	5.023437023	5.089784145
T_Sn	Post-Closure	Mean	5.16209E-05	5.05434E-05	5.00193E-05	4.80304E-05	5.01418E-05	5.13893E-05	4.94552E-05	5.01568E-05	4.9621E-05	4.92963E-05	4.97451E-05	4.9608E-05
T_Sr	Post-Closure	Mean	0.20843409	0.199511811	0.191632763	0.12303023	0.079326779	0.144216582	0.217359677	0.234745637	0.230159223	0.190028071	0.202169672	0.212891981
T_Ti	Post-Closure	Mean	0.002622785	0.002268876	0.002285802	0.002095233	0.004160419	0.003351006	0.002485807	0.002653206	0.001902541	0.003353888	0.003252856	0.002157611
T_Tl	Post-Closure	Mean	3.19375E-05	2.6305E-05	2.52899E-05	2.04711E-05	1.38439E-05	2.44425E-05	2.9192E-05	3.44404E-05	3.47796E-05	2.88872E-05	2.86183E-05	2.91784E-05
T_U	Post-Closure	Mean	0.000234567	0.000208404	0.000220546	0.000217275	0.000168886	0.0001737	0.000202172	0.000214884	0.000232374	0.000197953	0.000201041	0.000206141
T_V	Post-Closure	Mean	0.017523931	0.017807893	0.017718645	0.007796744	0.004714172	0.009989104	0.01551721	0.017533915	0.017006984	0.013742484	0.015510271	0.017101886
T_Zn	Post-Closure	Mean	0.013356493	0.014146353	0.014482809	0.007561868	0.004486182	0.006065382	0.008077864	0.009540879	0.010811935	0.009550025	0.01029487	0.012432956
D_Ag	Post-Closure	Mean	2.23143E-05	2.2411E-05	2.38302E-05	1.79191E-05	1.15654E-05	2.08962E-05	2.10082E-05	2.27695E-05	2.26561E-05	1.95658E-05	2.08542E-05	2.21195E-05
D_Al	Post-Closure	Mean	0.02349725	0.019333759	0.015814511	0.016859012	0.150063589	0.089688733	0.043219797	0.0330442	0.018065931	0.028848687	0.037927944	0.024168231
D_As	Post-Closure	Mean	0.000898233	0.000884357	0.000882424	0.000770177	0.000623181	0.000632594	0.000794215	0.000893351	0.000913818	0.000869056	0.000836362	0.000902131
D_B	Post-Closure	Mean	0.012272942	0.010566708	0.009775539	0.007076447	0.00761657	0.008259705	0.011703559	0.012984751	0.013296979	0.011750294	0.011650208	0.011934334
D_Ba	Post-Closure	Mean	0.00595401	0.005765628	0.005790194	0.006511567	0.004856728	0.004488368	0.004764329	0.005125201	0.005359916	0.004577595	0.004543583	0.004507566
D_Bi	Post-Closure	Mean	2.57912E-05	2.52576E-05	2.46781E-05	2.40236E-05	2.54762E-05	2.55524E-05	2.44777E-05	2.55606E-05	2.41706E-05	2.45778E-05	2.47308E-05	2.48066E-05
D_Be	Post-Closure	Mean	7.16513E-05	6.85414E-05	6.70396E-05	5.95049E-05	6.0428E-05	6.43398E-05	7.03249E-05	7.56981E-05	7.51494E-05	7.08919E-05	7.07304E-05	7.17856E-05
D_Ca	Post-Closure	Mean	86.62535858	85.7138443	84.5865097	54.68939209	38.30550003	69.8295517	91.16397858	94.24222565	96.34107208	89.75273132	92.0332489	86.12960052
D_Cd	Post-Closure	Mean	0.00016637	0.000175127	0.000178716	8.87964E-05	4.4881E-05	7.31052E-05	0.00010556	0.000121599	0.000136705	0.000117699	0.000127823	0.000155198
D_Co	Post-Closure	Mean	0.001294344	0.00136612	0.001397543	0.000651704	0.000382772	0.000665939	0.00097611	0.001114639	0.001131582	0.000933664	0.001056922	0.001209309
D_Cr	Post-Closure	Mean	0.000176173	0.00017252	0.000169356	0.000165354	0.000203884	0.000186256	0.000177704	0.000182695	0.000173789	0.000182648	0.000188414	0.000186801
D_Cu	Post-Closure	Mean	0.000433914	0.00036612	0.000374177	0.00031651	0.000525531	0.000391415	0.000444455	0.000460321	0.000461161	0.000426149	0.000423807	0.000431541
D_Fe	Post-Closure	Mean	0.05008918	0.044645842	0.037028927	0.045965537	0.09253148	0.061190397	0.051724508	0.049726639	0.039135914	0.041495107	0.041882288	0.037649076
D_Hg	Post-Closure	Mean	1.43213E-05	1.4549E-05	1.39254E-05	9.42406E-06	1.1303E-05	8.72176E-06	1.24383E-05	1.50018E-05	1.50807E-05	1.25108E-05	1.44315E-05	1.44853E-05
D_K	Post-Closure	Mean	40.33785629	42.38143539	43.08438492	18.34469986	9.496874809	20.58250237	32.14710617	37.07268143	36.5194931	29.62874222	33.69320679	38.06565094
D_Li	Post-Closure	Mean	0.067275845	0.068330042	0.067959636	0.029162768	0.016808428	0.037949938	0.059288565	0.067231268	0.065195397	0.052399043	0.059330888	0.065618739
D_Mg	Post-Closure	Mean	6.246468544	6.435997486	6.53608799	3.945743561	2.027587175	3.381752014	5.068667412	5.795184135	5.923168182	4.929418564	5.33804512	5.941837311
D_Mn	Post-Closure	Mean	0.416000247	0.432367235	0.442427635	0.21358791	0.103488207	0.215491384	0.322668731	0.369925648	0.370697349	0.312177956	0.352659047	0.395387948
D_Mo	Post-Closure	Mean	0.002428504	0.002497792	0.002515609	0.001378083	0.000770835	0.001163384	0.001662955	0.001950567	0.002235085	0.001862629	0.001966931	0.002339178
D_Na	Post-Closure	Mean	57.90951157	58.23713303	58.2976532	33.48959351	22.82087326	43.04827118	57.11862564	57.63793564	59.52812576	57.26947784	58.69868851	56.7435379
D_Ni	Post-Closure	Mean	0.001492732	0.0015197	0.001517491	0.000887399	0.000653502	0.000982185	0.001331066	0.001467052	0.001451276	0.001245257	0.00135312	0.001457268
D_P	Post-Closure	Mean	0.054097775	0.051267598	0.044435054	0.026389852	0.026349053	0.025847575	0.034433529	0.052121148	0.028441884	0.073954917	0.068899632	0.027257061
D_Pb	Post-Closure	Mean	9.95875E-05	0.000103898	0.000105791	6.18832E-05	4.53383E-05	5.59402E-05	6.88505E-05	7.65553E-05	8.50802E-05	7.91484E-05	8.2356E-05	9.51696E-05
D_S	Post-Closure	Mean	0.823973656	0.937595129	0.958398938	0.746560693	0.367438436	0.535969973	0.480284929	0.51420325	0.594775021	0.440652132	0.446955651	0.440721661
D_Sb	Post-Closure	Mean	0.007686951	0.007629669	0.007454906	0.003750704	0.002815859	0.005223933	0.0077408	0.00854974	0.008286427	0.006615216	0.007248701	0.007726865
D_Se	Post-Closure	Mean	0.000155642	0.000130638	0.000151617	9.65565E-05	7.59888E-05	8.50261E-05	0.000126375	0.00014177	0.00014505	0.000114056	0.000114261	0.000124949
D_Si	Post-Closure	Mean	5.192635059	4.867956638	4.852079868	5.246767044	4.276026726	4.470384598	4.76008749	4.838090897	4.826849461	4.892044067	4.897572041	4.867601871
D_Sn	Post-Closure	Mean	5.16209E-05	5.05434E-05	5.00193E-05	4.80304E-05	5.01418E-05	5.13893E-05	4.94552E-05	5.01568E-05	4.9621E-05	4.92963E-05	4.97451E-05	4.9608E-05
D_Sr	Post-Closure	Mean	0.207998559	0.198851779	0.190574825	0.123530395	0.078778602	0.143728599	0.216398135	0.234927058	0.230588734	0.189635143	0.204590186	0.213100269
D_Ti	Post-Closure	Mean	0.001624329	0.001506401	0.001587285	0.001185918	0.002249255	0.001719882	0.001363522	0.001876671	0.001194941	0.002765243	0.002631436	0.001490212
D_Tl	Post-Closure	Mean	3.19247E-05	2.6289E-05	2.52899E-05	2.04665E-05	1.38427E-05	2.44156E-05	2.91883E-05	3.44376E-05	3.47778E-05	2.88859E-05	2.86172E-05	2.91773E-05
D_U	Post-Closure	Mean	0.000225057	0.000197577	0.000209085	0.00020394	0.00015331	0.000163373	0.000193328	0.000206772	0.000226648	0.000189716	0.000192722	0.000197027
D_V	Post-Closure	Mean	0.017513135	0.017798251	0.017708004	0.00776269	0.004533418	0.009954709	0.015482646	0.017507229	0.016994329	0.013720426	0.015473243	0.017080422
D_Zn	Post-Closure	Mean	0.013067471	0.013796343	0.014272119	0.0073197	0.003934443	0.005839545	0.007753647	0.009237183	0.010369647	0.008975462	0.010075692	0.011986274

Appendix A.4.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ26

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.108354472	0.112636834	0.108631514	0.050871156	0.021570198	0.027070798	0.044671871	0.065907478	0.070613652	0.071176335	0.094731294	0.100819305
NO3_N	Closure	Mean	0.038625341	0.036788017	0.04081443	0.032141231	0.026864531	0.035175089	0.037218653	0.035762381	0.036552649	0.030001324	0.031981092	0.037417438
NO2_N	Closure	Mean	0.000891793	0.000907177	0.000956767	0.00093196	0.000700192	0.001089708	0.001058739	0.001041848	0.000972364	0.000868838	0.000909158	0.000899734
Br	Closure	Mean	0.02585724	0.025395526	0.025927139	0.025840359	0.025605537	0.026067171	0.027464055	0.025817852	0.026228761	0.026201496	0.026534662	0.025765795
Cl	Closure	Mean	1.262539864	1.289624095	1.231364846	0.648125708	0.426454931	0.463999331	0.642444909	0.798486829	0.869855404	0.864957452	1.103553176	1.160059094
F	Closure	Mean	0.062630326	0.060368877	0.062109634	0.049556188	0.038499348	0.047626212	0.058330007	0.061811939	0.066489637	0.057865761	0.061322324	0.062230982
TDP	Closure	Mean	0.010097235	0.00976429	0.011382706	0.010760998	0.008620312	0.009568904	0.008188223	0.009119396	0.00777376	0.007963755	0.008849575	0.010050397
SO4	Closure	Mean	19.64535332	18.93125153	17.47862244	9.438492775	6.731690407	7.302519321	11.97180653	14.97197151	16.78144836	14.07224846	20.61708832	20.12678528
T_CN	Closure	Mean	0.002711627	0.002689191	0.002625603	0.002509211	0.002527799	0.002585304	0.002550733	0.002563372	0.002587199	0.002559018	0.002685509	0.002682776
WAD_CN	Closure	Mean	0.002522415	0.002494165	0.002436681	0.002427868	0.002500511	0.002541977	0.002486507	0.002455732	0.002460845	0.002434083	0.002487794	0.002503619
T_Ag	Closure	Mean	1.33694E-05	1.22672E-05	1.30016E-05	1.33486E-05	2.0515E-05	1.71785E-05	1.53377E-05	1.5835E-05	1.5873E-05	1.38454E-05	1.41449E-05	1.4704E-05
T_Al	Closure	Mean	0.03401063	0.029832093	0.024197325	0.026382595	0.234927952	0.121924393	0.089635439	0.054386951	0.035199981	0.058826197	0.0619618	0.047509212
T_As	Closure	Mean	0.000841553	0.000798782	0.000758056	0.000733887	0.000620575	0.00066344	0.000827552	0.000921734	0.000927492	0.000842768	0.000831474	0.00088872
T_B	Closure	Mean	0.01057535	0.00924928	0.007596019	0.006336857	0.006973555	0.007385494	0.010735605	0.011741322	0.012467219	0.011288567	0.01127242	0.012050307
T_Ba	Closure	Mean	0.006656113	0.006581552	0.00647836	0.007052881	0.005559656	0.005239398	0.006044366	0.006390167	0.006873239	0.00593595	0.005843244	0.006139638
T_Bi	Closure	Mean	2.52461E-05	2.49714E-05	2.44003E-05	2.42934E-05	2.50169E-05	2.54473E-05	2.48781E-05	2.45635E-05	2.46094E-05	2.4342E-05	2.48821E-05	2.50316E-05
T_Be	Closure	Mean	6.62839E-05	6.23446E-05	5.82701E-05	5.37869E-05	5.49987E-05	5.83716E-05	6.57853E-05	6.88214E-05	7.06954E-05	6.67721E-05	6.77658E-05	7.00249E-05
T_Ca	Closure	Mean	17.61519241	18.18919563	18.39673805	14.85074902	8.562742233	11.30461693	14.00558376	16.34209442	17.06478119	16.16085625	16.3342247	16.97331238
T_Cd	Closure	Mean	3.15535E-05	2.54941E-05	2.08303E-05	1.50503E-05	2.23983E-05	2.36973E-05	3.35546E-05	3.93345E-05	4.27285E-05	3.73529E-05	3.68321E-05	3.88407E-05
T_Co	Closure	Mean	0.000382939	0.000352335	0.000309262	0.000173557	0.000159114	0.000177879	0.000284964	0.000342561	0.000372131	0.00031922	0.000340951	0.000403194
T_Cr	Closure	Mean	0.000218119	0.000192921	0.000190846	0.000221092	0.000277564	0.000226605	0.000240069	0.000216157	0.000225642	0.000248545	0.000246385	0.000224595
T_Cu	Closure	Mean	0.000387653	0.000359628	0.000330168	0.000288441	0.000588576	0.000401278	0.000429113	0.000418113	0.000428807	0.000450822	0.000401786	0.000416794
T_Fe	Closure	Mean	0.065342225	0.061503138	0.051379632	0.066458523	0.178315029	0.099736795	0.089118689	0.083503187	0.076174304	0.082244284	0.078755915	0.081462428
T_Hg	Closure	Mean	9.28521E-06	8.13768E-06	7.03316E-06	5.42904E-06	8.3901E-06	7.6724E-06	8.90424E-06	9.91685E-06	1.06275E-05	9.42301E-06	9.66075E-06	1.06006E-05
T_K	Closure	Mean	1.826639295	1.646270752	1.456413388	1.017181635	1.02883327	1.14324522	1.592181444	1.909513712	2.057487726	1.76587534	2.067552328	2.072634459
T_Li	Closure	Mean	0.002770653	0.002271846	0.001825685	0.001293996	0.001697392	0.001891237	0.002848384	0.00335368	0.003606971	0.003125094	0.003606306	0.003535588
T_Mg	Closure	Mean	3.805293798	3.880316973	3.964134932	3.037621737	1.559707642	2.336323738	2.686729193	3.609387875	3.778828859	3.547617197	3.647525549	3.633320093
T_Mn	Closure	Mean	0.012759893	0.012047841	0.011366178	0.007120834	0.011700123	0.011184219	0.013392693	0.014159918	0.014014977	0.012427117	0.014485927	0.013232195
T_Mo	Closure	Mean	0.001919457	0.001816617	0.001691126	0.001106984	0.000852805	0.000856923	0.001301363	0.00163353	0.00184393	0.001498308	0.001573993	0.001939745
T_Na	Closure	Mean	6.726102829	6.873918056	6.721438885	4.244997978	2.507668972	3.069142818	4.088558674	4.988482952	5.269227028	5.128857136	5.635682583	6.073841095
T_Ni	Closure	Mean	0.000520101	0.000457515	0.000385194	0.000312067	0.000342232	0.000402759	0.000532271	0.000590038	0.000617951	0.000558171	0.000563155	0.000590593
T_P	Closure	Mean	0.017518381	0.018473089	0.018647617	0.011550346	0.016441809	0.015975557	0.016611334	0.019426243	0.017951393	0.017941104	0.016903322	0.016567677
T_Pb	Closure	Mean	3.92673E-05	3.69749E-05	3.58075E-05	2.92021E-05	5.69705E-05	4.36592E-05	4.56331E-05	4.31564E-05	4.32658E-05	3.96502E-05	4.05504E-05	4.17365E-05
T_S	Closure	Mean	0.998967111	1.029743075	0.964934349	0.902894735	0.444419742	0.654668093	0.601207614	0.89141953	0.976156116	0.968893409	0.880940139	0.944086671
T_Sb	Closure	Mean	0.00365689	0.002867601	0.002168454	0.001427021	0.002113979	0.002304511	0.003798792	0.004612947	0.005015531	0.004256617	0.00419281	0.004611123
T_Se	Closure	Mean	0.000144468	0.000127411	0.000134879	9.30925E-05	8.56076E-05	9.90092E-05	0.000121949	0.000142148	0.00014765	0.000130118	0.000136174	0.000143961
T_Si	Closure	Mean	5.599677563	5.344672203	5.031480312	5.719491005	4.613937855	4.653682232	5.145987511	5.268263817	5.274715424	5.357582092	5.39663744	5.736651897
T_Sn	Closure	Mean	5.04601E-05	4.98865E-05	4.87918E-05	4.86269E-05	5.00374E-05	5.08674E-05	4.97798E-05	4.91665E-05	4.92847E-05	4.87448E-05	4.98108E-05	5.009E-05
T_Sr	Closure	Mean	0.08976984	0.090351932	0.093620256	0.084402882	0.051115684	0.060289986	0.075376287	0.083465748	0.092951998	0.077318013	0.07884834	0.083600014
T_Ti	Closure	Mean	0.002840504	0.002822996	0.002617196	0.002902118	0.004411568	0.003514231	0.003001078	0.003010842	0.002741733	0.003960516	0.003899339	0.003033717
T_Tl	Closure	Mean	2.5876E-05	2.18483E-05	2.00499E-05	1.73752E-05	1.83511E-05	2.24399E-05	2.633E-05	3.18001E-05	3.342E-05	2.87791E-05	2.87106E-05	3.07821E-05
T_U	Closure	Mean	0.000215827	0.000203738	0.000205823	0.000213916	0.000183075	0.000173863	0.000196422	0.000206242	0.00023586	0.000198956	0.000204375	0.000220499
T_V	Closure	Mean	0.000921581	0.000757896	0.0006154	0.000500783	0.000682844	0.000724273	0.001050359	0.001095376	0.001175492	0.001000651	0.001211481	0.001161743
T_Zn	Closure	Mean	0.0029662	0.002906789	0.00245013	0.001946561	0.002507904	0.002545536	0.003107402	0.003395556	0.003450265	0.003123379	0.003139265	0.003310471
D_Ag	Closure	Mean	1.30767E-05	1.19432E-05	1.26732E-05	1.32624E-05	1.09211E-05	1.49663E-05	1.27441E-05	1.52903E-05	1.54783E-05	1.35847E-05	1.3829E-05	1.44631E-05
D_Al	Closure	Mean	0.020661006	0.013789881	0.010559695	0.016593032	0.158604786	0.090804264	0.05588967	0.037389763	0.022848718	0.036214605	0.045467194	0.030221825
D_As	Closure	Mean	0.000807416	0.000759369	0.000731731	0.000681459	0.000546417	0.000595451	0.000776797	0.000859197	0.00088994	0.000786178	0.00078249	0.000851027
D_B	Closure	Mean	0.010548204	0.009217109	0.007560417	0.006327617	0.006964225	0.007360518	0.010722341	0.011713442	0.012447413	0.01127407	0.011257268	0.012027561
D_Ba	Closure	Mean	0.006327395	0.006128458	0.006223511	0.006822615	0.004990938	0.00478878	0.005685669	0.006224717	0.006749547	0.00548071	0.005517705	0.005979605
D_Bi	Closure	Mean	2.5214E-05	2.49316E-05	2.43566E-05	2.42743E-05	2.50036E-05	2.54174E-05	2.4862E-05	2.45524E-05	2.46017E-05	2.43346E-05	2.48763E-05	2.50265E-05
D_Be	Closure	Mean	6.62839E-05	6.23446E-05	5.82701E-05	5.37869E-05	5.49987E-05	5.83716E-05	6.57853E-05	6.88214E-05	7.06954E-05	6.67721E-05	6.77658E-05	7.00249E-05
D_Ca	Closure	Mean	17.35757828	17.76023865	17.86634064	14.78091526	8.520302773	11.05766964	13.59599304	16.1181488	16.9024868	15.81513882	16.0839901	16.73357201
D_Cd	Closure	Mean	3.2111E-05	2.61584E-05	2.13278E-05	1.48603E-05	2.08555E-05	2.32092E-05	3.55467E-05	3.96817E-05	4.25379E-05	3.78417E-05	3.70869E-05	4.04899E-05
D_Co	Closure	Mean	0.000382316	0.000351596	0.000307044	0.000171582	0.000156103	0.000174027	0.000284512	0.000341392	0.000371326	0.000318638	0.000340316	0.000402638
D_Cr	Closure	Mean	0.000147922	0.000146162	0.000136192	0.000158357	0.000211143	0.000184935	0.000169356	0.000165229	0.000161035	0.000184094	0.000180151	0.000176908
D_Cu	Closure	Mean	0.000389432	0.000329983	0.000320847	0.000275698	0.000547611	0.000394347	0.000427745	0.000420452	0.000442774	0.000403912	0.000410123	0.000423727
D_Fe	Closure	Mean	0.046341445	0.041534804	0.033562742	0.042467967	0.100102648	0.067355849	0.062600188	0.0608842	0.052466024	0.05967797	0.055366546	0.055127762
D_Hg	Closure	Mean	9.27083E-06	8.1223E-06	7.01799E-06	5.42324E-06	8.63411E-06	7.17788E-06	8.91534E-06	9.87648E-06	1.06036E-05	9.40778E-06	9.64523E-06	1.05868E-05
D_K	Closure	Mean	1.814763546	1.623074174	1.442593813	0.996370196	1.006891608	1.130324006	1.584270477	1.887415051	2.039797783	1.730777383	2.067611933	2.062906027
D_Li	Closure	Mean	0.00277062	0.002271809	0.001825402	0.001293874	0.001697329	0.001891056	0.00284829	0.003353614	0.003606923	0.003125063	0.003606271	0.003535558
D_Mg	Closure	Mean	3.720359325	3.802324057	3.866282463	3.004312277	1.538830996	2.300844431	2.692413568	3.541664839	3.701864481	3.470168829	3.558234453	3.600983381
D_Mn	Closure	Mean	0.007923511	0.00709958	0.006075096	0.004241531	0.004881801	0.00597504	0.008339765	0.009431072	0.009804104	0.008985069	0.011012495	0.009544071
D_Mo	Closure	Mean	0.001869238	0.001760416	0.001641856	0.001083875	0.000830767	0.000834279	0.001291122	0.001603156	0.001829715	0.001456921	0.001554435	0.001891961
D_Na	Closure	Mean	6.680125237	6.815287113	6.674798012	4.163470745	2.49403739	2.944633484	4.075013161	4.909417152	5.231187344	5.092843533	5.559464931	6.067807674
D_Ni	Closure	Mean	0.000519391	0.000456488	0.000383168	0.000300309	0.000336687	0.000399101	0.000530782	0.000589011	0.000617129	0.00055761	0.000562495	0.00059004
D_P	Closure	Mean	0.069998227	0.064434335	0.057556115	0.064376861	0.043410398	0.038109429	0.047066461	0.071222633	0.056533959	0.110083073	0.106211968	0.074568689
D_Pb	Closure	Mean	3.71881E-05	3.45271E-05	3.18434E-05	2.82444E-05	2.86356E-05	3.09488E-05	3.70588E-05	3.92297E-05	4.03635E-05	3.7687E-05	3.82808E-05	3.98944E-05
D_S	Closure	Mean	0.887196779	0.996068478	1.027206898	0.778898954	0.422128081	0.626402438	0.609204531	0.91369158	0.994771481	0.88837254	0.954149067	0.872806132
D_Sb	Closure	Mean	0.003656848	0.00286752	0.002168288	0.00142695	0.002113944	0.002304411	0.003798738	0.004612881	0.005015474	0.004256576	0.004192767	0.004611085
D_Se	Closure	Mean	0.000134706	0.000109213	0.000133934	8.74414E-05	8.68994E-05	9.32152E-05	0.000118694	0.000133568	0.000141911	0.000111697	0.000114809	0.000129023
D_Si	Closure	Mean	5.40933466	5.13147831	4.911613941	5.367927551	4.320026875	4.490991592	5.013697624	5.082306385	5.164999008	5.180830479	5.21844244	5.337852478
D_Sn	Closure	Mean	5.04601E-05	4.98865E-05	4.87918E-05	4.86269E-05	5.00374E-05	5.08674E-05	4.97798E-05	4.91665E-05	4.92847E-05	4.87448E-05	4.98108E-05	5.009E-05
D_Sr	Closure	Mean	0.088691831	0.088156514	0.090546407	0.084941663	0.050549634	0.059179667	0.074471369	0.083673261	0.092515469	0.07560318	0.077194631	0.083433129
D_Ti	Closure	Mean	0.002024718	0.001815443	0.001560304	0.002045074	0.002622354	0.001945982	0.001845761	0.002388416	0.001535428	0.003524179	0.003378297	0.00237284
D_Tl	Closure	Mean	2.58657E-05	2.18355E-05	2.00358E-05	1.73715E-05	1.83473E-05	2.24285E-05	2.63248E-05	3.17966E-05	3.34175E-05	2.87775E-05	2.87088E-05	3.07805E-05
D_U	Closure	Mean	0.000209126	0.000193244	0.000194554	0.000199093	0.000168326	0.000163391	0.000187903	0.000198364	0.000229472	0.000189276	0.000196087	0.000210131
D_V	Closure	Mean	0.0008751	0.000738669	0.000593771	0.000436179	0.000541343	0.000630257	0.000937243	0.001053098	0.001117013	0.000986176	0.00111713	0.00108357
D_Zn	Closure	Mean	0.002354492	0.002200719	0.001953395	0.001790792	0.001956793	0.002179674	0.002671489	0.002864064	0.002776689	0.002391975	0.002666046	0.002471269

Appendix A.4.3: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ26

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.792246044	0.825710535	0.860260844	0.398656756	0.403594971	0.575086534	0.691703498	0.785853088	0.771523178	0.678972304	0.748209119	0.745496929
NO3_N	Post-Closure	Mean	0.999717295	0.824726224	0.896870494	0.464713573	0.243106797	0.5932073	0.92234385	0.923891306	0.947630227	0.907237053	0.90355885	0.947620749
NO2_N	Post-Closure	Mean	0.003860292	0.00362765	0.003433445	0.00219148	0.001531324	0.003092046	0.004029821	0.004268012	0.00421588	0.003746197	0.00390634	0.004044798
Br	Post-Closure	Mean	0.044418972	0.045044366	0.042049762	0.040209588	0.039921515	0.035066582	0.041149326	0.046533614	0.047206432	0.042947881	0.048407692	0.047978166
Cl	Post-Closure	Mean	14.21429348	14.22949505	14.02539063	7.701771736	5.962605953	11.12918758	14.41207504	14.17069244	14.6898613	14.36310959	14.63861942	14.01046181
F	Post-Closure	Mean	0.338071585	0.337426007	0.333081096	0.16593875	0.104823656	0.208688229	0.31212917	0.33661899	0.334872335	0.285109252	0.310256243	0.334068209
TDP	Post-Closure	Mean	0.017825207	0.015911788	0.015539304	0.01105137	0.009497264	0.015938267	0.020205645	0.021375377	0.016883878	0.015661772	0.017183304	0.01805974
SO4	Post-Closure	Mean	291.1760864	287.931366	280.16745	151.9682465	122.7119522	234.1358185	301.519928	301.0983582	307.5705261	294.8361511	300.4379272	290.6121521
T_CN	Post-Closure	Mean	0.003501691	0.003442372	0.003512865	0.003279289	0.003052255	0.003681045	0.003795166	0.003697963	0.003751468	0.003783234	0.003716131	0.003522925
WAD_CN	Post-Closure	Mean	0.002441351	0.002451665	0.002393444	0.002410207	0.002356647	0.002267822	0.001988144	0.001902417	0.001802759	0.001826257	0.001820648	0.001701531
T_Ag	Post-Closure	Mean	2.00891E-05	2.00811E-05	2.08555E-05	1.64148E-05	2.05665E-05	1.97938E-05	1.92979E-05	2.05782E-05	2.06007E-05	1.8522E-05	1.92999E-05	2.00612E-05
T_Al	Post-Closure	Mean	0.032325786	0.028596755	0.025873119	0.025321841	0.216832235	0.113708444	0.056526311	0.044276215	0.026741665	0.049310457	0.053070731	0.036656577
T_As	Post-Closure	Mean	0.000841713	0.000831131	0.000825897	0.000775198	0.000709426	0.000663748	0.000801588	0.000894744	0.000884563	0.000865642	0.000819779	0.000856488
T_B	Post-Closure	Mean	0.010463837	0.009238195	0.008337325	0.00675069	0.007430242	0.007933575	0.010748129	0.011611398	0.01180449	0.010685076	0.010530896	0.010556083
T_Ba	Post-Closure	Mean	0.006514608	0.006496376	0.006407168	0.007030295	0.005367433	0.004909463	0.005367504	0.00561601	0.005811888	0.005113844	0.004917535	0.004918273
T_Bi	Post-Closure	Mean	2.53372E-05	2.49433E-05	2.45464E-05	2.41303E-05	2.54567E-05	2.54835E-05	2.44705E-05	2.53589E-05	2.41497E-05	2.45296E-05	2.46156E-05	2.46812E-05
T_Be	Post-Closure	Mean	6.67046E-05	6.52319E-05	6.3724E-05	5.80028E-05	5.96785E-05	6.2917E-05	6.73184E-05	7.14208E-05	7.03762E-05	6.82064E-05	6.73356E-05	6.8196E-05
T_Ca	Post-Closure	Mean	77.34106445	76.41946411	74.67089844	48.38437271	35.77529526	64.01888275	82.75743103	83.4360199	85.8104248	80.79743195	82.02246094	76.95333099
T_Cd	Post-Closure	Mean	0.000140896	0.000148027	0.000148922	7.10805E-05	4.38482E-05	6.66968E-05	9.17338E-05	0.000105479	0.000118434	0.000104004	0.000111943	0.000131653
T_Co	Post-Closure	Mean	0.001100434	0.001158727	0.001170862	0.000555645	0.000359328	0.000611572	0.000861931	0.000970539	0.000981576	0.000830858	0.000927888	0.001038935
T_Cr	Post-Closure	Mean	0.000216511	0.000194076	0.000202792	0.000219788	0.000267249	0.000224458	0.000226217	0.000206964	0.000212046	0.00023377	0.000230434	0.000211611
T_Cu	Post-Closure	Mean	0.000385487	0.000368944	0.00036389	0.000311096	0.000565068	0.000377593	0.000418912	0.000423827	0.000422232	0.000446277	0.000389718	0.000391483
T_Fe	Post-Closure	Mean	0.062549062	0.059417419	0.049363803	0.065739229	0.164625973	0.091036424	0.06753327	0.066713259	0.057286043	0.065466821	0.062462073	0.058470819
T_Hg	Post-Closure	Mean	1.22991E-05	1.2202E-05	1.10435E-05	8.54799E-06	1.08882E-05	9.04144E-06	1.10911E-05	1.29833E-05	1.30377E-05	1.10366E-05	1.25958E-05	1.25385E-05
T_K	Post-Closure	Mean	34.99349976	36.26736069	36.30241394	15.37503624	8.769551277	18.62863541	28.22816467	32.15868759	32.04400253	26.62393951	29.94602013	33.44164658
T_Li	Post-Closure	Mean	0.058786634	0.059440702	0.05826994	0.024405461	0.015512708	0.034330286	0.052043773	0.058271874	0.057178445	0.047112983	0.052763466	0.057648648
T_Mg	Post-Closure	Mean	5.809290886	5.965262413	6.099338531	3.760509491	1.964424014	3.177656412	4.7118783	5.311074257	5.516081333	4.6060462	4.94351244	5.459680557
T_Mn	Post-Closure	Mean	0.364170045	0.376471728	0.379747689	0.179849058	0.100934997	0.197575465	0.285204023	0.321855009	0.32614851	0.282199651	0.314365029	0.348259717
T_Mo	Post-Closure	Mean	0.002181414	0.002236983	0.002242133	0.001255081	0.000748134	0.001091584	0.001532694	0.001777237	0.002015124	0.00171645	0.001774973	0.002088333
T_Na	Post-Closure	Mean	51.02703476	51.102005	50.43894958	28.59648895	21.25017929	39.36045456	51.34486771	50.62994385	52.53203201	51.20676422	52.02317047	50.18334579
T_Ni	Post-Closure	Mean	0.00133356	0.001351983	0.001334759	0.000791892	0.000625182	0.000912278	0.001198744	0.001303331	0.001301771	0.001144306	0.001229192	0.001308524
T_P	Post-Closure	Mean	0.016260184	0.015030941	0.014774696	0.010166292	0.015279183	0.017045751	0.021619871	0.020866999	0.017401481	0.016750794	0.01672435	0.017203867
T_Pb	Post-Closure	Mean	8.82947E-05	9.16662E-05	9.22282E-05	5.52638E-05	6.56339E-05	5.47057E-05	6.4063E-05	7.00927E-05	7.72224E-05	7.34702E-05	7.55309E-05	8.49823E-05
T_S	Post-Closure	Mean	0.853209078	0.951778293	0.87209332	0.863347709	0.362462103	0.544230998	0.450181872	0.569687068	0.629960537	0.675014019	0.436378807	0.567839682
T_Sb	Post-Closure	Mean	0.006709473	0.006627117	0.006394175	0.00317224	0.00261584	0.004732595	0.006794648	0.007405244	0.007213534	0.005953345	0.006449286	0.006767969
T_Se	Post-Closure	Mean	0.000141624	0.000125135	0.000131652	8.37343E-05	6.91259E-05	9.09642E-05	0.000117463	0.000130574	0.000129761	0.000114457	0.000117034	0.000116738
T_Si	Post-Closure	Mean	5.572374344	5.308578491	5.143449783	5.699543953	4.544940948	4.66264534	5.016525269	5.157473564	5.078882217	5.185281277	5.167490482	5.292103291
T_Sn	Post-Closure	Mean	5.06457E-05	5.0017E-05	4.95903E-05	4.82233E-05	5.01782E-05	5.1186E-05	4.93575E-05	4.9907E-05	4.93693E-05	4.91748E-05	4.94732E-05	4.931E-05
T_Sr	Post-Closure	Mean	0.192601711	0.184792101	0.17790018	0.117189065	0.075859196	0.134273946	0.199294314	0.212913215	0.211822554	0.176606759	0.186261728	0.195701599
T_Ti	Post-Closure	Mean	0.002624351	0.002312022	0.002323477	0.002711995	0.004220854	0.003456021	0.00279852	0.003009321	0.002364552	0.003574215	0.003502484	0.002616013
T_Tl	Post-Closure	Mean	2.53656E-05	2.14028E-05	1.95094E-05	1.7094E-05	1.31459E-05	2.2658E-05	2.57616E-05	2.93943E-05	2.94479E-05	2.51112E-05	2.46729E-05	2.43754E-05
T_U	Post-Closure	Mean	0.000213521	0.000201446	0.000219302	0.000212963	0.000169422	0.000172382	0.000191485	0.000200598	0.000217081	0.000186048	0.000187925	0.000191473
T_V	Post-Closure	Mean	0.015343581	0.015506179	0.015209185	0.006570957	0.004392747	0.009073666	0.013681439	0.015213998	0.014954243	0.012369908	0.013840497	0.015069202
T_Zn	Post-Closure	Mean	0.011497469	0.012317084	0.012261611	0.006070421	0.004290615	0.005634868	0.007260641	0.00843851	0.009484517	0.008553348	0.009140497	0.010759296
D_Ag	Post-Closure	Mean	1.98596E-05	1.98795E-05	2.06696E-05	1.60471E-05	1.10992E-05	1.94291E-05	1.903E-05	2.03665E-05	2.0287E-05	1.80738E-05	1.89838E-05	1.97942E-05
D_Al	Post-Closure	Mean	0.019798005	0.013592447	0.010395091	0.016335377	0.147690713	0.087997183	0.039054036	0.031123247	0.018165432	0.030927764	0.038489446	0.023018813
D_As	Post-Closure	Mean	0.000826373	0.000814484	0.000809706	0.000731099	0.000609803	0.000614082	0.000758725	0.000839143	0.000864233	0.000824071	0.000788787	0.000835666
D_B	Post-Closure	Mean	0.010438195	0.009238192	0.008337323	0.006750689	0.007430242	0.007933575	0.010739643	0.011594771	0.011793012	0.010676879	0.010523394	0.010544871
D_Ba	Post-Closure	Mean	0.006194746	0.00605242	0.006158328	0.00680221	0.004828682	0.004500221	0.005084539	0.005501217	0.005724988	0.004751761	0.004680369	0.00482212
D_Bi	Post-Closure	Mean	2.53066E-05	2.49047E-05	2.45288E-05	2.41197E-05	2.54567E-05	2.54607E-05	2.44603E-05	2.53558E-05	2.41471E-05	2.45263E-05	2.4615E-05	2.46803E-05
D_Be	Post-Closure	Mean	6.67046E-05	6.52319E-05	6.3724E-05	5.80028E-05	5.96785E-05	6.2917E-05	6.73184E-05	7.14208E-05	7.03762E-05	6.82064E-05	6.73356E-05	6.8196E-05
D_Ca	Post-Closure	Mean	77.29734802	76.30532074	74.42364502	48.39886475	35.76176834	63.92730713	82.56217194	83.48139191	85.79497528	80.60247803	81.95285797	76.95761871
D_Cd	Post-Closure	Mean	0.000140797	0.00014794	0.000148843	7.02351E-05	4.19976E-05	6.63955E-05	9.28348E-05	0.000105342	0.000117694	0.000103737	0.000111643	0.000132292
D_Co	Post-Closure	Mean	0.001100326	0.001158636	0.001169778	0.000553093	0.000358625	0.000606969	0.000861815	0.000970446	0.00098144	0.00083068	0.000927748	0.001038811
D_Cr	Post-Closure	Mean	0.00017086	0.000167302	0.000163666	0.0001635	0.000205237	0.00018723	0.000174373	0.000177082	0.000173117	0.000184431	0.000189039	0.000182367
D_Cu	Post-Closure	Mean	0.000386839	0.000346402	0.000354494	0.000301703	0.000525661	0.000382538	0.000416186	0.000423334	0.000431222	0.000397415	0.000393404	0.000394009
D_Fe	Post-Closure	Mean	0.044190053	0.039905805	0.032050744	0.041942734	0.092356421	0.061479513	0.04988154	0.049476016	0.039801821	0.047732379	0.043984581	0.039753892
D_Hg	Post-Closure	Mean	1.22812E-05	1.2209E-05	1.10449E-05	8.55064E-06	1.10562E-05	8.15311E-06	1.10707E-05	1.29774E-05	1.30327E-05	1.10288E-05	1.25866E-05	1.25274E-05
D_K	Post-Closure	Mean	34.99475098	36.26277924	36.30327225	15.34150314	8.777376175	18.62662506	28.22574425	32.15146637	32.04101181	26.60912704	29.9532795	33.44309616
D_Li	Post-Closure	Mean	0.058786634	0.059440702	0.05826994	0.024405461	0.015512708	0.034330286	0.052043773	0.058271874	0.057178445	0.047112983	0.052763466	0.057648648
D_Mg	Post-Closure	Mean	5.792595387	5.96356678	6.038757324	3.751691103	1.954907775	3.163121939	4.72895956	5.308945656	5.506706715	4.598493576	4.945799828	5.49373579
D_Mn	Post-Closure	Mean	0.363463283	0.376077682	0.379305184	0.178863421	0.095601641	0.195091799	0.284297884	0.320856363	0.325166315	0.281140447	0.313527703	0.347294718
D_Mo	Post-Closure	Mean	0.002148866	0.002201949	0.002212529	0.001240359	0.000733097	0.001078861	0.001531674	0.001761349	0.002006572	0.001688697	0.001764558	0.002059126
D_Na	Post-Closure	Mean	50.98701859	51.05791855	50.39374924	28.53001785	21.21335411	39.23400879	51.33120728	50.56847382	52.49599075	51.15272903	51.966465	50.17183304
D_Ni	Post-Closure	Mean	0.001333448	0.001351884	0.00133411	0.000785329	0.000624358	0.000912098	0.001198597	0.001303216	0.001301621	0.001144085	0.001229035	0.001308393
D_P	Post-Closure	Mean	0.060584579	0.058086824	0.053203262	0.052302063	0.036620922	0.036376461	0.04710703	0.063986987	0.04426875	0.084500901	0.081063405	0.049607862
D_Pb	Post-Closure	Mean	8.77694E-05	9.12199E-05	9.18208E-05	5.44921E-05	4.39083E-05	5.29947E-05	6.35348E-05	6.96644E-05	7.65365E-05	7.24596E-05	7.48449E-05	8.4347E-05
D_S	Post-Closure	Mean	0.692694128	0.875705838	0.931520939	0.738811731	0.356680691	0.517624438	0.449851871	0.507147551	0.614028156	0.407823771	0.458612621	0.399861634
D_Sb	Post-Closure	Mean	0.006709473	0.006627117	0.006394174	0.00317224	0.00261584	0.004732595	0.006794648	0.007405244	0.007213534	0.005953345	0.006449286	0.006767969
D_Se	Post-Closure	Mean	0.000132297	0.000106698	0.000130779	8.48415E-05	7.21479E-05	8.15164E-05	0.000112228	0.000121907	0.000124273	9.99467E-05	9.93308E-05	0.000105025
D_Si	Post-Closure	Mean	5.38435173	5.097570419	5.047361374	5.345984459	4.287734509	4.500820637	4.900695324	5.000964165	4.97703743	5.024013996	5.025575161	5.010174751
D_Sn	Post-Closure	Mean	5.06457E-05	5.0017E-05	4.95903E-05	4.82233E-05	5.01782E-05	5.1186E-05	4.93575E-05	4.9907E-05	4.93693E-05	4.91748E-05	4.94732E-05	4.931E-05
D_Sr	Post-Closure	Mean	0.191913828	0.18393673	0.176267579	0.11768008	0.075184144	0.133712322	0.19876413	0.213564485	0.211868346	0.176023021	0.187770218	0.195629135
D_Ti	Post-Closure	Mean	0.001763661	0.001662121	0.001743085	0.001897643	0.002474319	0.001950497	0.001828939	0.002364005	0.001773711	0.003076898	0.002983701	0.002063705
D_Tl	Post-Closure	Mean	2.53557E-05	2.13904E-05	1.94961E-05	1.70906E-05	1.31448E-05	2.26337E-05	2.57583E-05	2.93919E-05	2.94464E-05	2.51102E-05	2.4672E-05	2.43746E-05
D_U	Post-Closure	Mean	0.000206729	0.000190969	0.000207739	0.00019825	0.000152423	0.000161716	0.000182934	0.000192092	0.000209756	0.000176445	0.0001794	0.000181343
D_V	Post-Closure	Mean	0.015317812	0.015497799	0.015200084	0.006521131	0.00419481	0.009017299	0.013606793	0.015190599	0.014919787	0.012350085	0.013773734	0.015020019
D_Zn	Post-Closure	Mean	0.011178812	0.011947066	0.012038812	0.005880025	0.003756468	0.00542496	0.006972375	0.008129459	0.009057119	0.007995424	0.008827277	0.010234656

Appendix A.4.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ7

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.087124906	0.091436155	0.086470664	0.036185365	0.019976448	0.02538586	0.039435726	0.055809602	0.059617143	0.058646578	0.078914598	0.080589436
NO3_N	Closure	Mean	0.034926143	0.034504674	0.035452463	0.024559703	0.023900848	0.03293848	0.032366287	0.030378113	0.030578151	0.025466021	0.026713256	0.031614047
NO2_N	Closure	Mean	0.000813113	0.001022253	0.000854172	0.000961226	0.000678946	0.001084278	0.000987951	0.000954986	0.000890472	0.000804142	0.000838741	0.000921886
Br	Closure	Mean	0.025637103	0.025289061	0.025600838	0.025509387	0.025546342	0.025973205	0.027081404	0.025688235	0.02599396	0.025958849	0.026205076	0.025548117
Cl	Closure	Mean	1.056018829	1.086701989	1.005910635	0.509782195	0.409397542	0.447855651	0.589938521	0.706564784	0.761251748	0.753088415	0.955056965	0.969436407
F	Closure	Mean	0.05874268	0.057019129	0.059161689	0.051380828	0.038513385	0.046943009	0.056343716	0.058405474	0.063032098	0.055591188	0.058681857	0.058688555
TDP	Closure	Mean	0.010112296	0.008639374	0.012559102	0.011381041	0.008297813	0.009427586	0.007766367	0.009479309	0.007292564	0.007657485	0.007782045	0.008516501
SO4	Closure	Mean	16.15029716	15.80038261	14.16168404	6.92821455	6.038754463	6.787657738	10.54777718	12.78098583	14.21002007	12.13545132	17.36369324	16.32433128
T_CN	Closure	Mean	0.002668936	0.002653189	0.002605047	0.002510519	0.002525617	0.002577627	0.002541018	0.002549785	0.002570924	0.002549018	0.002649256	0.002645121
WAD_CN	Closure	Mean	0.002515154	0.002493449	0.002450826	0.002455873	0.002500631	0.002537651	0.002486994	0.002461233	0.00246612	0.002446228	0.002487214	0.00250064
T_Ag	Closure	Mean	1.16545E-05	1.08504E-05	1.11693E-05	1.40717E-05	1.97901E-05	1.69474E-05	1.38322E-05	1.40716E-05	1.39646E-05	1.23817E-05	1.25328E-05	1.4746E-05
T_Al	Closure	Mean	0.03201836	0.028689861	0.022227427	0.027857754	0.262848437	0.125964656	0.083322406	0.052867368	0.033302229	0.05395953	0.061849054	0.044697043
T_As	Closure	Mean	0.000764022	0.000729726	0.000672322	0.000636349	0.000626354	0.000649318	0.000792009	0.000869747	0.000869723	0.000784409	0.000769462	0.000800577
T_B	Closure	Mean	0.009403707	0.008398402	0.0069903	0.005330119	0.006755555	0.007149186	0.009956961	0.010629273	0.011143571	0.010238477	0.010133274	0.010002082
T_Ba	Closure	Mean	0.006888554	0.006937779	0.006945578	0.00763371	0.005909438	0.005314161	0.006192979	0.0066616	0.007127875	0.006098848	0.005959698	0.006497027
T_Bi	Closure	Mean	2.51692E-05	2.49585E-05	2.45337E-05	2.45687E-05	2.5017E-05	2.54024E-05	2.48815E-05	2.46176E-05	2.46621E-05	2.44633E-05	2.48759E-05	2.50027E-05
T_Be	Closure	Mean	6.28371E-05	5.98567E-05	5.63267E-05	5.26851E-05	5.45096E-05	5.77122E-05	6.36279E-05	6.56998E-05	6.70103E-05	6.39697E-05	6.45162E-05	6.55621E-05
T_Ca	Closure	Mean	16.85755157	17.48664856	17.99474144	14.89833069	8.258991241	10.93970299	13.45474911	15.60645676	16.61517143	15.50411606	15.24315262	16.20790672
T_Cd	Closure	Mean	2.55017E-05	2.33552E-05	1.71735E-05	1.23902E-05	2.14023E-05	2.22628E-05	3.00001E-05	3.329E-05	3.58481E-05	3.23719E-05	3.15113E-05	3.13604E-05
T_Co	Closure	Mean	0.000314251	0.000292837	0.000249484	0.000130736	0.000160908	0.000167979	0.000253243	0.000294798	0.000315542	0.00027483	0.000289287	0.000326626
T_Cr	Closure	Mean	0.000209477	0.000193672	0.000185078	0.000216927	0.000318028	0.000232807	0.000236653	0.000209813	0.000214617	0.000235998	0.000249074	0.000221493
T_Cu	Closure	Mean	0.000358859	0.000337817	0.000311732	0.000285068	0.000628064	0.00042065	0.00043558	0.000390418	0.000401474	0.000416776	0.000374403	0.000379934
T_Fe	Closure	Mean	0.07456588	0.073219709	0.063315228	0.102383815	0.213059872	0.106543191	0.093383588	0.096254863	0.091142252	0.092686392	0.090457752	0.091247462
T_Hg	Closure	Mean	7.87429E-06	7.02198E-06	5.98468E-06	4.39857E-06	8.50393E-06	7.27575E-06	8.22765E-06	8.70091E-06	9.1922E-06	8.51509E-06	8.37319E-06	8.8171E-06
T_K	Closure	Mean	1.549096465	1.421548724	1.248047471	0.933592796	0.960926056	1.078667283	1.420868874	1.685724378	1.784337282	1.546182752	1.765393376	1.725411177
T_Li	Closure	Mean	0.002296891	0.001919829	0.001518687	0.001020266	0.001555271	0.001771774	0.00253084	0.002885111	0.003058163	0.002687645	0.003048914	0.002873131
T_Mg	Closure	Mean	3.682945251	3.778470278	3.909894705	3.296807528	1.538404107	2.281047583	2.6248312	3.463544607	3.693214178	3.418063879	3.442317724	3.519375563
T_Mn	Closure	Mean	0.013231409	0.012597553	0.013038565	0.011099565	0.013349605	0.01129736	0.013164473	0.01366125	0.013877964	0.013071688	0.014349408	0.014151004
T_Mo	Closure	Mean	0.001663843	0.001613292	0.001483422	0.000942699	0.000782351	0.000811598	0.001178335	0.001472425	0.001646979	0.00135251	0.001385832	0.001663004
T_Na	Closure	Mean	6.036533356	6.243452549	6.025397778	4.035802841	2.427284956	2.994293928	3.902607441	4.693971634	4.932134628	4.755010128	5.164367676	5.481341362
T_Ni	Closure	Mean	0.000463503	0.000416109	0.00035386	0.00029439	0.000380832	0.000389551	0.000493951	0.000534017	0.000552814	0.000506764	0.00050653	0.000515158
T_P	Closure	Mean	0.015385416	0.016170878	0.015793821	0.010362216	0.017150782	0.015795615	0.015658561	0.017543167	0.016491445	0.017010981	0.015328111	0.014266594
T_Pb	Closure	Mean	3.63081E-05	3.46155E-05	3.33444E-05	2.79563E-05	6.67378E-05	4.47852E-05	4.26934E-05	4.01959E-05	4.0047E-05	3.722E-05	3.77712E-05	3.80656E-05
T_S	Closure	Mean	0.932978451	0.972222209	0.915980518	0.911457181	0.423660606	0.627463102	0.558242679	0.819147825	0.84901768	0.922715783	0.769627273	0.877872288
T_Sb	Closure	Mean	0.002905071	0.002308353	0.001678311	0.000947583	0.001865725	0.002110949	0.003292291	0.003864243	0.004138923	0.003555753	0.003447742	0.003601998
T_Se	Closure	Mean	0.000126783	0.000113721	0.000115159	7.88753E-05	8.36473E-05	9.64359E-05	0.000115873	0.000127567	0.000128309	0.000123485	0.000124061	0.000125547
T_Si	Closure	Mean	5.713523388	5.506457329	5.342348576	5.847517967	4.68926239	4.670552254	5.244445324	5.438430786	5.416730404	5.506650448	5.550643444	5.867407322
T_Sn	Closure	Mean	5.03112E-05	4.98707E-05	4.9055E-05	4.91593E-05	5.0037E-05	5.07787E-05	4.97827E-05	4.9268E-05	4.9378E-05	4.89752E-05	4.97884E-05	5.00247E-05
T_Sr	Closure	Mean	0.088780686	0.090076111	0.093655936	0.086197525	0.049702778	0.058976404	0.073968843	0.082287043	0.092421591	0.07639797	0.076964043	0.083257675
T_Ti	Closure	Mean	0.002785267	0.002612503	0.002173025	0.003278645	0.005590896	0.003588055	0.003256936	0.003323017	0.002766074	0.004126218	0.004075665	0.003063404
T_Tl	Closure	Mean	2.15482E-05	1.85248E-05	1.65811E-05	1.69599E-05	1.73501E-05	2.17804E-05	2.34572E-05	2.74146E-05	2.84119E-05	2.48252E-05	2.44504E-05	2.7269E-05
T_U	Closure	Mean	0.000203731	0.000199883	0.000216762	0.00021432	0.000183304	0.000171334	0.000184541	0.000191832	0.000218542	0.000184395	0.000190208	0.000205194
T_V	Closure	Mean	0.000781565	0.000657178	0.000531322	0.00051534	0.000764016	0.000718197	0.001009728	0.001028418	0.001064529	0.00091986	0.001096251	0.001013736
T_Zn	Closure	Mean	0.002660112	0.00262672	0.002231276	0.001818053	0.002468503	0.002456936	0.002889928	0.003084509	0.003105426	0.002853179	0.002842506	0.002910855
D_Ag	Closure	Mean	1.1418E-05	1.05867E-05	1.09113E-05	1.40115E-05	1.02136E-05	1.49579E-05	1.17067E-05	1.36138E-05	1.36378E-05	1.21625E-05	1.22601E-05	1.45533E-05
D_Al	Closure	Mean	0.016106045	0.012353319	0.008762252	0.015389583	0.158521146	0.091322191	0.05134546	0.034715313	0.020120718	0.032710377	0.042214502	0.026162941
D_As	Closure	Mean	0.000722678	0.000688274	0.000644976	0.000578067	0.000522984	0.000579123	0.000737708	0.000815713	0.000826568	0.000727341	0.000714209	0.000753865
D_B	Closure	Mean	0.00938174	0.00837224	0.006962704	0.005245639	0.006746934	0.007125681	0.009945216	0.010605642	0.011127036	0.010226242	0.010120458	0.009983752
D_Ba	Closure	Mean	0.006594793	0.006516356	0.00670068	0.007284854	0.004976379	0.00480743	0.005841823	0.006513319	0.0070242	0.005742187	0.00567968	0.00634554
D_Bi	Closure	Mean	2.51433E-05	2.49263E-05	2.45E-05	2.45558E-05	2.5005E-05	2.53744E-05	2.48673E-05	2.46082E-05	2.46556E-05	2.44571E-05	2.4871E-05	2.49986E-05
D_Be	Closure	Mean	6.28371E-05	5.98567E-05	5.63267E-05	5.26851E-05	5.45096E-05	5.77122E-05	6.36279E-05	6.56998E-05	6.70103E-05	6.39697E-05	6.45162E-05	6.55621E-05
D_Ca	Closure	Mean	16.63091278	17.23738289	17.39971161	14.95310879	8.183113098	10.75926018	13.04429626	15.42196178	16.4836483	15.07435608	14.95451927	15.98614979
D_Cd	Closure	Mean	2.59527E-05	2.14772E-05	1.76608E-05	1.14908E-05	1.92872E-05	2.16457E-05	3.17324E-05	3.35812E-05	3.54744E-05	3.27836E-05	3.14212E-05	3.26639E-05
D_Co	Closure	Mean	0.000313746	0.000292234	0.000247776	0.000127567	0.000143504	0.000163528	0.000252854	0.000293814	0.000314873	0.00027434	0.000288751	0.000324029
D_Cr	Closure	Mean	0.000147712	0.000144479	0.000138715	0.000156041	0.00021222	0.000185546	0.000166049	0.000162268	0.000156956	0.000178104	0.000178934	0.000170352
D_Cu	Closure	Mean	0.000360415	0.00031416	0.000304886	0.000268111	0.000555469	0.00040573	0.000429812	0.00039238	0.000408695	0.000378344	0.000381464	0.000385531
D_Fe	Closure	Mean	0.051312808	0.047215316	0.039852422	0.062263265	0.101725318	0.068381622	0.067106836	0.067966111	0.0633118	0.066828437	0.063194133	0.059534598
D_Hg	Closure	Mean	7.86271E-06	7.00949E-06	5.97263E-06	4.39459E-06	8.26658E-06	6.81622E-06	8.03995E-06	8.66751E-06	9.17248E-06	8.25505E-06	8.36023E-06	8.96734E-06
D_K	Closure	Mean	1.54178369	1.402539492	1.226919413	0.906624854	0.929667294	1.066593766	1.41217339	1.668423057	1.76887238	1.517541766	1.772634745	1.710471153
D_Li	Closure	Mean	0.002296864	0.001919799	0.001518467	0.001020186	0.001555213	0.001771604	0.002530757	0.002885055	0.003058122	0.002687618	0.003048884	0.002873106
D_Mg	Closure	Mean	3.620266914	3.754126787	3.819235325	3.287558794	1.511039138	2.246602058	2.625985622	3.404853106	3.618782997	3.310218811	3.326438427	3.468170881
D_Mn	Closure	Mean	0.009174109	0.008332204	0.008015199	0.008262117	0.005040168	0.005941965	0.008321242	0.009388538	0.009816969	0.009613877	0.011024173	0.01053608
D_Mo	Closure	Mean	0.001620668	0.001553427	0.001426311	0.000921763	0.000760178	0.000788345	0.001165143	0.001436023	0.001634806	0.001312565	0.001360474	0.001611758
D_Na	Closure	Mean	6.010155201	6.167183399	6.001141548	3.932435989	2.419539928	2.855585337	3.890818596	4.628173351	4.891218662	4.69779253	5.084134102	5.481799603
D_Ni	Closure	Mean	0.000462929	0.000415273	0.000352298	0.000286006	0.000327393	0.000389075	0.000492643	0.000533147	0.000552131	0.000506291	0.000505975	0.000506116
D_P	Closure	Mean	0.06052345	0.056626394	0.049772665	0.046114728	0.040900737	0.042089984	0.044026483	0.083705679	0.061870806	0.116440311	0.113232248	0.061329164
D_Pb	Closure	Mean	3.46238E-05	3.26194E-05	3.02449E-05	2.72991E-05	2.82797E-05	3.0485E-05	3.54114E-05	3.68731E-05	3.76347E-05	3.55677E-05	3.58643E-05	3.65882E-05
D_S	Closure	Mean	0.794257164	0.970609069	0.999734402	0.789106011	0.404474258	0.601602554	0.565738082	0.812033176	0.929513752	0.88738668	0.881567836	0.824967206
D_Sb	Closure	Mean	0.002905037	0.002308288	0.001678182	0.000952337	0.001865693	0.002110855	0.003292244	0.003864186	0.004138875	0.003555719	0.003447706	0.003601968
D_Se	Closure	Mean	0.000118496	9.97645E-05	0.000108655	7.56766E-05	8.15727E-05	8.99933E-05	0.000107968	0.000121887	0.000121395	0.000106108	0.000101243	0.000112415
D_Si	Closure	Mean	5.58339262	5.364048004	5.178467751	5.488577366	4.356359959	4.511016846	5.107662678	5.243611336	5.332975388	5.288516045	5.360794544	5.519006252
D_Sn	Closure	Mean	5.03112E-05	4.98707E-05	4.9055E-05	4.91593E-05	5.0037E-05	5.07787E-05	4.97827E-05	4.9268E-05	4.9378E-05	4.89752E-05	4.97884E-05	5.00247E-05
D_Sr	Closure	Mean	0.088962309	0.0896134	0.090129845	0.086355187	0.048926432	0.057911981	0.073177621	0.082259148	0.092061557	0.074999645	0.074760586	0.082674079
D_Ti	Closure	Mean	0.00164157	0.001486572	0.001225714	0.001460943	0.002597885	0.001917973	0.001721682	0.002800289	0.001721453	0.003759137	0.003637045	0.001925289
D_Tl	Closure	Mean	2.15398E-05	1.85145E-05	1.65702E-05	1.69575E-05	1.67468E-05	2.17698E-05	2.34526E-05	2.74115E-05	2.84098E-05	2.48238E-05	2.44488E-05	2.72677E-05
D_U	Closure	Mean	0.000197384	0.000190868	0.000203773	0.000198993	0.000163649	0.000160159	0.000176982	0.000184914	0.000212327	0.000175186	0.000182129	0.00019312
D_V	Closure	Mean	0.000744664	0.000641595	0.000514414	0.000349296	0.000520146	0.000598164	0.000868963	0.000972101	0.000963512	0.000863233	0.000960918	0.000894602
D_Zn	Closure	Mean	0.002172843	0.002057648	0.001847432	0.001557364	0.001911771	0.002111833	0.002445481	0.002509992	0.002403331	0.002076791	0.002316796	0.00218894

Appendix A.4.4: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ7

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.706071198	0.724410415	0.73093015	0.302586526	0.372850567	0.52793324	0.60913074	0.677820146	0.68177259	0.612240791	0.648048818	0.664242208
NO3_N	Post-Closure	Mean	0.882328629	0.733245492	0.761738658	0.360727608	0.22252056	0.543313265	0.833981276	0.818412602	0.849111497	0.817204416	0.814385295	0.846480012
NO2_N	Post-Closure	Mean	0.003485721	0.003385054	0.002983581	0.001927652	0.001445152	0.002915281	0.003646812	0.003833018	0.00382559	0.0034223	0.003566166	0.003715417
Br	Post-Closure	Mean	0.041890863	0.042408828	0.039284226	0.037736923	0.038998358	0.03422372	0.039483368	0.043776292	0.044471566	0.041060533	0.04565135	0.044796739
Cl	Post-Closure	Mean	12.63953114	12.59792805	11.93931293	6.046442986	5.496217728	10.21089935	13.05205727	12.6155014	13.12496281	12.93087578	13.07375813	12.50515366
F	Post-Closure	Mean	0.304816246	0.303062081	0.290361434	0.141258195	0.099089012	0.193542033	0.283358604	0.302469432	0.304153413	0.263215184	0.283553958	0.302529305
TDP	Post-Closure	Mean	0.016994972	0.014545209	0.015660437	0.011170772	0.009131624	0.015170421	0.018564764	0.020202512	0.01564803	0.014824625	0.015771452	0.016429914
SO4	Post-Closure	Mean	258.6255188	254.6765137	238.1700287	118.8026123	112.7579041	214.4811401	272.6152344	267.4444275	274.3011169	265.0451355	268.1193237	259.0427856
T_CN	Post-Closure	Mean	0.003356838	0.003332586	0.003340861	0.003123034	0.003001682	0.003583746	0.003664088	0.003575949	0.003612059	0.003635541	0.003577381	0.003382142
WAD_CN	Post-Closure	Mean	0.002449187	0.002459259	0.002416469	0.002435615	0.002367584	0.002282693	0.002046301	0.001987759	0.001903981	0.001911982	0.001917093	0.001825699
T_Ag	Post-Closure	Mean	1.83808E-05	1.83156E-05	1.84847E-05	1.61584E-05	2.00155E-05	1.93756E-05	1.77467E-05	1.87693E-05	1.89356E-05	1.72881E-05	1.7848E-05	1.95103E-05
T_Al	Post-Closure	Mean	0.030713953	0.027730713	0.023710528	0.026875444	0.23992148	0.118287437	0.05550852	0.044407897	0.026382556	0.046584085	0.054467864	0.036255911
T_As	Post-Closure	Mean	0.000791249	0.000778388	0.000763214	0.000711157	0.000707549	0.000648973	0.000773547	0.000856821	0.00085137	0.000827571	0.000781812	0.00080793
T_B	Post-Closure	Mean	0.009342841	0.008652718	0.007764104	0.005987559	0.007250982	0.007648169	0.010026613	0.010696155	0.010786589	0.009915967	0.00971567	0.009329951
T_Ba	Post-Closure	Mean	0.006769917	0.006863513	0.006883858	0.007568227	0.005707601	0.005002584	0.005583989	0.005976317	0.006189523	0.005353842	0.005154443	0.005395222
T_Bi	Post-Closure	Mean	2.52497E-05	2.49383E-05	2.46481E-05	2.43773E-05	2.54646E-05	2.54393E-05	2.454E-05	2.53237E-05	2.42589E-05	2.46088E-05	2.46631E-05	2.47358E-05
T_Be	Post-Closure	Mean	6.44335E-05	6.31322E-05	6.15726E-05	5.63965E-05	5.89931E-05	6.18305E-05	6.52004E-05	6.854E-05	6.76201E-05	6.62791E-05	6.53361E-05	6.57803E-05
T_Ca	Post-Closure	Mean	70.17967224	69.2011261	65.84083557	40.98817062	33.29721451	59.09854507	75.71569824	75.36103058	78.03436279	73.82453918	74.15062714	69.98886108
T_Cd	Post-Closure	Mean	0.000122078	0.000129689	0.000124455	5.47207E-05	4.14777E-05	6.15265E-05	8.24851E-05	9.32252E-05	0.000104526	9.35711E-05	9.98823E-05	0.000115017
T_Co	Post-Closure	Mean	0.000961434	0.001007474	0.000981295	0.00044577	0.000343172	0.000563705	0.000773196	0.000863005	0.000876304	0.000758157	0.000832675	0.000913231
T_Cr	Post-Closure	Mean	0.000208479	0.00019494	0.000195109	0.000216033	0.000302751	0.000230593	0.000224984	0.000202817	0.000205177	0.000225993	0.000236008	0.000211999
T_Cu	Post-Closure	Mean	0.000357878	0.00035503	0.000347249	0.000304407	0.000603819	0.0003978	0.000427638	0.000400316	0.000400184	0.000419287	0.00037028	0.000368281
T_Fe	Post-Closure	Mean	0.072130755	0.0713287	0.061616689	0.098376304	0.192447513	0.098171875	0.074146472	0.080756016	0.072968312	0.07621967	0.074796751	0.069884829
T_Hg	Post-Closure	Mean	1.08536E-05	1.07519E-05	9.76622E-06	7.41161E-06	1.08117E-05	8.55863E-06	1.0249E-05	1.1545E-05	1.16003E-05	1.01338E-05	1.12217E-05	1.11106E-05
T_K	Post-Closure	Mean	31.07609177	32.07112503	30.96706963	12.1335268	8.067403793	17.0281601	25.19340706	28.46453857	28.6585083	24.21773148	26.93261719	29.81794548
T_Li	Post-Closure	Mean	0.052187871	0.052544992	0.049615581	0.019153601	0.014238833	0.031371001	0.046437975	0.051529363	0.051109038	0.042864602	0.047450148	0.051380876
T_Mg	Post-Closure	Mean	5.51128912	5.657109261	5.744181156	3.702137232	1.911182284	3.018099308	4.426145077	4.996518135	5.272797108	4.436184883	4.691426277	5.198026657
T_Mn	Post-Closure	Mean	0.324603438	0.334094912	0.325550944	0.143664747	0.094399057	0.181397274	0.255944371	0.285636425	0.292655051	0.257844627	0.283818305	0.311995149
T_Mo	Post-Closure	Mean	0.001977935	0.002036569	0.001996825	0.001115393	0.000711618	0.001022628	0.00140668	0.001642305	0.001858428	0.001596878	0.001629418	0.00189914
T_Na	Post-Closure	Mean	45.64677429	45.56022644	43.36877441	23.0355072	19.65620232	36.20611191	46.67663956	45.33204269	47.19929886	46.32191086	46.67351532	45.04474258
T_Ni	Post-Closure	Mean	0.001210827	0.001222923	0.001172516	0.000676	0.000622381	0.000854916	0.001096119	0.001180658	0.001189294	0.00106275	0.001129754	0.001192479
T_P	Post-Closure	Mean	0.01523234	0.014064564	0.012939429	0.009646322	0.01602797	0.016633213	0.020259315	0.01934481	0.016584212	0.016382042	0.01586563	0.015971148
T_Pb	Post-Closure	Mean	7.97043E-05	8.24536E-05	8.07408E-05	4.85655E-05	7.09609E-05	5.48771E-05	5.99062E-05	6.4879E-05	7.10129E-05	6.82496E-05	6.97031E-05	7.70047E-05
T_S	Post-Closure	Mean	0.818081915	0.910815358	0.844974041	0.879000664	0.352411687	0.526166677	0.427573323	0.550439596	0.572864771	0.678644538	0.409163386	0.576749742
T_Sb	Post-Closure	Mean	0.005956905	0.005858651	0.005447257	0.002510393	0.002416154	0.004327075	0.006064452	0.006547634	0.006447482	0.005416397	0.00580065	0.006031414
T_Se	Post-Closure	Mean	0.000124872	0.000112184	0.000113019	7.45467E-05	6.88424E-05	8.93047E-05	0.000112321	0.000119078	0.000115951	0.000111057	0.000109922	0.000107187
T_Si	Post-Closure	Mean	5.691516876	5.476235867	5.446711063	5.830347061	4.62057066	4.678658009	5.12620306	5.330354214	5.228373051	5.338884354	5.335147381	5.48206234
T_Sn	Post-Closure	Mean	5.04775E-05	5.00246E-05	4.97039E-05	4.87221E-05	5.02672E-05	5.10819E-05	4.94492E-05	4.99531E-05	4.94423E-05	4.93193E-05	4.9538E-05	4.94345E-05
T_Sr	Post-Closure	Mean	0.180567622	0.17374967	0.165048376	0.110907756	0.072637856	0.125992522	0.184739307	0.197066948	0.198892519	0.167137861	0.174344599	0.183329299
T_Ti	Post-Closure	Mean	0.002613757	0.002203607	0.001992931	0.003083542	0.005099894	0.003532141	0.003058917	0.003292631	0.002432699	0.003765021	0.003717955	0.002703672
T_Tl	Post-Closure	Mean	2.12317E-05	1.82374E-05	1.62461E-05	1.67738E-05	1.28618E-05	2.20013E-05	2.31508E-05	2.57772E-05	2.5781E-05	2.23606E-05	2.17686E-05	2.28038E-05
T_U	Post-Closure	Mean	0.000202218	0.000198204	0.000226936	0.000213668	0.000170452	0.000170595	0.000181195	0.000188468	0.000205397	0.0001761	0.000179156	0.000185162
T_V	Post-Closure	Mean	0.01363461	0.013721055	0.012968762	0.005240277	0.004120457	0.008338235	0.012276111	0.013519336	0.013412153	0.011289834	0.01249251	0.013470192
T_Zn	Post-Closure	Mean	0.010138271	0.010816671	0.010429031	0.004901541	0.00412196	0.005278716	0.006637132	0.007613443	0.008514919	0.007787925	0.00825212	0.009527425
D_Ag	Post-Closure	Mean	1.81777E-05	1.81382E-05	1.83272E-05	1.58487E-05	1.06412E-05	1.90395E-05	1.75054E-05	1.858E-05	1.86558E-05	1.68838E-05	1.75649E-05	1.92732E-05
D_Al	Post-Closure	Mean	0.015637022	0.012211437	0.008658638	0.015620302	0.148563147	0.089052677	0.037009887	0.029650155	0.017308159	0.028753193	0.036963053	0.020912113
D_As	Post-Closure	Mean	0.000768477	0.000757151	0.000744952	0.000665664	0.000592523	0.000594919	0.000730183	0.00080738	0.000825139	0.000784036	0.000745183	0.000779229
D_B	Post-Closure	Mean	0.009322034	0.008652716	0.007764101	0.00593731	0.007250981	0.007648169	0.010019043	0.01069096	0.010776831	0.009908957	0.009709255	0.00932995
D_Ba	Post-Closure	Mean	0.006482634	0.006448716	0.006643496	0.00723115	0.00482701	0.00453693	0.00529881	0.005869801	0.006114459	0.005059648	0.004941846	0.005295821
D_Bi	Post-Closure	Mean	2.52248E-05	2.49069E-05	2.46341E-05	2.437E-05	2.54646E-05	2.54178E-05	2.45309E-05	2.5321E-05	2.42567E-05	2.46059E-05	2.46625E-05	2.4735E-05
D_Be	Post-Closure	Mean	6.44335E-05	6.31322E-05	6.15726E-05	5.63965E-05	5.89931E-05	6.18305E-05	6.52004E-05	6.854E-05	6.76201E-05	6.62791E-05	6.53361E-05	6.57803E-05
D_Ca	Post-Closure	Mean	70.12945557	69.15922546	65.51026917	41.06507874	33.26427841	59.06335068	75.50125122	75.40400696	78.02080536	73.56703949	74.04798126	69.97603607
D_Cd	Post-Closure	Mean	0.000121992	0.000127882	0.000124461	5.37571E-05	3.93301E-05	6.10649E-05	8.34682E-05	9.3103E-05	0.000103722	9.33327E-05	9.94156E-05	0.000115572
D_Co	Post-Closure	Mean	0.000961344	0.001007396	0.000980403	0.000442655	0.000334605	0.000558505	0.000773092	0.000862922	0.000876194	0.000757995	0.000832561	0.000911854
D_Cr	Post-Closure	Mean	0.000167642	0.000163281	0.000160524	0.00016205	0.000206766	0.000187755	0.000171195	0.000173557	0.000168641	0.000180209	0.000187677	0.000177348
D_Cu	Post-Closure	Mean	0.000359076	0.000335071	0.000339254	0.000291534	0.000534811	0.000394534	0.000420989	0.000399899	0.000404057	0.000377449	0.000372315	0.000370094
D_Fe	Post-Closure	Mean	0.049491391	0.045812596	0.038651627	0.060294867	0.094511241	0.062917106	0.055661943	0.057613894	0.051046658	0.055190928	0.052370466	0.045785118
D_Hg	Post-Closure	Mean	1.0839E-05	1.0758E-05	9.77132E-06	7.41383E-06	1.06402E-05	7.73253E-06	1.00528E-05	1.15398E-05	1.1596E-05	9.93514E-06	1.12139E-05	1.12103E-05
D_K	Post-Closure	Mean	31.07850075	32.06695938	30.96106339	12.09831333	8.068003654	17.02638626	25.1898632	28.45903778	28.65534973	24.20459366	26.94344139	29.81558609
D_Li	Post-Closure	Mean	0.052187871	0.052544992	0.049615581	0.019153601	0.014238833	0.031371001	0.046437975	0.051529363	0.051109038	0.042864602	0.047450148	0.051380876
D_Mg	Post-Closure	Mean	5.499371052	5.679071426	5.682504654	3.701749325	1.897559285	3.003103971	4.438631058	4.993303299	5.257850647	4.407968521	4.669552803	5.215373516
D_Mn	Post-Closure	Mean	0.323886335	0.333600879	0.324565649	0.142352149	0.088024057	0.17854923	0.254759669	0.284545481	0.291430295	0.25657174	0.282822788	0.310785383
D_Mo	Post-Closure	Mean	0.001947655	0.001995859	0.001957665	0.001100095	0.000696035	0.001008506	0.001402393	0.001620349	0.00185063	0.001568504	0.001614161	0.001865267
D_Na	Post-Closure	Mean	45.61702728	45.50366974	43.33817291	22.95272064	19.62430954	36.06422424	46.66420746	45.27755356	47.16126633	46.25799561	46.60443497	45.03720474
D_Ni	Post-Closure	Mean	0.001210727	0.001222835	0.001171965	0.000670463	0.000595596	0.000857786	0.001095986	0.001180555	0.001189158	0.001062546	0.001129612	0.001187961
D_P	Post-Closure	Mean	0.05322665	0.051653802	0.046584796	0.041004073	0.035454649	0.040456865	0.044659179	0.07374166	0.050555363	0.093221374	0.090980873	0.043543749
D_Pb	Post-Closure	Mean	7.92512E-05	8.20699E-05	8.04065E-05	4.7927E-05	4.2506E-05	5.05976E-05	5.94284E-05	6.44963E-05	7.04054E-05	6.73461E-05	6.90968E-05	7.64556E-05
D_S	Post-Closure	Mean	0.641654909	0.874781609	0.92598325	0.755453527	0.347203523	0.501568735	0.427280217	0.473985732	0.614144325	0.467211634	0.470853657	0.439035326
D_Sb	Post-Closure	Mean	0.005956904	0.005858651	0.005447257	0.0025128	0.002416154	0.004327075	0.006064451	0.006547634	0.006447482	0.005416397	0.00580065	0.006031414
D_Se	Post-Closure	Mean	0.000116892	9.79359E-05	0.000106624	7.4978E-05	6.93076E-05	7.95633E-05	0.000103021	0.000113038	0.000109414	9.68121E-05	9.03128E-05	9.61997E-05
D_Si	Post-Closure	Mean	5.562026501	5.334144115	5.299552917	5.47032547	4.32144022	4.519729137	5.00420475	5.155657291	5.144026279	5.141963959	5.179103851	5.19262743
D_Sn	Post-Closure	Mean	5.04775E-05	5.00246E-05	4.97039E-05	4.87221E-05	5.02672E-05	5.10819E-05	4.94492E-05	4.99531E-05	4.94423E-05	4.93193E-05	4.9538E-05	4.94345E-05
D_Sr	Post-Closure	Mean	0.180549338	0.173791781	0.162892878	0.111294851	0.071860254	0.125437647	0.184259996	0.197504565	0.198937759	0.166607365	0.175200507	0.183041126
D_Ti	Post-Closure	Mean	0.001516323	0.001437766	0.001424891	0.001432539	0.002476546	0.001924986	0.0017207	0.002741952	0.001889729	0.003335934	0.003274238	0.001794226
D_Tl	Post-Closure	Mean	2.12237E-05	1.82273E-05	1.62461E-05	1.67715E-05	1.25025E-05	2.19791E-05	2.31479E-05	2.57751E-05	2.57797E-05	2.23597E-05	2.17678E-05	2.28031E-05
D_U	Post-Closure	Mean	0.00019579	0.000189172	0.000213651	0.000198427	0.00015022	0.000159283	0.000173517	0.000180924	0.000198349	0.000166849	0.00017086	0.000173637
D_V	Post-Closure	Mean	0.013611814	0.013713648	0.012961068	0.005136173	0.003868728	0.008251099	0.012174766	0.013483709	0.013349368	0.011247828	0.01239907	0.013396581
D_Zn	Post-Closure	Mean	0.009863344	0.010498204	0.010247333	0.004645968	0.003581428	0.005078672	0.006325641	0.007245653	0.00803737	0.007181721	0.007886006	0.009033163

Appendix A.4.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ9

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.021450983	0.021843562	0.020307994	0.013349304	0.009817013	0.011408061	0.011890427	0.016057855	0.020489248	0.019392915	0.020685673	0.019772129
NO3_N	Closure	Mean	0.066241175	0.072710656	0.075469203	0.048444267	0.040201187	0.025725914	0.018566107	0.016722666	0.015068803	0.013952401	0.061713405	0.069820479
NO2_N	Closure	Mean	0.001133905	0.002032699	0.001033629	0.001036594	0.001412187	0.00119929	0.001016147	0.000958147	0.000974783	0.000826384	0.001308008	0.001388246
Br	Closure	Mean	0.025110859	0.025044169	0.025071384	0.025059169	0.025079716	0.025140474	0.025232201	0.025088063	0.025169475	0.025189236	0.025204197	0.025077017
Cl	Closure	Mean	0.392551392	0.401060492	0.375189364	0.310687333	0.289121687	0.317562401	0.386452466	0.352820516	0.377252787	0.366883785	0.391414315	0.368267238
F	Closure	Mean	0.060324501	0.059577882	0.064919598	0.059905767	0.057830017	0.057903763	0.058411483	0.057246428	0.0601715	0.060924336	0.060346443	0.065315053
TDP	Closure	Mean	0.01504245	0.011287944	0.014613995	0.016263679	0.010865834	0.009372824	0.008049902	0.009223477	0.007181968	0.007899872	0.009710764	0.014071614
SO4	Closure	Mean	5.967512608	6.15985775	5.61414957	4.163600445	3.993723154	3.981750011	4.208895206	4.956479073	5.534795284	5.217833996	6.090510845	5.627280235
T_CN	Closure	Mean	0.002524739	0.002529749	0.002515192	0.00249894	0.002503269	0.002509667	0.002506509	0.002510353	0.002514146	0.002511435	0.002524188	0.002519457
WAD_CN	Closure	Mean	0.002502807	0.002499079	0.002493398	0.002493141	0.002500331	0.002504756	0.002498186	0.002492884	0.002491431	0.002490306	0.002497786	0.00250036
T_Ag	Closure	Mean	8.47501E-06	8.13577E-06	1.94898E-05	1.48827E-05	1.2373E-05	1.52122E-05	1.0635E-05	1.00167E-05	9.51058E-06	9.3017E-06	9.2184E-06	1.22168E-05
T_Al	Closure	Mean	0.028500957	0.022292471	0.035629369	0.033235978	0.074676827	0.063517965	0.04650512	0.038318414	0.030697061	0.038134195	0.04014935	0.029450499
T_As	Closure	Mean	0.000639279	0.000600313	0.000581426	0.000589453	0.000590698	0.000588402	0.000601236	0.000631516	0.000650379	0.000621559	0.000626417	0.000623157
T_B	Closure	Mean	0.005685646	0.005552646	0.004549948	0.004802763	0.005196629	0.004696172	0.005586082	0.005855467	0.006151989	0.005981904	0.005899502	0.005225186
T_Ba	Closure	Mean	0.006643612	0.006699677	0.006736215	0.006402018	0.005883357	0.005929646	0.006094013	0.006081639	0.006694119	0.006586355	0.006312258	0.006193487
T_Bi	Closure	Mean	2.50751E-05	2.50309E-05	2.49721E-05	2.49777E-05	2.50369E-05	2.50629E-05	2.49891E-05	2.49334E-05	2.49168E-05	2.49052E-05	2.49798E-05	2.50577E-05
T_Be	Closure	Mean	5.224E-05	5.18262E-05	5.11198E-05	5.08634E-05	5.08715E-05	5.13201E-05	5.17401E-05	5.25231E-05	5.33385E-05	5.28314E-05	5.27736E-05	5.241E-05
T_Ca	Closure	Mean	20.31438255	21.42487335	20.68536186	18.66978264	17.8620739	17.50439835	17.69946861	18.88359642	18.68109322	19.56299019	18.75008965	21.30366516
T_Cd	Closure	Mean	7.50308E-06	7.54344E-06	8.38596E-06	7.28206E-06	7.0517E-06	7.68548E-06	8.94433E-06	8.79898E-06	1.0203E-05	1.078E-05	9.06269E-06	8.8022E-06
T_Co	Closure	Mean	9.29065E-05	9.10023E-05	7.53356E-05	6.19774E-05	6.16801E-05	6.67637E-05	7.45678E-05	8.80384E-05	0.00010154	9.2412E-05	9.28781E-05	8.68262E-05
T_Cr	Closure	Mean	0.000159769	0.000152423	0.00017457	0.000165347	0.000189775	0.000193438	0.000176087	0.000155312	0.000164216	0.000171018	0.000170449	0.000163684
T_Cu	Closure	Mean	0.000279381	0.000279648	0.000283347	0.000302778	0.000382352	0.000308242	0.000361734	0.000303166	0.000301639	0.000297867	0.000285887	0.000281804
T_Fe	Closure	Mean	0.080249742	0.083419405	0.108852074	0.083520494	0.096398905	0.088779233	0.080616117	0.082973167	0.092224367	0.09070792	0.095845744	0.081577905
T_Hg	Closure	Mean	3.49547E-06	3.37368E-06	3.13246E-06	3.00652E-06	3.49791E-06	3.43495E-06	3.38612E-06	3.61352E-06	3.91264E-06	4.12764E-06	3.68454E-06	3.55207E-06
T_K	Closure	Mean	1.001539588	0.968967974	0.951050878	0.960961759	0.821305931	0.812195778	0.835083127	0.927354991	0.978237152	0.978995204	0.969982386	0.956603289
T_Li	Closure	Mean	0.000814112	0.000763848	0.000676821	0.000651228	0.000623852	0.00068141	0.000758115	0.000884718	0.001006265	0.000939856	0.000980734	0.000869084
T_Mg	Closure	Mean	4.679069042	4.724022865	4.848830223	4.32043314	4.227385044	4.057096958	4.120392799	4.34134531	4.360136509	4.370918274	4.305838585	4.748163223
T_Mn	Closure	Mean	0.016084384	0.014733021	0.016491439	0.015173483	0.016787941	0.01387296	0.01422757	0.01502621	0.015676007	0.015114554	0.040943306	0.016971795
T_Mo	Closure	Mean	0.000745827	0.000765129	0.000721263	0.000608111	0.000548375	0.000560636	0.000601789	0.000696741	0.000799904	0.000716161	0.000692596	0.000716554
T_Na	Closure	Mean	4.150238991	4.162218571	4.065840721	3.473544598	3.371232748	3.263209105	3.388072014	3.588329315	3.76453352	3.814167976	3.734045982	4.001932144
T_Ni	Closure	Mean	0.000284793	0.000278327	0.000265973	0.000262308	0.000267735	0.000270626	0.000281936	0.000295408	0.000309543	0.00030064	0.000296392	0.000288735
T_P	Closure	Mean	0.027691789	0.026597917	0.032457519	0.026952125	0.025364684	0.022678977	0.020172384	0.018618617	0.01752294	0.018438146	0.027251324	0.02721197
T_Pb	Closure	Mean	2.93684E-05	3.04552E-05	3.01363E-05	3.10898E-05	4.54467E-05	3.69595E-05	3.30784E-05	3.17328E-05	3.12848E-05	3.07328E-05	3.03689E-05	2.96272E-05
T_S	Closure	Mean	1.277991176	1.314469934	1.217250228	1.43452704	1.084366202	1.0723809	1.108662963	1.21859324	1.069315791	1.298074007	1.079487801	1.310254931
T_Sb	Closure	Mean	0.000547409	0.000467851	0.000326055	0.000289575	0.000242715	0.000336112	0.00045886	0.000662891	0.000857724	0.000752497	0.000696312	0.000594183
T_Se	Closure	Mean	9.28776E-05	8.75373E-05	0.000127773	8.39916E-05	7.94274E-05	7.64626E-05	8.4294E-05	8.55062E-05	8.22718E-05	9.2536E-05	8.58389E-05	8.62292E-05
T_Si	Closure	Mean	4.944252491	4.956214905	4.857242107	4.642068863	4.438771248	4.326445103	4.197470665	4.156515121	4.256001949	4.360050678	4.745933533	4.902945518
T_Sn	Closure	Mean	5.0058E-05	4.99821E-05	4.98728E-05	4.98686E-05	5.00101E-05	5.00993E-05	4.99686E-05	4.98641E-05	4.98397E-05	4.98151E-05	4.99637E-05	5.00089E-05
T_Sr	Closure	Mean	0.102331653	0.103091374	0.102131337	0.090553932	0.090869017	0.08636535	0.086812519	0.091611497	0.096606746	0.090877242	0.092072137	0.102362268
T_Ti	Closure	Mean	0.003182916	0.002237543	0.002538295	0.002971513	0.003019252	0.002339134	0.003572209	0.003341074	0.002772079	0.004844878	0.004843876	0.003428967
T_Tl	Closure	Mean	9.90603E-06	9.31461E-06	1.23898E-05	1.54729E-05	1.06288E-05	1.58911E-05	1.11414E-05	1.16128E-05	1.19414E-05	1.13882E-05	1.11144E-05	1.37951E-05
T_U	Closure	Mean	0.000115153	0.000116041	0.000123856	0.000120416	0.000102446	0.000102485	0.000100871	0.000108187	0.000119412	0.000110617	0.00010986	0.000108791
T_V	Closure	Mean	0.000374068	0.000353563	0.000391448	0.00037944	0.000408395	0.000401018	0.000454184	0.00047861	0.000522642	0.000420594	0.00044301	0.000401917
T_Zn	Closure	Mean	0.001773976	0.001871744	0.001792149	0.001801868	0.001875538	0.001851819	0.001827997	0.001862715	0.001918272	0.001870761	0.001858655	0.001690788
D_Ag	Closure	Mean	8.11031E-06	7.81554E-06	1.13806E-05	1.4876E-05	9.81588E-06	1.49803E-05	9.6427E-06	9.3814E-06	9.01251E-06	8.83649E-06	8.79018E-06	1.17994E-05
D_Al	Closure	Mean	0.00435	0.0037	0.0029	0.015557763	0.042957656	0.03392541	0.024573572	0.014646369	0.015240215	0.014005092	0.018944552	0.008290686
D_As	Closure	Mean	0.000582141	0.00055208	0.000541702	0.000534618	0.000542337	0.000534176	0.000553056	0.000579188	0.000617095	0.000575388	0.000559632	0.00056819
D_B	Closure	Mean	0.005682289	0.005548218	0.004455554	0.004770985	0.005195479	0.004646546	0.005584592	0.00585169	0.006148511	0.005979742	0.00589726	0.005222623
D_Ba	Closure	Mean	0.00650928	0.00623108	0.006195559	0.006008389	0.005497343	0.005554741	0.005706355	0.005993371	0.006480225	0.006149513	0.005906395	0.005962
D_Bi	Closure	Mean	2.50269E-05	2.49897E-05	2.49329E-05	2.49311E-05	2.50032E-05	2.50473E-05	2.49815E-05	2.49281E-05	2.49135E-05	2.49022E-05	2.4978E-05	2.50026E-05
D_Be	Closure	Mean	5.224E-05	5.18262E-05	5.11198E-05	5.08634E-05	5.08715E-05	5.13201E-05	5.17401E-05	5.25231E-05	5.33385E-05	5.28314E-05	5.27736E-05	5.241E-05
D_Ca	Closure	Mean	20.87945557	20.69474602	20.27932358	18.18839455	17.24637985	17.27449036	17.7057209	18.64321136	18.87656975	18.48512459	18.50904655	19.76068306
D_Cd	Closure	Mean	8.22466E-06	7.60997E-06	7.57969E-06	7.2083E-06	8.00655E-06	8.51518E-06	1.03643E-05	9.97106E-06	1.0978E-05	1.16647E-05	9.90968E-06	9.69409E-06
D_Co	Closure	Mean	9.20892E-05	9.02259E-05	7.43969E-05	5.97748E-05	5.97772E-05	6.33132E-05	7.41071E-05	8.74203E-05	0.000100678	9.14232E-05	9.19748E-05	8.41474E-05
D_Cr	Closure	Mean	9.40323E-05	9.11303E-05	0.000107876	0.000121308	0.000134122	0.000126983	0.000127139	0.000109497	0.000118991	0.000133256	0.000119111	0.000114733
D_Cu	Closure	Mean	0.000288507	0.000316968	0.000277761	0.000282097	0.000361529	0.00031066	0.000367621	0.000311912	0.000310898	0.000305392	0.00029836	0.000304319
D_Fe	Closure	Mean	0.045813415	0.04463115	0.051912092	0.045583967	0.050450556	0.046486191	0.048084326	0.049656849	0.055994112	0.053794034	0.052061863	0.048375443
D_Hg	Closure	Mean	3.48076E-06	3.36076E-06	3.11942E-06	2.99188E-06	3.45778E-06	3.29835E-06	3.31771E-06	3.5767E-06	3.88447E-06	3.71047E-06	3.66107E-06	3.55745E-06
D_K	Closure	Mean	0.981157184	0.956301272	0.933712542	0.938858688	0.807144761	0.769876599	0.797977507	0.884820163	0.951184869	0.917599559	0.974807382	0.953369439
D_Li	Closure	Mean	0.000814073	0.00076354	0.000676491	0.000650854	0.000623539	0.000681242	0.000758012	0.00088464	0.001006203	0.000939798	0.000980681	0.000869039
D_Mg	Closure	Mean	4.858773232	4.668988228	4.932748795	4.24897337	4.195088863	3.901176691	4.117737293	4.234679699	4.292409897	4.309272766	4.15550375	4.54718256
D_Mn	Closure	Mean	0.009054778	0.008281616	0.009309183	0.008091714	0.004811249	0.005457582	0.007344921	0.007814173	0.009612817	0.008377717	0.009909322	0.009136237
D_Mo	Closure	Mean	0.000700887	0.000702164	0.000689457	0.000574554	0.000506689	0.000537029	0.000598581	0.000666138	0.000794432	0.000660127	0.000654098	0.000660876
D_Na	Closure	Mean	4.203555584	4.116379261	4.017306805	3.423827887	3.342022896	3.186886787	3.386799097	3.574063301	3.724274397	3.653341055	3.637232542	3.897274017
D_Ni	Closure	Mean	0.000283931	0.000277527	0.00026137	0.000257572	0.000259623	0.00027023	0.000280261	0.000294108	0.000308475	0.000299574	0.000295665	0.000282054
D_P	Closure	Mean	0.044623248	0.042208515	0.039908741	0.044738706	0.040156174	0.031138817	0.052220315	0.101685651	0.059428521	0.144062892	0.143782631	0.046875834
D_Pb	Closure	Mean	2.66667E-05	2.63932E-05	2.58961E-05	2.56838E-05	2.56262E-05	2.59388E-05	2.63163E-05	2.6898E-05	2.74831E-05	2.7126E-05	2.70644E-05	2.67843E-05
D_S	Closure	Mean	1.166578293	1.352973461	1.337875962	1.186271191	1.080722332	1.075097561	1.162216663	1.163189888	1.11562717	1.226959586	1.187205672	1.300485373
D_Sb	Closure	Mean	0.00054731	0.000467665	0.000325863	0.000290128	0.000242535	0.000336018	0.000458745	0.000662791	0.000857644	0.000752423	0.000696245	0.000594126
D_Se	Closure	Mean	0.000123857	8.74663E-05	0.000123985	7.98369E-05	7.3402E-05	7.02641E-05	7.80956E-05	8.83257E-05	8.3873E-05	8.31364E-05	8.35102E-05	8.16128E-05
D_Si	Closure	Mean	4.871106625	4.76173687	4.731674671	4.443039417	4.183420658	4.093097687	4.011278152	4.007194519	4.125113964	4.131772041	4.666464806	4.805698395
D_Sn	Closure	Mean	5.0058E-05	4.99821E-05	4.98728E-05	4.98686E-05	5.00101E-05	5.00993E-05	4.99686E-05	4.98641E-05	4.98397E-05	4.98151E-05	4.99637E-05	5.00089E-05
D_Sr	Closure	Mean	0.10236679	0.103015192	0.102237597	0.088896453	0.089769624	0.083826572	0.086837091	0.09134835	0.096273191	0.08938095	0.089037649	0.098178469
D_Ti	Closure	Mean	0.001013893	0.00091211	0.000893048	0.001208945	0.001295362	0.001067677	0.000883627	0.00318347	0.00159185	0.004780961	0.004769532	0.001169474
D_Tl	Closure	Mean	9.88646E-06	9.29734E-06	1.23728E-05	1.54726E-05	1.05483E-05	1.58892E-05	1.11359E-05	1.16087E-05	1.19381E-05	1.13851E-05	1.11116E-05	1.37732E-05
D_U	Closure	Mean	0.000109661	0.000108421	0.000114809	0.000111797	9.39506E-05	9.5968E-05	9.61998E-05	0.000103182	0.000113508	0.000103013	0.000101785	0.00010176
D_V	Closure	Mean	0.000349854	0.000334793	0.000269786	0.000299293	0.000288675	0.000323029	0.000334574	0.000384532	0.00040168	0.000385926	0.000397816	0.00035587
D_Zn	Closure	Mean	0.0014184	0.001166685	0.001364508	0.00151682	0.00155511	0.001454655	0.001225097	0.001261925	0.001228319	0.001369221	0.001323664	0.001036676

Appendix A.4.5: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ9

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.173724279	0.173863813	0.141767815	0.083373956	0.064271949	0.075313255	0.091472931	0.143364176	0.196972355	0.169543505	0.164290398	0.162724674
NO3_N	Post-Closure	Mean	0.26912421	0.230814874	0.198505834	0.125103518	0.060831264	0.104800738	0.139295951	0.167652071	0.236310706	0.230458111	0.260724515	0.262546271
NO2_N	Post-Closure	Mean	0.001735547	0.002537193	0.00143592	0.001269001	0.001439301	0.001464901	0.001415475	0.001515205	0.001753311	0.001540394	0.001965565	0.00201003
Br	Post-Closure	Mean	0.028625544	0.028535904	0.027739154	0.02961964	0.028199689	0.02642406	0.027177876	0.02841891	0.029603422	0.02995008	0.029646344	0.028944902
Cl	Post-Closure	Mean	3.268371582	3.049804449	2.459747076	1.748298645	1.027698517	1.695566416	2.264127254	2.720777035	3.635789633	3.703629017	3.45266819	3.146189451
F	Post-Closure	Mean	0.117691725	0.114188232	0.107357822	0.078681216	0.063878648	0.075502753	0.089237817	0.104127221	0.124486603	0.116499767	0.116699547	0.121720143
TDP	Post-Closure	Mean	0.016347097	0.012648868	0.015476039	0.015896825	0.010643768	0.009933417	0.009491671	0.011184323	0.009539512	0.009656062	0.011693999	0.015521542
SO4	Post-Closure	Mean	63.62480545	60.67059326	47.85749817	33.13193893	19.56661797	32.88166046	43.76494598	55.82699203	74.28370667	74.53382111	69.23493958	63.73723602
T_CN	Post-Closure	Mean	0.002702752	0.002698791	0.002661735	0.00267369	0.002540198	0.002636044	0.00265807	0.002700321	0.002776684	0.002815984	0.002777793	0.002691621
WAD_CN	Post-Closure	Mean	0.00249143	0.002492754	0.00248788	0.002488207	0.002477391	0.002469208	0.002436114	0.002406995	0.002368347	0.0023624	0.002379727	0.002372586
T_Ag	Post-Closure	Mean	1.03858E-05	1.01108E-05	2.05826E-05	1.52188E-05	1.27884E-05	1.55352E-05	1.13203E-05	1.11555E-05	1.13173E-05	1.10086E-05	1.0882E-05	1.35214E-05
T_Al	Post-Closure	Mean	0.028295534	0.022165218	0.035316359	0.033066995	0.074649304	0.062849641	0.043830834	0.036987163	0.029419115	0.037004933	0.039082121	0.028338257
T_As	Post-Closure	Mean	0.000652064	0.000619594	0.000599188	0.000619028	0.000607988	0.000583285	0.000596895	0.000631854	0.000654822	0.000644086	0.00063826	0.0006378
T_B	Post-Closure	Mean	0.005848835	0.005745481	0.004857631	0.005044829	0.005396453	0.004784224	0.005666495	0.00601031	0.006318141	0.006178105	0.006058877	0.005458883
T_Ba	Post-Closure	Mean	0.0066237	0.006688038	0.006726527	0.006400153	0.005847365	0.005879485	0.006003588	0.005961526	0.006497251	0.006387821	0.00613157	0.005993025
T_Bi	Post-Closure	Mean	2.50857E-05	2.50272E-05	2.49957E-05	2.51338E-05	2.52765E-05	2.5052E-05	2.49661E-05	2.51464E-05	2.48397E-05	2.49677E-05	2.49053E-05	2.50014E-05
T_Be	Post-Closure	Mean	5.33667E-05	5.3127E-05	5.2445E-05	5.22128E-05	5.19943E-05	5.17262E-05	5.2202E-05	5.35556E-05	5.44356E-05	5.43101E-05	5.37466E-05	5.34538E-05
T_Ca	Post-Closure	Mean	32.67232513	32.85837173	29.49324799	24.8652916	20.61350441	24.11480522	26.85757065	30.54171181	34.50600815	34.93888855	33.14886093	33.50681305
T_Cd	Post-Closure	Mean	2.87769E-05	3.03714E-05	2.65597E-05	1.86803E-05	1.37516E-05	1.36832E-05	1.71707E-05	2.18427E-05	2.91146E-05	2.79896E-05	2.67571E-05	2.79073E-05
T_Co	Post-Closure	Mean	0.000263268	0.000266281	0.000221831	0.000156344	0.0001045	0.000118091	0.000150956	0.000208319	0.000271216	0.000247748	0.000249283	0.000250639
T_Cr	Post-Closure	Mean	0.000160045	0.000153143	0.000175079	0.000167465	0.000190395	0.000193269	0.000175256	0.000155485	0.000163876	0.000171086	0.000169902	0.00016375
T_Cu	Post-Closure	Mean	0.00028619	0.000288296	0.000291172	0.00030893	0.000389291	0.000307554	0.00036067	0.000308184	0.000304334	0.000306713	0.000289109	0.000287347
T_Fe	Post-Closure	Mean	0.079785742	0.082987644	0.107211776	0.083403461	0.095098257	0.087571323	0.077681929	0.079988547	0.087641753	0.086543985	0.09185487	0.077532835
T_Hg	Post-Closure	Mean	4.41505E-06	4.36009E-06	4.03337E-06	4.27708E-06	4.32307E-06	3.6734E-06	3.70321E-06	4.25449E-06	4.62797E-06	4.9502E-06	4.43607E-06	4.3394E-06
T_K	Post-Closure	Mean	7.857944965	7.796814919	6.398044109	3.48025322	1.803339601	2.751208305	4.060853958	6.090251923	8.151900291	7.203650951	7.323309422	7.545639992
T_Li	Post-Closure	Mean	0.012548316	0.0120996	0.009597071	0.004815785	0.002395473	0.00429967	0.006755465	0.010319536	0.013940883	0.012108893	0.012351763	0.012413188
T_Mg	Post-Closure	Mean	5.033950329	5.100908756	5.141250134	4.248520374	4.074422359	4.147109985	4.319954872	4.600014687	4.739143372	4.482991695	4.545340061	5.024135113
T_Mn	Post-Closure	Mean	0.087728091	0.085486501	0.073270619	0.045718659	0.027730973	0.034638535	0.047275048	0.066813722	0.089016572	0.081235707	0.105640747	0.085731812
T_Mo	Post-Closure	Mean	0.000854307	0.000882826	0.000822662	0.000697	0.000552384	0.000579884	0.000642638	0.000759816	0.000899068	0.00081866	0.000788118	0.000826725
T_Na	Post-Closure	Mean	13.83998966	13.14161968	11.10473156	8.370031357	5.762947083	7.952029705	9.817107201	11.65243244	14.88051796	15.15160847	14.15829754	13.40504742
T_Ni	Post-Closure	Mean	0.000474632	0.000467626	0.00042169	0.000362263	0.000315657	0.000328066	0.000369707	0.000430818	0.000501346	0.000476289	0.000472707	0.000471214
T_P	Post-Closure	Mean	0.027236901	0.026237309	0.03192899	0.026101151	0.024787104	0.022729352	0.020626962	0.01896335	0.017681362	0.017827092	0.026605597	0.026515992
T_Pb	Post-Closure	Mean	3.89796E-05	4.07444E-05	3.86271E-05	3.65443E-05	4.82696E-05	3.85788E-05	3.61378E-05	3.72501E-05	3.97659E-05	3.90755E-05	3.84177E-05	3.838E-05
T_S	Post-Closure	Mean	1.263296366	1.305665731	1.205364108	1.410440326	1.037480831	1.051649451	1.084162354	1.175121665	1.014114261	1.223127246	1.004442573	1.242733479
T_Sb	Post-Closure	Mean	0.001468056	0.001390717	0.00108809	0.000741899	0.000492218	0.000615253	0.000899166	0.001323899	0.001773934	0.001567922	0.001542417	0.001485101
T_Se	Post-Closure	Mean	9.26658E-05	8.75014E-05	0.000127376	8.38439E-05	7.79628E-05	7.59929E-05	8.41703E-05	8.45515E-05	8.09801E-05	9.09841E-05	8.39013E-05	8.43726E-05
T_Si	Post-Closure	Mean	4.942396641	4.954617977	4.860049725	4.659805298	4.449251652	4.327477932	4.194547653	4.177105904	4.256240845	4.371056557	4.725441456	4.872488022
T_Sn	Post-Closure	Mean	5.00827E-05	5.0042E-05	4.99877E-05	4.99963E-05	5.04296E-05	5.00999E-05	4.99633E-05	5.01706E-05	4.98434E-05	4.99555E-05	4.98444E-05	4.99011E-05
T_Sr	Post-Closure	Mean	0.123216204	0.121359244	0.115422875	0.095864363	0.089737386	0.094458304	0.101510592	0.113178208	0.124767072	0.113645695	0.115817659	0.124361366
T_Ti	Post-Closure	Mean	0.003147368	0.002203323	0.002507533	0.002937322	0.00302069	0.002335793	0.003553722	0.003331163	0.002677093	0.004731308	0.004749608	0.003389544
T_Tl	Post-Closure	Mean	1.00746E-05	9.58159E-06	1.23477E-05	1.54437E-05	1.05691E-05	1.58834E-05	1.12423E-05	1.1535E-05	1.18496E-05	1.13637E-05	1.10441E-05	1.35684E-05
T_U	Post-Closure	Mean	0.000115147	0.000116174	0.000124163	0.00012306	0.000104967	0.000102759	0.00010134	0.000110012	0.00011937	0.000111769	0.000109865	0.000108863
T_V	Post-Closure	Mean	0.003397541	0.003278926	0.002688285	0.001476754	0.00088156	0.00133029	0.001994443	0.00290042	0.003842868	0.003310669	0.003371532	0.003374522
T_Zn	Post-Closure	Mean	0.003396635	0.003614872	0.003239822	0.002635529	0.002330128	0.002283901	0.002416018	0.002821158	0.003344743	0.003189744	0.003193935	0.003162069
D_Ag	Post-Closure	Mean	1.00298E-05	9.79505E-06	1.25669E-05	1.51593E-05	9.89625E-06	1.54865E-05	1.05101E-05	1.05691E-05	1.08333E-05	1.05108E-05	1.04593E-05	1.31115E-05
D_Al	Post-Closure	Mean	0.00435	0.0037	0.0029	0.015545431	0.043812495	0.033782087	0.023782032	0.014652264	0.015129442	0.014030479	0.018853042	0.008300001
D_As	Post-Closure	Mean	0.000600115	0.000575249	0.000566611	0.000566688	0.000552605	0.000531133	0.00055222	0.000583306	0.000627922	0.000603061	0.000573479	0.000586602
D_B	Post-Closure	Mean	0.005848835	0.005745481	0.004778304	0.0050175	0.005396453	0.004739042	0.005666495	0.006009596	0.006318141	0.006178104	0.006058876	0.005458883
D_Ba	Post-Closure	Mean	0.006489839	0.006220846	0.006187515	0.006007031	0.005464706	0.005510634	0.005626992	0.005881498	0.006294449	0.005968175	0.005742723	0.005774727
D_Bi	Post-Closure	Mean	2.50385E-05	2.49861E-05	2.49581E-05	2.50893E-05	2.52353E-05	2.50333E-05	2.49548E-05	2.51399E-05	2.48346E-05	2.4964E-05	2.4903E-05	2.49521E-05
D_Be	Post-Closure	Mean	5.33667E-05	5.3127E-05	5.2445E-05	5.22128E-05	5.19943E-05	5.17262E-05	5.2202E-05	5.35556E-05	5.44356E-05	5.43101E-05	5.37466E-05	5.34538E-05
D_Ca	Post-Closure	Mean	33.18391418	32.23651123	29.14255524	24.45121002	20.05480766	23.90451813	26.87332916	30.33750534	34.7004776	33.96280289	32.93744659	32.11391068
D_Cd	Post-Closure	Mean	2.94022E-05	3.0394E-05	2.6517E-05	1.85588E-05	1.35076E-05	1.46442E-05	1.8076E-05	2.291E-05	2.97294E-05	2.86596E-05	2.7467E-05	2.86975E-05
D_Co	Post-Closure	Mean	0.000262535	0.000265594	0.000220995	0.000153994	0.000102122	0.000115105	0.000149611	0.000207238	0.000270288	0.000246829	0.000248454	0.000248303
D_Cr	Post-Closure	Mean	9.95643E-05	9.65442E-05	0.000111396	0.000128276	0.000138162	0.000127531	0.000128106	0.000113685	0.000122823	0.000135391	0.00012253	0.000118096
D_Cu	Post-Closure	Mean	0.000293944	0.000319732	0.000286682	0.000289524	0.000369049	0.000311145	0.000367431	0.000317128	0.000313023	0.000310727	0.000299878	0.000306965
D_Fe	Post-Closure	Mean	0.045509502	0.044403683	0.051694449	0.04552234	0.049788799	0.045797177	0.046529733	0.047865029	0.05320479	0.05136865	0.049810704	0.045972656
D_Hg	Post-Closure	Mean	4.40416E-06	4.35057E-06	4.02328E-06	4.26571E-06	4.29042E-06	3.49996E-06	3.63367E-06	4.22183E-06	4.60273E-06	4.58506E-06	4.41414E-06	4.34556E-06
D_K	Post-Closure	Mean	7.840379238	7.78751421	6.383440018	3.453543425	1.792278171	2.712605476	4.025745869	6.050973892	8.129437447	7.150481701	7.329777241	7.54394722
D_Li	Post-Closure	Mean	0.012548287	0.012099341	0.009596811	0.004815508	0.002395215	0.00429954	0.006755381	0.010319475	0.013940838	0.012108851	0.012351723	0.012413153
D_Mg	Post-Closure	Mean	5.220528603	5.056098938	5.231909275	4.185739994	4.043260098	3.98945713	4.314786434	4.50405407	4.688367367	4.440099239	4.429330349	4.849410057
D_Mn	Post-Closure	Mean	0.081626602	0.079882912	0.067001745	0.039633796	0.01664038	0.026495393	0.040913709	0.060343333	0.083818428	0.075568132	0.077730432	0.078852102
D_Mo	Post-Closure	Mean	0.000812599	0.00082362	0.000793496	0.000669376	0.000517528	0.000557672	0.000639976	0.000731838	0.000895135	0.000768752	0.000754731	0.000778309
D_Na	Post-Closure	Mean	13.88737202	13.10043812	11.05919361	8.32110405	5.730519772	7.875322342	9.815084457	11.63882828	14.84753799	14.99933147	14.06542778	13.31170559
D_Ni	Post-Closure	Mean	0.000473873	0.00046692	0.000417598	0.00035778	0.000307506	0.000327657	0.000368194	0.000429645	0.000500439	0.000475384	0.000472047	0.00046547
D_P	Post-Closure	Mean	0.044161513	0.041878581	0.039854307	0.043433674	0.039290827	0.030657936	0.052426603	0.099570997	0.055672925	0.137430489	0.138456866	0.044227816
D_Pb	Post-Closure	Mean	3.65027E-05	3.69696E-05	3.47667E-05	3.18304E-05	2.9139E-05	2.88113E-05	3.01653E-05	3.29666E-05	3.64443E-05	3.58509E-05	3.54907E-05	3.57819E-05
D_S	Post-Closure	Mean	1.148969412	1.339587569	1.329238057	1.165774465	1.036640167	1.054982424	1.135676622	1.110147595	1.044692278	1.110084176	1.099401116	1.221088052
D_Sb	Post-Closure	Mean	0.001467977	0.001390556	0.001087927	0.000742358	0.000492058	0.000615173	0.000899065	0.001323817	0.001773873	0.001567867	0.001542365	0.001485056
D_Se	Post-Closure	Mean	0.000123551	8.72651E-05	0.000123584	7.96845E-05	7.25465E-05	6.95536E-05	7.77653E-05	8.73022E-05	8.24587E-05	8.18858E-05	8.15663E-05	7.98068E-05
D_Si	Post-Closure	Mean	4.869335175	4.760359287	4.737482071	4.463903427	4.199611187	4.094521046	4.010547161	4.031722069	4.126562119	4.148474693	4.647403717	4.779077053
D_Sn	Post-Closure	Mean	5.00827E-05	5.0042E-05	4.99877E-05	4.99963E-05	5.04296E-05	5.00999E-05	4.99633E-05	5.01706E-05	4.98434E-05	4.99555E-05	4.98444E-05	4.99011E-05
D_Sr	Post-Closure	Mean	0.12313208	0.121363297	0.115595922	0.094525136	0.088684589	0.091955334	0.101478875	0.113036685	0.124582395	0.112381175	0.113448448	0.120622598
D_Ti	Post-Closure	Mean	0.001057639	0.000967659	0.000964231	0.001220868	0.001338654	0.001073659	0.000896242	0.003165287	0.001577985	0.004640006	0.004666911	0.001196964
D_Tl	Post-Closure	Mean	1.0059E-05	9.56787E-06	1.23308E-05	1.54434E-05	1.04976E-05	1.58806E-05	1.1237E-05	1.15311E-05	1.18471E-05	1.13608E-05	1.1042E-05	1.35504E-05
D_U	Post-Closure	Mean	0.000109643	0.000108644	0.000115207	0.000114499	9.63545E-05	9.61778E-05	9.65952E-05	0.000104768	0.000113326	0.0001041	0.000101663	0.000101738
D_V	Post-Closure	Mean	0.003375053	0.003261548	0.002579884	0.001403498	0.000762737	0.001258322	0.001882223	0.002814566	0.003738416	0.003277676	0.003328279	0.003331569
D_Zn	Post-Closure	Mean	0.002986806	0.002963699	0.002829093	0.002178744	0.001863106	0.001906482	0.001836439	0.002257436	0.002711787	0.002698677	0.00269243	0.002548071

Appendix A.4.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ13

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.020952372	0.021098398	0.01987718	0.013230953	0.009750824	0.011362499	0.011822171	0.015884032	0.020024234	0.018898902	0.020247167	0.019327654
NO3_N	Closure	Mean	0.066484436	0.072450295	0.074892081	0.048259903	0.039591972	0.025126046	0.018280722	0.016363332	0.014657266	0.013560966	0.06095003	0.069373593
NO2_N	Closure	Mean	0.00113621	0.002028333	0.001016371	0.00103592	0.001393687	0.001194243	0.001007085	0.000947403	0.00096749	0.00084596	0.001277228	0.001387173
Br	Closure	Mean	0.025106546	0.025042975	0.025069969	0.025057497	0.025077999	0.025136888	0.025227958	0.025085846	0.025164265	0.025181225	0.025196506	0.025074938
Cl	Closure	Mean	0.387199581	0.395036668	0.370684713	0.30912748	0.288253635	0.315764397	0.384062082	0.349753827	0.372554541	0.362142563	0.385615379	0.364461988
F	Closure	Mean	0.060258232	0.059576008	0.064839266	0.059873734	0.057671249	0.057804588	0.058360979	0.057169225	0.060148709	0.060698707	0.060334247	0.06512183
TDP	Closure	Mean	0.014958388	0.011254001	0.014299783	0.016232451	0.010834767	0.009278827	0.007983645	0.009230217	0.007209513	0.00786548	0.009578072	0.013811162
SO4	Closure	Mean	5.892769814	6.075432301	5.561803341	4.153654575	3.977161884	3.958954573	4.189481258	4.907242775	5.460971355	5.152667522	5.987809658	5.568395138
T_CN	Closure	Mean	0.002523879	0.002527336	0.002514418	0.002498982	0.002503211	0.002509441	0.002506335	0.002509927	0.002513389	0.002510793	0.002523238	0.002518848
WAD_CN	Closure	Mean	0.00250271	0.00249914	0.002493651	0.002493315	0.002500326	0.002504671	0.002498224	0.002493099	0.002491795	0.002490672	0.002497897	0.002500363
T_Ag	Closure	Mean	8.36833E-06	8.03453E-06	1.90266E-05	1.46918E-05	1.22271E-05	1.5208E-05	1.05382E-05	9.87934E-06	9.36473E-06	9.15545E-06	9.04968E-06	1.19924E-05
T_Al	Closure	Mean	0.029236775	0.022125751	0.035368837	0.033932783	0.075865395	0.063703269	0.046353303	0.038173266	0.030582465	0.037851363	0.040121108	0.029275391
T_As	Closure	Mean	0.000638849	0.000600272	0.000581658	0.000589994	0.000590237	0.00058802	0.000602343	0.000632283	0.000651136	0.000622775	0.00062531	0.000622742
T_B	Closure	Mean	0.005660772	0.005530328	0.004564837	0.004804728	0.005192103	0.004674184	0.005575072	0.005830492	0.006113167	0.005947644	0.005861579	0.005217764
T_Ba	Closure	Mean	0.006677183	0.006703715	0.006761915	0.006455389	0.005906776	0.005948336	0.006114833	0.006113525	0.006727881	0.006639714	0.006366559	0.006230083
T_Bi	Closure	Mean	2.50728E-05	2.50304E-05	2.49735E-05	2.49784E-05	2.50362E-05	2.50616E-05	2.49894E-05	2.49355E-05	2.49204E-05	2.49087E-05	2.49808E-05	2.50561E-05
T_Be	Closure	Mean	5.21607E-05	5.17566E-05	5.10805E-05	5.08422E-05	5.08522E-05	5.12831E-05	5.17076E-05	5.24497E-05	5.32268E-05	5.27326E-05	5.26575E-05	5.2334E-05
T_Ca	Closure	Mean	20.33393669	21.4033432	20.67845726	18.69459724	17.80770874	17.48476982	17.70702553	18.87685204	18.70028305	19.55502319	18.7387085	21.26117897
T_Cd	Closure	Mean	7.33299E-06	7.41665E-06	8.18871E-06	7.17977E-06	6.97333E-06	7.61571E-06	8.87186E-06	8.61775E-06	9.94511E-06	1.06446E-05	8.79018E-06	8.67177E-06
T_Co	Closure	Mean	9.13143E-05	8.93452E-05	7.44091E-05	6.16914E-05	6.14099E-05	6.63135E-05	7.4103E-05	8.69151E-05	9.97682E-05	9.09138E-05	9.10682E-05	8.56457E-05
T_Cr	Closure	Mean	0.000159398	0.000150311	0.00017305	0.000165503	0.000190133	0.000192743	0.000175629	0.000155	0.000163419	0.000170292	0.000169596	0.00016249
T_Cu	Closure	Mean	0.000278408	0.000281025	0.000282228	0.00030225	0.000386584	0.000310067	0.000362877	0.000305959	0.000302288	0.000296213	0.000284405	0.000283106
T_Fe	Closure	Mean	0.083039306	0.084906884	0.110627107	0.086375043	0.097981043	0.089728944	0.081396215	0.084909521	0.094995923	0.095342442	0.100203536	0.082948409
T_Hg	Closure	Mean	3.46049E-06	3.34075E-06	3.11019E-06	2.99459E-06	3.47667E-06	3.41139E-06	3.36974E-06	3.58109E-06	3.86491E-06	4.07236E-06	3.63494E-06	3.54185E-06
T_K	Closure	Mean	0.996778965	0.963244796	0.950995326	0.962814331	0.81948489	0.809456289	0.833056271	0.923175335	0.971969068	0.972772837	0.960052311	0.951256633
T_Li	Closure	Mean	0.000802977	0.000753726	0.00067055	0.00064762	0.000621092	0.000676669	0.000753279	0.000873465	0.000989148	0.000924488	0.000960753	0.000857401
T_Mg	Closure	Mean	4.683031082	4.723724842	4.850756168	4.327776909	4.213415623	4.050124168	4.116679668	4.341038704	4.363171577	4.369315147	4.312697411	4.742309093
T_Mn	Closure	Mean	0.016471446	0.014873893	0.016740272	0.01566413	0.016867517	0.014012785	0.01434776	0.015446139	0.016174121	0.015915308	0.04091173	0.017208954
T_Mo	Closure	Mean	0.00074078	0.000758596	0.000718004	0.00060936	0.000547071	0.000559496	0.000601501	0.00069515	0.000795352	0.000713977	0.000686536	0.000712689
T_Na	Closure	Mean	4.136702061	4.137228012	4.052037239	3.473333359	3.360523939	3.256691933	3.385491133	3.582816601	3.75432229	3.797631741	3.716524839	3.987440825
T_Ni	Closure	Mean	0.000283541	0.000277216	0.000265398	0.000262008	0.000267349	0.000270163	0.000281342	0.000294083	0.000307534	0.000298868	0.000294438	0.000287508
T_P	Closure	Mean	0.027663136	0.02660799	0.032202378	0.027050424	0.025318928	0.022591596	0.02004645	0.018512229	0.017470025	0.018417172	0.027126327	0.027143445
T_Pb	Closure	Mean	2.92267E-05	3.02784E-05	2.9968E-05	3.09676E-05	4.52644E-05	3.66379E-05	3.29334E-05	3.15459E-05	3.10753E-05	3.05331E-05	3.01471E-05	2.948E-05
T_S	Closure	Mean	1.280622363	1.32133317	1.217269063	1.434316754	1.082775831	1.073572755	1.108269334	1.214494944	1.069453239	1.306577802	1.086915612	1.311618805
T_Sb	Closure	Mean	0.000529769	0.000451794	0.000316246	0.000283858	0.000238403	0.00032858	0.000451191	0.000644949	0.000830388	0.000727944	0.000669153	0.000576972
T_Se	Closure	Mean	9.24634E-05	8.68538E-05	0.000125688	8.35548E-05	7.92851E-05	7.62595E-05	8.43911E-05	8.50412E-05	8.19406E-05	9.25999E-05	8.50466E-05	8.53635E-05
T_Si	Closure	Mean	4.950424194	4.954911709	4.865100384	4.650633335	4.44157362	4.31970644	4.197097778	4.151278019	4.253168106	4.37622261	4.760275364	4.910093307
T_Sn	Closure	Mean	5.0056E-05	4.99833E-05	4.98777E-05	4.98719E-05	5.001E-05	5.00975E-05	4.99692E-05	4.98682E-05	4.98466E-05	4.98221E-05	4.99656E-05	5.00089E-05
T_Sr	Closure	Mean	0.102489866	0.10312447	0.102177911	0.090650387	0.090623118	0.086308219	0.086829871	0.091712072	0.096749067	0.091026396	0.092251904	0.102355197
T_Ti	Closure	Mean	0.003241247	0.002267895	0.002572428	0.00301329	0.003050677	0.002352084	0.003579711	0.003330891	0.002788192	0.004850659	0.004850539	0.003418312
T_Tl	Closure	Mean	9.74679E-06	9.16607E-06	1.21389E-05	1.52668E-05	1.05109E-05	1.58691E-05	1.10355E-05	1.14282E-05	1.17127E-05	1.11687E-05	1.08645E-05	1.35205E-05
T_U	Closure	Mean	0.00011518	0.000115623	0.000123917	0.0001207	0.000102412	0.000102408	0.000100687	0.000107981	0.000118721	0.000110175	0.000109344	0.000108643
T_V	Closure	Mean	0.000371402	0.000349851	0.000386623	0.000383574	0.000412165	0.000402662	0.000456256	0.000479382	0.000519335	0.000414736	0.00043511	0.000397158
T_Zn	Closure	Mean	0.001764746	0.001859265	0.001782519	0.001795527	0.001867789	0.001842769	0.001822019	0.001864509	0.001904338	0.001857936	0.001843912	0.001684762
D_Ag	Closure	Mean	8.01447E-06	7.72434E-06	1.11654E-05	1.46853E-05	9.7172E-06	1.49814E-05	9.60748E-06	9.26205E-06	8.88289E-06	8.70605E-06	8.63873E-06	1.15879E-05
D_Al	Closure	Mean	0.00433955	0.003593077	0.0027	0.015351088	0.04287865	0.033215567	0.023405546	0.014429599	0.007	0.01185562	0.018530628	0.008183656
D_As	Closure	Mean	0.000581903	0.000551495	0.000539656	0.000534765	0.00054146	0.000533196	0.000553799	0.000581225	0.000617514	0.000573856	0.00055878	0.000567917
D_B	Closure	Mean	0.005657541	0.00552609	0.004473696	0.004773555	0.005190984	0.004605164	0.005573613	0.005826833	0.006109823	0.005945567	0.005859436	0.005215288
D_Ba	Closure	Mean	0.006529787	0.006243998	0.006232957	0.006045183	0.005512405	0.005568123	0.005727979	0.006014107	0.00651195	0.006208291	0.005945405	0.006002497
D_Bi	Closure	Mean	2.5026E-05	2.49903E-05	2.49355E-05	2.49328E-05	2.50031E-05	2.50465E-05	2.49819E-05	2.49303E-05	2.49171E-05	2.49059E-05	2.49791E-05	2.50026E-05
D_Be	Closure	Mean	5.21607E-05	5.17566E-05	5.10805E-05	5.08422E-05	5.08522E-05	5.12831E-05	5.17076E-05	5.24497E-05	5.32268E-05	5.27326E-05	5.26575E-05	5.2334E-05
D_Ca	Closure	Mean	20.91562843	20.69729996	20.27316093	18.23270416	17.20382309	17.25459099	17.70384979	18.64950943	18.89940071	18.49838448	18.45760345	19.71662331
D_Cd	Closure	Mean	8.03427E-06	7.43015E-06	7.40782E-06	7.10806E-06	7.88874E-06	8.4254E-06	1.02253E-05	9.7609E-06	1.06972E-05	1.13531E-05	9.60506E-06	9.46866E-06
D_Co	Closure	Mean	9.0521E-05	8.85931E-05	7.35013E-05	5.94706E-05	5.95393E-05	6.2709E-05	7.36506E-05	8.63149E-05	9.8935E-05	8.99596E-05	9.02023E-05	8.30507E-05
D_Cr	Closure	Mean	9.56555E-05	8.97594E-05	0.000105963	0.000120649	0.000134008	0.000127167	0.000126588	0.000109099	0.000117588	0.000133795	0.000118697	0.000112731
D_Cu	Closure	Mean	0.000287281	0.000316327	0.000276851	0.000281465	0.00036315	0.000309134	0.000365573	0.000310256	0.000308937	0.000303516	0.000296402	0.000304943
D_Fe	Closure	Mean	0.04638546	0.045420129	0.05199432	0.046697207	0.050968122	0.046845391	0.048704918	0.051122725	0.057896294	0.055483118	0.053475119	0.049583904
D_Hg	Closure	Mean	3.44622E-06	3.32825E-06	3.09758E-06	2.98023E-06	3.43729E-06	3.27797E-06	3.30257E-06	3.54533E-06	3.83765E-06	3.66815E-06	3.61242E-06	3.54707E-06
D_K	Closure	Mean	0.977566481	0.95100528	0.930229187	0.939622998	0.805681586	0.767422616	0.796083987	0.881402731	0.944744349	0.913382649	0.966425061	0.947840512
D_Li	Closure	Mean	0.000802939	0.000753426	0.00067023	0.000647255	0.000620785	0.000676506	0.000753178	0.00087339	0.000989088	0.000924432	0.000960702	0.000857358
D_Mg	Closure	Mean	4.861052513	4.672620773	4.93320322	4.257873535	4.180850506	3.897046089	4.116829872	4.233465672	4.294201374	4.303314209	4.151870728	4.544868469
D_Mn	Closure	Mean	0.009375995	0.008506557	0.009502075	0.008597524	0.004911076	0.005614751	0.007469231	0.008247516	0.010128787	0.00898008	0.010559501	0.009512496
D_Mo	Closure	Mean	0.000695664	0.000696536	0.00068584	0.000575652	0.000505943	0.000535598	0.000598005	0.000664082	0.000789324	0.00065722	0.000648743	0.000657638
D_Na	Closure	Mean	4.185591698	4.094687939	4.005836487	3.421334505	3.332924366	3.182653427	3.384215117	3.566432953	3.710407019	3.638967037	3.623433352	3.884711742
D_Ni	Closure	Mean	0.000282706	0.000276442	0.000260952	0.000257369	0.000259402	0.000269837	0.000279697	0.000292818	0.000306501	0.00029784	0.000293742	0.000281036
D_P	Closure	Mean	0.044039946	0.043747425	0.041535269	0.04561441	0.039846972	0.030716132	0.053277705	0.10132619	0.060376909	0.14428471	0.144048497	0.048153482
D_Pb	Closure	Mean	2.66075E-05	2.63399E-05	2.58645E-05	2.5667E-05	2.56123E-05	2.59124E-05	2.62918E-05	2.68429E-05	2.73997E-05	2.70518E-05	2.69779E-05	2.6728E-05
D_S	Closure	Mean	1.166867852	1.351618886	1.346915126	1.192155123	1.079483867	1.074859023	1.161596775	1.156326056	1.118179202	1.231787086	1.181760788	1.299275279
D_Sb	Closure	Mean	0.000529673	0.000451613	0.00031606	0.000284398	0.000238227	0.000328382	0.000451079	0.000644852	0.000830311	0.000727872	0.000669089	0.000576917
D_Se	Closure	Mean	0.000122891	8.62204E-05	0.000121701	7.94277E-05	7.29011E-05	7.02884E-05	7.7786E-05	8.77256E-05	8.30304E-05	8.24617E-05	8.26302E-05	8.11568E-05
D_Si	Closure	Mean	4.873707294	4.758070469	4.735041618	4.447077751	4.186606884	4.088328362	4.009057522	4.005755901	4.123762608	4.141009331	4.676632881	4.809509754
D_Sn	Closure	Mean	5.0056E-05	4.99833E-05	4.98777E-05	4.98719E-05	5.001E-05	5.00975E-05	4.99692E-05	4.98682E-05	4.98466E-05	4.98221E-05	4.99656E-05	5.00089E-05
D_Sr	Closure	Mean	0.102610551	0.10305173	0.102380663	0.089099914	0.0895776	0.083752982	0.086844027	0.091401398	0.09638948	0.089513749	0.089214981	0.098182932
D_Ti	Closure	Mean	0.000995878	0.000968678	0.000948745	0.001237913	0.00129316	0.0010587	0.000915904	0.003169788	0.001627056	0.004789155	0.004779342	0.001213717
D_Tl	Closure	Mean	9.72777E-06	9.1493E-06	1.21224E-05	1.52665E-05	1.04322E-05	1.58672E-05	1.10301E-05	1.14242E-05	1.17095E-05	1.11657E-05	1.08618E-05	1.34993E-05
D_U	Closure	Mean	0.000109559	0.00010809	0.000115042	0.000111935	9.3911E-05	9.5804E-05	9.60789E-05	0.00010304	0.000112894	0.000102721	0.000101233	0.000101499
D_V	Closure	Mean	0.000346422	0.000331656	0.000269093	0.000298161	0.000287796	0.000321128	0.000332989	0.000382733	0.000396597	0.000381229	0.000391733	0.00035254
D_Zn	Closure	Mean	0.001408238	0.001160438	0.001338943	0.001501754	0.001552244	0.001442224	0.001212239	0.001250042	0.001204644	0.001340381	0.001290747	0.00101999

Appendix A.4.6: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, WQ13

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.169071749	0.16873014	0.137798727	0.081724524	0.063014731	0.073544949	0.090038195	0.13999176	0.191627711	0.164834514	0.158819914	0.158531621
NO3_N	Post-Closure	Mean	0.263995171	0.225907028	0.194250748	0.123261675	0.05975261	0.10201776	0.136927754	0.163565978	0.22988373	0.223407194	0.253115803	0.257003754
NO2_N	Post-Closure	Mean	0.001720739	0.002517486	0.001408593	0.001263288	0.001421781	0.001452734	0.001400285	0.001491635	0.001725821	0.001534407	0.001916693	0.001992502
Br	Post-Closure	Mean	0.02852932	0.028432615	0.027640415	0.029540136	0.02814151	0.026385387	0.027140094	0.028328773	0.029473346	0.02982056	0.029479148	0.028833421
Cl	Post-Closure	Mean	3.188807726	2.963314772	2.391485453	1.715946913	1.01008904	1.655929208	2.229131937	2.658551455	3.537110567	3.598723888	3.336915255	3.068171263
F	Post-Closure	Mean	0.116032146	0.112531103	0.105974466	0.078253791	0.063590422	0.074905388	0.08863616	0.102831662	0.122666255	0.114733189	0.114722326	0.120037965
TDP	Post-Closure	Mean	0.016238879	0.012579238	0.015180429	0.01587463	0.010618535	0.009825516	0.009403751	0.011137355	0.00949626	0.00958185	0.011521858	0.015272637
SO4	Post-Closure	Mean	62.05475235	58.92083359	46.51210022	32.49843597	19.19769859	32.06732178	43.0585289	54.51487732	72.33297729	72.38755798	66.86846924	62.12656021
T_CN	Post-Closure	Mean	0.002695649	0.002689063	0.002656232	0.002668925	0.002538484	0.002632692	0.002655639	0.002695739	0.002769213	0.002807	0.002768215	0.002686209
WAD_CN	Post-Closure	Mean	0.002491603	0.002492969	0.002488294	0.002488443	0.002477806	0.002470012	0.002437247	0.002409745	0.002372223	0.002366251	0.002384234	0.002376191
T_Ag	Post-Closure	Mean	1.02437E-05	9.96178E-06	2.01379E-05	1.50542E-05	1.26457E-05	1.55202E-05	1.12188E-05	1.10041E-05	1.11455E-05	1.08422E-05	1.06835E-05	1.32952E-05
T_Al	Post-Closure	Mean	0.029033374	0.022002663	0.0350779	0.033727683	0.075768664	0.063046604	0.04373173	0.036894113	0.029349763	0.036778864	0.039097238	0.028210592
T_As	Post-Closure	Mean	0.00065136	0.000618986	0.000598788	0.000618919	0.000607266	0.000583023	0.000598024	0.000632573	0.000655366	0.000644465	0.00063685	0.000637006
T_B	Post-Closure	Mean	0.005823464	0.005722248	0.004860889	0.005042729	0.005389034	0.004759922	0.00565499	0.005983449	0.006280161	0.006144027	0.006020704	0.005445824
T_Ba	Post-Closure	Mean	0.006657601	0.006692341	0.006752403	0.006453476	0.005871121	0.00589913	0.006025268	0.005995585	0.006534928	0.006440993	0.006189583	0.006033389
T_Bi	Post-Closure	Mean	2.50831E-05	2.50267E-05	2.49961E-05	2.51336E-05	2.52726E-05	2.50515E-05	2.49669E-05	2.5142E-05	2.48449E-05	2.49705E-05	2.49087E-05	2.50012E-05
T_Be	Post-Closure	Mean	5.3272E-05	5.30326E-05	5.23701E-05	5.21725E-05	5.19581E-05	5.16806E-05	5.21645E-05	5.34608E-05	5.43084E-05	5.41856E-05	5.36119E-05	5.33596E-05
T_Ca	Post-Closure	Mean	32.36274719	32.4845314	29.2163372	24.74868393	20.49762344	23.91438675	26.7044735	30.24089432	34.06430054	34.46759033	32.61958694	33.14442825
T_Cd	Post-Closure	Mean	2.7992E-05	2.9512E-05	2.57915E-05	1.83738E-05	1.35488E-05	1.34492E-05	1.6959E-05	2.13418E-05	2.83361E-05	2.73604E-05	2.58833E-05	2.72498E-05
T_Co	Post-Closure	Mean	0.000257255	0.000259482	0.000216458	0.000154285	0.000103388	0.000116215	0.000149172	0.000204221	0.000264961	0.000242103	0.000242326	0.000245204
T_Cr	Post-Closure	Mean	0.000159724	0.000151251	0.000173607	0.000167593	0.000190728	0.00019259	0.000174827	0.000155203	0.000163131	0.000170415	0.000169126	0.000162636
T_Cu	Post-Closure	Mean	0.00028521	0.000289194	0.00028996	0.000308369	0.000393108	0.000309348	0.000361807	0.000310647	0.000304878	0.000305086	0.00028771	0.000288353
T_Fe	Post-Closure	Mean	0.082574658	0.084525943	0.10898824	0.086259007	0.096691333	0.088535503	0.078492008	0.081933022	0.09041103	0.090924256	0.095878161	0.078947276
T_Hg	Post-Closure	Mean	4.36104E-06	4.304E-06	3.98594E-06	4.24519E-06	4.28917E-06	3.64359E-06	3.68211E-06	4.20799E-06	4.56401E-06	4.88087E-06	4.36273E-06	4.30927E-06
T_K	Post-Closure	Mean	7.661202908	7.578074455	6.228218079	3.429707527	1.779621363	2.693900824	4.001528263	5.952919006	7.944281101	7.020702839	7.093160152	7.363090992
T_Li	Post-Closure	Mean	0.012211185	0.011738913	0.009315394	0.004726693	0.002352819	0.004193544	0.006644553	0.010066786	0.013563835	0.011779353	0.011939286	0.012092651
T_Mg	Post-Closure	Mean	5.025818825	5.088014126	5.133503914	4.255860329	4.064136505	4.137438774	4.312676907	4.592403889	4.73017168	4.477664948	4.541851521	5.011754036
T_Mn	Post-Closure	Mean	0.086035781	0.083440021	0.071717024	0.045455605	0.027550448	0.034187939	0.046793822	0.065853044	0.08736299	0.079923265	0.10334605	0.084075622
T_Mo	Post-Closure	Mean	0.000847043	0.000873576	0.000816484	0.000696365	0.000551216	0.000578117	0.000641663	0.000756792	0.000892266	0.000813751	0.00077941	0.00082019
T_Na	Post-Closure	Mean	13.57538223	12.84372997	10.87534332	8.264019012	5.698381901	7.81682682	9.702459335	11.44472599	14.54857349	14.79432583	13.76618767	13.14028931
T_Ni	Post-Closure	Mean	0.000468326	0.00046081	0.000416348	0.000360085	0.000314344	0.000326036	0.000367598	0.000426168	0.000494283	0.000469875	0.000464942	0.000465247
T_P	Post-Closure	Mean	0.027219459	0.026255911	0.031700898	0.026209492	0.024754597	0.022640195	0.020501697	0.01886267	0.017636545	0.01782934	0.026527729	0.026478892
T_Pb	Post-Closure	Mean	3.85695E-05	4.02483E-05	3.82002E-05	3.63409E-05	4.80463E-05	3.82355E-05	3.5952E-05	3.69423E-05	3.93399E-05	3.86613E-05	3.79347E-05	3.8002E-05
T_S	Post-Closure	Mean	1.266025424	1.312519431	1.205789089	1.41069591	1.036899567	1.053319216	1.084192514	1.172527194	1.015805721	1.232317209	1.013718247	1.245867491
T_Sb	Post-Closure	Mean	0.001428482	0.001348915	0.00105592	0.000728568	0.000483404	0.000599661	0.000884248	0.001291147	0.001725685	0.001525083	0.001490585	0.001446519
T_Se	Post-Closure	Mean	9.22598E-05	8.68022E-05	0.000125312	8.34107E-05	7.78602E-05	7.58081E-05	8.42686E-05	8.4138E-05	8.07042E-05	9.10943E-05	8.32334E-05	8.36072E-05
T_Si	Post-Closure	Mean	4.948572159	4.953332901	4.867379189	4.667322636	4.451810837	4.320868492	4.194272518	4.171768665	4.253575802	4.386282444	4.739819527	4.879813194
T_Sn	Post-Closure	Mean	5.00799E-05	5.00386E-05	4.99885E-05	5.00018E-05	5.04248E-05	5.00991E-05	4.99645E-05	5.01651E-05	4.98495E-05	4.99608E-05	4.98496E-05	4.99037E-05
T_Sr	Post-Closure	Mean	0.122769035	0.120842755	0.115063943	0.095819078	0.089521974	0.094169848	0.101263009	0.112717517	0.124104977	0.113106713	0.115128271	0.123769119
T_Ti	Post-Closure	Mean	0.003203075	0.002231506	0.002540146	0.002977374	0.003049996	0.002348671	0.003561314	0.003321467	0.002693519	0.004739897	0.00475934	0.003380646
T_Tl	Post-Closure	Mean	9.93319E-06	9.44268E-06	1.20991E-05	1.52383E-05	1.04659E-05	1.58591E-05	1.11374E-05	1.13644E-05	1.16564E-05	1.11594E-05	1.08322E-05	1.33313E-05
T_U	Post-Closure	Mean	0.000115174	0.000115752	0.000124209	0.000123281	0.000104905	0.000102678	0.000101155	0.00010978	0.000118713	0.000111334	0.0001094	0.000108723
T_V	Post-Closure	Mean	0.003310803	0.0031848	0.002612903	0.001457506	0.000874475	0.001305713	0.001969048	0.002838803	0.003746998	0.003223888	0.003262991	0.003290472
T_Zn	Post-Closure	Mean	0.003339775	0.00354643	0.003184203	0.002614301	0.002314001	0.002263555	0.002400166	0.002797865	0.003290514	0.003139449	0.003132559	0.00311491
D_Ag	Post-Closure	Mean	9.89651E-06	9.65463E-06	1.23423E-05	1.499E-05	9.80725E-06	1.54725E-05	1.04614E-05	1.04322E-05	1.06744E-05	1.03579E-05	1.02749E-05	1.2896E-05
D_Al	Post-Closure	Mean	0.004341267	0.003598067	0.0027	0.01536148	0.043731946	0.033091489	0.022820149	0.014456679	0.007	0.011863678	0.018465811	0.008208313
D_As	Post-Closure	Mean	0.000599435	0.000574072	0.000564013	0.00056621	0.000551672	0.000530249	0.000552948	0.000585107	0.000627989	0.000600968	0.000572212	0.000585831
D_B	Post-Closure	Mean	0.005823463	0.005722248	0.004783872	0.005015836	0.005389034	0.004696314	0.005654989	0.005982754	0.006280161	0.006144027	0.006020704	0.005445824
D_Ba	Post-Closure	Mean	0.006510729	0.006233964	0.006224993	0.00604379	0.00548012	0.0055249	0.005649245	0.0059046	0.00632987	0.00602387	0.005785637	0.005818432
D_Bi	Post-Closure	Mean	2.50372E-05	2.49868E-05	2.49596E-05	2.50899E-05	2.52322E-05	2.50333E-05	2.49558E-05	2.51356E-05	2.484E-05	2.4967E-05	2.49065E-05	2.49533E-05
D_Be	Post-Closure	Mean	5.3272E-05	5.30326E-05	5.23701E-05	5.21725E-05	5.19581E-05	5.16806E-05	5.21645E-05	5.34608E-05	5.43084E-05	5.41856E-05	5.36119E-05	5.33596E-05
D_Ca	Post-Closure	Mean	32.88913345	31.87982368	28.86441422	24.34974098	19.94838524	23.70331192	26.7114048	30.04673958	34.26184082	33.50456238	32.37502289	31.74639511
D_Cd	Post-Closure	Mean	2.8602E-05	2.94877E-05	2.5751E-05	1.82544E-05	1.32944E-05	1.43878E-05	1.78107E-05	2.23854E-05	2.89354E-05	2.78877E-05	2.65702E-05	2.79586E-05
D_Co	Post-Closure	Mean	0.00025654	0.000258813	0.000215646	0.000151972	0.000101054	0.000113101	0.00014785	0.000203166	0.000264058	0.000241209	0.000241525	0.00024293
D_Cr	Post-Closure	Mean	0.000100915	9.51585E-05	0.000109497	0.000127628	0.000137991	0.000127701	0.000127558	0.000113214	0.00012143	0.00013581	0.000122028	0.000116162
D_Cu	Post-Closure	Mean	0.000292784	0.00031913	0.000285613	0.000288878	0.000370439	0.000309639	0.000365468	0.000315451	0.0003111	0.000309011	0.000298124	0.000307448
D_Fe	Post-Closure	Mean	0.046086986	0.045212399	0.051783014	0.046636328	0.050314963	0.046167649	0.047164768	0.049323589	0.05509514	0.053028468	0.051231548	0.047187567
D_Hg	Post-Closure	Mean	4.35041E-06	4.29473E-06	3.97613E-06	4.234E-06	4.25711E-06	3.47419E-06	3.61376E-06	4.17617E-06	4.53952E-06	4.52558E-06	4.34158E-06	4.31527E-06
D_K	Post-Closure	Mean	7.644551277	7.569020271	6.210513592	3.402245283	1.768811226	2.655484438	3.966515303	5.914246082	7.921543121	6.968941212	7.100875854	7.361198425
D_Li	Post-Closure	Mean	0.012211156	0.011738661	0.009315141	0.00472642	0.002352566	0.004193419	0.006644471	0.010066727	0.013563791	0.011779313	0.011939249	0.012092618
D_Mg	Post-Closure	Mean	5.210493565	5.046062469	5.22258234	4.193248272	4.032702923	3.982572794	4.310143948	4.4954319	4.677963257	4.431108475	4.416576385	4.839196682
D_Mn	Post-Closure	Mean	0.079858117	0.077891156	0.065378852	0.039365888	0.016462615	0.026054602	0.040428419	0.059375968	0.082155488	0.074141972	0.075905755	0.077290386
D_Mo	Post-Closure	Mean	0.000805081	0.000815059	0.000786904	0.000668512	0.00051672	0.000555587	0.000638718	0.000728326	0.000887799	0.000763064	0.00074646	0.000772126
D_Na	Post-Closure	Mean	13.61915398	12.80511856	10.83173752	8.213159561	5.667453766	7.742233753	9.700472832	11.42930412	14.51247501	14.64346409	13.67639828	13.04820824
D_Ni	Post-Closure	Mean	0.000467586	0.000460125	0.000412377	0.000355676	0.000306344	0.000325639	0.000366109	0.000425022	0.0004934	0.000468995	0.000464305	0.000459655
D_P	Post-Closure	Mean	0.043613497	0.043399569	0.041426346	0.044282846	0.039016992	0.030272229	0.05339187	0.099279381	0.05661802	0.137818173	0.138904169	0.045515481
D_Pb	Post-Closure	Mean	3.61577E-05	3.65766E-05	3.44518E-05	3.17004E-05	2.90594E-05	2.87087E-05	3.00758E-05	3.27617E-05	3.6111E-05	3.55294E-05	3.51115E-05	3.5477E-05
D_S	Post-Closure	Mean	1.149616122	1.338625193	1.338235617	1.171758533	1.036335945	1.055244446	1.135521889	1.105320573	1.048985362	1.117551327	1.097919106	1.222272515
D_Sb	Post-Closure	Mean	0.001428405	0.001348758	0.001055762	0.00072902	0.000483247	0.000599483	0.000884149	0.001291067	0.001725626	0.001525029	0.001490535	0.001446475
D_Se	Post-Closure	Mean	0.000122598	8.59958E-05	0.000121321	7.92787E-05	7.20938E-05	6.9584E-05	7.747E-05	8.676E-05	8.16986E-05	8.1288E-05	8.08129E-05	7.94287E-05
D_Si	Post-Closure	Mean	4.871954918	4.756714344	4.740428448	4.467571735	4.202404022	4.089839935	4.008424282	4.029788971	4.125216484	4.157011032	4.657760143	4.783219814
D_Sn	Post-Closure	Mean	5.00799E-05	5.00386E-05	4.99885E-05	5.00018E-05	5.04248E-05	5.00991E-05	4.99645E-05	5.01651E-05	4.98495E-05	4.99608E-05	4.98496E-05	4.99037E-05
D_Sr	Post-Closure	Mean	0.122760788	0.120846689	0.115318872	0.094563395	0.08851634	0.091650948	0.101222485	0.112530239	0.123894028	0.111822791	0.112749174	0.1200286
D_Ti	Post-Closure	Mean	0.001040764	0.001014442	0.001011934	0.001245928	0.001335981	0.001064696	0.00092678	0.003152391	0.001608287	0.004651521	0.004679928	0.001236587
D_Tl	Post-Closure	Mean	9.91797E-06	9.42932E-06	1.20828E-05	1.5238E-05	1.03957E-05	1.58564E-05	1.11322E-05	1.1361E-05	1.1654E-05	1.11566E-05	1.08301E-05	1.33138E-05
D_U	Post-Closure	Mean	0.000109543	0.000108306	0.000115415	0.000114596	9.62881E-05	9.60117E-05	9.64736E-05	0.000104602	0.000112748	0.000103808	0.000101152	0.000101492
D_V	Post-Closure	Mean	0.003287625	0.003167883	0.002507685	0.001379841	0.000751323	0.001230234	0.001853292	0.002750451	0.003640591	0.003191785	0.003221178	0.003248653
D_Zn	Post-Closure	Mean	0.002930213	0.002898898	0.002758664	0.002152817	0.001854138	0.001882294	0.001813743	0.002220843	0.002647469	0.002634214	0.002614115	0.002490282

Appendix A.4.7: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Midway

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.016279712	0.015325379	0.015615892	0.012013865	0.008942033	0.010867902	0.010958271	0.014124402	0.015397585	0.014140526	0.015927367	0.014646103
NO3_N	Closure	Mean	0.068938218	0.069265507	0.068496503	0.046008162	0.031906929	0.018208468	0.014518929	0.012271215	0.010256435	0.009430024	0.053254236	0.064337559
NO2_N	Closure	Mean	0.00115922	0.001963717	0.000830652	0.001027586	0.001162312	0.001135301	0.000887561	0.000823932	0.000889318	0.001055074	0.000969461	0.00137481
Br	Closure	Mean	0.025066426	0.025028771	0.025049901	0.025039034	0.025056925	0.02509506	0.025172813	0.025059542	0.025107013	0.025104651	0.025118303	0.025050649
Cl	Closure	Mean	0.33564797	0.338138044	0.324720442	0.291584134	0.277651072	0.295118928	0.352500528	0.315943509	0.324686766	0.315858424	0.328705698	0.322680324
F	Closure	Mean	0.059509821	0.05955204	0.06398464	0.05946885	0.055689357	0.056648992	0.057693567	0.056281321	0.059906125	0.058282726	0.060204279	0.062964655
TDP	Closure	Mean	0.013992601	0.010846516	0.010957612	0.015838699	0.010431733	0.008182525	0.007108924	0.009310459	0.007499604	0.007522451	0.008361158	0.011038456
SO4	Closure	Mean	5.172895908	5.285586834	5.032957077	4.055190086	3.776643753	3.696285963	3.937254667	4.357513905	4.684555531	4.471268654	4.980487347	4.921208382
T_CN	Closure	Mean	0.002515261	0.002513472	0.002507581	0.002499385	0.002502461	0.002506718	0.002504303	0.002505838	0.002506858	0.002505394	0.002513761	0.002512068
WAD_CN	Closure	Mean	0.002501762	0.002499575	0.002496147	0.002495289	0.002500275	0.00250352	0.002498715	0.002495596	0.002495372	0.002494378	0.002498928	0.00250033
T_Ag	Closure	Mean	7.21341E-06	6.96366E-06	1.40074E-05	1.23368E-05	1.03823E-05	1.51544E-05	9.25846E-06	8.30834E-06	7.79484E-06	7.60977E-06	7.39222E-06	9.50094E-06
T_Al	Closure	Mean	0.037355714	0.020396382	0.032739859	0.042358376	0.091109291	0.065790549	0.044367239	0.036612704	0.029383162	0.034888431	0.03996085	0.027339267
T_As	Closure	Mean	0.000635129	0.00060096	0.000584382	0.000596874	0.000584373	0.000583726	0.00061721	0.000641629	0.000659992	0.000635882	0.000614609	0.000618136
T_B	Closure	Mean	0.005416102	0.005322945	0.004723126	0.004835548	0.005137422	0.004414915	0.005432055	0.005551877	0.005700776	0.005587777	0.00549602	0.005136453
T_Ba	Closure	Mean	0.007049737	0.00675629	0.00704408	0.007120031	0.006208756	0.00616708	0.006390575	0.006482942	0.00709563	0.007214202	0.006920866	0.006648421
T_Bi	Closure	Mean	2.50485E-05	2.50216E-05	2.49851E-05	2.49859E-05	2.5027E-05	2.50449E-05	2.49925E-05	2.49587E-05	2.49552E-05	2.49449E-05	2.49904E-05	2.50381E-05
T_Be	Closure	Mean	5.13702E-05	5.10846E-05	5.06737E-05	5.0597E-05	5.06166E-05	5.08653E-05	5.12838E-05	5.163E-05	5.20378E-05	5.16961E-05	5.15354E-05	5.14932E-05
T_Ca	Closure	Mean	20.51563263	21.13653564	20.60002708	18.98606491	17.12502098	17.24918175	17.80514526	18.79027939	18.90335655	19.4684124	18.61803627	20.80661392
T_Cd	Closure	Mean	5.59754E-06	6.18942E-06	6.10185E-06	5.95425E-06	6.0003E-06	6.80261E-06	7.92502E-06	6.58381E-06	7.20125E-06	9.23266E-06	6.14935E-06	7.2328E-06
T_Co	Closure	Mean	7.58577E-05	7.38592E-05	6.50215E-05	5.83676E-05	5.81491E-05	6.11255E-05	6.80683E-05	7.44192E-05	8.10962E-05	7.52692E-05	7.36159E-05	7.26636E-05
T_Cr	Closure	Mean	0.000155823	0.000128767	0.000157066	0.000167698	0.000194786	0.000184534	0.00016958	0.000151573	0.000154879	0.000162622	0.000161345	0.000149198
T_Cu	Closure	Mean	0.000268323	0.000296197	0.00027037	0.000295768	0.000440489	0.000331338	0.000378124	0.000338619	0.000309609	0.000278808	0.000269999	0.000297692
T_Fe	Closure	Mean	0.114852354	0.101815663	0.129922241	0.12287128	0.1181297	0.100827843	0.091763742	0.107632257	0.126577929	0.14709112	0.142706558	0.098260455
T_Hg	Closure	Mean	3.11027E-06	3.02099E-06	2.87988E-06	2.85541E-06	3.2138E-06	3.13494E-06	3.15612E-06	3.21872E-06	3.35852E-06	3.48671E-06	3.15528E-06	3.43105E-06
T_K	Closure	Mean	0.949093819	0.906436443	0.951706707	0.986128926	0.797275007	0.777341247	0.806677401	0.876696169	0.905790448	0.907439649	0.862566888	0.892110765
T_Li	Closure	Mean	0.00069198	0.000656361	0.000605986	0.000605637	0.000587423	0.000621415	0.000690383	0.000747954	0.00080761	0.00076322	0.000766272	0.000728248
T_Mg	Closure	Mean	4.709134579	4.705479145	4.868048668	4.413854599	4.037421227	3.966825008	4.066659451	4.334988594	4.391838074	4.352300644	4.375052452	4.67726326
T_Mn	Closure	Mean	0.02084019	0.016346719	0.019397108	0.021538295	0.017853215	0.015634732	0.015943157	0.020357627	0.021721859	0.023976294	0.040523283	0.019839697
T_Mo	Closure	Mean	0.00069397	0.000697719	0.000685779	0.000625933	0.000531495	0.000546308	0.000598173	0.000678609	0.000748178	0.000691829	0.000628271	0.000670373
T_Na	Closure	Mean	4.008444309	3.894330025	3.91083169	3.474051476	3.227493048	3.181741238	3.351926327	3.523803949	3.651894331	3.635367632	3.543480396	3.835365295
T_Ni	Closure	Mean	0.000271158	0.000266643	0.000259525	0.000258543	0.000262598	0.000265024	0.000273611	0.000279289	0.00028621	0.00028028	0.000275579	0.000273953
T_P	Closure	Mean	0.027187541	0.026530357	0.029526925	0.028188495	0.02473755	0.021549083	0.018389173	0.017329086	0.01692057	0.018228015	0.025895355	0.026384426
T_Pb	Closure	Mean	2.7739E-05	2.84141E-05	2.81592E-05	2.9476E-05	4.29596E-05	3.29644E-05	3.10431E-05	2.94135E-05	2.88446E-05	2.84307E-05	2.79919E-05	2.78566E-05
T_S	Closure	Mean	1.304011106	1.388584614	1.217871308	1.430209637	1.061951995	1.087085962	1.102722287	1.166865587	1.069799304	1.391299844	1.156631351	1.326200962
T_Sb	Closure	Mean	0.000353957	0.000297507	0.000215353	0.000217323	0.000185864	0.000240719	0.000351475	0.000444879	0.000540577	0.000470318	0.000406994	0.000386767
T_Se	Closure	Mean	8.81047E-05	7.97597E-05	0.000103788	7.82434E-05	7.75577E-05	7.40566E-05	8.57084E-05	7.97743E-05	7.84171E-05	9.33387E-05	7.728E-05	7.57074E-05
T_Si	Closure	Mean	5.025798798	4.945728302	4.951526642	4.759569168	4.477025509	4.241156101	4.193021297	4.094154358	4.225748539	4.55087471	4.904853344	4.990235806
T_Sn	Closure	Mean	5.00363E-05	4.99918E-05	4.99262E-05	4.99096E-05	5.0008E-05	5.00731E-05	4.99779E-05	4.99158E-05	4.99141E-05	4.98928E-05	4.99832E-05	5.00077E-05
T_Sr	Closure	Mean	0.104103118	0.103355393	0.102665842	0.09178517	0.087540992	0.085616648	0.087053582	0.092857197	0.098275907	0.092504881	0.093906634	0.102260433
T_Ti	Closure	Mean	0.003855456	0.002574221	0.002932637	0.003515797	0.003452199	0.002504185	0.003679867	0.003211392	0.002957849	0.00490937	0.004914742	0.003295441
T_Tl	Closure	Mean	8.07824E-06	7.65082E-06	9.49901E-06	1.27382E-05	9.05113E-06	1.56167E-05	9.63324E-06	9.33262E-06	9.2665E-06	8.8546E-06	8.42985E-06	1.04756E-05
T_U	Closure	Mean	0.000116235	0.000112056	0.000124902	0.000124471	0.000102077	0.000101584	9.829E-05	0.000105759	0.000111393	0.000105521	0.000104428	0.000107051
T_V	Closure	Mean	0.000345008	0.00031282	0.000335955	0.000435414	0.000460599	0.000421635	0.000484257	0.000489707	0.000484855	0.000352969	0.000357919	0.000344378
T_Zn	Closure	Mean	0.001670023	0.001730472	0.0016795	0.001719191	0.001770991	0.001737616	0.001743739	0.001889129	0.001755881	0.001722955	0.001700626	0.001618075
D_Ag	Closure	Mean	6.97938E-06	6.76161E-06	8.89369E-06	1.23322E-05	8.48573E-06	1.49912E-05	9.13622E-06	7.89455E-06	7.48703E-06	7.32751E-06	7.15041E-06	9.24032E-06
D_Al	Closure	Mean	0.004224932	0.002885126	0.002364338	0.012813816	0.041992575	0.030778909	0.020711629	0.011918813	0.007	0.010617916	0.014491505	0.006990116
D_As	Closure	Mean	0.000580426	0.000546456	0.000517876	0.000536798	0.000530548	0.000521946	0.000563818	0.000605247	0.000622582	0.0005576	0.000550642	0.000564944
D_B	Closure	Mean	0.005414094	0.005320489	0.0046659	0.004811879	0.005136667	0.004120009	0.005430986	0.005549515	0.005698783	0.005586547	0.005494819	0.00513491
D_Ba	Closure	Mean	0.006759359	0.006389454	0.006639095	0.006501202	0.005708606	0.005724294	0.006014437	0.006254185	0.006857344	0.006821749	0.006347625	0.006464376
D_Bi	Closure	Mean	2.50169E-05	2.4995E-05	2.49608E-05	2.49527E-05	2.50026E-05	2.5035E-05	2.49869E-05	2.49556E-05	2.49532E-05	2.49433E-05	2.49894E-05	2.50027E-05
D_Be	Closure	Mean	5.13702E-05	5.10846E-05	5.06737E-05	5.0597E-05	5.06166E-05	5.08653E-05	5.12838E-05	5.163E-05	5.20378E-05	5.16961E-05	5.15354E-05	5.14932E-05
D_Ca	Closure	Mean	21.27531624	20.68156815	20.19959641	18.76132774	16.66897392	17.01517868	17.67650795	18.71045876	19.1405201	18.62631989	17.96186638	19.23500252
D_Cd	Closure	Mean	6.06842E-06	5.61939E-06	5.59679E-06	5.90491E-06	6.44103E-06	7.37476E-06	8.39505E-06	7.38412E-06	7.70021E-06	8.05636E-06	6.64667E-06	6.97069E-06
D_Co	Closure	Mean	7.53323E-05	7.33584E-05	6.44446E-05	5.65107E-05	5.67327E-05	5.59435E-05	6.77272E-05	7.40209E-05	8.05633E-05	7.46781E-05	7.31135E-05	7.09977E-05
D_Cr	Closure	Mean	0.000113749	7.55631E-05	8.55465E-05	0.000112712	0.000132652	0.000129389	0.00011927	0.000104584	0.000102418	0.000139553	0.000114808	9.04563E-05
D_Cu	Closure	Mean	0.000274295	0.000310094	0.000267101	0.000273715	0.000383913	0.000291269	0.000338533	0.000291214	0.000287801	0.000283645	0.00027724	0.00031193
D_Fe	Closure	Mean	0.0528486	0.054132394	0.053054426	0.060705427	0.057598125	0.051070802	0.056962285	0.068139367	0.078995116	0.073834002	0.06757772	0.063084684
D_Hg	Closure	Mean	3.10091E-06	3.01289E-06	2.87186E-06	2.84455E-06	3.1842E-06	3.0401E-06	3.10514E-06	3.19482E-06	3.34112E-06	3.22413E-06	3.142E-06	3.43451E-06
D_K	Closure	Mean	0.942941129	0.898498774	0.894175768	0.949832559	0.787949979	0.738688707	0.771489501	0.843820333	0.876695216	0.869526327	0.884366453	0.886654317
D_Li	Closure	Mean	0.000691954	0.00065616	0.00060578	0.000605363	0.000587195	0.000621305	0.000690306	0.000747903	0.000807572	0.000763185	0.000766243	0.00072822
D_Mg	Closure	Mean	4.863634586	4.695631027	4.932994366	4.362816811	4.001522064	3.847296953	4.103960991	4.217303753	4.309725761	4.242237091	4.114393234	4.518624306
D_Mn	Closure	Mean	0.012951855	0.011010644	0.011646977	0.014675486	0.006158211	0.007452424	0.009121122	0.01326415	0.015749462	0.015648386	0.01703006	0.013719841
D_Mo	Closure	Mean	0.000646889	0.000645535	0.000649643	0.000590354	0.00049737	0.000518982	0.000590843	0.000642132	0.000736004	0.000627352	0.000597521	0.000622338
D_Na	Closure	Mean	4.007817745	3.885519743	3.889106274	3.394299984	3.220037699	3.134325027	3.350816488	3.483268023	3.571690083	3.498865604	3.487466335	3.753705502
D_Ni	Closure	Mean	0.000270614	0.000266149	0.000256727	0.000255086	0.000256732	0.000265223	0.000272351	0.000278431	0.000285553	0.000279646	0.000275183	0.000269795
D_P	Closure	Mean	0.037657015	0.059569299	0.058589067	0.05614784	0.035989884	0.025843028	0.067288384	0.097066708	0.070360288	0.14653489	0.146607399	0.062289853
D_Pb	Closure	Mean	2.60182E-05	2.58264E-05	2.55379E-05	2.54739E-05	2.54426E-05	2.56138E-05	2.59723E-05	2.62272E-05	2.6513E-05	2.62731E-05	2.61421E-05	2.61047E-05
D_S	Closure	Mean	1.164328694	1.333042026	1.441242099	1.26232636	1.06352365	1.071535349	1.153029442	1.077613711	1.144281745	1.279441118	1.128648877	1.285702109
D_Sb	Closure	Mean	0.000353893	0.000297386	0.000215234	0.00021772	0.000185733	0.000239314	0.000351389	0.000444813	0.000540527	0.000470273	0.000406956	0.000386731
D_Se	Closure	Mean	0.000112375	7.30994E-05	9.76488E-05	7.44841E-05	6.6743E-05	7.06368E-05	7.37005E-05	8.08684E-05	7.39252E-05	7.52994E-05	7.39333E-05	7.60698E-05
D_Si	Closure	Mean	4.908545494	4.724364281	4.772082806	4.499752045	4.227054119	4.033195019	3.980387449	3.9921422	4.112298012	4.241456509	4.779343128	4.852284431
D_Sn	Closure	Mean	5.00363E-05	4.99918E-05	4.99262E-05	4.99096E-05	5.0008E-05	5.00731E-05	4.99779E-05	4.99158E-05	4.99141E-05	4.98928E-05	4.99832E-05	5.00077E-05
D_Sr	Closure	Mean	0.105180621	0.103313193	0.103890933	0.091528624	0.087168843	0.082874246	0.086928219	0.091995917	0.097628646	0.090816528	0.09094511	0.098220579
D_Ti	Closure	Mean	0.000797518	0.001549704	0.001549811	0.001588446	0.001266565	0.000953881	0.001349172	0.003008453	0.001999576	0.004872285	0.004873979	0.001703062
D_Tl	Closure	Mean	8.06541E-06	7.6397E-06	9.48844E-06	1.2738E-05	8.99369E-06	1.56155E-05	9.62915E-06	9.3299E-06	9.26445E-06	8.85277E-06	8.42825E-06	1.04615E-05
D_U	Closure	Mean	0.000109168	0.000105427	0.000117828	0.000113887	9.34883E-05	9.39661E-05	9.45196E-05	0.000101561	0.000106402	9.96806E-05	9.59519E-05	9.86337E-05
D_V	Closure	Mean	0.000311631	0.000300897	0.00026186	0.000284877	0.00027714	0.000298757	0.000312363	0.000363351	0.00034251	0.000331772	0.000332361	0.00031565
D_Zn	Closure	Mean	0.001300958	0.001099458	0.001068125	0.001316905	0.001516546	0.001296775	0.00104295	0.001116795	0.000950575	0.001032884	0.000967425	0.000834578

Appendix A.4.7: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Midway

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.117706247	0.113385066	0.09328074	0.061821491	0.047527108	0.053217214	0.070905522	0.100054719	0.130370304	0.111156538	0.101309165	0.109118439
NO3_N	Post-Closure	Mean	0.205034882	0.171549171	0.146485806	0.100801222	0.046365783	0.070097975	0.105349906	0.114865884	0.155506626	0.145625964	0.172555298	0.191608816
NO2_N	Post-Closure	Mean	0.00155326	0.002290028	0.00110069	0.001193521	0.001196554	0.001311421	0.001195976	0.001210406	0.001407779	0.001474039	0.001393255	0.001785347
Br	Post-Closure	Mean	0.027427256	0.027280858	0.026633635	0.028498728	0.027386613	0.025941191	0.026636388	0.02727833	0.027978348	0.028286738	0.027738266	0.027546436
Cl	Post-Closure	Mean	2.274241686	2.031339884	1.640849471	1.321471572	0.795394242	1.201872706	1.76290226	1.920223117	2.425305128	2.432263851	2.133939981	2.150416613
F	Post-Closure	Mean	0.097301558	0.094497137	0.090747058	0.072960235	0.060000688	0.068112954	0.080686875	0.087650687	0.101759285	0.094491825	0.093821682	0.10022299
TDP	Post-Closure	Mean	0.014950525	0.011769019	0.011801374	0.01558545	0.010284674	0.008561959	0.00822633	0.010599119	0.008996626	0.008725472	0.009674842	0.012319219
SO4	Post-Closure	Mean	43.99241257	40.06236267	31.69566345	24.78074455	14.69801521	22.7308979	33.65172195	38.87360764	49.74888229	48.45217896	42.25240326	43.16322708
T_CN	Post-Closure	Mean	0.002639606	0.002618549	0.002600153	0.00261389	0.002520111	0.002592334	0.002622178	0.00263904	0.002683009	0.00270529	0.002667038	0.002623709
WAD_CN	Post-Closure	Mean	0.002494029	0.002495317	0.002492635	0.002491339	0.002483194	0.00247924	0.00245213	0.00244024	0.002415724	0.0024103	0.002429943	0.002417727
T_Ag	Post-Closure	Mean	8.59728E-06	8.32232E-06	1.50801E-05	1.29069E-05	1.07999E-05	1.53494E-05	9.84616E-06	9.19838E-06	9.15626E-06	8.92712E-06	8.56485E-06	1.06231E-05
T_Al	Post-Closure	Mean	0.037192199	0.020296022	0.032620054	0.041898441	0.090369776	0.065292917	0.042413194	0.035843633	0.028620696	0.034344692	0.03934725	0.026744789
T_As	Post-Closure	Mean	0.00064386	0.000613174	0.000594913	0.000617862	0.000597836	0.000580138	0.000613581	0.000641493	0.000662139	0.000648904	0.000622304	0.000627857
T_B	Post-Closure	Mean	0.005551087	0.005474474	0.004901781	0.005019005	0.00529382	0.004473847	0.005501839	0.005671842	0.005849415	0.00575701	0.005624073	0.005294865
T_Ba	Post-Closure	Mean	0.007035044	0.006748289	0.007037095	0.007113499	0.006172935	0.006130346	0.006314832	0.006395441	0.006955163	0.007022747	0.006780923	0.006494433
T_Bi	Post-Closure	Mean	2.50554E-05	2.50187E-05	2.49979E-05	2.51221E-05	2.52175E-05	2.50424E-05	2.49774E-05	2.50935E-05	2.4901E-05	2.49936E-05	2.49438E-05	2.50002E-05
T_Be	Post-Closure	Mean	5.22061E-05	5.20017E-05	5.15415E-05	5.16556E-05	5.1489E-05	5.1153E-05	5.16638E-05	5.2363E-05	5.28658E-05	5.27705E-05	5.22107E-05	5.22555E-05
T_Ca	Post-Closure	Mean	28.78402138	28.43002701	26.15821457	23.34559631	19.06036186	21.6054039	24.66768265	26.66857529	29.09925461	29.21123314	27.10647774	28.87148857
T_Cd	Post-Closure	Mean	1.94256E-05	2.04907E-05	1.7647E-05	1.45064E-05	1.09708E-05	1.07595E-05	1.41442E-05	1.54693E-05	1.9559E-05	2.03192E-05	1.68073E-05	1.96581E-05
T_Co	Post-Closure	Mean	0.000189818	0.000186554	0.000157705	0.000128304	8.9445E-05	9.47992E-05	0.00012553	0.000156143	0.000193435	0.000177712	0.000168822	0.000181391
T_Cr	Post-Closure	Mean	0.000156335	0.000130555	0.000157873	0.000169353	0.000195094	0.000184512	0.000169097	0.000151965	0.000155027	0.000163109	0.000161501	0.000149887
T_Cu	Post-Closure	Mean	0.000273972	0.000300026	0.000276323	0.000301072	0.000442757	0.000330446	0.00037705	0.000340337	0.000311124	0.000286565	0.000273145	0.000300173
T_Fe	Post-Closure	Mean	0.113466948	0.101175822	0.128517911	0.121554911	0.117009327	0.099872619	0.089327686	0.104887553	0.121279836	0.138760552	0.136963412	0.095088691
T_Hg	Post-Closure	Mean	3.7538E-06	3.69103E-06	3.46364E-06	3.83404E-06	3.85241E-06	3.29413E-06	3.40223E-06	3.66781E-06	3.86562E-06	4.08701E-06	3.61686E-06	3.95691E-06
T_K	Post-Closure	Mean	5.453166485	5.242658615	4.368603706	2.804039478	1.489212871	2.043358564	3.216261625	4.340905666	5.567245007	4.932926655	4.660432816	5.217643261
T_Li	Post-Closure	Mean	0.008418016	0.007906359	0.006219146	0.00362069	0.001832008	0.002987572	0.00517525	0.007093947	0.009236585	0.008008148	0.007575679	0.008320308
T_Mg	Post-Closure	Mean	4.932276726	4.94234848	5.048187256	4.35781765	3.931992769	4.024171352	4.215389252	4.503302097	4.627928734	4.420118332	4.505483627	4.865537167
T_Mn	Post-Closure	Mean	0.067241691	0.061322708	0.054784972	0.042496897	0.025409438	0.029144995	0.040476162	0.054686271	0.068544082	0.065052733	0.079067267	0.064626254
T_Mo	Post-Closure	Mean	0.000769315	0.000777091	0.000750637	0.00068977	0.000536396	0.00055818	0.000629065	0.00072229	0.000816348	0.000759228	0.000689344	0.000744878
T_Na	Post-Closure	Mean	10.53406811	9.628596306	8.353069305	6.973612309	4.907066345	6.267640591	8.176558495	8.981525421	10.80994987	10.8234272	9.689792633	10.02510452
T_Ni	Post-Closure	Mean	0.000397464	0.000388784	0.000357797	0.000332594	0.000297779	0.000302931	0.000339636	0.00037149	0.000413303	0.000396468	0.00038286	0.000395076
T_P	Post-Closure	Mean	0.026901696	0.026293822	0.029267032	0.027507549	0.024334265	0.02157812	0.018816546	0.017673066	0.017113248	0.017864728	0.025665212	0.026029505
T_Pb	Post-Closure	Mean	3.40515E-05	3.4933E-05	3.35321E-05	3.3722E-05	4.51696E-05	3.42065E-05	3.34523E-05	3.32864E-05	3.45142E-05	3.39877E-05	3.29187E-05	3.36321E-05
T_S	Post-Closure	Mean	1.293062449	1.381602645	1.210630178	1.412507296	1.028526306	1.072628498	1.084270835	1.140728951	1.034014463	1.332864523	1.107436538	1.281560183
T_Sb	Post-Closure	Mean	0.000982463	0.000904276	0.000702664	0.000559959	0.000372341	0.000421499	0.000686319	0.000906135	0.00117178	0.001034178	0.000942039	0.000992307
T_Se	Post-Closure	Mean	8.79814E-05	7.9617E-05	0.000103601	7.81403E-05	7.65811E-05	7.37843E-05	8.56031E-05	7.93256E-05	7.77188E-05	9.23436E-05	7.64666E-05	7.48861E-05
T_Si	Post-Closure	Mean	5.0242033	4.944524288	4.950605869	4.766061783	4.484331608	4.243224621	4.191290855	4.111177921	4.226896763	4.553024769	4.888072491	4.965285778
T_Sn	Post-Closure	Mean	5.00521E-05	5.00161E-05	4.99931E-05	5.00502E-05	5.03514E-05	5.00834E-05	4.99783E-05	5.01058E-05	4.99082E-05	5.00023E-05	4.99055E-05	4.99341E-05
T_Sr	Post-Closure	Mean	0.1177046	0.115097806	0.111060113	0.095338017	0.086785764	0.090871789	0.097989962	0.107287034	0.116470426	0.106926076	0.107830904	0.116761968
T_Ti	Post-Closure	Mean	0.003812055	0.002545103	0.002901834	0.003470468	0.003437581	0.002500699	0.003662451	0.003206517	0.002881097	0.004832307	0.00485686	0.003275269
T_Tl	Post-Closure	Mean	8.3337E-06	7.92433E-06	9.6116E-06	1.27186E-05	9.13567E-06	1.55816E-05	9.7377E-06	9.40346E-06	9.45301E-06	9.04038E-06	8.61092E-06	1.05732E-05
T_U	Post-Closure	Mean	0.000116226	0.000112223	0.000125047	0.000126297	0.000104128	0.000101786	9.87232E-05	0.000107139	0.000111613	0.000106576	0.00010473	0.00010717
T_V	Post-Closure	Mean	0.002335194	0.002184012	0.001783809	0.001221898	0.000790982	0.001027841	0.001633696	0.002115337	0.002647185	0.002230491	0.002114459	0.002301246
T_Zn	Post-Closure	Mean	0.002719975	0.002822285	0.002582684	0.002345277	0.002109586	0.002026887	0.002189038	0.002528508	0.002680959	0.002575228	0.002495925	0.002570644
D_Ag	Post-Closure	Mean	8.35576E-06	8.11364E-06	9.82946E-06	1.28255E-05	8.65303E-06	1.53154E-05	9.8051E-06	8.79908E-06	8.83546E-06	8.59911E-06	8.30739E-06	1.03516E-05
D_Al	Post-Closure	Mean	0.004237965	0.002963576	0.002406339	0.01300504	0.042757098	0.030793289	0.020255109	0.01212906	0.007	0.011011025	0.01479116	0.007121361
D_As	Post-Closure	Mean	0.000592361	0.000561784	0.000535047	0.000560304	0.000539482	0.000519998	0.000562874	0.000606914	0.000629201	0.000577107	0.000559236	0.000576986
D_B	Post-Closure	Mean	0.005551087	0.005474474	0.004850857	0.00499788	0.00529382	0.004190636	0.005501839	0.005671372	0.005849415	0.005757009	0.005624073	0.005294865
D_Ba	Post-Closure	Mean	0.006745473	0.006382168	0.006632813	0.006499618	0.005675765	0.00569237	0.005946612	0.006175215	0.006724826	0.006632954	0.006222999	0.006317557
D_Bi	Post-Closure	Mean	2.50243E-05	2.49925E-05	2.49741E-05	2.50879E-05	2.51871E-05	2.50302E-05	2.49689E-05	2.5089E-05	2.48979E-05	2.49915E-05	2.49424E-05	2.49676E-05
D_Be	Post-Closure	Mean	5.22061E-05	5.20017E-05	5.15415E-05	5.16556E-05	5.1489E-05	5.1153E-05	5.16638E-05	5.2363E-05	5.28658E-05	5.27705E-05	5.22107E-05	5.22555E-05
D_Ca	Post-Closure	Mean	29.48469353	28.01524925	25.79136848	23.1432724	18.63409805	21.38456154	24.55429268	26.59645653	29.33005524	28.39823532	26.50911522	27.41393089
D_Cd	Post-Closure	Mean	1.98514E-05	1.99264E-05	1.7618E-05	1.44121E-05	1.05818E-05	1.14283E-05	1.42674E-05	1.62207E-05	1.99754E-05	1.92089E-05	1.72487E-05	1.94152E-05
D_Co	Post-Closure	Mean	0.000189319	0.000186097	0.000157165	0.000126489	8.76841E-05	9.01627E-05	0.000124507	0.000155405	0.000192817	0.000177109	0.00016832	0.00017985
D_Cr	Post-Closure	Mean	0.000116446	7.99328E-05	8.86469E-05	0.000119185	0.00013582	0.000129754	0.000120198	0.000107675	0.000105787	0.000140783	0.000117023	9.39088E-05
D_Cu	Post-Closure	Mean	0.000279321	0.000312593	0.000273538	0.000280393	0.000388558	0.000291879	0.000339237	0.000295615	0.000290038	0.000289395	0.000279763	0.000313117
D_Fe	Post-Closure	Mean	0.052625202	0.053975292	0.052914347	0.060441725	0.057060566	0.050550271	0.055660404	0.066538401	0.076145321	0.071150407	0.065778449	0.061044592
D_Hg	Post-Closure	Mean	3.74644E-06	3.68468E-06	3.45708E-06	3.82514E-06	3.82801E-06	3.17354E-06	3.3518E-06	3.64581E-06	3.8515E-06	3.84574E-06	3.60388E-06	3.96107E-06
D_K	Post-Closure	Mean	5.447520733	5.236326694	4.315744877	2.766584396	1.481702566	2.007190704	3.1825459	4.3095994	5.541327477	4.897553444	4.681637287	5.213393688
D_Li	Post-Closure	Mean	0.008417997	0.007906181	0.006218975	0.003620474	0.001831816	0.002987485	0.005175186	0.007093906	0.009236556	0.008008121	0.007575655	0.008320287
D_Mg	Post-Closure	Mean	5.092809677	4.933833122	5.118537426	4.306890965	3.897115946	3.902653933	4.248521328	4.394212246	4.559003353	4.330936909	4.280319691	4.718864441
D_Mn	Post-Closure	Mean	0.060204439	0.056456074	0.047684051	0.036355294	0.014360392	0.021141926	0.034056451	0.048131503	0.063231088	0.057948612	0.056768816	0.058979515
D_Mo	Post-Closure	Mean	0.000724459	0.000726577	0.000716357	0.000658912	0.000506643	0.000531874	0.000622293	0.000687946	0.000805673	0.000699605	0.000661076	0.000700977
D_Na	Post-Closure	Mean	10.53471279	9.618505478	8.331125259	6.897704124	4.895561218	6.218515396	8.175046921	8.944022179	10.73763466	10.68890572	9.632922173	9.947984695
D_Ni	Post-Closure	Mean	0.000396955	0.000388329	0.000355176	0.000329139	0.000291753	0.000302665	0.000338476	0.000370683	0.000412703	0.000395882	0.000382472	0.000391288
D_P	Post-Closure	Mean	0.037492435	0.059238464	0.058171831	0.054744091	0.035532057	0.025703195	0.066495486	0.095749207	0.067118347	0.142052203	0.143391714	0.06007228
D_Pb	Post-Closure	Mean	3.24008E-05	3.24484E-05	3.10554E-05	3.00573E-05	2.80453E-05	2.75282E-05	2.88838E-05	3.03498E-05	3.23458E-05	3.19137E-05	3.11734E-05	3.19543E-05
D_S	Post-Closure	Mean	1.152676821	1.324564219	1.43374145	1.244731188	1.031926632	1.057818532	1.133108258	1.047228575	1.096338034	1.19923842	1.081694484	1.235626459
D_Sb	Post-Closure	Mean	0.000982409	0.000904166	0.000702558	0.00056031	0.000372222	0.000420151	0.000686241	0.000906078	0.001171739	0.001034142	0.000942007	0.000992277
D_Se	Post-Closure	Mean	0.00011221	7.27527E-05	9.74666E-05	7.43752E-05	6.643E-05	7.00605E-05	7.35407E-05	8.04091E-05	7.33287E-05	7.48069E-05	7.31321E-05	7.51156E-05
D_Si	Post-Closure	Mean	4.907148838	4.723372459	4.77389431	4.515419006	4.238158226	4.035270214	3.980708361	4.009478569	4.113255501	4.250495434	4.764698505	4.831738949
D_Sn	Post-Closure	Mean	5.00521E-05	5.00161E-05	4.99931E-05	5.00502E-05	5.03514E-05	5.00834E-05	4.99783E-05	5.01058E-05	4.99082E-05	5.00023E-05	4.99055E-05	4.99341E-05
D_Sr	Post-Closure	Mean	0.118604794	0.115100406	0.112239942	0.095162563	0.086392157	0.088165037	0.097828835	0.106548369	0.11595086	0.105414703	0.105352782	0.113003395
D_Ti	Post-Closure	Mean	0.000842873	0.001543913	0.001555226	0.001569897	0.001301838	0.000961219	0.001345551	0.002998691	0.001952554	0.004775343	0.00481016	0.001690852
D_Tl	Post-Closure	Mean	8.32308E-06	7.91521E-06	9.60272E-06	1.27184E-05	9.08313E-06	1.55798E-05	9.73374E-06	9.40109E-06	9.45137E-06	9.03892E-06	8.60962E-06	1.05613E-05
D_U	Post-Closure	Mean	0.000109156	0.000105566	0.000117974	0.000115964	9.54449E-05	9.41352E-05	9.48798E-05	0.00010274	0.000106503	0.000100625	9.61688E-05	9.87342E-05
D_V	Post-Closure	Mean	0.002303839	0.002172338	0.001714352	0.001085653	0.000611573	0.000910565	0.001470015	0.001996857	0.002517804	0.0022087	0.002088087	0.002272854
D_Zn	Post-Closure	Mean	0.002313788	0.002220639	0.001992462	0.00182205	0.001741204	0.001599719	0.001510403	0.001792008	0.001922169	0.001908173	0.001798027	0.0018222

Appendix A.4.8: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Outlet

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Closure	Mean	0.015058434	0.013889924	0.014485818	0.011684762	0.008674975	0.010727021	0.010665365	0.013642597	0.014202612	0.012953455	0.014835973	0.013345468
NO3_N	Closure	Mean	0.0696216	0.068252079	0.066637665	0.045246765	0.029272661	0.016076339	0.013174467	0.011031644	0.0090208	0.008290531	0.051229201	0.062853426
NO2_N	Closure	Mean	0.001165644	0.001940904	0.000777865	0.001024732	0.001083726	0.001116876	0.000844764	0.000786158	0.000867288	0.00111165	0.000889302	0.001371075
Br	Closure	Mean	0.025055911	0.02502453	0.025043022	0.025033586	0.025049912	0.025082013	0.025153358	0.025051247	0.025090437	0.025085688	0.025097815	0.025043217
Cl	Closure	Mean	0.321862638	0.323417515	0.312240958	0.286250383	0.274159521	0.288785309	0.341185957	0.306022257	0.311966419	0.304117918	0.314339906	0.310759813
F	Closure	Mean	0.05928354	0.059544366	0.063744463	0.059329595	0.055016577	0.056288406	0.057453763	0.056008954	0.059838757	0.057602853	0.060168874	0.062336002
TDP	Closure	Mean	0.013696681	0.010719423	0.01001283	0.01570119	0.01028934	0.007839854	0.006795217	0.009336081	0.00758006	0.007433	0.008044883	0.010242842
SO4	Closure	Mean	4.980634212	5.083061218	4.890702248	4.029958725	3.710894108	3.61551404	3.848756313	4.194618702	4.471321106	4.28528595	4.726732254	4.736429691
T_CN	Closure	Mean	0.002512864	0.002511341	0.002506263	0.002499486	0.002502192	0.002505895	0.002503681	0.002504816	0.002505742	0.00250423	0.002511327	0.002510107
WAD_CN	Closure	Mean	0.002501499	0.002499666	0.002496805	0.002495897	0.002500255	0.002503106	0.002498884	0.002496331	0.002496264	0.002495355	0.002499171	0.002500303
T_Ag	Closure	Mean	6.87488E-06	6.65707E-06	1.25735E-05	1.15378E-05	9.74938E-06	1.5136E-05	8.80036E-06	7.8297E-06	7.35099E-06	7.18238E-06	6.97022E-06	8.77987E-06
T_Al	Closure	Mean	0.039788377	0.019906878	0.032039192	0.04515944	0.096430108	0.06641686	0.043660842	0.036170024	0.029059123	0.034079887	0.039958984	0.026783751
T_As	Closure	Mean	0.000634239	0.000601426	0.000585212	0.000599285	0.000582352	0.000582443	0.000622666	0.000644685	0.000662756	0.000639612	0.000611943	0.000616811
T_B	Closure	Mean	0.005349657	0.005269439	0.00476762	0.004848644	0.005119655	0.004333114	0.005381845	0.005469298	0.005586163	0.005489327	0.005405211	0.005113442
T_Ba	Closure	Mean	0.007161184	0.006773596	0.007125507	0.007350941	0.006313039	0.006235662	0.006489811	0.006597176	0.007201307	0.007366396	0.0070616	0.006769605
T_Bi	Closure	Mean	2.50414E-05	2.50186E-05	2.49879E-05	2.4988E-05	2.50239E-05	2.50392E-05	2.49935E-05	2.49656E-05	2.49639E-05	2.49545E-05	2.49926E-05	2.50326E-05
T_Be	Closure	Mean	5.1153E-05	5.0907E-05	5.05619E-05	5.05205E-05	5.0539E-05	5.07396E-05	5.11349E-05	5.13866E-05	5.17064E-05	5.14125E-05	5.12558E-05	5.12512E-05
T_Ca	Closure	Mean	20.56255531	21.05093384	20.57684708	19.0793457	16.89179993	17.17320824	17.83954239	18.76094055	18.9596653	19.44335365	18.58438492	20.6730938
T_Cd	Closure	Mean	5.11163E-06	5.8641E-06	5.51736E-06	5.5527E-06	5.67364E-06	6.54977E-06	7.59025E-06	5.97699E-06	6.43689E-06	8.8504E-06	5.48861E-06	6.82005E-06
T_Co	Closure	Mean	7.17032E-05	6.99092E-05	6.24899E-05	5.73188E-05	5.70917E-05	5.95333E-05	6.59528E-05	7.07308E-05	7.5954E-05	7.1012E-05	6.92806E-05	6.89534E-05
T_Cr	Closure	Mean	0.000154872	0.000122692	0.000152624	0.000168554	0.000196438	0.000181931	0.000167409	0.000150574	0.000152481	0.000160514	0.000159286	0.000145339
T_Cu	Closure	Mean	0.000265466	0.00030067	0.00026705	0.000293566	0.000459155	0.000337979	0.000383663	0.000348808	0.000311814	0.000274027	0.000266385	0.000301967
T_Fe	Closure	Mean	0.124145605	0.106675334	0.135433003	0.135053948	0.125104859	0.104301125	0.095511146	0.114788294	0.135425508	0.160726935	0.153234214	0.102728195
T_Hg	Closure	Mean	3.0137E-06	2.93593E-06	2.81671E-06	2.81129E-06	3.1259E-06	3.04816E-06	3.08074E-06	3.11116E-06	3.218E-06	3.32465E-06	3.0357E-06	3.40007E-06
T_K	Closure	Mean	0.935941279	0.891007841	0.952224374	0.994157076	0.789916515	0.767281413	0.797397137	0.862981617	0.887541831	0.889540493	0.837892652	0.875092447
T_Li	Closure	Mean	0.000661502	0.000630693	0.000588332	0.000592382	0.000576358	0.000604256	0.000668274	0.000710772	0.000757246	0.00071913	0.000717551	0.000691123
T_Mg	Closure	Mean	4.713767052	4.697007656	4.872205257	4.441366673	3.97710824	3.940086842	4.048280239	4.332346439	4.398663998	4.347468853	4.389610291	4.658369541
T_Mn	Closure	Mean	0.022097738	0.016767865	0.020143684	0.023469243	0.018184122	0.016138539	0.016518872	0.021901358	0.023326006	0.026102563	0.040398933	0.020599458
T_Mo	Closure	Mean	0.00068191	0.000682176	0.00067728	0.000632019	0.000526462	0.000542245	0.000597202	0.000674135	0.000735486	0.000686035	0.000613847	0.000658345
T_Na	Closure	Mean	3.974642992	3.82972312	3.8723979	3.475436211	3.18253541	3.158699274	3.340127945	3.50711298	3.625228882	3.593909025	3.499469519	3.792235136
T_Ni	Closure	Mean	0.000267783	0.000263888	0.000257929	0.000257459	0.000261022	0.000263512	0.000270887	0.000274903	0.000280288	0.000275201	0.00027089	0.000270058
T_P	Closure	Mean	0.027018405	0.026468741	0.028785428	0.028546058	0.024536651	0.021214945	0.017797485	0.016979305	0.01677089	0.018184045	0.025577286	0.026164809
T_Pb	Closure	Mean	2.73135E-05	2.78817E-05	2.76473E-05	2.89759E-05	4.21716E-05	3.18433E-05	3.0366E-05	2.87669E-05	2.82227E-05	2.78549E-05	2.74516E-05	2.73911E-05
T_S	Closure	Mean	1.309965014	1.406956196	1.218135715	1.428190231	1.054486394	1.09115994	1.100578427	1.152103066	1.069525242	1.413362741	1.173610687	1.330236077
T_Sb	Closure	Mean	0.00030569	0.000256858	0.000187787	0.000196318	0.000168621	0.000213411	0.000316434	0.000385631	0.000460209	0.000399893	0.000341757	0.000332083
T_Se	Closure	Mean	8.68536E-05	7.77575E-05	9.76969E-05	7.64669E-05	7.699E-05	7.34432E-05	8.61965E-05	7.81844E-05	7.74386E-05	9.35669E-05	7.53032E-05	7.28967E-05
T_Si	Closure	Mean	5.049780846	4.944204807	4.976490498	4.797883034	4.489221573	4.216671944	4.191970825	4.07770443	4.219117165	4.600578785	4.942878246	5.013736725
T_Sn	Closure	Mean	5.00308E-05	4.99936E-05	4.99389E-05	4.99213E-05	5.00073E-05	5.00644E-05	4.99809E-05	4.99299E-05	4.99308E-05	4.99114E-05	4.99872E-05	5.0007E-05
T_Sr	Closure	Mean	0.104555815	0.103394359	0.102801561	0.092149884	0.086489633	0.085391574	0.08713115	0.093204901	0.098706774	0.092886843	0.094299898	0.102227308
T_Ti	Closure	Mean	0.004032771	0.002658714	0.003033071	0.003682113	0.003591695	0.002552172	0.003715904	0.003174137	0.003004817	0.004924953	0.004930644	0.003258311
T_Tl	Closure	Mean	7.60108E-06	7.22974E-06	8.76401E-06	1.18858E-05	8.56043E-06	1.55338E-05	9.12837E-06	8.69941E-06	8.58029E-06	8.2177E-06	7.81627E-06	9.59569E-06
T_U	Closure	Mean	0.000116712	0.000111229	0.000125252	0.000125867	0.000102	0.000101353	9.7446E-05	0.000105125	0.000109362	0.00010425	0.000103225	0.000106609
T_V	Closure	Mean	0.000337815	0.000302726	0.000321874	0.000453325	0.000477532	0.000427513	0.000494593	0.000493369	0.000475509	0.000335965	0.000338452	0.000329142
T_Zn	Closure	Mean	0.001643391	0.001694273	0.001650424	0.00169401	0.001738268	0.001704907	0.001715984	0.001897992	0.001714441	0.001685895	0.001664619	0.001598889
D_Ag	Closure	Mean	6.67647E-06	6.48638E-06	8.25944E-06	1.15337E-05	8.06844E-06	1.49935E-05	8.96419E-06	7.47701E-06	7.09219E-06	6.94639E-06	6.77133E-06	8.56095E-06
D_Al	Closure	Mean	0.004190924	0.002670548	0.002225671	0.011958416	0.041736096	0.029857147	0.019427167	0.011143119	0.007	0.009793689	0.01345794	0.006642629
D_As	Closure	Mean	0.00058023	0.000545286	0.000511749	0.000537566	0.00052686	0.000518498	0.000567511	0.000612817	0.00062422	0.00055309	0.000548647	0.000564108
D_B	Closure	Mean	0.005347976	0.005267399	0.004719772	0.004827536	0.005119012	0.003967709	0.00538091	0.005467308	0.005584524	0.005488317	0.005404239	0.00511216
D_Ba	Closure	Mean	0.006828456	0.006433082	0.006755293	0.006656796	0.00577519	0.005773185	0.006117553	0.006328393	0.006956561	0.006982616	0.006447878	0.00659875
D_Bi	Closure	Mean	2.50144E-05	2.49961E-05	2.49675E-05	2.49588E-05	2.50024E-05	2.50309E-05	2.49886E-05	2.4963E-05	2.49622E-05	2.49531E-05	2.49918E-05	2.50025E-05
D_Be	Closure	Mean	5.1153E-05	5.0907E-05	5.05619E-05	5.05205E-05	5.0539E-05	5.07396E-05	5.11349E-05	5.13866E-05	5.17064E-05	5.14125E-05	5.12558E-05	5.12512E-05
D_Ca	Closure	Mean	21.37415695	20.66716766	20.17709541	18.93413734	16.48599434	16.93780518	17.66550446	18.7256012	19.20722389	18.65820503	17.83518028	19.10001183
D_Cd	Closure	Mean	5.51238E-06	5.12141E-06	5.09161E-06	5.50987E-06	5.95879E-06	7.04627E-06	7.74063E-06	6.6685E-06	6.86138E-06	7.1447E-06	5.90243E-06	6.24985E-06
D_Co	Closure	Mean	7.12578E-05	6.94855E-05	6.20064E-05	5.56712E-05	5.58413E-05	5.39245E-05	6.56512E-05	7.03929E-05	7.55056E-05	7.05199E-05	6.88694E-05	6.75555E-05
D_Cr	Closure	Mean	0.000119185	7.15714E-05	7.97946E-05	0.000110094	0.000132226	0.000130107	0.000116627	0.000103211	9.81032E-05	0.000141178	0.000113877	8.39944E-05
D_Cu	Closure	Mean	0.000270548	0.000308437	0.000264345	0.000271101	0.000391149	0.000285665	0.000328831	0.000285364	0.000281814	0.000278143	0.000272387	0.000313977
D_Fe	Closure	Mean	0.054808959	0.056670889	0.053399697	0.065514021	0.059909955	0.052403688	0.059952684	0.073412232	0.085143834	0.079094052	0.071278945	0.067024335
D_Hg	Closure	Mean	3.00578E-06	2.9291E-06	2.80999E-06	2.80162E-06	3.09974E-06	2.96584E-06	3.0355E-06	3.09078E-06	3.20338E-06	3.10277E-06	3.02477E-06	3.40302E-06
D_K	Closure	Mean	0.9337129	0.88425535	0.884277165	0.953519702	0.782118022	0.729704499	0.76286155	0.832878053	0.857915759	0.857664347	0.86369282	0.86903888
D_Li	Closure	Mean	0.00066148	0.000630522	0.000588159	0.000592138	0.000576157	0.000604162	0.000668206	0.000710729	0.000757215	0.000719101	0.000717526	0.0006911
D_Mg	Closure	Mean	4.860375404	4.698920727	4.931834698	4.396621227	3.940098047	3.83117938	4.098953724	4.211672306	4.312897205	4.225713253	4.104214191	4.51081562
D_Mn	Closure	Mean	0.014044171	0.011745648	0.012263516	0.016680552	0.006581044	0.008028234	0.00972357	0.014813714	0.01737559	0.01750939	0.018721303	0.014948741
D_Mo	Closure	Mean	0.000634241	0.000632884	0.00063999	0.000595802	0.000494721	0.00051384	0.000588476	0.00063598	0.000721517	0.000619396	0.00058493	0.000612364
D_Na	Closure	Mean	3.959116936	3.830296516	3.85747838	3.386502504	3.181900978	3.119591713	3.33915782	3.459233999	3.535116673	3.463381529	3.453071594	3.716372967
D_Ni	Closure	Mean	0.000267323	0.000263472	0.000255589	0.000254395	0.000255864	0.000263781	0.000269766	0.00027417	0.000279735	0.000274675	0.000270569	0.000266568
D_P	Closure	Mean	0.035755217	0.064085267	0.063317239	0.059636619	0.034683906	0.024345566	0.072331667	0.095724337	0.073121861	0.147131562	0.147240534	0.06641221
D_Pb	Closure	Mean	2.58567E-05	2.56909E-05	2.54484E-05	2.54135E-05	2.53867E-05	2.55243E-05	2.58599E-05	2.60441E-05	2.62663E-05	2.60601E-05	2.59339E-05	2.59255E-05
D_S	Closure	Mean	1.162577868	1.326803207	1.46730268	1.285263181	1.05789876	1.070299387	1.14978826	1.053542733	1.151237965	1.291712642	1.115110636	1.281713724
D_Sb	Closure	Mean	0.000305635	0.000256755	0.000187686	0.000196668	0.000168505	0.00021163	0.000316358	0.000385574	0.000460168	0.000399856	0.000341725	0.000332053
D_Se	Closure	Mean	0.000109277	6.93483E-05	9.09438E-05	7.28449E-05	6.46923E-05	7.07714E-05	7.22369E-05	7.87791E-05	7.13373E-05	7.33067E-05	7.16972E-05	7.45892E-05
D_Si	Closure	Mean	4.920200825	4.715932846	4.782774925	4.518796444	4.241034508	4.01619482	3.970436811	3.98897481	4.11017704	4.270325184	4.806418896	4.86484623
D_Sn	Closure	Mean	5.00308E-05	4.99936E-05	4.99389E-05	4.99213E-05	5.00073E-05	5.00644E-05	4.99809E-05	4.99299E-05	4.99308E-05	4.99114E-05	4.99872E-05	5.0007E-05
D_Sr	Closure	Mean	0.105921336	0.10335958	0.10431353	0.092324048	0.086345978	0.082592361	0.086955041	0.092173398	0.09797556	0.091149032	0.091382243	0.098227389
D_Ti	Closure	Mean	0.000738767	0.001714704	0.001717356	0.001705368	0.00125794	0.000921162	0.001506444	0.00295786	0.002103327	0.004894318	0.004897454	0.001843991
D_Tl	Closure	Mean	7.59014E-06	7.2203E-06	8.75514E-06	1.18856E-05	8.51011E-06	1.55328E-05	9.12475E-06	8.69708E-06	8.57857E-06	8.21617E-06	7.81495E-06	9.5838E-06
D_U	Closure	Mean	0.000109207	0.000104857	0.000118679	0.000114657	9.33744E-05	9.34203E-05	9.39775E-05	0.000101154	0.000104606	9.88638E-05	9.4656E-05	9.78215E-05
D_V	Closure	Mean	0.000301938	0.000292641	0.000259866	0.000280631	0.000273663	0.000291722	0.000305112	0.000357842	0.000327443	0.000318187	0.000317423	0.000305017
D_Zn	Closure	Mean	0.001270051	0.001083203	0.000992224	0.001254571	0.001504501	0.001251163	0.000982474	0.001077086	0.000878924	0.000947001	0.00088512	0.000780894

Appendix A.4.8: Tables, Predicted Water Quality Concentrations, Variable Climate Case (VCC) with Base Case Source Terms

Receiving Stream Nodes, Chedakuz Outlet

			Concentration (mg/L)											
Parameter	**Phase**	**Metric**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
NH3_N	Post-Closure	Mean	0.102047808	0.097249269	0.080130525	0.055345245	0.042391818	0.047001917	0.063987046	0.087493666	0.111921676	0.09513732	0.085679799	0.093831971
NO3_N	Post-Closure	Mean	0.186637327	0.155360684	0.132417232	0.09337531	0.041876383	0.060370963	0.093932442	0.099404685	0.132814988	0.123107716	0.150443703	0.171331987
NO2_N	Post-Closure	Mean	0.001502231	0.00221961	0.001008984	0.001170422	0.001117776	0.001267675	0.001121238	0.001120921	0.001310695	0.001458647	0.001247284	0.001720985
Br	Post-Closure	Mean	0.027081557	0.026937405	0.026361303	0.028126469	0.027119949	0.025805596	0.026454313	0.026953049	0.027526964	0.027808525	0.027269045	0.027157111
Cl	Post-Closure	Mean	1.989710808	1.762982965	1.422506571	1.191319942	0.725122452	1.063712716	1.594517827	1.687025547	2.095315695	2.091730356	1.810520411	1.866892457
F	Post-Closure	Mean	0.091604531	0.089221016	0.086314335	0.071183771	0.058792051	0.066060394	0.077842914	0.082921013	0.095433392	0.088385105	0.08809907	0.094090901
TDP	Post-Closure	Mean	0.014539523	0.011516341	0.010780993	0.01548076	0.010164045	0.008166189	0.007797597	0.010435885	0.008845175	0.008465697	0.009158446	0.011396414
SO4	Post-Closure	Mean	38.37037659	34.64974213	27.38017273	22.23766518	13.22447014	19.88749504	30.25623512	33.91220093	42.86174393	41.44202042	35.62683487	37.29875565
T_CN	Post-Closure	Mean	0.002621586	0.002601878	0.002584467	0.002597097	0.00251521	0.002579445	0.0026096	0.002620368	0.002656572	0.002674845	0.002639296	0.002604823
WAD_CN	Post-Closure	Mean	0.002494869	0.002496028	0.002493844	0.002492315	0.002485096	0.002482088	0.002457442	0.002449206	0.002428595	0.002423597	0.002441996	0.002430271
T_Ag	Post-Closure	Mean	8.08467E-06	7.83327E-06	1.35603E-05	1.21252E-05	1.01497E-05	1.52981E-05	9.34022E-06	8.62309E-06	8.54788E-06	8.34488E-06	7.977E-06	9.79313E-06
T_Al	Post-Closure	Mean	0.039633587	0.01981537	0.031951796	0.044674903	0.095581055	0.065977007	0.041935489	0.035532199	0.028424064	0.033656705	0.039448667	0.026305951
T_As	Post-Closure	Mean	0.000641714	0.000611717	0.000593946	0.000617656	0.000594477	0.000579305	0.000619412	0.00064447	0.000664403	0.000650319	0.000618426	0.000625098
T_B	Post-Closure	Mean	0.005470508	0.005402565	0.004915171	0.005012238	0.005260546	0.004383781	0.005446503	0.00557571	0.005720798	0.005641479	0.005517308	0.005249253
T_Ba	Post-Closure	Mean	0.007148314	0.006766718	0.00711944	0.007338287	0.006277171	0.006203287	0.006420113	0.006520552	0.00707913	0.007190585	0.006937834	0.006632399
T_Bi	Post-Closure	Mean	2.50472E-05	2.50161E-05	2.49981E-05	2.51146E-05	2.51962E-05	2.50385E-05	2.49807E-05	2.50793E-05	2.49169E-05	2.49978E-05	2.49533E-05	2.50001E-05
T_Be	Post-Closure	Mean	5.18834E-05	5.16995E-05	5.12997E-05	5.14747E-05	5.13235E-05	5.09903E-05	5.14821E-05	5.20248E-05	5.24335E-05	5.23478E-05	5.18331E-05	5.19161E-05
T_Ca	Post-Closure	Mean	27.66580772	27.25365829	25.26510811	22.89077187	18.5791378	20.8977375	23.93338013	25.53900719	27.63604927	27.67146683	25.61964989	27.54746628
T_Cd	Post-Closure	Mean	1.6897E-05	1.79622E-05	1.52761E-05	1.31769E-05	1.00817E-05	9.93622E-06	1.31289E-05	1.36363E-05	1.69561E-05	1.82517E-05	1.43618E-05	1.7363E-05
T_Co	Post-Closure	Mean	0.000169426	0.000165628	0.00014071	0.000119389	8.47144E-05	8.83024E-05	0.000117051	0.000141128	0.00017189	0.000158366	0.000148707	0.00016172
T_Cr	Post-Closure	Mean	0.000155359	0.000124444	0.000153448	0.000170034	0.000196663	0.000181935	0.000167021	0.000150972	0.000152712	0.000161025	0.000159503	0.000146063
T_Cu	Post-Closure	Mean	0.00027051	0.000303511	0.000272275	0.000298458	0.000460363	0.0003371	0.00038262	0.000349899	0.000313044	0.00028102	0.000269212	0.000303827
T_Fe	Post-Closure	Mean	0.122707494	0.106029056	0.134170413	0.133549526	0.124060698	0.103444189	0.093274996	0.11211367	0.130384192	0.152536362	0.147892237	0.099915385
T_Hg	Post-Closure	Mean	3.57277E-06	3.51123E-06	3.31189E-06	3.68935E-06	3.69928E-06	3.18469E-06	3.30186E-06	3.50092E-06	3.65907E-06	3.84795E-06	3.42094E-06	3.84912E-06
T_K	Post-Closure	Mean	4.784981251	4.572273731	3.83012414	2.594408989	1.393611073	1.847269773	2.934836864	3.837377071	4.850437641	4.305772305	3.994468689	4.55553627
T_Li	Post-Closure	Mean	0.007267481	0.006789185	0.005319302	0.003248775	0.001661289	0.002623653	0.004648106	0.006163141	0.007928162	0.006872157	0.006379901	0.007154267
T_Mg	Post-Closure	Mean	4.903321266	4.898134232	5.023363113	4.391217232	3.885732174	3.988644123	4.180055141	4.475589275	4.597253799	4.403841972	4.495713234	4.82011652
T_Mn	Post-Closure	Mean	0.061611257	0.054896351	0.049903315	0.041641887	0.02473438	0.027652306	0.038237024	0.051241387	0.062916294	0.060632139	0.072410457	0.058629513
T_Mo	Post-Closure	Mean	0.000746803	0.000750037	0.000732082	0.000688138	0.000531289	0.000552215	0.000624704	0.000711888	0.000794147	0.000743388	0.000665249	0.000722166
T_Na	Post-Closure	Mean	9.587822914	8.706512451	7.619411945	6.548910141	4.64622736	5.796104908	7.626208782	8.204033852	9.700717926	9.664683342	8.593429565	9.062448502
T_Ni	Post-Closure	Mean	0.000375998	0.000367792	0.000340821	0.000323156	0.000292119	0.000295942	0.000329588	0.000354369	0.000388841	0.000374345	0.000360385	0.000373409
T_P	Post-Closure	Mean	0.026780462	0.026268797	0.028580628	0.027930353	0.024186077	0.021238547	0.018199276	0.017298656	0.016951865	0.01787897	0.025413595	0.025885519
T_Pb	Post-Closure	Mean	3.27069E-05	3.34019E-05	3.21836E-05	3.27983E-05	4.41633E-05	3.29431E-05	3.25384E-05	3.21304E-05	3.30748E-05	3.26028E-05	3.15684E-05	3.23095E-05
T_S	Post-Closure	Mean	1.300475717	1.400601506	1.21207726	1.412522793	1.025218964	1.078587413	1.084154963	1.130326986	1.039131522	1.361848116	1.132005811	1.292192698
T_Sb	Post-Closure	Mean	0.00084701	0.000775298	0.000600062	0.000501963	0.00033447	0.000367376	0.000615141	0.000785588	0.001004181	0.000885971	0.000791603	0.000851857
T_Se	Post-Closure	Mean	8.67516E-05	7.76107E-05	9.75529E-05	7.63768E-05	7.61498E-05	7.3198E-05	8.60982E-05	7.78362E-05	7.68735E-05	9.27203E-05	7.46848E-05	7.22839E-05
T_Si	Post-Closure	Mean	5.048338413	4.94315815	4.975615501	4.801906586	4.495571136	4.218810558	4.190553665	4.092987061	4.220186234	4.601284981	4.928002834	4.99186039
T_Sn	Post-Closure	Mean	5.00443E-05	5.00125E-05	4.99938E-05	5.00588E-05	5.03206E-05	5.00762E-05	4.99824E-05	5.00892E-05	4.99231E-05	5.00087E-05	4.99209E-05	4.99437E-05
T_Sr	Post-Closure	Mean	0.116159849	0.1133812	0.109880932	0.095209323	0.085841231	0.089867517	0.096819066	0.105584286	0.114152394	0.105064355	0.105830252	0.114582337
T_Ti	Post-Closure	Mean	0.003992227	0.002634077	0.003005697	0.003637361	0.003577741	0.002548905	0.003699053	0.003170327	0.002936953	0.004858586	0.004882128	0.00324243
T_Tl	Post-Closure	Mean	7.84676E-06	7.48382E-06	8.89346E-06	1.18689E-05	8.66889E-06	1.54973E-05	9.23135E-06	8.78806E-06	8.78958E-06	8.42957E-06	8.00604E-06	9.73166E-06
T_U	Post-Closure	Mean	0.000116702	0.000111396	0.000125364	0.000127445	0.000103864	0.000101531	9.7854E-05	0.000106342	0.000109598	0.000105213	0.000103523	0.000106724
T_V	Post-Closure	Mean	0.002039368	0.001892362	0.00154271	0.001144196	0.000764914	0.000944531	0.001513907	0.001889302	0.002314815	0.001931122	0.001799609	0.001995448
T_Zn	Post-Closure	Mean	0.002537296	0.002616281	0.002410346	0.002252194	0.002039015	0.001953413	0.002112757	0.002445922	0.002500489	0.002408915	0.002324951	0.002406211
D_Ag	Post-Closure	Mean	7.87696E-06	7.65457E-06	9.08655E-06	1.20523E-05	8.24546E-06	1.52685E-05	9.56367E-06	8.27865E-06	8.27339E-06	8.06485E-06	7.76165E-06	9.5615E-06
D_Al	Post-Closure	Mean	0.004205024	0.002753231	0.002269667	0.012176377	0.042444292	0.029898653	0.019061778	0.011373712	0.007	0.010226225	0.013785508	0.006782045
D_As	Post-Closure	Mean	0.000590392	0.000558348	0.000526524	0.000558344	0.000535136	0.000516832	0.000566581	0.000613982	0.000629743	0.000569957	0.000555817	0.000574335
D_B	Post-Closure	Mean	0.005470508	0.005402565	0.004872021	0.004993185	0.005260546	0.004030405	0.005446503	0.00557531	0.005720798	0.005641478	0.005517308	0.005249253
D_Ba	Post-Closure	Mean	0.00681639	0.006426767	0.00674975	0.006655232	0.00574324	0.005745052	0.006054789	0.006259718	0.006841306	0.006808579	0.006339036	0.006466908
D_Bi	Post-Closure	Mean	2.50207E-05	2.49939E-05	2.4978E-05	2.50838E-05	2.51694E-05	2.50282E-05	2.49732E-05	2.50755E-05	2.49142E-05	2.4996E-05	2.49521E-05	2.49722E-05
D_Be	Post-Closure	Mean	5.18834E-05	5.16995E-05	5.12997E-05	5.14747E-05	5.13235E-05	5.09903E-05	5.14821E-05	5.20248E-05	5.24335E-05	5.23478E-05	5.18331E-05	5.19161E-05
D_Ca	Post-Closure	Mean	28.42182732	26.89867592	24.89352798	22.75884247	18.19644165	20.67366028	23.77522469	25.5065155	27.87706375	26.9040699	24.92433167	26.07183266
D_Cd	Post-Closure	Mean	1.72634E-05	1.7231E-05	1.52532E-05	1.30894E-05	9.64481E-06	1.05181E-05	1.29823E-05	1.42911E-05	1.73149E-05	1.66473E-05	1.47341E-05	1.68279E-05
D_Co	Post-Closure	Mean	0.000168996	0.000165232	0.000140253	0.000117756	8.31545E-05	8.31778E-05	0.000116129	0.000140492	0.00017136	0.000157853	0.000148289	0.000160406
D_Cr	Post-Closure	Mean	0.000121269	7.54401E-05	8.27519E-05	0.000116166	0.000135078	0.000130422	0.000117508	0.000105933	0.000101148	0.000142196	0.000115742	8.71985E-05
D_Cu	Post-Closure	Mean	0.000275128	0.000310684	0.000269941	0.000277328	0.000395002	0.000286261	0.000329699	0.000289348	0.000283978	0.000283489	0.000274768	0.000314869
D_Fe	Post-Closure	Mean	0.054612987	0.056532912	0.053280879	0.065148324	0.059417058	0.051941354	0.058756009	0.071954131	0.082347699	0.076370127	0.06966117	0.065186486
D_Hg	Post-Closure	Mean	3.56656E-06	3.50579E-06	3.3063E-06	3.6813E-06	3.67762E-06	3.0799E-06	3.25802E-06	3.48199E-06	3.6471E-06	3.64155E-06	3.41015E-06	3.85295E-06
D_K	Post-Closure	Mean	4.782882214	4.566786766	3.766731739	2.553296089	1.387284517	1.811831594	2.901603937	3.80847311	4.823548794	4.275462627	4.019480228	4.550552845
D_Li	Post-Closure	Mean	0.007267463	0.006789033	0.005319157	0.00324858	0.001661119	0.002623579	0.00464805	0.006163106	0.007928136	0.006872134	0.006379882	0.007154248
D_Mg	Post-Closure	Mean	5.055745602	4.90009737	5.087872505	4.346362114	3.849670887	3.877835989	4.22635603	4.362620831	4.523159027	4.301532269	4.242446899	4.681596756
D_Mn	Post-Closure	Mean	0.054313656	0.050255865	0.042581007	0.035487246	0.013700567	0.019695578	0.03179761	0.04466261	0.057572402	0.053121127	0.051587224	0.053346142
D_Mo	Post-Closure	Mean	0.000701057	0.000702005	0.0006964	0.000656196	0.000503237	0.000524706	0.000616516	0.000675652	0.000781567	0.000681058	0.000638295	0.000679563
D_Na	Post-Closure	Mean	9.57461071	8.70514679	7.603890419	6.464051247	4.641576767	5.755201817	7.62486887	8.159355164	9.617253304	9.535154343	8.545737267	8.990003586
D_Ni	Post-Closure	Mean	0.000375563	0.000367404	0.000338602	0.000320048	0.000286786	0.000295716	0.00032855	0.000353672	0.000388328	0.000373847	0.000360065	0.000370181
D_P	Post-Closure	Mean	0.035643682	0.063711554	0.062890552	0.058290727	0.034325674	0.024255596	0.071354881	0.09461388	0.070200793	0.143275857	0.144556269	0.064372785
D_Pb	Post-Closure	Mean	3.12939E-05	3.1282E-05	3.00866E-05	2.94913E-05	2.76944E-05	2.71668E-05	2.84534E-05	2.95945E-05	3.12268E-05	3.08457E-05	3.01144E-05	3.08886E-05
D_S	Post-Closure	Mean	1.152732372	1.319659591	1.460588694	1.269101977	1.030174494	1.058442116	1.132075906	1.02857852	1.110090971	1.222742796	1.076994777	1.239544868
D_Sb	Post-Closure	Mean	0.000846964	0.000775203	0.000599971	0.000502278	0.000334365	0.000365653	0.000615072	0.000785539	0.001004146	0.00088594	0.000791577	0.000851832
D_Se	Post-Closure	Mean	0.000109144	6.90059E-05	9.08053E-05	7.27491E-05	6.45507E-05	7.02535E-05	7.21195E-05	7.84294E-05	7.08983E-05	7.29557E-05	7.10927E-05	7.38272E-05
D_Si	Post-Closure	Mean	4.918962479	4.715080261	4.783901691	4.53271246	4.250631332	4.018276215	3.97096014	4.004000187	4.110881805	4.277603149	4.793553829	4.846676826
D_Sn	Post-Closure	Mean	5.00443E-05	5.00125E-05	4.99938E-05	5.00588E-05	5.03206E-05	5.00762E-05	4.99824E-05	5.00892E-05	4.99231E-05	5.00087E-05	4.99209E-05	4.99437E-05
D_Sr	Post-Closure	Mean	0.11735139	0.113383397	0.111336999	0.095418431	0.085663944	0.087101609	0.096612982	0.104667835	0.113536604	0.103482544	0.103327207	0.110819243
D_Ti	Post-Closure	Mean	0.000780481	0.001707167	0.001714262	0.001686032	0.001290005	0.000928295	0.001499439	0.00295	0.002057144	0.004810543	0.00484382	0.001828352
D_Tl	Post-Closure	Mean	7.83761E-06	7.47592E-06	8.88593E-06	1.18687E-05	8.62247E-06	1.54958E-05	9.22836E-06	8.78602E-06	8.78818E-06	8.42834E-06	8.00494E-06	9.72143E-06
D_U	Post-Closure	Mean	0.000109196	0.000104973	0.00011878	0.000116512	9.51549E-05	9.35726E-05	9.43153E-05	0.000102189	0.000104736	9.97564E-05	9.48863E-05	9.79304E-05
D_V	Post-Closure	Mean	0.002005412	0.001882354	0.001483871	0.000986517	0.000565574	0.000813923	0.001332496	0.001761098	0.002178268	0.001912494	0.001777546	0.001971235
D_Zn	Post-Closure	Mean	0.002132163	0.002029166	0.001772065	0.001706582	0.001702739	0.00151152	0.001400264	0.001658335	0.001706448	0.001692962	0.001577845	0.001619918

Appendix B: Plotted Water Quality Model Results

BW GOLD LTD
a subsidiary company of Artemis Gold Inc

B.1.1 TSFC

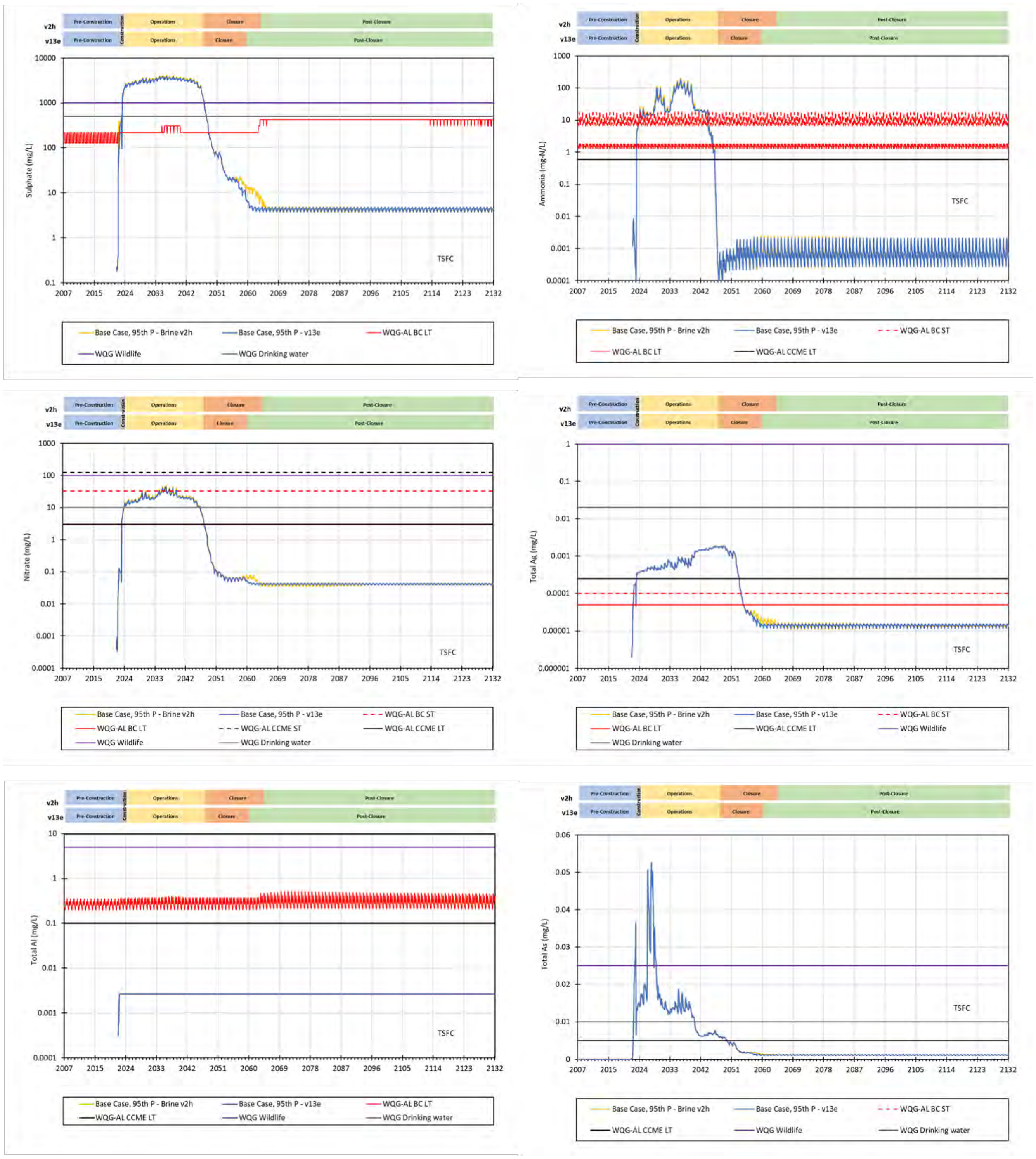

Figure B.1.1-1: **95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for TSFC (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

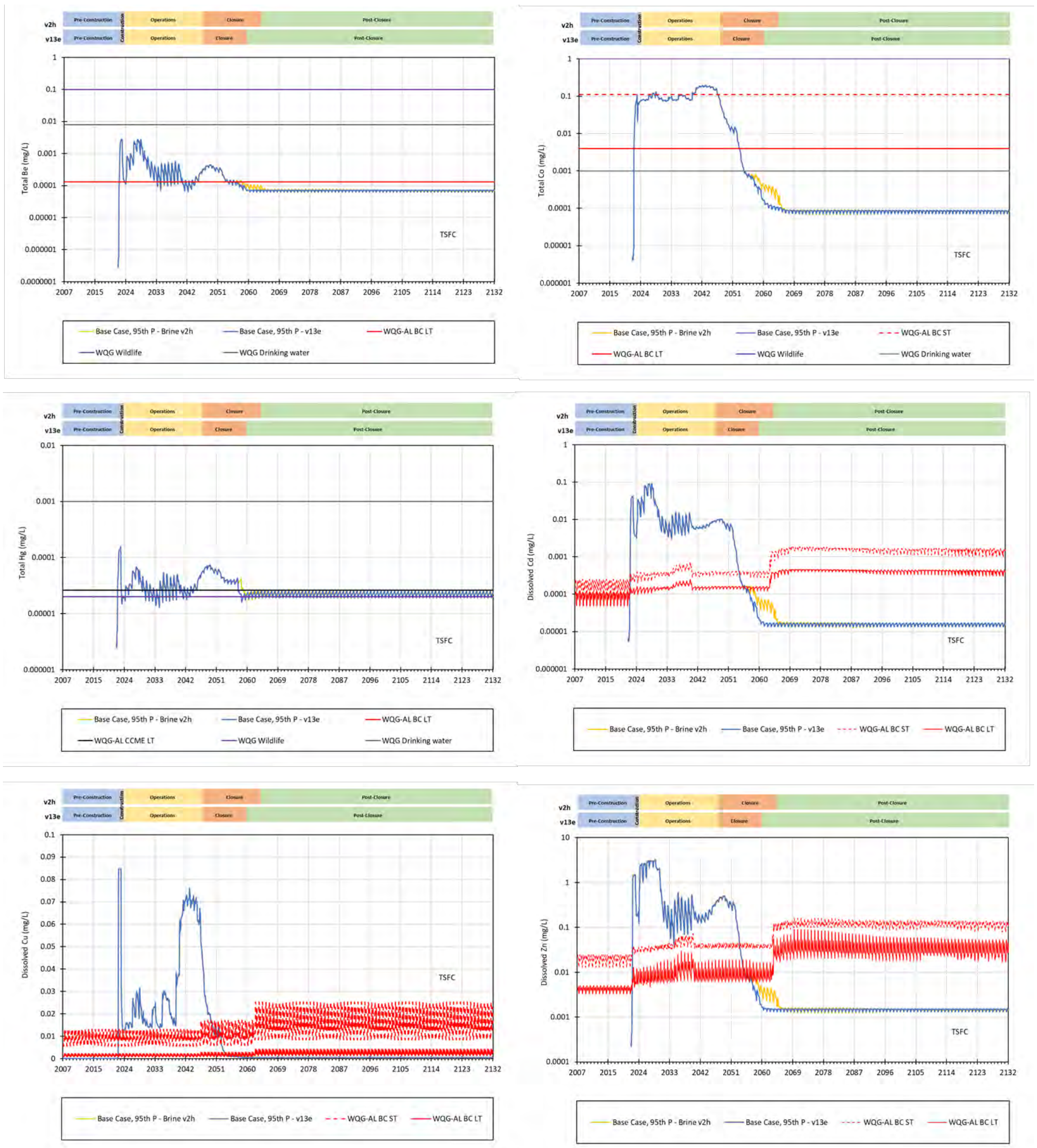

Figure B.1.1-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for TSFC (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.1.2 TSFD

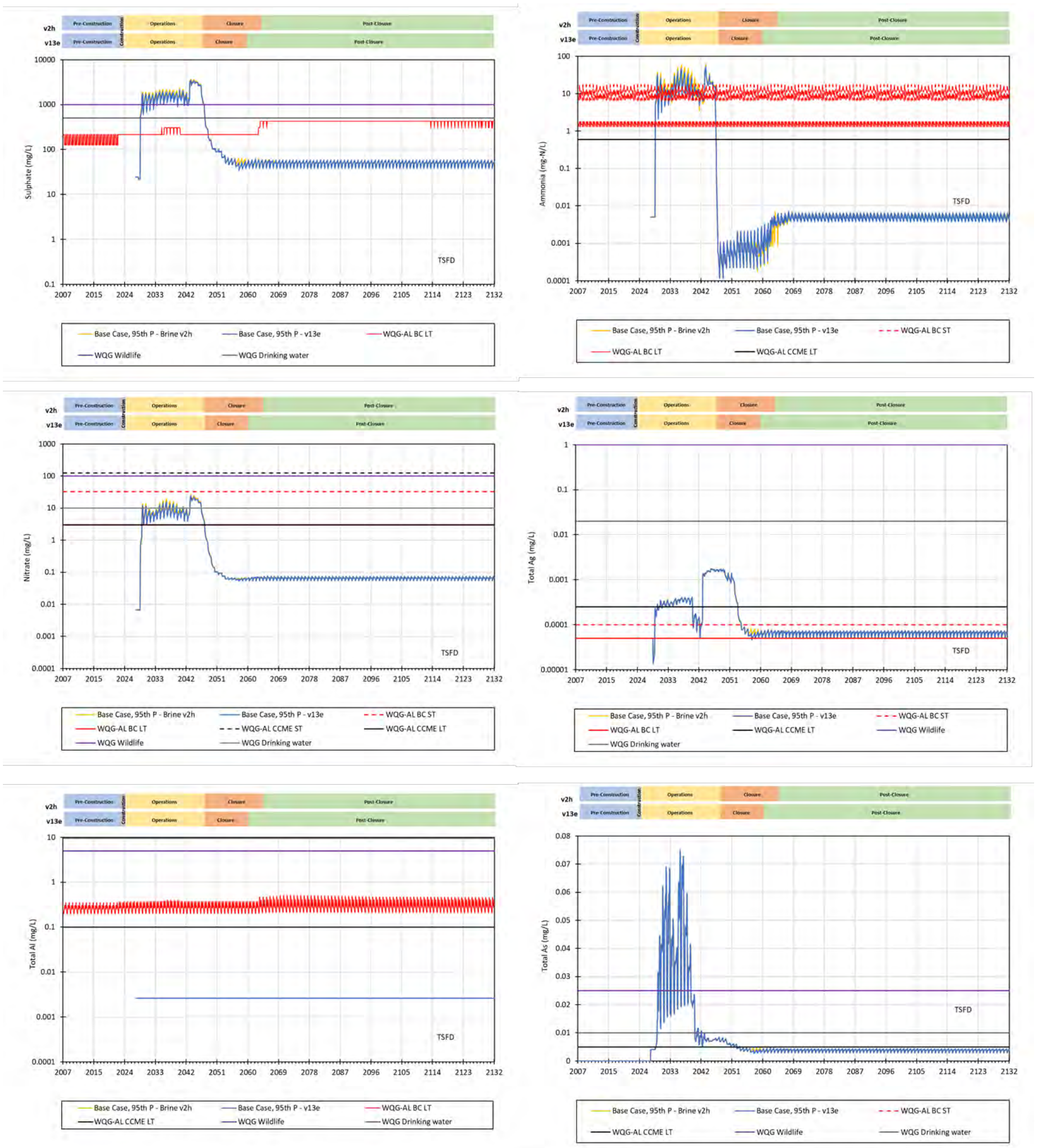

Figure B.1.2-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for TSFD (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

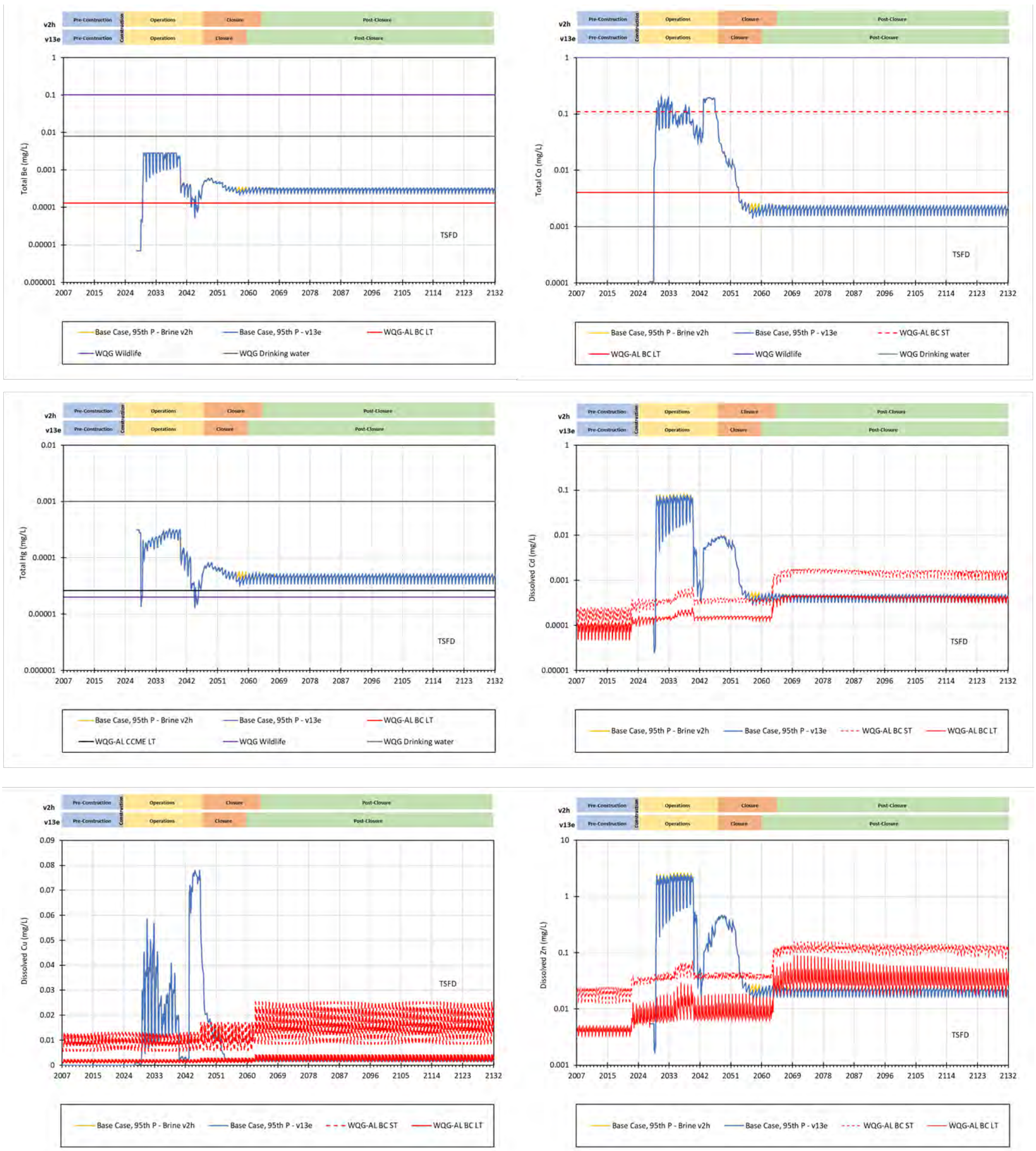

Figure B.1.2-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for TSFD (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.1.3 Mill

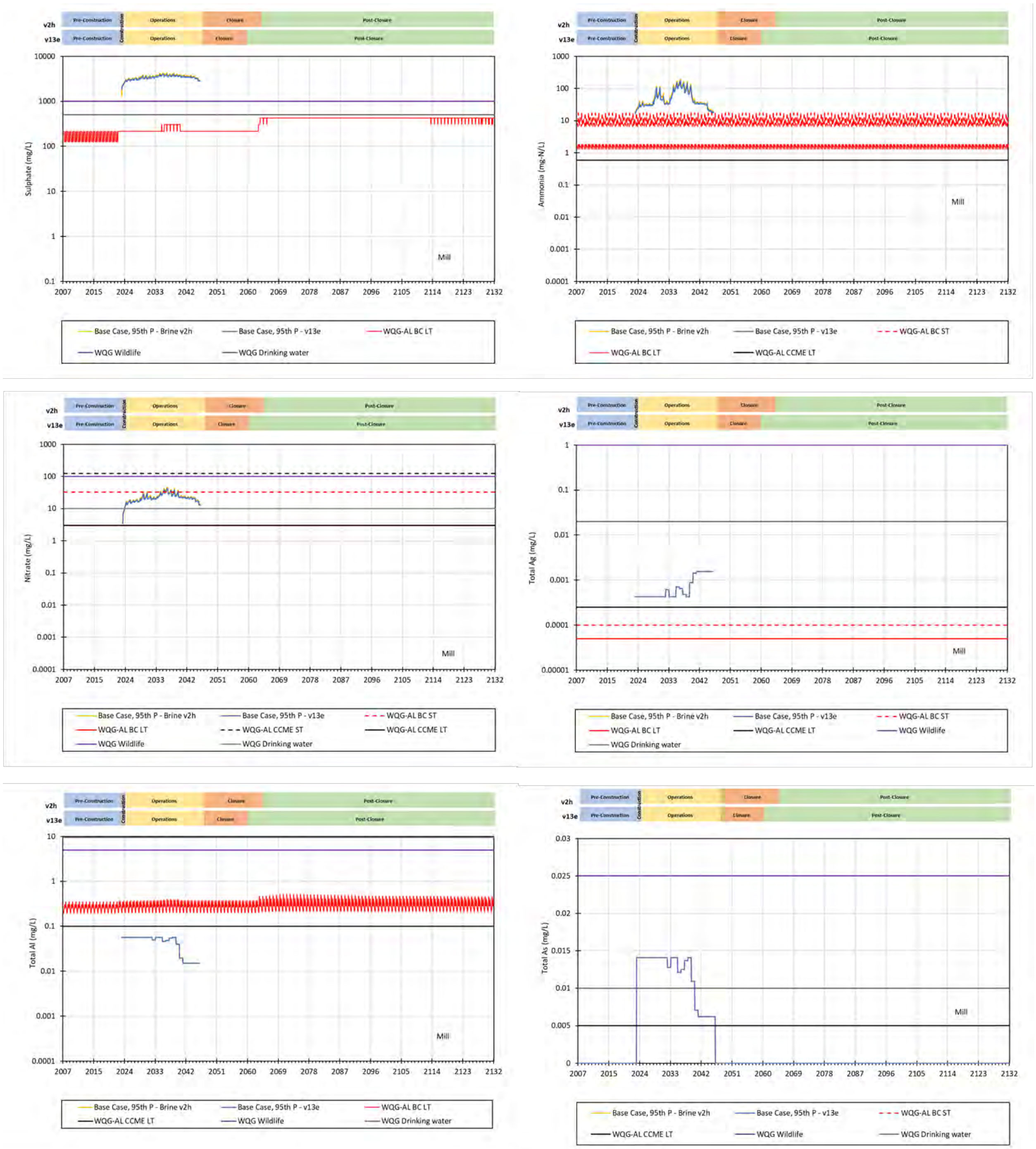

Figure B.1.3-1: **95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for Mill (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

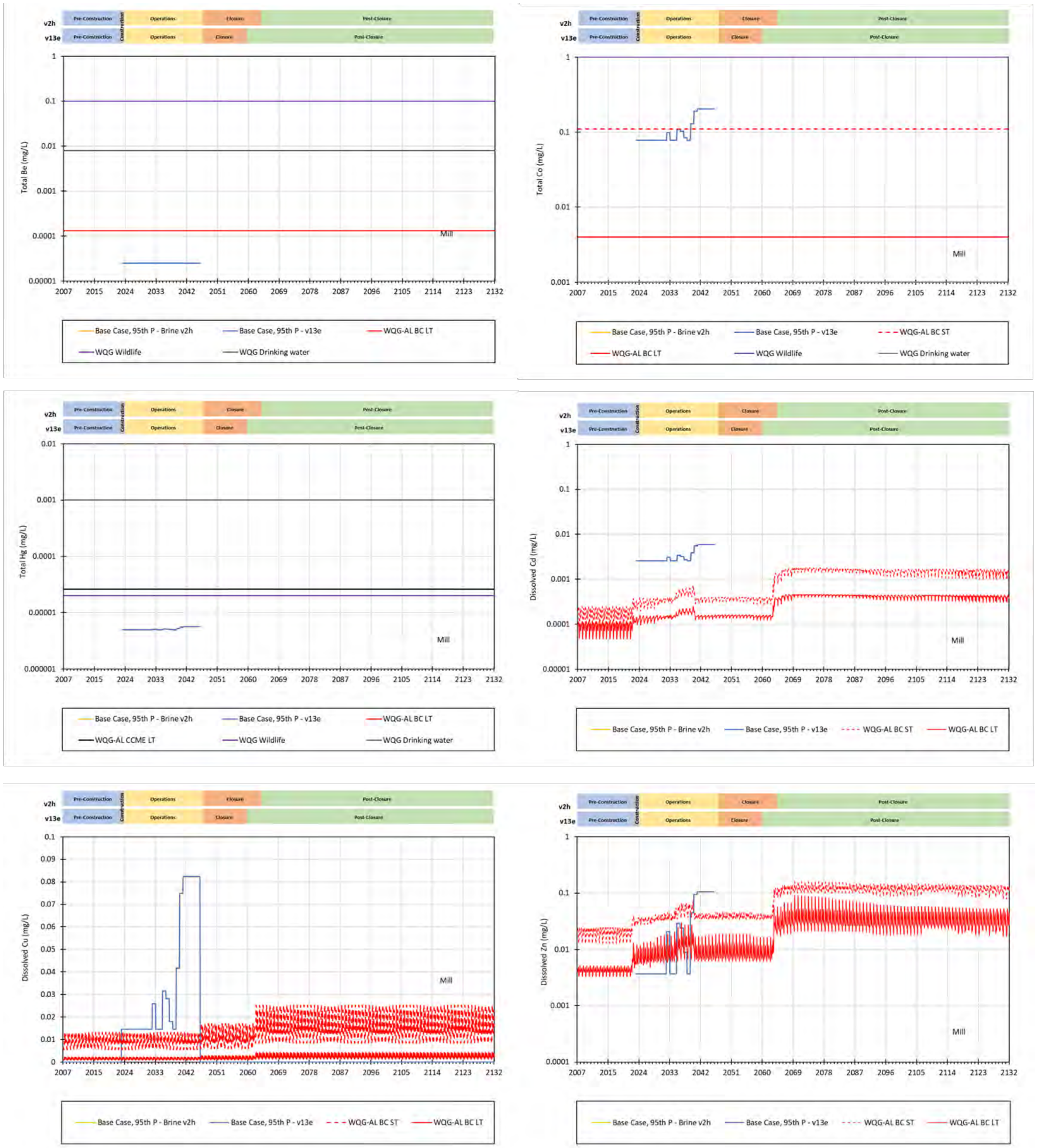

Figure B.1.3-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for Mill (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.1.4 Open Pit/Pit Lake

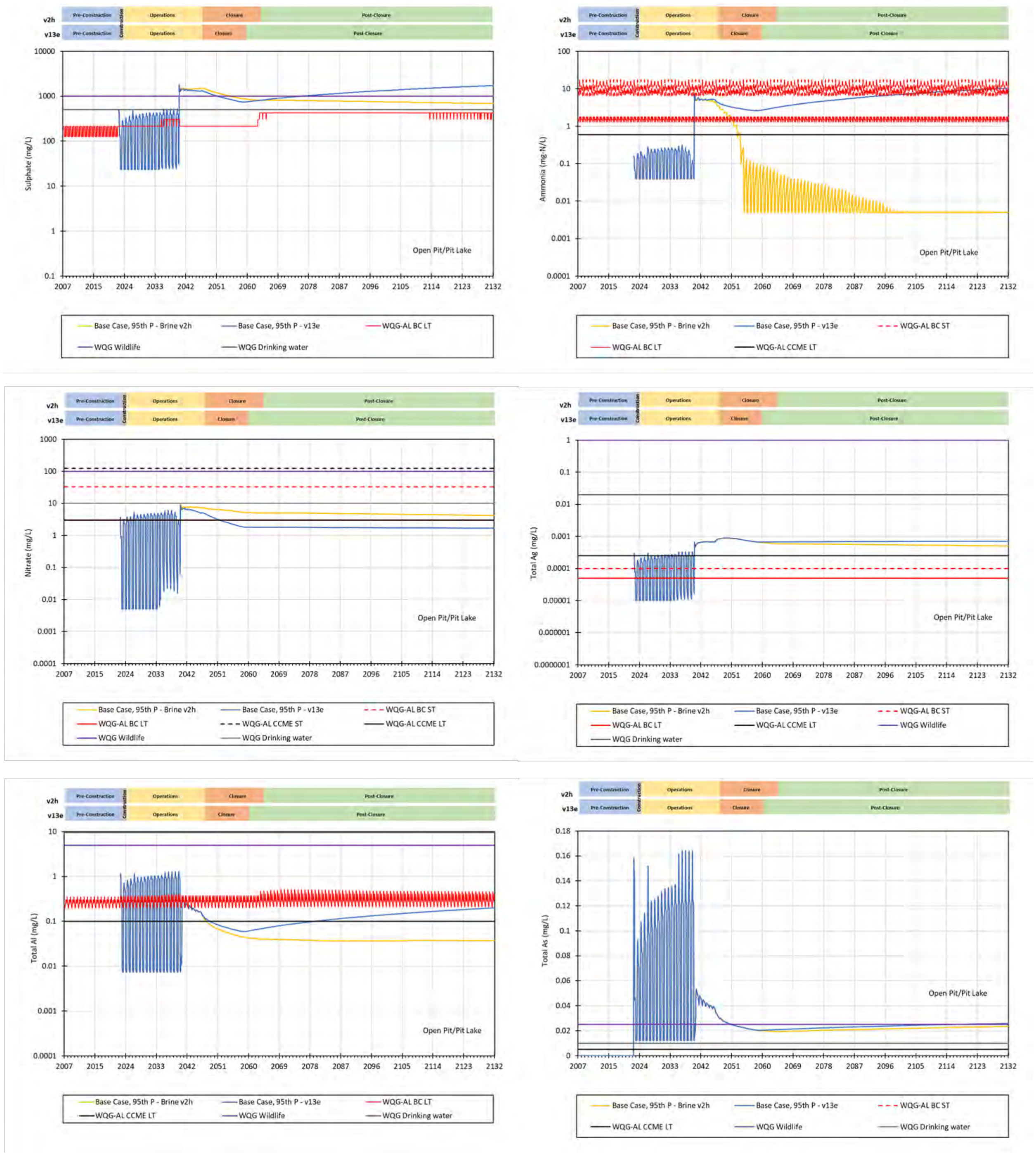

Figure B.1.4-1: **95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for Open Pit/Pit Lake (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

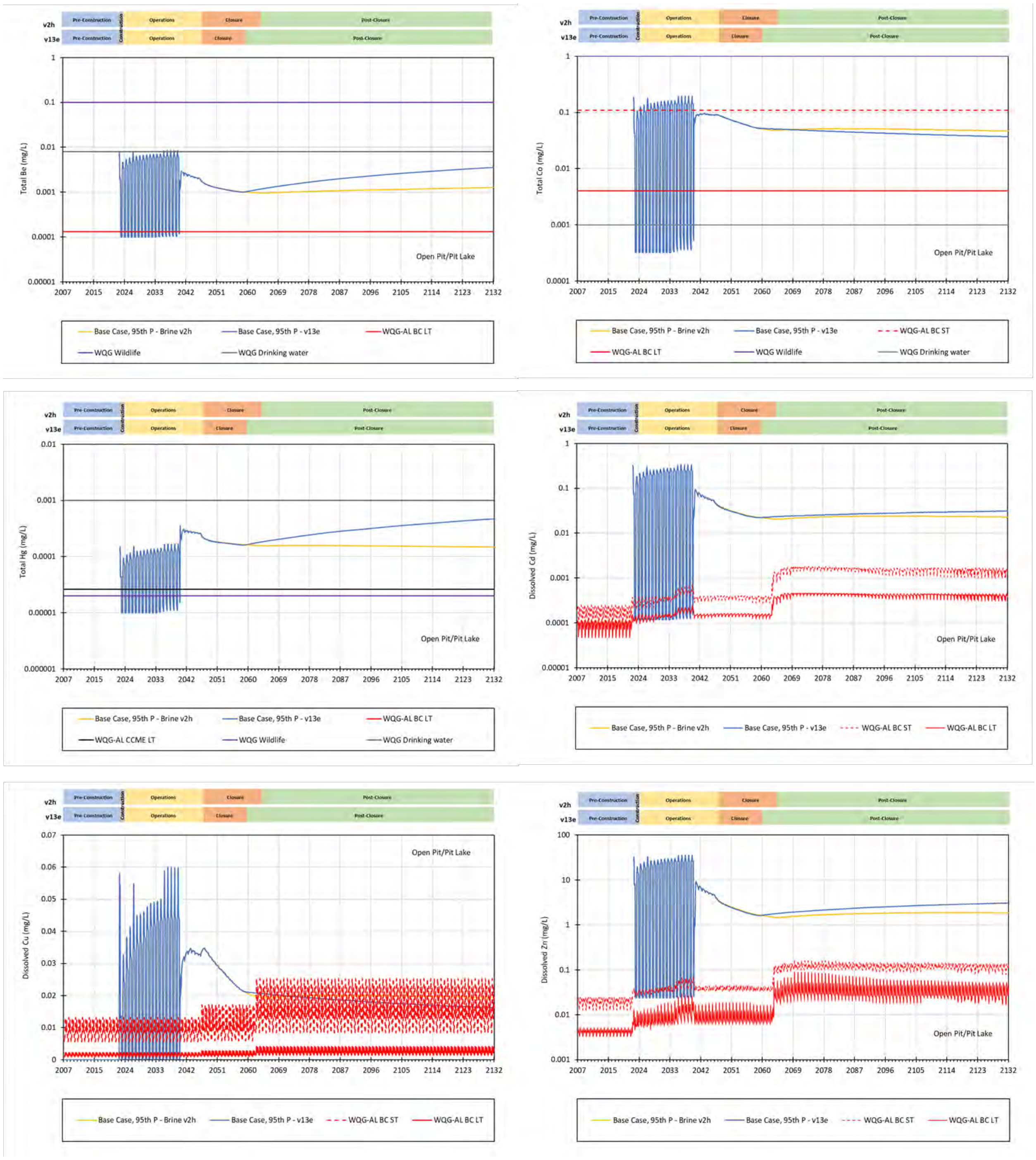

Figure B.1.4-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for Open Pit/Pit Lake (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.1.5 ECD

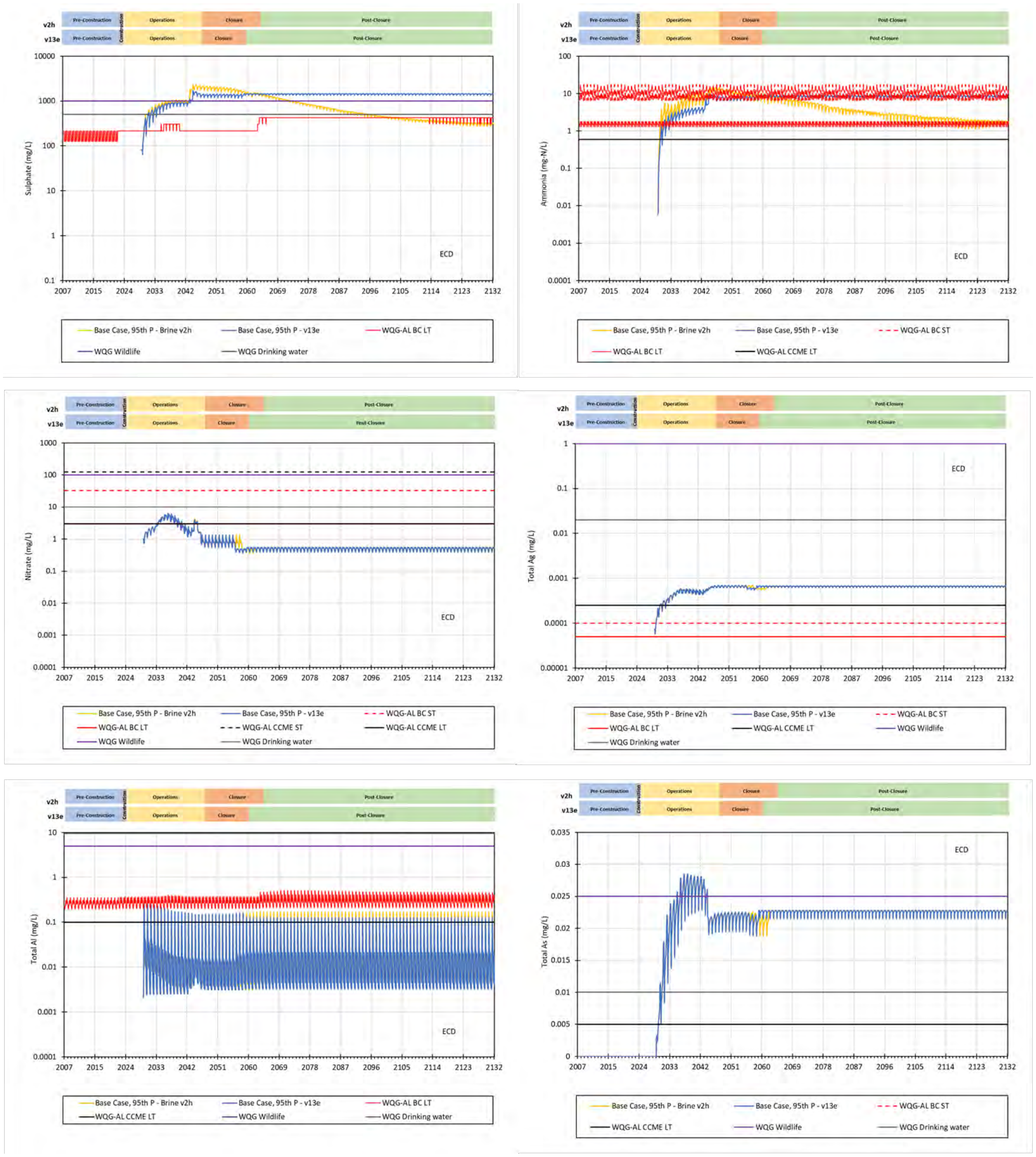

Figure B.1.5-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for ECD (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

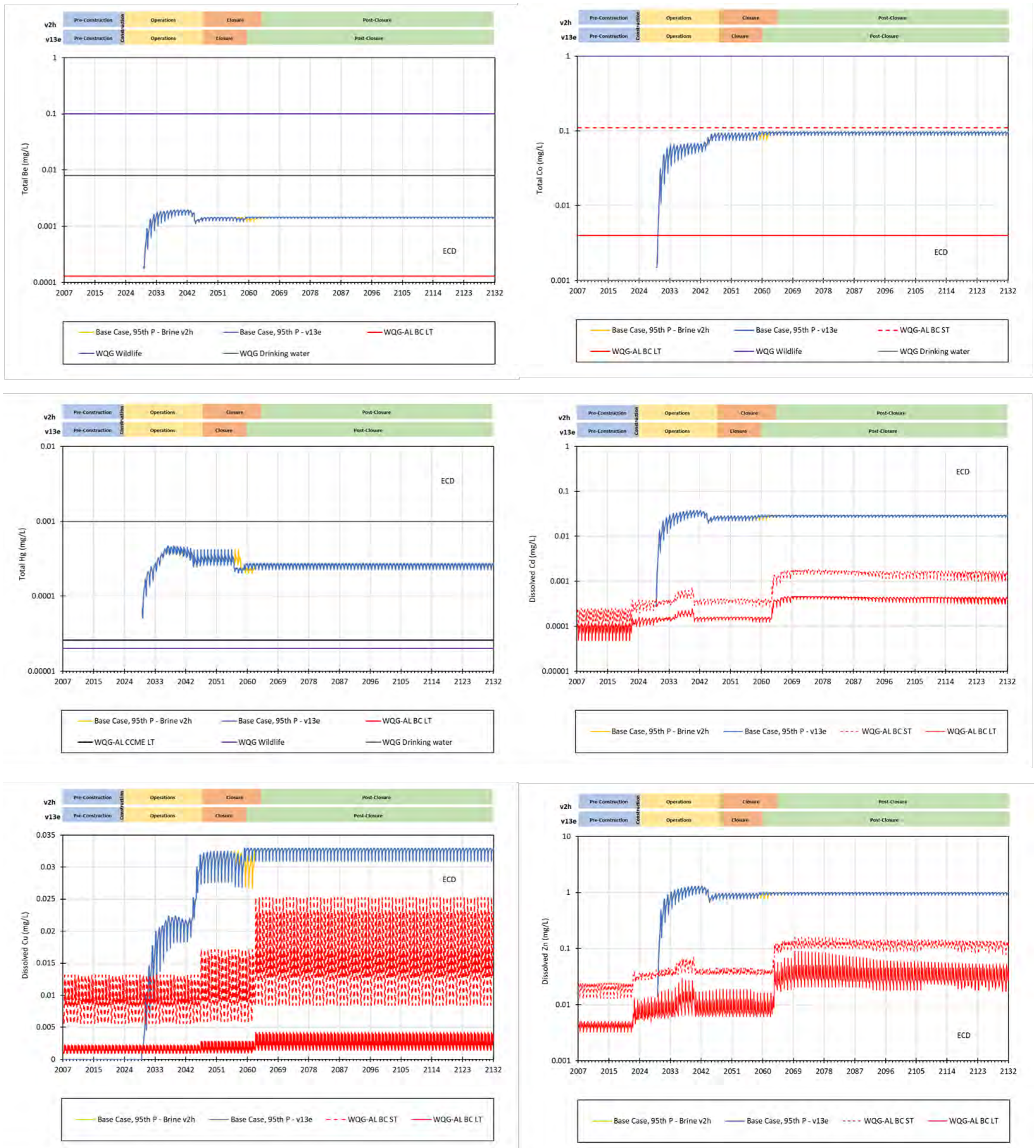

Figure B.1.5-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for ECD (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.1.6 WMP

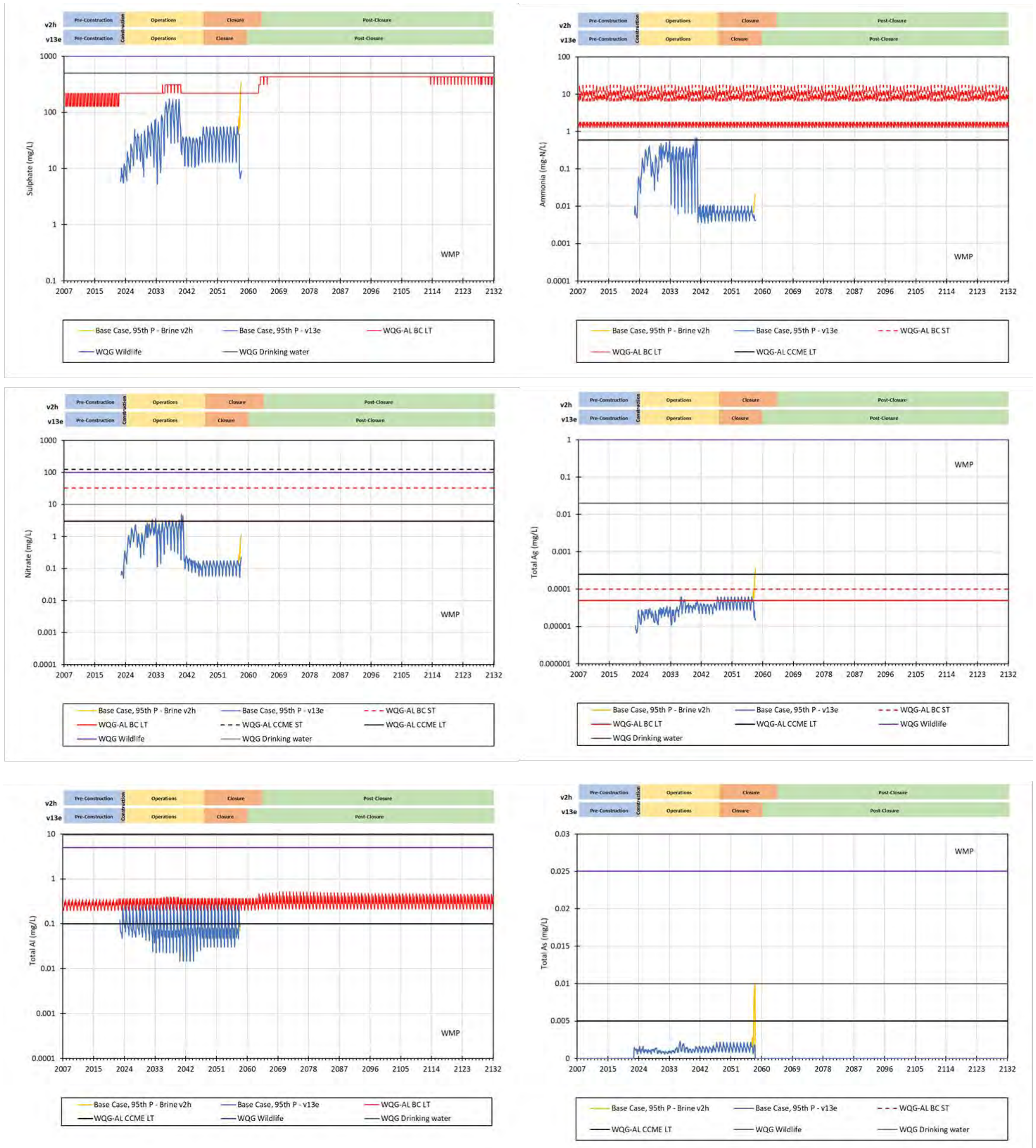

Figure B.1.6-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WMP (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

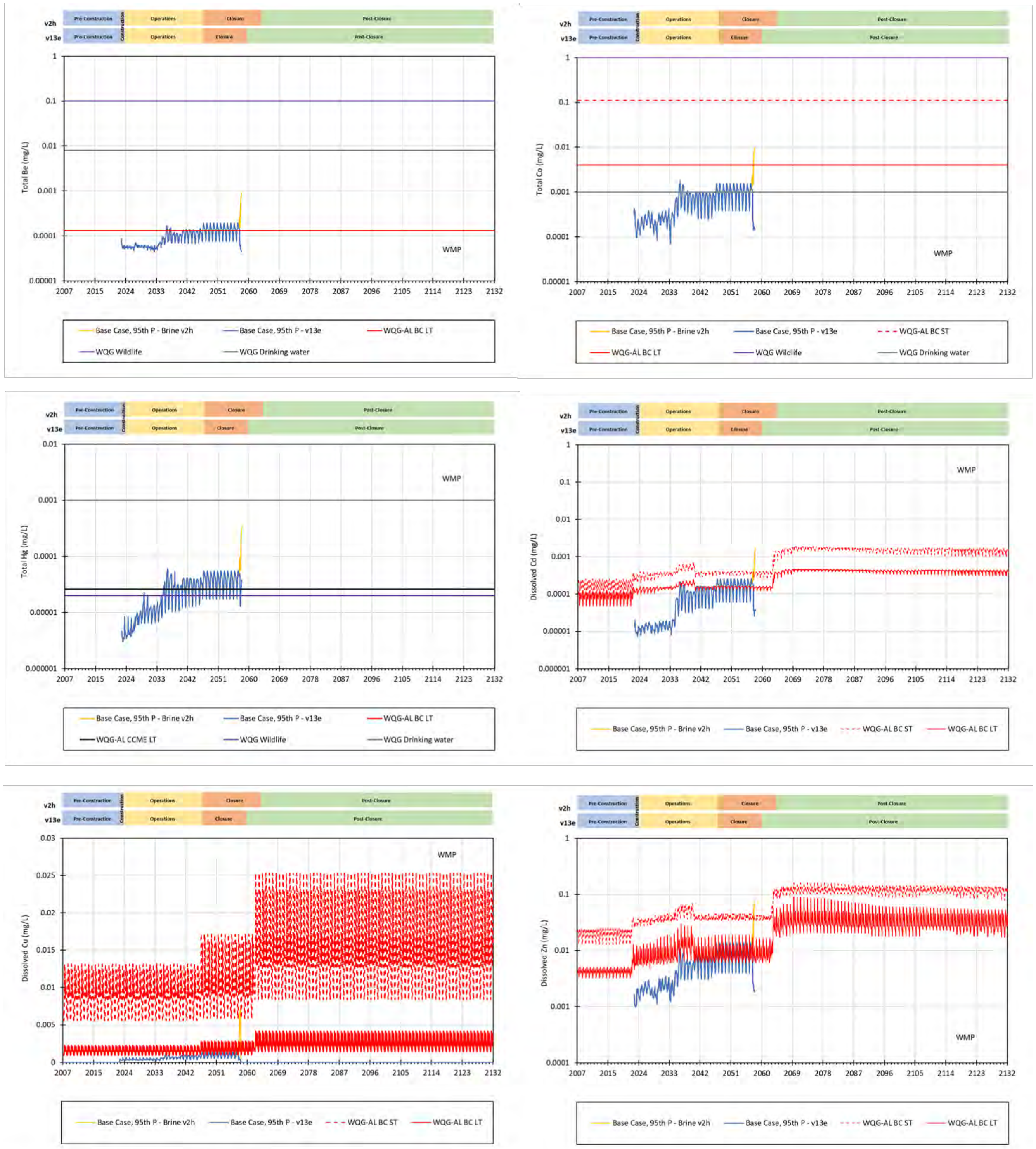

Figure B.1.6-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WMP (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.1.7 FWR

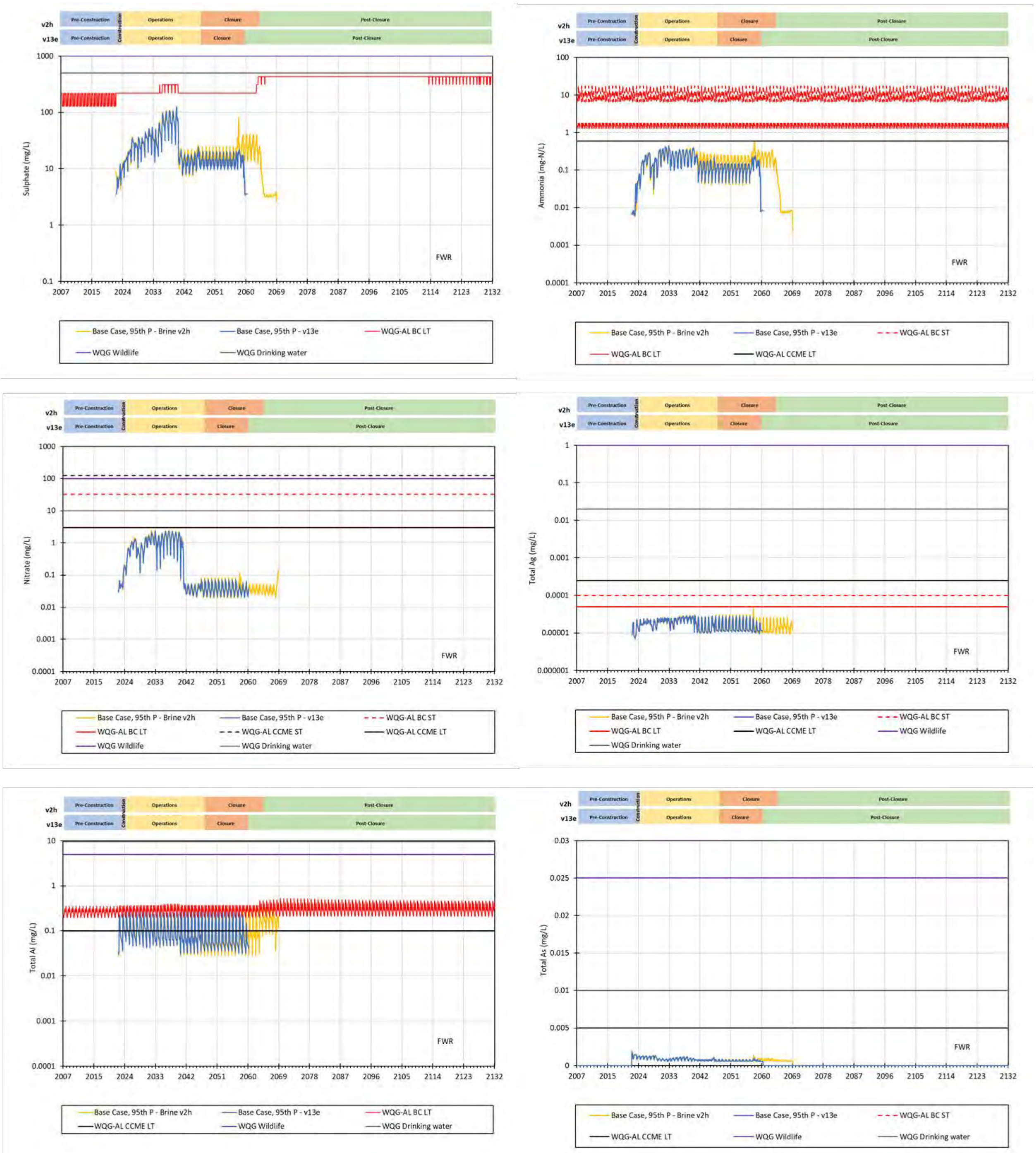

Figure B.1.7-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for FWR (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

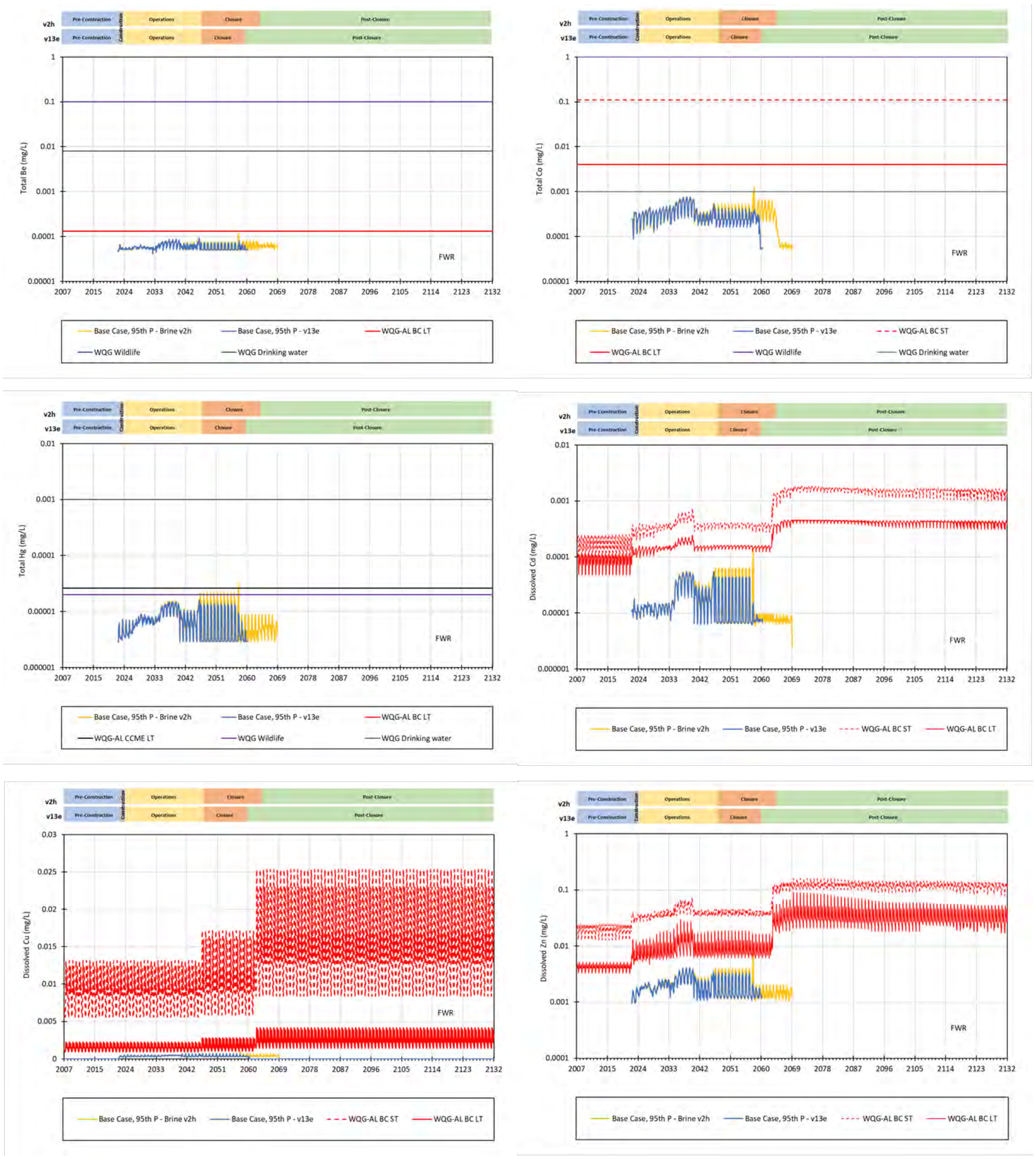

Figure B.1.7-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for FWR (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.1.8 Spillway

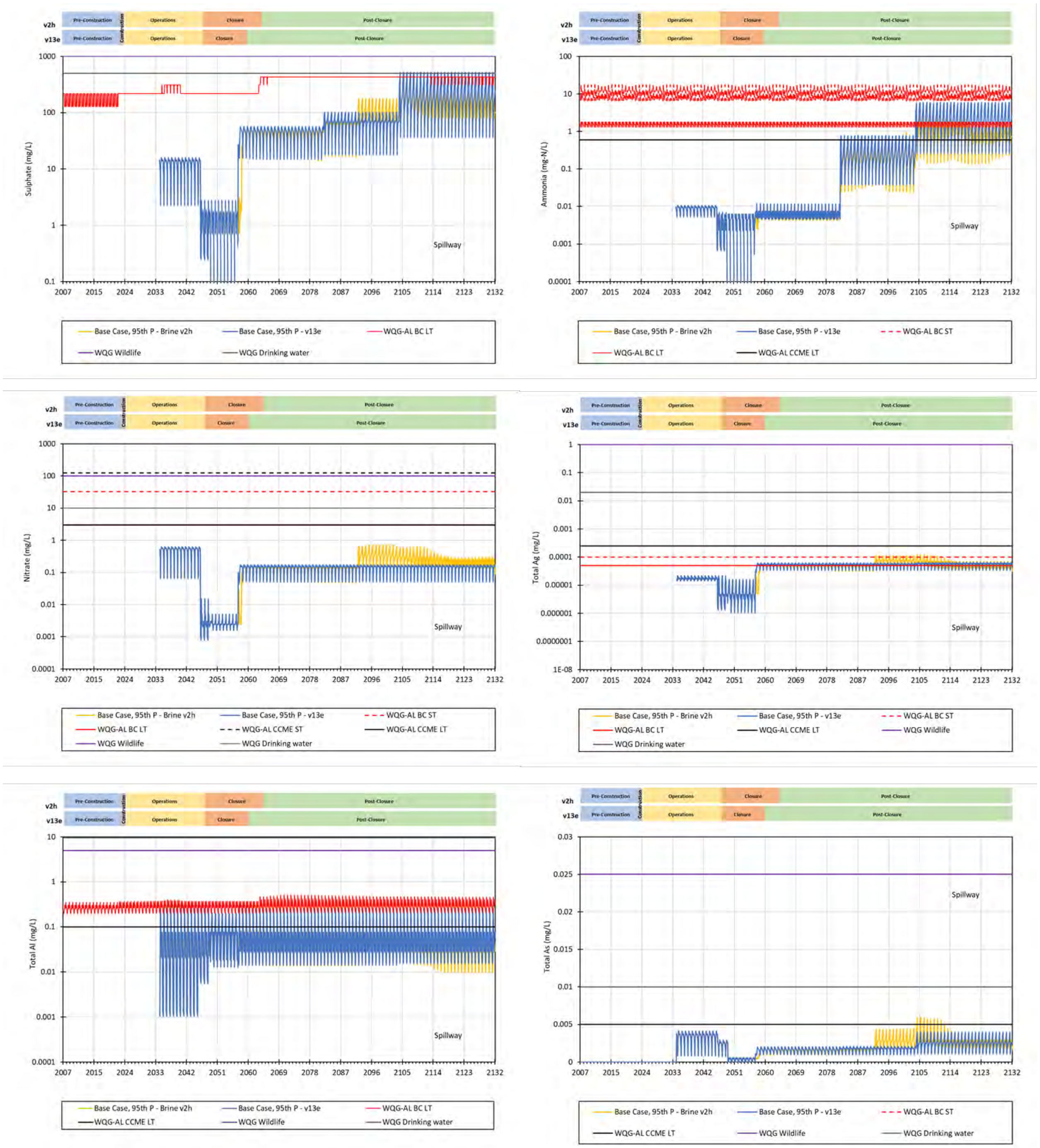

Figure B.1.8-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for Spillway (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

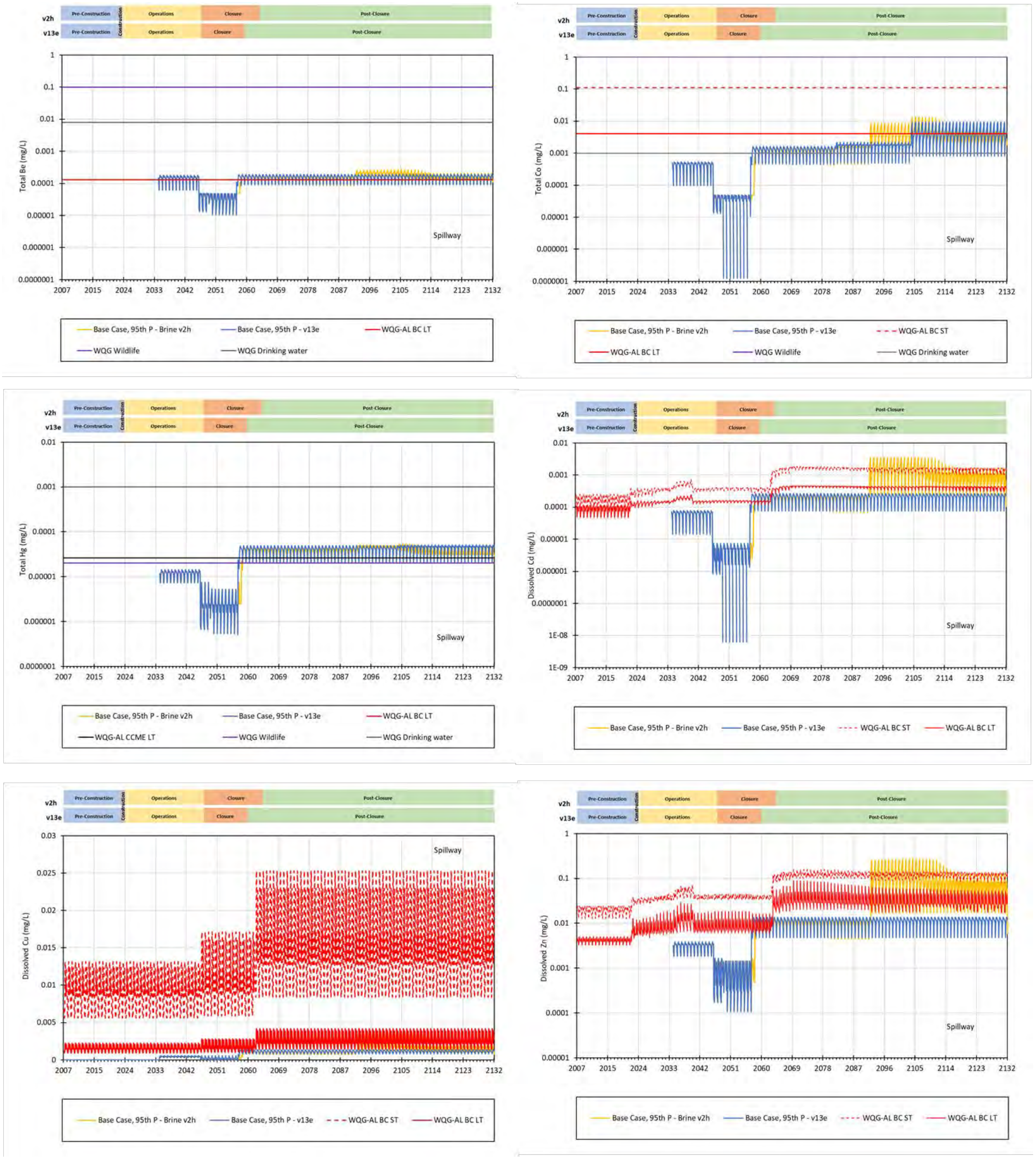

Figure B.1.8-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for Spillway (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.1.9 MRWTP

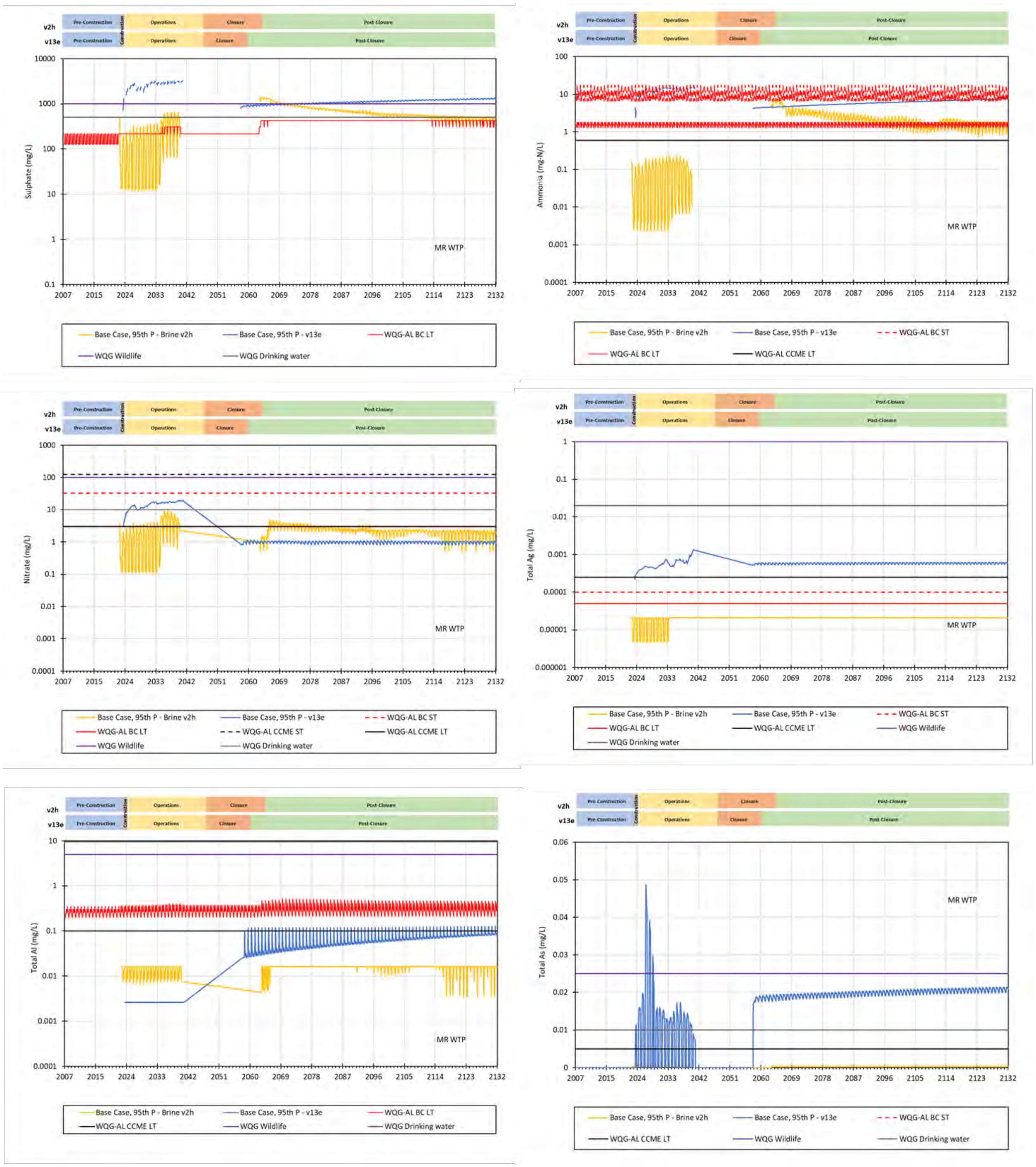

Figure B.1.9-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for MRWTP (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

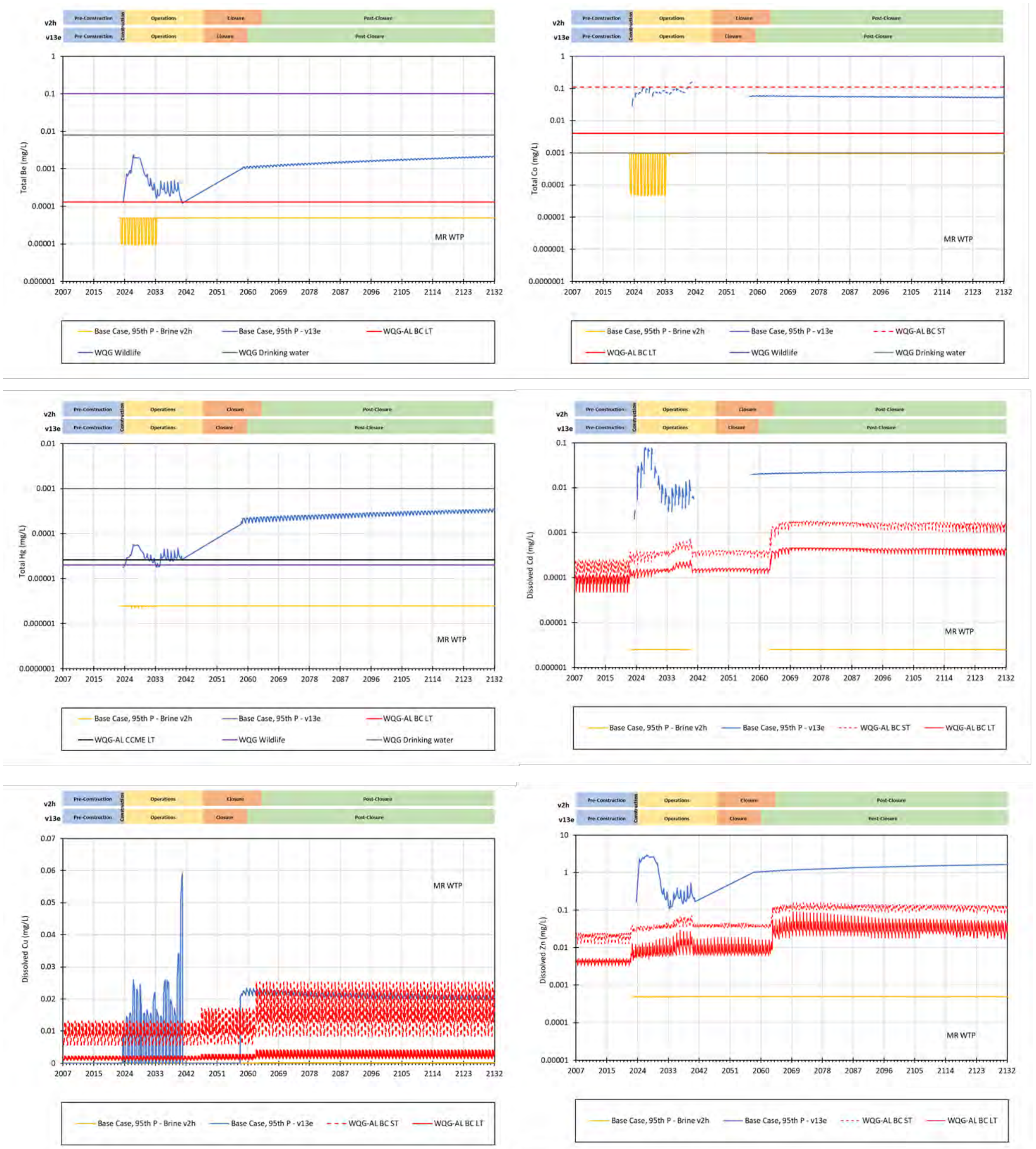

Figure B.1.9-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for MRWTP (clockwise from upper left). Water quality guidelines (WQG) are show for reference only, and are calculated using WQ28 predicted hardness, and WQ28 baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.2.1 WQ28

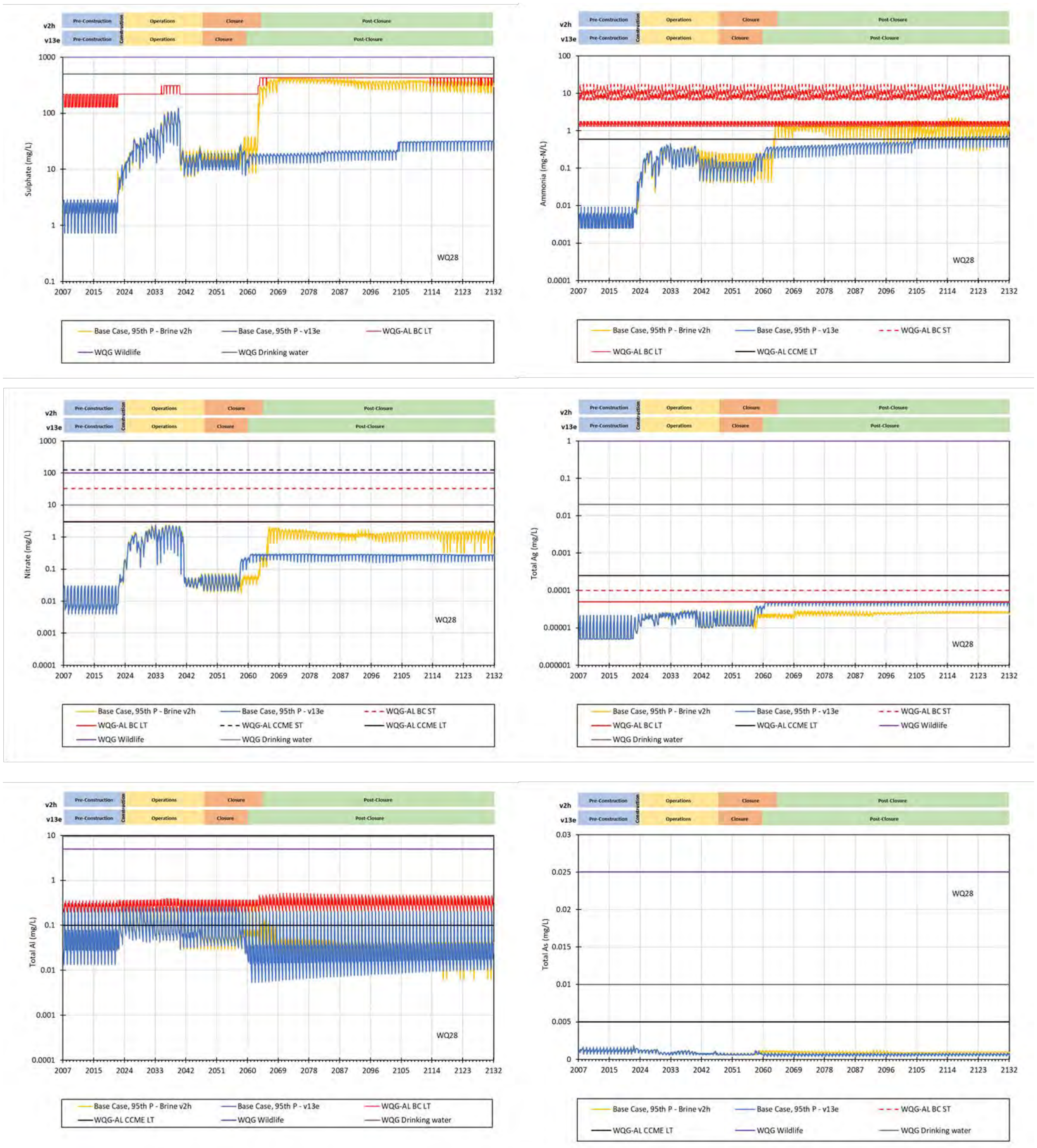

Figure B.2.1-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ28 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

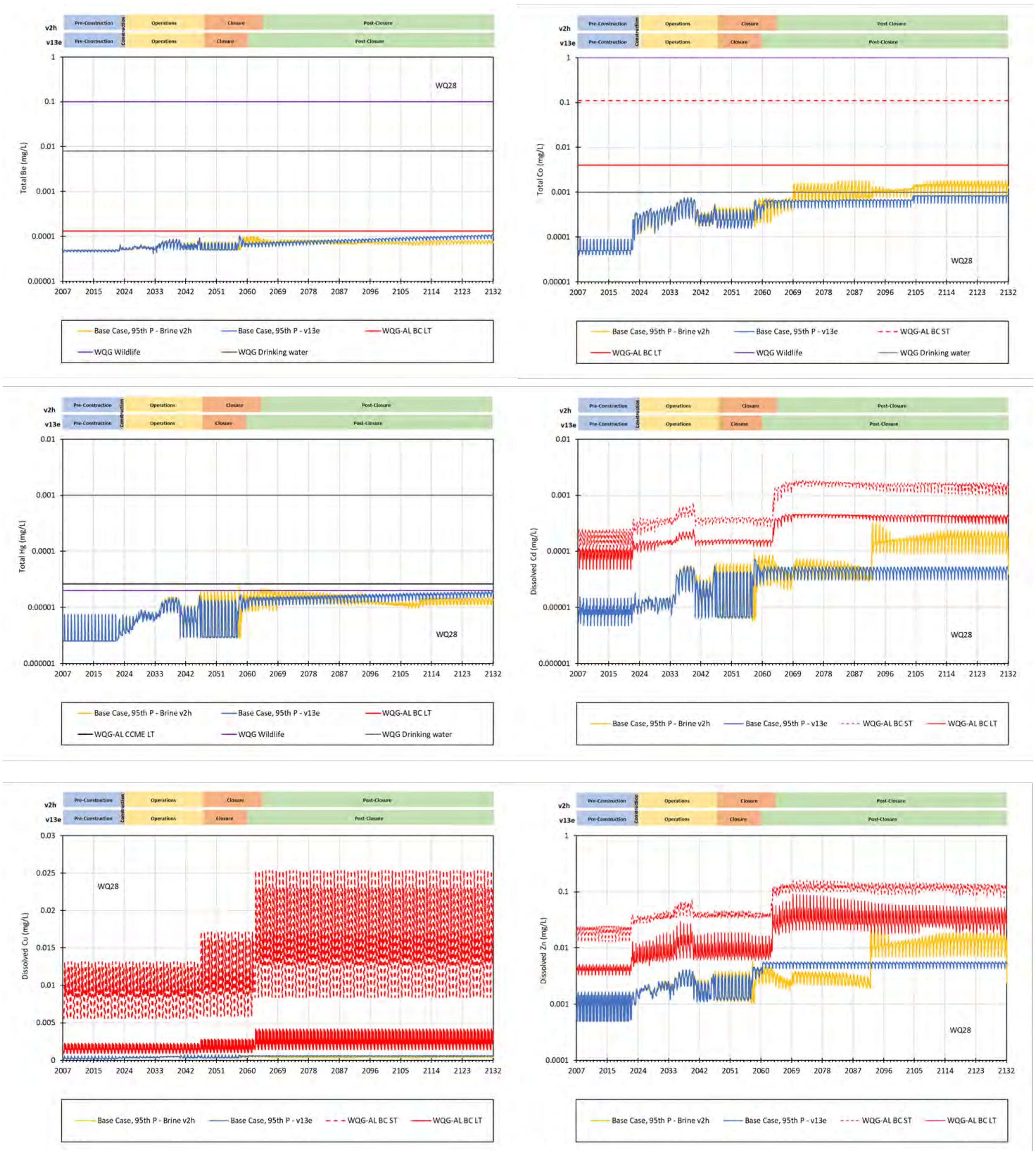

Figure B.2.1-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ28 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.2.2 WQ27

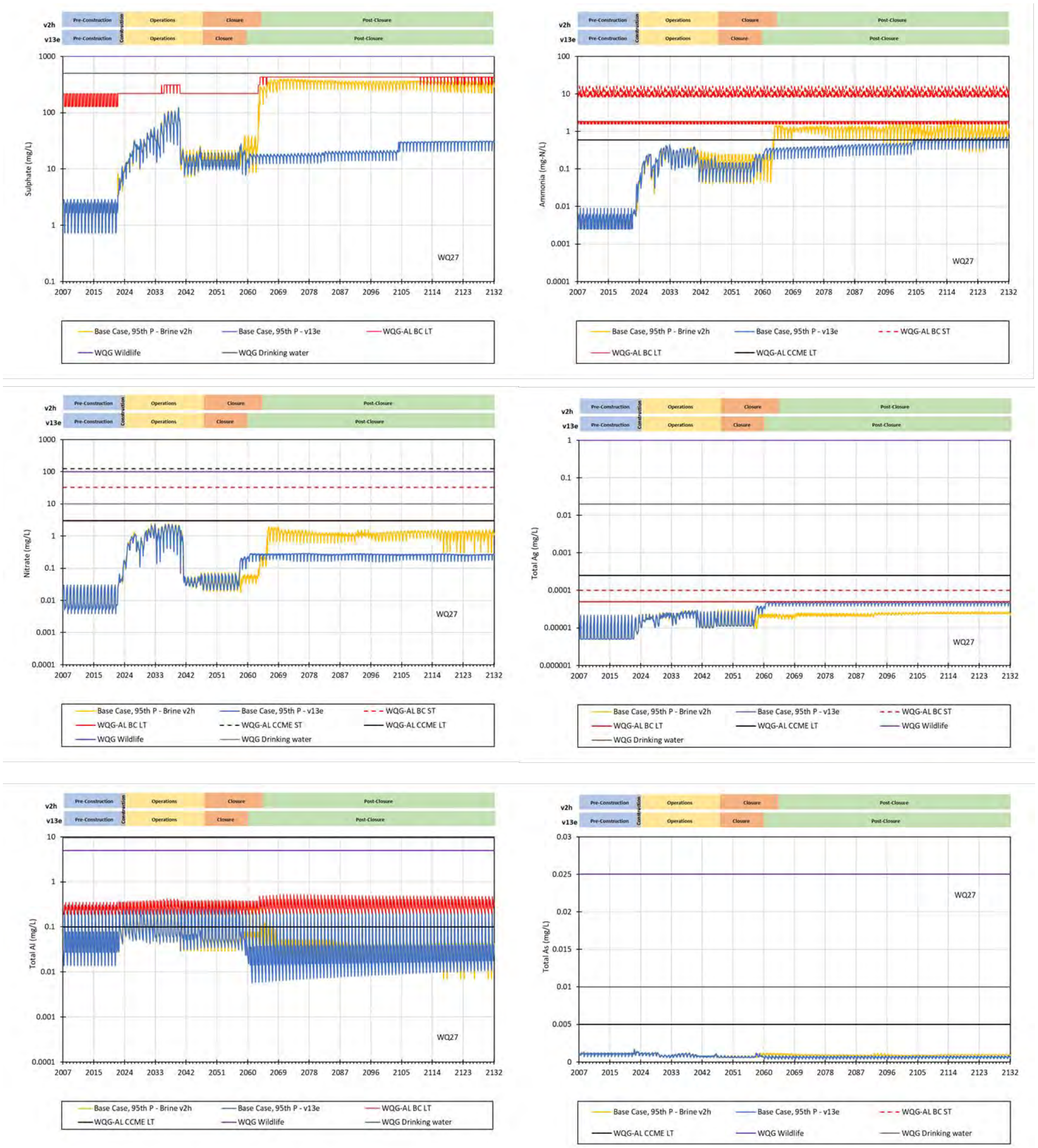

Figure B.2.2-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ27 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

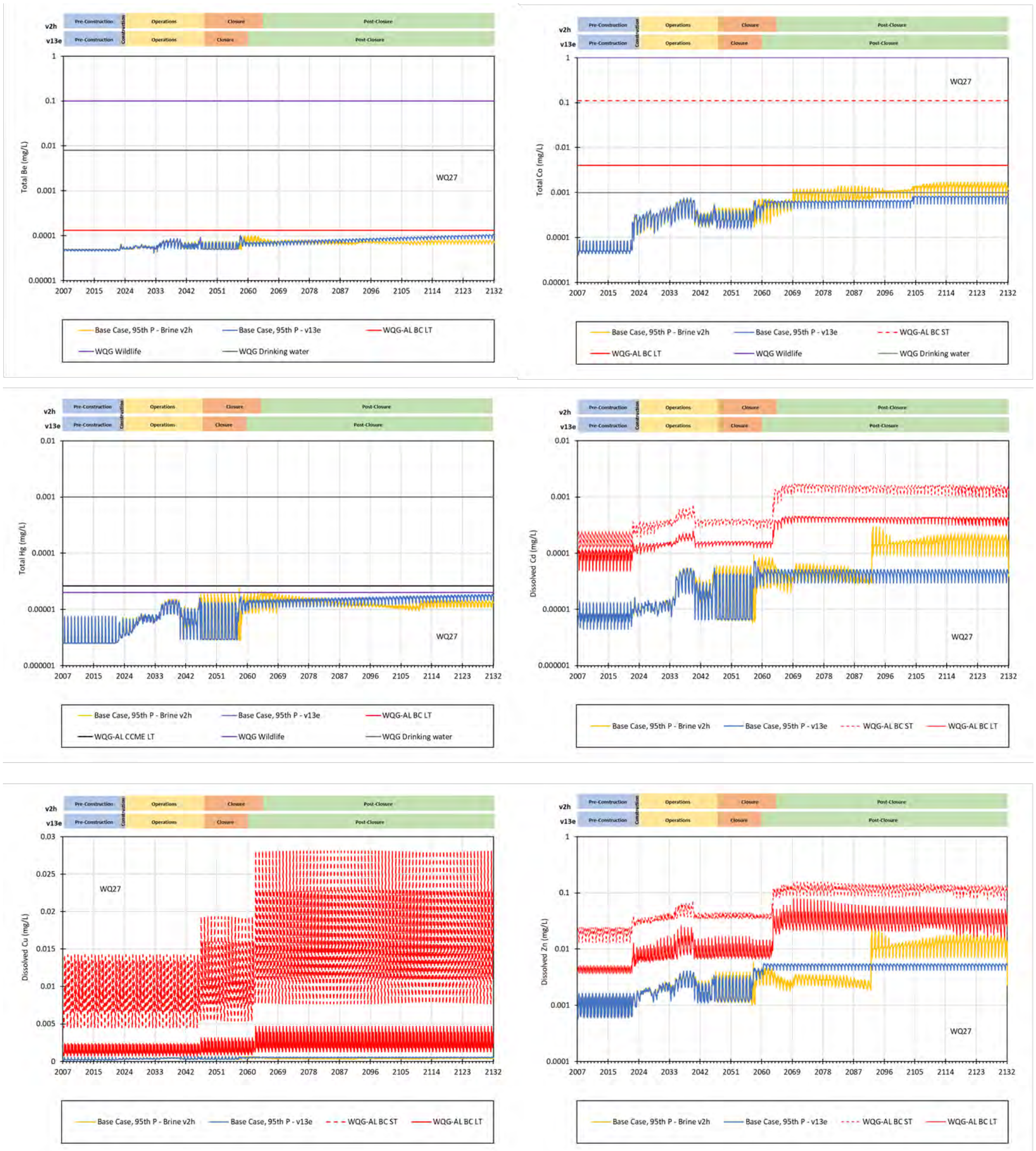

Figure B.2.2-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ27 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.2.3 WQ26

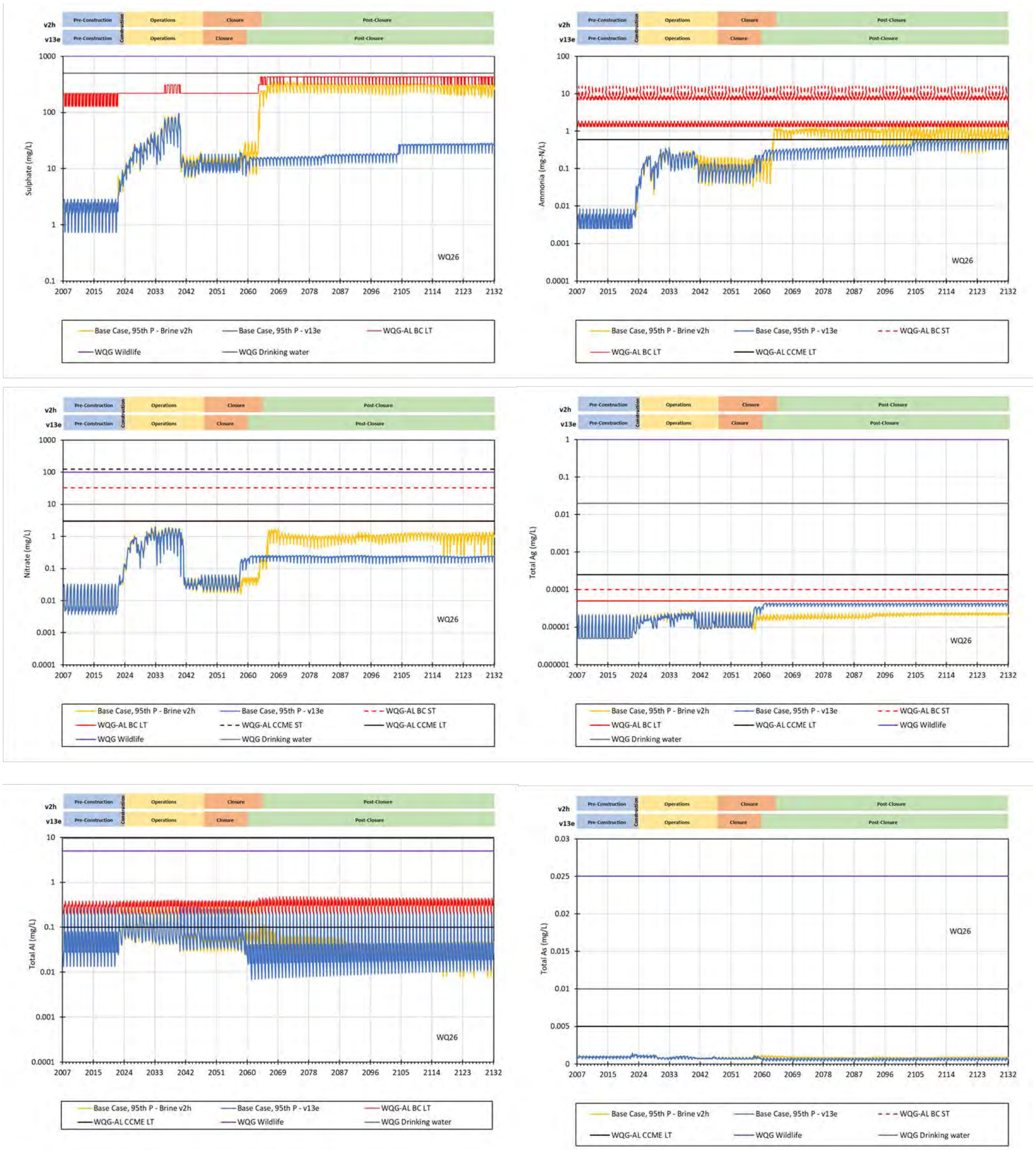

Figure B.2.3-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ26 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

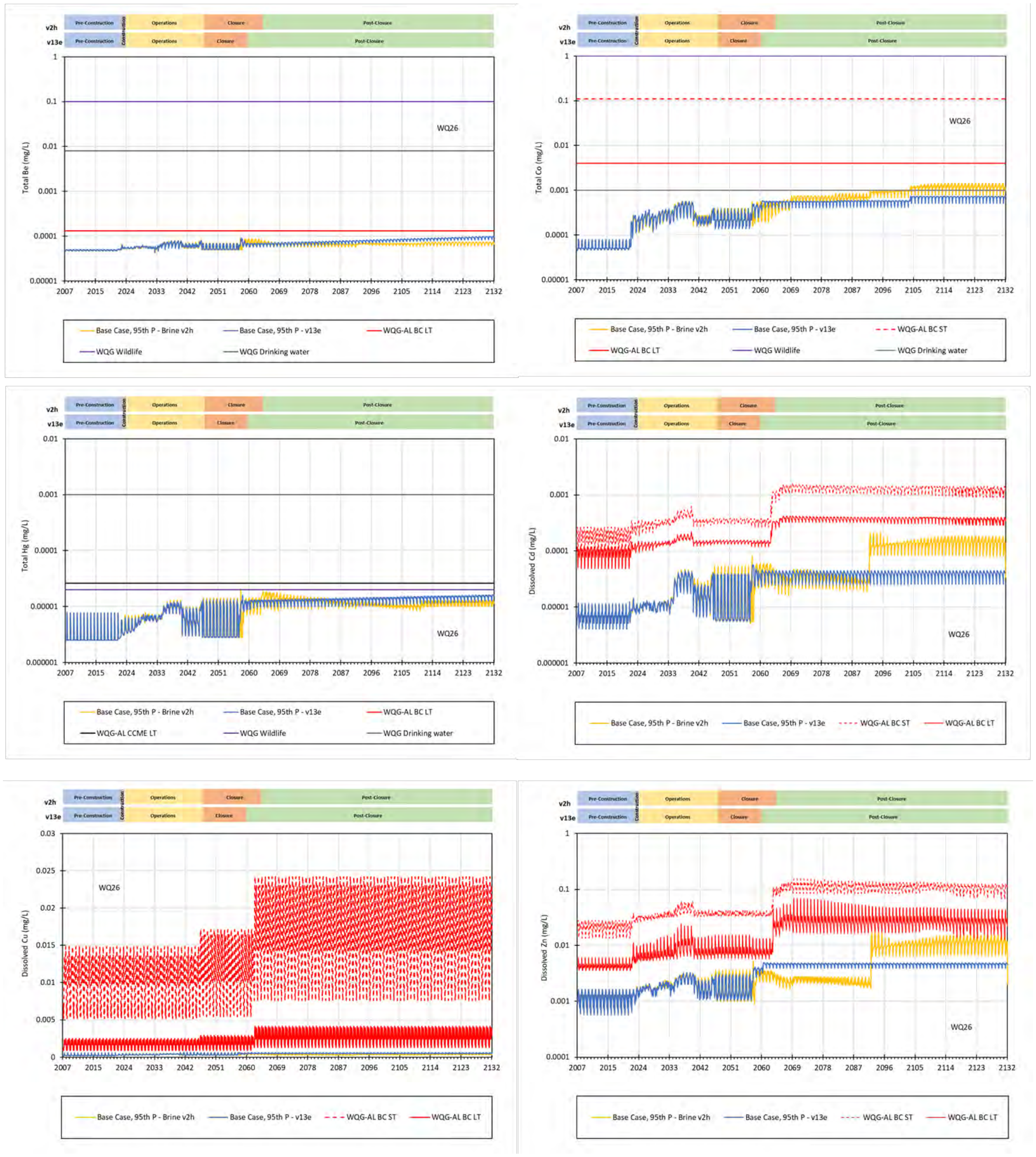

Figure B.2.3-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ26 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.2.4 WQ7

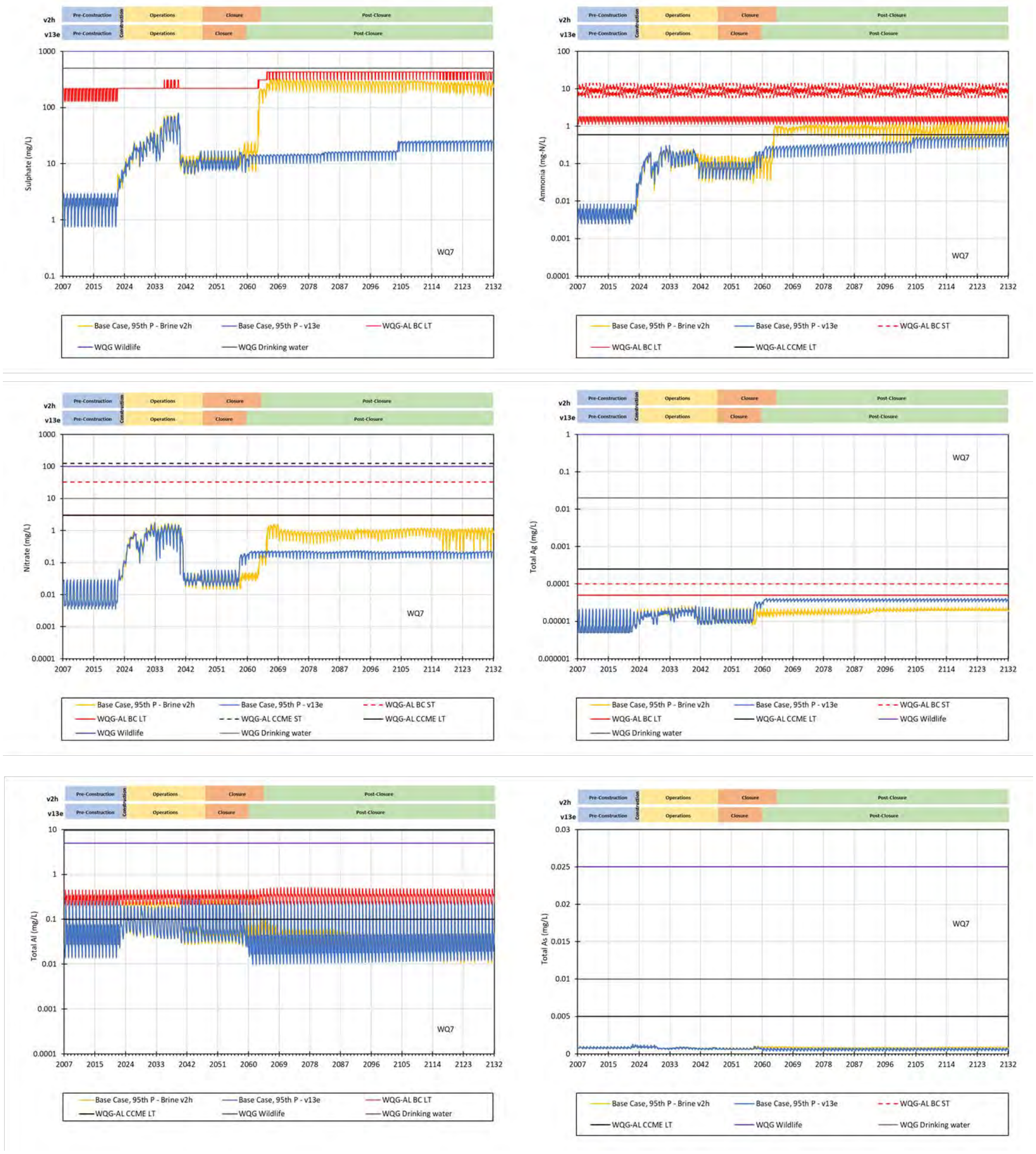

Figure B.2.4-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ7 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

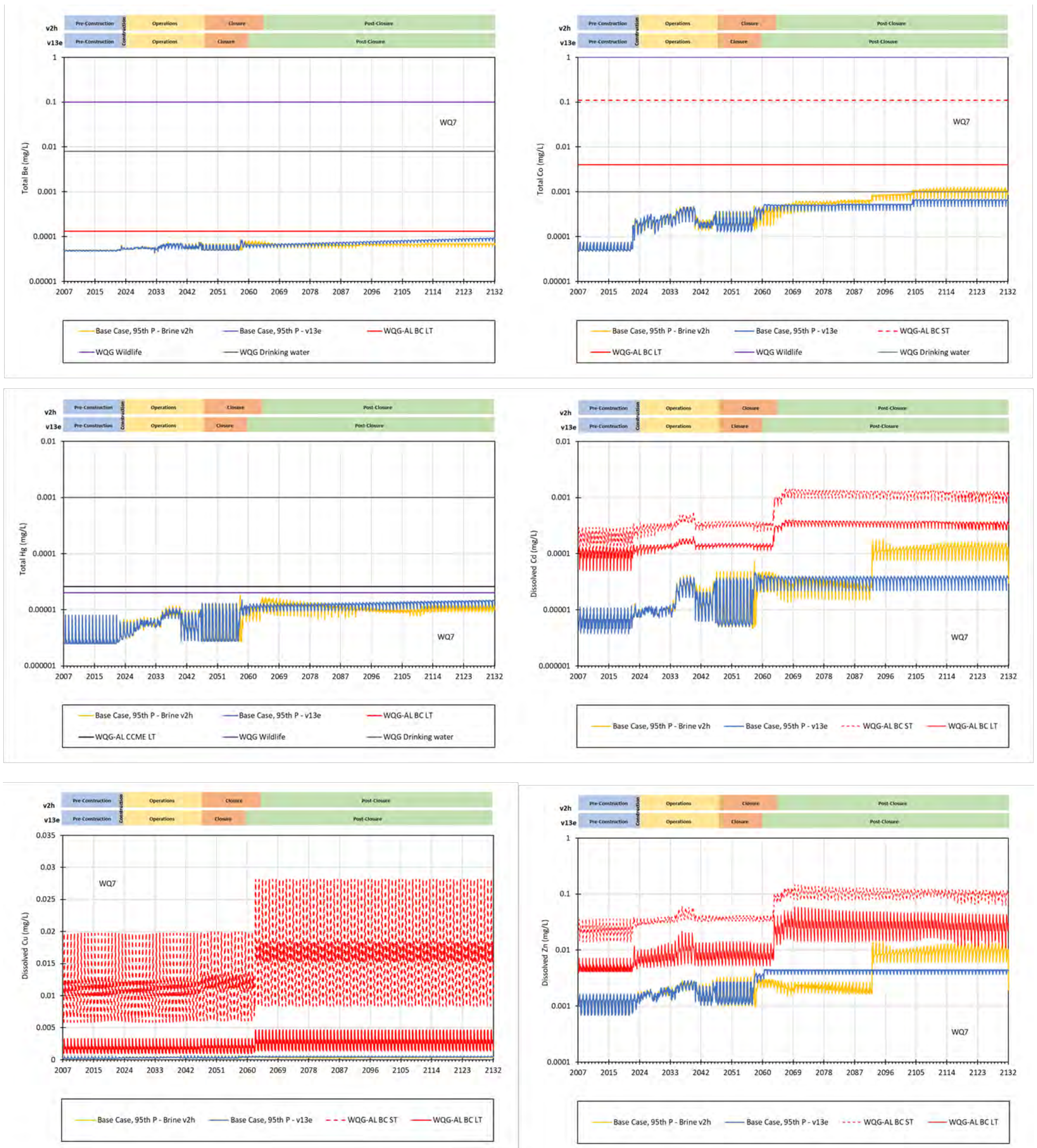

Figure B.2.4-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ7 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.2.5 WQ9

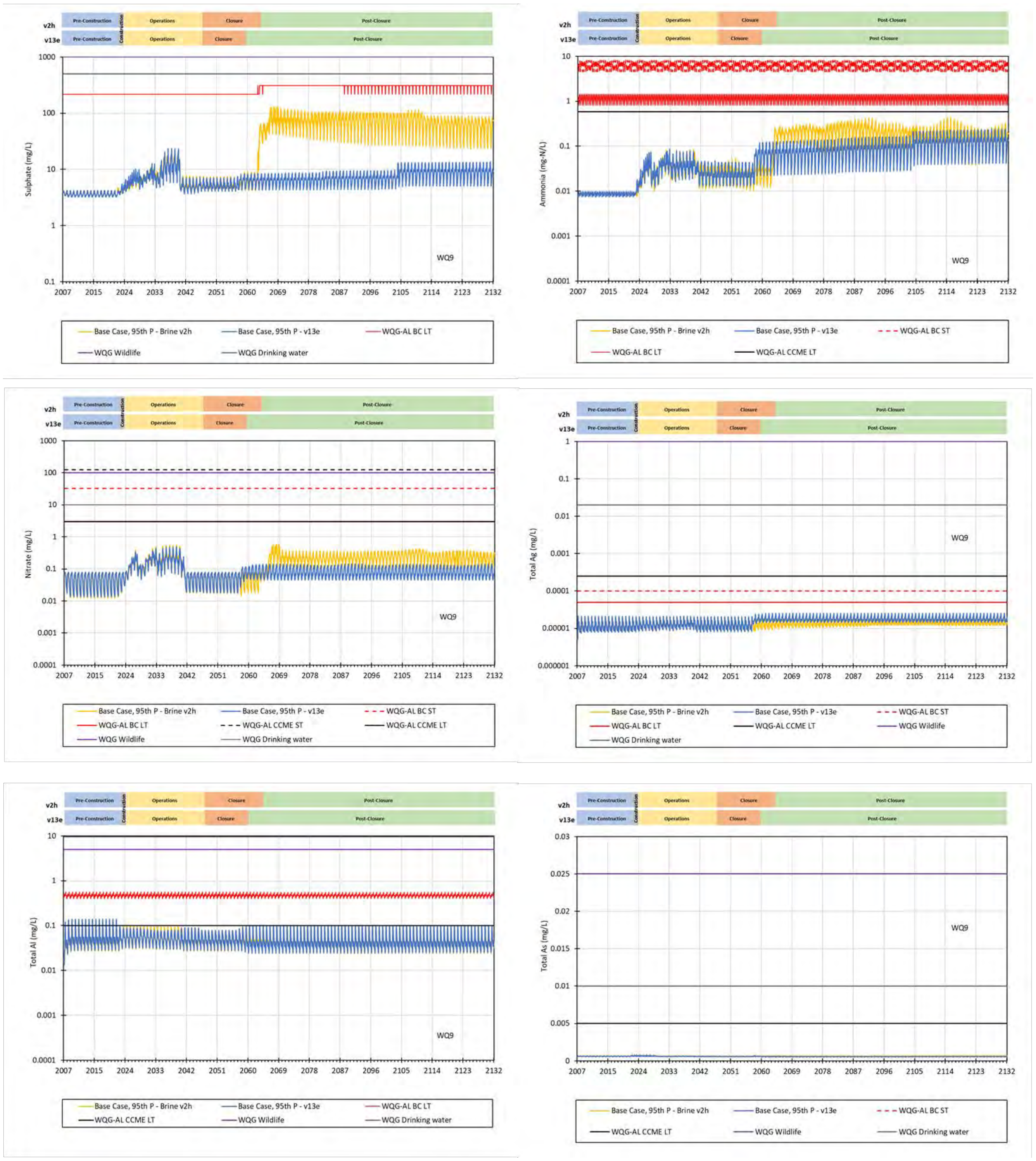

Figure B.2.5-1: **95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ9 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

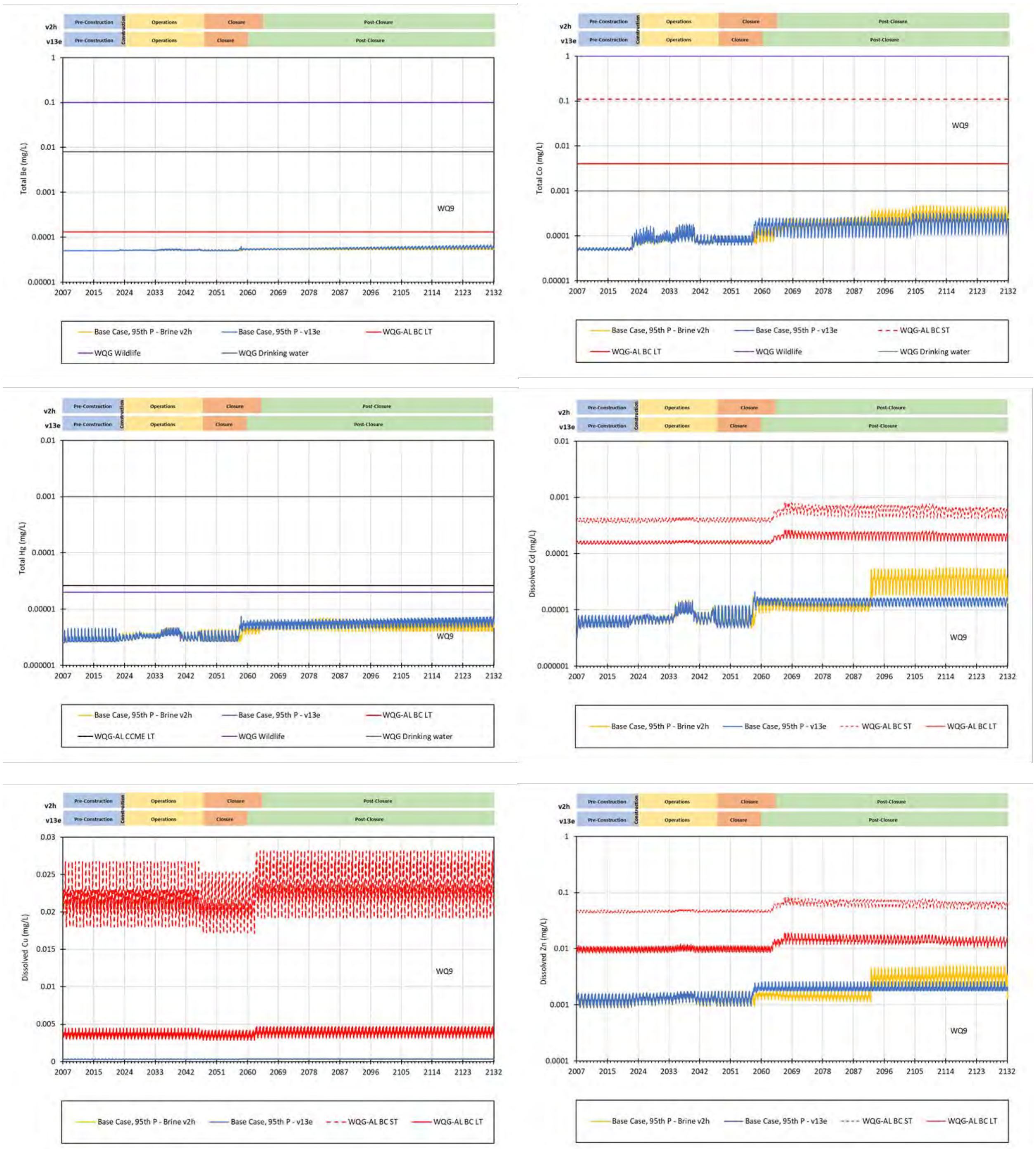

Figure B.2.5-2: 95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ9 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

B.2.6 WQ13

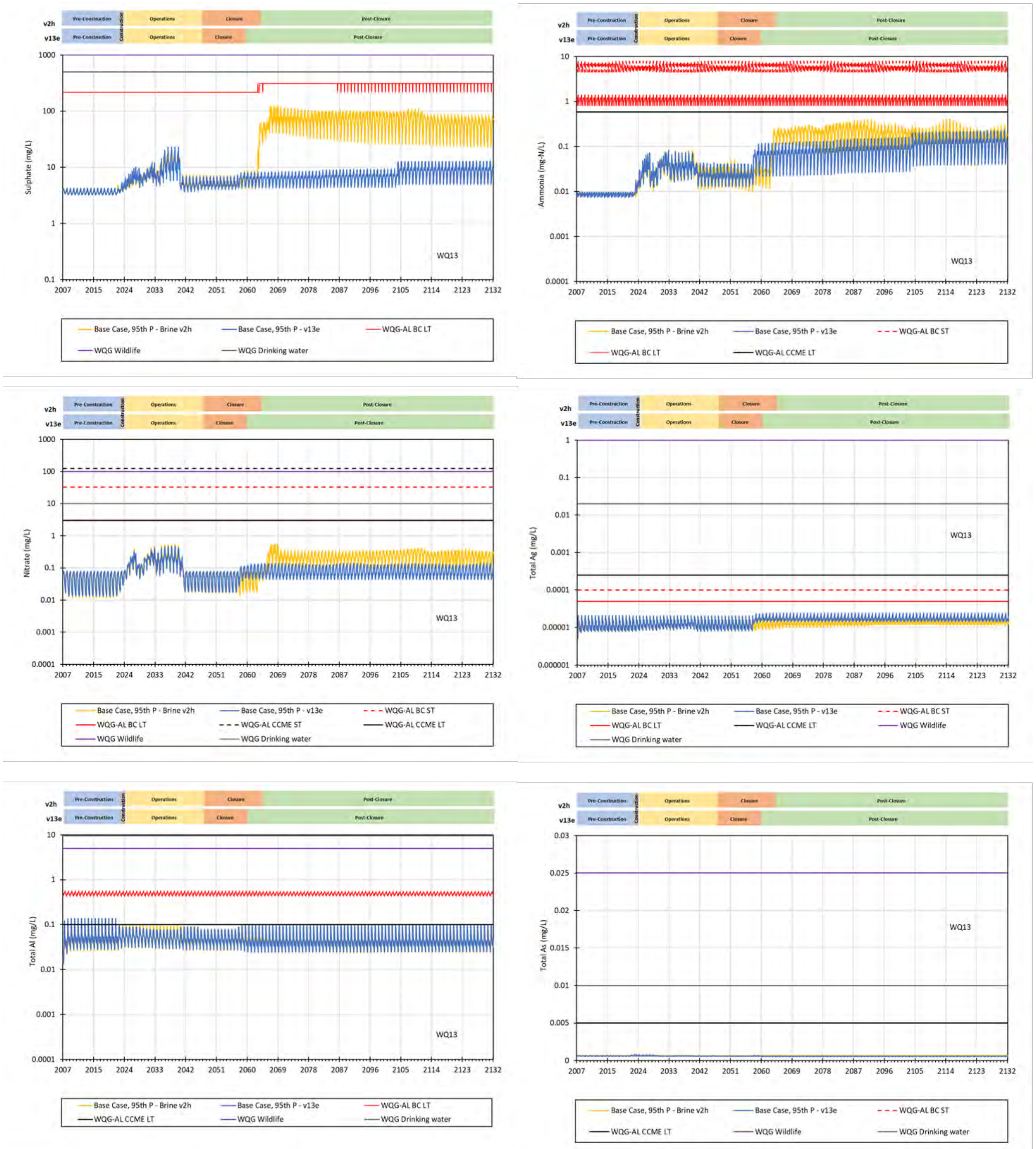

Figure B.2.6-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for WQ13 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

Figure B.2.6-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for WQ13 (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.2.7 Chedakuz Midway

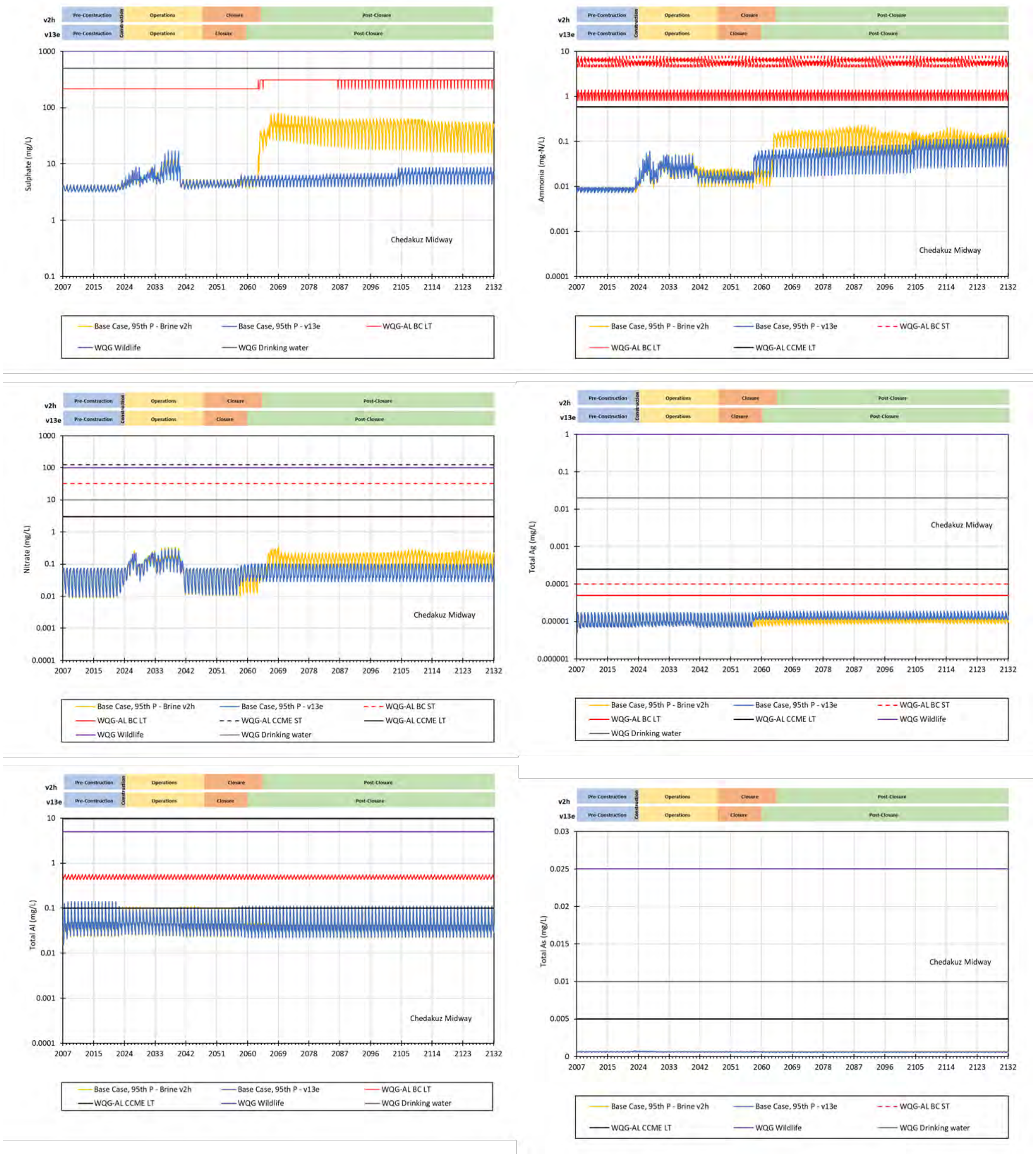

Figure B.2.7-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for Chedakuz Midway (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

Figure B.2.7-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for Chedakuz Midway (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

B.2.8 Chedakuz Outlet

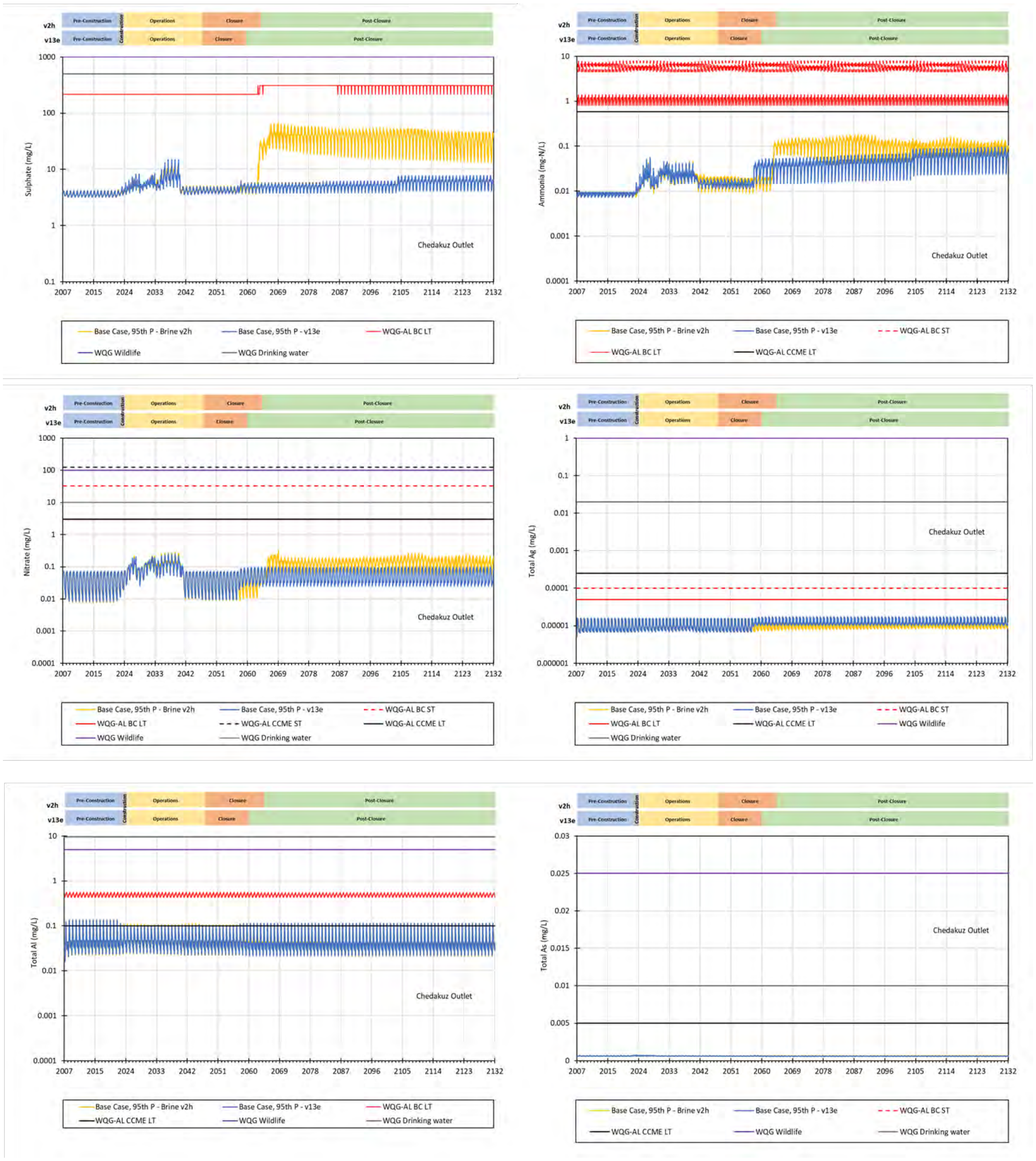

Figure B.2.8-1: 95th percentile predictions for sulphate, ammonia, total silver, total arsenic, total aluminum and nitrate for Chedakuz Outlet (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.

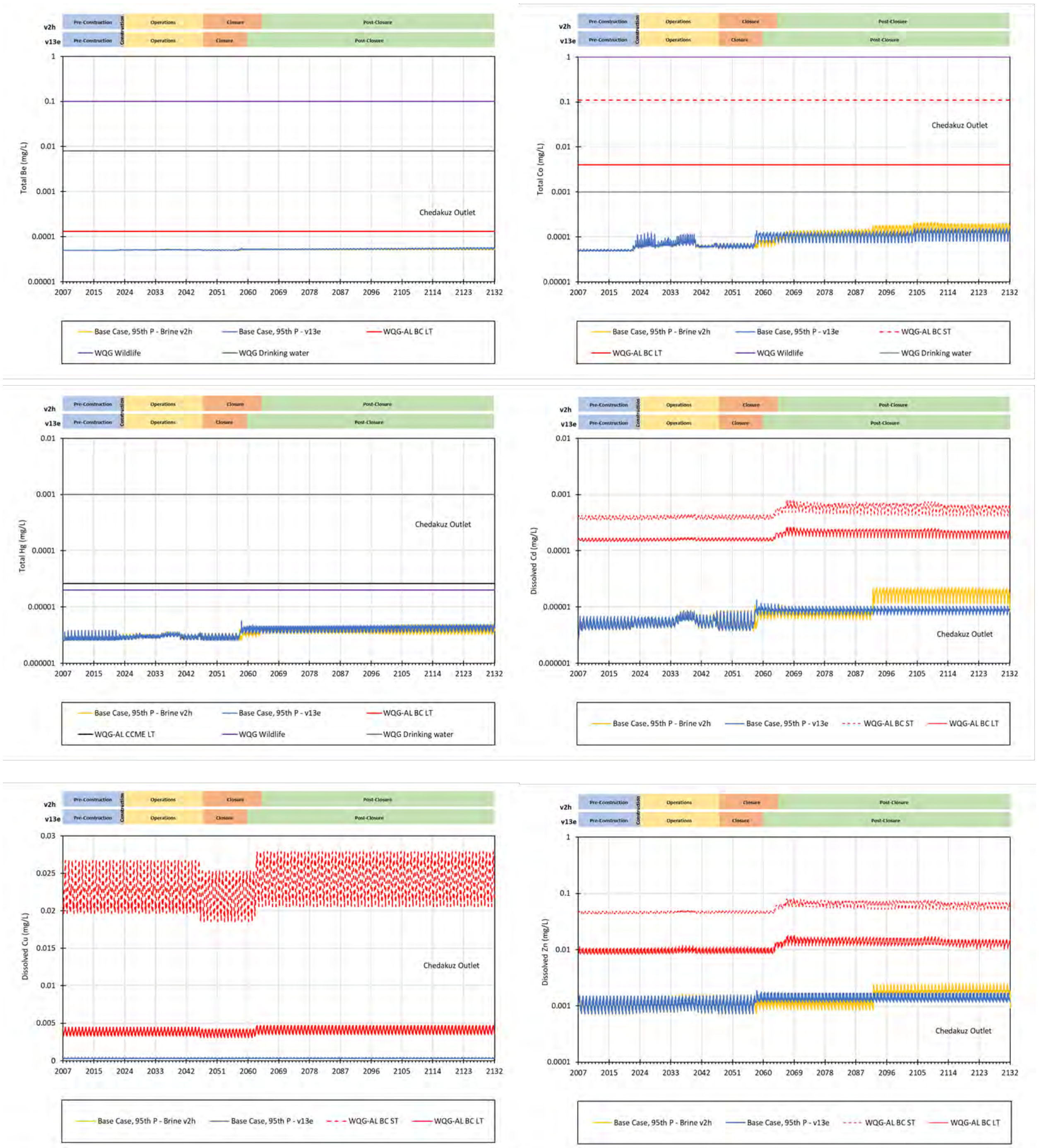

Figure B.2.8-2: **95th percentile predictions for total beryllium, total cobalt, dissolved cadmium, dissolved zinc, dissolved copper and total mercury for Chedakuz Outlet (clockwise from upper left). Water quality guidelines (WQG) calculated using corresponding predicted hardness, and baseline monthly temperature, pH, and DOC. ST: short-term; LT: long-term.**

Appendix C: Metallurgical Report (JAT MetConsult Ltd.)

BW GOLD LTD
a subsidiary company of Artemis Gold Inc

JAT MetConsult Ltd.

To: Alastair Tiver

From: John Thomas

ADDITION OF SULFATE IONS TO MILL WASTE WATER DURING CYANIDE DESTRUCTION

INTRODUCTION

Following a review of the initial post closure water quality modelling results generated as part of Blackwater Gold Ltd's (BW Gold) work plan relating to long-term brine management, a concern was raised with respect to sulphate concentrations generated because of cyanide destruction. To address the concern raised, Metallurgical Consultants Ltd. was engaged by BW Gold to review existing metallurgical test work and provide an opinion on Sulphate (SO_4) concentrations generated because of the cyanide detoxification process to be utilized at the Blackwater Gold Project. The basis for the analysis is test work undertaken by Base Met Labs and detailed in the report "Metallurgical Assessment of the Blackwater Gold Deposit, December 18, 2019".

The following memorandum summarizes test work reviewed and presents an estimate for the anticipated SO_4 concentration generated due to the cyanide detoxification process.

BACKGROUND

Water quality modelling undertaken for the Blackwater Gold Project Joint Application for Mines Act and Environmental Management Act permits, indicated that long term water treatment for SO_4 would be required post closure. The treatment process used would result in a brine retentate being generated which would be stored in the pit lake. During the review of the Blackwater Gold Project Joint Application for Mines Act/Environmental Management Act permits, concerns associated with long-term brine management during the post-closure phase of the project were raised. To address these concerns, BW Gold presented a work plan for the development of alternative strategies for brine management, pit lake water quality and associated water treatment. The results of which, will inform the development of a "Closure and Post Closure Water Quality Management Plan". A key component of this work is the development of an updated water quality model incorporating revised source terms and optimized discharge of SO4 which accumulates at site over time.

The primary source of sulphate generated is through the detoxification of cyanide used in the gold extraction process. Gold and silver will be extracted utilizing a combined gravity and carbon in leach (CIL) circuit. A key component of the extraction process is the leaching of gold and sliver whereby a cyanide solution is introduced into the CIL circuit and gold and silver is progressively leached from the ore solids. The exhausted tails slurry produced by the CIL process will contain cyanide. Treatment is necessary to reduce the free cyanide and potentially cyanide forming complexes to permitted levels prior to discharge to the Tailings Storage Facility. The Blackwater plant will use a process to achieve this that is widely used in the industry which oxidizes free cyanide and weak acid dissociable cyanide complexes (WAD) using sulfur dioxide and oxygen in the presence of a copper catalyst. The chemistry of the process can be summarized by the following reaction.

5766 Goldenrod Crescent, Delta, BC V4L 2G6. Tel +1 604 505 8546 jatmetco@gmail.com

$$CN^- + SO_2 + O_2 + Cu + H_2O = CNO^- + Cu + H_2SO_4$$

The presence of thiocyanate may occur, cyanate can be hydrolized and metals precipitated as hydroxides, but to estimate the addition of sulfate to the treated liquid phase tailings, this equation is sufficient.

The cyanide detoxification process oxidizes weak acid dissociable complexes and free cyanide, any stable complexes will remain in solution.

METALLURGICAL TESTWORK SUMMARY

The following is a summary of cyanide detoxification test work undertaken by Base Met Labs and detailed in the report "Metallurgical Assessment of the Blackwater Gold Deposit", dated December 18, 2019.

Test work was undertaken on three composite samples constructed from a total of 48 variability samples received for test work. Prior to cyanide detoxification testing, the three composites were run through the selected leach process and then treated for cyanide destruction. The table below summarizes the results obtained.

Feed	Test	pH	NaCN	SO2	Cu	Solution Assay mg/t				
			to leach kg/t	g/g WAD	mg/l	WAD CN	Cu	Fe	Ni	Zn
Comp 1										
Composit	Feed	10.3	1.16			367	161	9	0.95	55.5
	A	8.5		3.5	15	7.5	5.4	0.4	<0.1	<0.1
	B	8.5		4.5	0	14.4				
	C	8.5		4.5	15	0.2	0.79	0.6	<0.1	<0.1
Comp 2										
Composit	Feed	10.5	0.77			273	28.1	3.77	0.86	95.1
	A			3.5	15	0.4	1	<0.2	<0.1	0.19
	B			3.5	0	11.4	5.8	<0.2	0.18	0.2
	C			3.0	15	11.5	15.6	<0.2	<0.1	0.1
Comp 3										
Composit	Feed	10.3	0.78			264	73.7	12.8	0.48	58.7
	A			3.0	15	24.8	32.9	0.1	<0.1	<0.1
	B			3.5	15	7.5	4.8	0.11	<0.1	<0.1
	C			4.0	15	0.3	1.3	<0.1	<0.1	<0.1

Table 1: Cyanide Detoxification Results

RESULTS

The theoretical consumption for sulfur dioxide is 2.5 g SO_2 / g of WAD cyanide but in practice, oxidation of other species raises this ratio. The goal of the test work is to determine the actual amount of SO_2 required. This test work has shown that 4: 1 SO_2: CN^- is necessary to achieve low levels of WAD cyanide.

The results show that a ratio of 4:1 $SO_2:CN^-$ is adequate to achieve permitted levels of WAD cyanide discharge. The WAD content of the liquid phase varies somewhat, as precise control of cyanide addition in batch test work is not easy, in the plant an automated control system will be used to maintain the desired level of free cyanide, which forms part of the WAD cyanide. The WAD cyanide concentration varies with the amount of cyanide added as would be expected. However, plotting the results obtained through the test work (Figure 1), allows a regression line to be generated to estimate WAD cyanide concentrations for a range of cyanide additions.

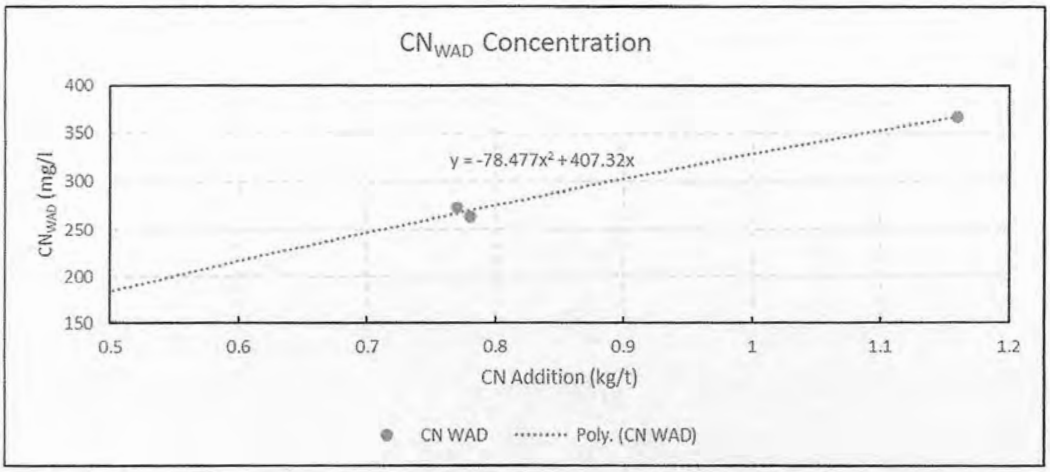

Figure1: Cyanide Addition vs WAD Cyanide

RECOMMENDATION

The addition of cyanide to achieve adequate recovery of gold and silver has been determined to be 0.6 kg of sodium cyanide (NaCN) per ton of ore treated for the Blackwater Gold Project. Given the cyanide addition rate of 0.6 kg/t, a WAD cyanide concentration of 220 mg/l WAD could be anticipated based on the regression above (Figure 1).

Assuming this concentration, then the amount of SO_2 required would be estimated as 0.22 (CN_{WAD}) x 4 (SO_2:CN) = 0.88 kg of SO_2 is required per ton of ore. The addition of this amount of SO_2 will produce 0.88 (SO_2) x 96/64 (SO_4/SO_2) =1.32 kg of sulfate. Assuming a 10% variation in cyanide addition from time to time, this would increase sulphate to 1.45 kg per tonne of ore processed.

The solids concentration at the end of the leach will be a nominal 45%, resulting in a ratio of 1.22 m3 of water per ton of solids leached.8. Thus, 1.45 tons of sulfate will be dissolved in 1.22 m3 of water, giving a concentration of 1.20 kg/m3 (or 1200 mg/liter).

J. A. Thomas

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, Dr. J. A. THOMAS # 34665

John A. Thomas Ph.D. P. Eng.

August 22, 2023 Permit to Practice 1004324

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Appendix D: Brine Management Work Plan Task 4: Parameter of Concern Technical Memorandum

Technical Memorandum

To:	**BW Gold Ltd.**	**Date: Sep. 4, 2024**
From:	**Lorax Environmental Services Ltd.**	**Project #: A599-4**
Subject:	**Brine Management Work Plan Task 4: Parameter of Concern Review**	

1. Introduction

This memorandum has been generated for BW Gold Ltd. (BW Gold) by Lorax Environmental Services Ltd. (Lorax) to address Task 4 of the "Brine Management Work Plan" (Lorax 2022b). Appendix A of Lorax (2022b) provides the following definition and description of Task 4:

- **Task 4 Definition**: Confirm parameters of interest that will be the focus of Work Plan optimization investigations Tasks 5, 6, 7.
- **Task 4 Description**: Evaluate parameters of interest that require treatment via the Membrane Water Treatment Plant (WTP) in order to meet environmental guidelines and cannot be treated via other treatment systems that do not produce a brine (*e.g.*, Metals WTP). During mine plan development (pre-Application), sulphate (SO_4) was identified as a key parameter that could only be treated via membrane treatment technology. Sulphate has been a focus owing to challenges in treatment but other parameters may also need consideration.

The outcomes of Task 4 are intended to inform the completion of Task 5, 6 and 7 which relate to water balance/water quality model optimization and investigations to minimize or eliminate the long-term liability related to brine management at Blackwater.

2. Analysis

Task 4 of the Brine Management Work Plan has been partially addressed by the POC evaluations presented in Section 6 of BQE (2022) and Lorax (2022a). As part of that work, Lorax conducted an exercise that identified the parameters of concern (POCs), as defined by ENV (2019), for all reasonably-foreseeable potential sources of effluent discharge to Davidson Creek in the Post-Closure phase (Lorax, 2022a). The exercise considers the following five key contact waters in the Post Closure phase as potential sources of effluent discharge:

- Tailings Storage Facility (TSF) C and TSF D overflow via the Spillway
- Environmental Control Dam (ECD)
- Upper Waste Stockpile Sediment Control Pond (UWS SCP)
- Pit Lake surface layer
- Pit Lake brine layer

The lists of POCs identified in Lorax (2022a) includes a wide range of POCs that require treatment as part of the mine plan, including sulphate. These POCs and water types were subsequently grouped according to the following categories and the preferred treatment technologies for each were evaluated in BQE (2022):

1. Metal oxyanions: As, Cr, Sb, Se
2. Metals: Ag, Al, Be, Cd, Co, Cu, Mn, Ni, Pb, Tl, U, Zn
3. Nitrogen species: ammonia and nitrite
4. Nitrogen species: nitrate
5. Major anions: sulphate
6. Minor anions: F

Of the above categories, BQE (2022) concluded that membrane treatment was the preferred treatment for POC treatment categories 3, 5 and 6 as per the above list. It is noted the Metals WTP would represent the preferential treatment technology for categories 1 and 2 (*i.e.*, metals).

Of these parameters, sulphate remains the primary parameter of interest driving the need for membrane treatment under the most recent mine plan and water balance/water quality model (Lorax 2022d) and should remain the focus of the Brine Management Work Plan. During Operations, sulphate in the TSF pond and pore water primarily originates from SO_2-air cyanide destruction applied to tailings discharge water, which contributes a large store of sulphate in the TSF that is expected to persist beyond the Closure phase. Sulphate concentrations in contact waters emanating from the TSF through Post-Closure will eventually decline over an undetermined period as this load is rinsed out of the TSF; quantifying and optimizing the duration of this period remains a central focus of the Brine Management Work Plan.

Sulphate is a POC in all five contact water types listed above evaluated in Lorax (2022a) and persists in the Project surface water and groundwater systems over the course of Project life (*i.e.*, sulphate is unlikely to attenuate in the Project environment unless sulphate reducing conditions can be induced). Comparison of WQ28 water quality model predictions for the Base Case and No Membrane Treatment sensitivity shows sulphate concentrations measurably above the BC freshwater water quality guideline (WQG) in the No Membrane Treatment case (Figure 2-1). Note the model source terms do not reflect the eventual decline in sulphate concentrations anticipated to occur as the sulphate store in the TSF depletes.

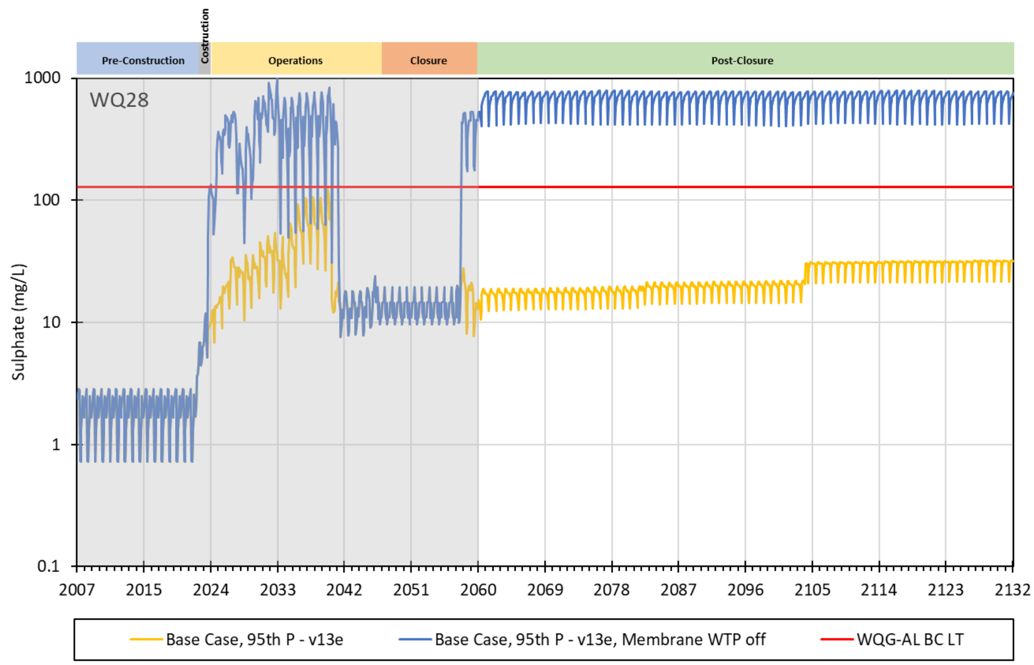


Figure 2-1: Sulphate predictions at WQ28 for the Post-Closure phase (non-shaded area) for water quality model Base and Untreated Effluent cases ("Membrane WTP off"; Lorax 2022c). Values reflect the 95th percentile concentrations for the v13e Variable Climate Case, Base Case source term model. British Columbia short-term water quality guideline for aquatic life (WQG-AL BC ST) calculated using the lowest monthly median baseline concentration for WQ28 hardness.

In addition to sulphate, ammonia is identified as another parameter of interest that should be considered in the Brine Management Work Plan (Figure 2-2). Ammonia is identified as a POC in four of the five contact waters evaluated in Lorax (2022a) and results primarily from cyanide destruction in the mill during the Project Operation phase, similar to sulphate, and to a lesser extent from blasting residues. Within the saturated pore space of the TSF, ammonia is expected to remain relatively stable as the sub-oxic conditions will promote stability and biological uptake will be limited to anaerobic bacteria consuming residual organic carbon within the TSF. Concentrations of this parameter will eventually decline in the long term as this load is rinsed out of the TSF, similar to sulphate. Once released from the TSF and directed to the lower level of the pit lake (via membrane treatment of ECD water) a portion of the ammonia is expected to attenuate, which will be dependent on pit lake nutrient availability, turbidity and depth of the surface water layer, which will vary over time.

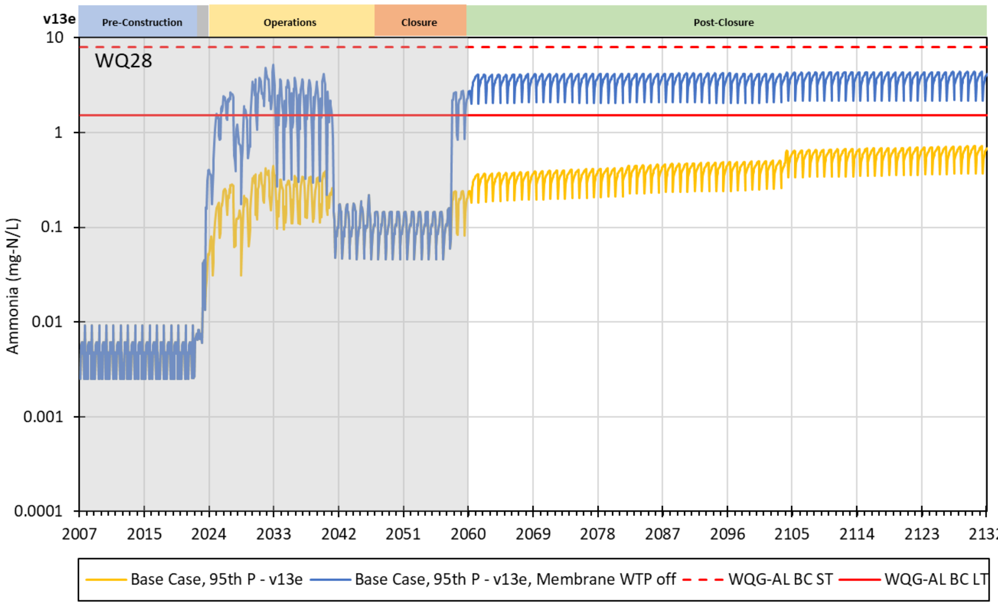


Figure 2-2: Ammonia predictions at WQ28 for the Post-Closure phase (non-shaded area) for water quality model Base and Untreated Effluent cases ("Membrane WTP off"; Lorax 2022c). Values reflect the 95th percentile concentrations for the v13e Variable Climate Case, Base Case source term model. British Columbia short- and long-term water quality guideline for aquatic life (WQG-AL BC ST and LT, respectively) calculated using the median baseline pH at WQ28, and assumed temperature of 15°C.

It is noted that peak ammonia concentrations in mine waters are expected to decay faster compared to sulphate. This expectation relates to the presences of solid-phase sulphur stores at the mine site and the potential for sulphate mineral dissolution from saturated zones of the TSF and sulfide mineral oxidation from unsaturated mine waste. In contrast, the ammonia source within the mine site is finite, relating to mill operations (cyanide degradation) and explosive use during Operations. This ammonia will be subject to various attenuation mechanisms noted above which have not been considered in the model to date outside of the TSF pond during Operations.

Regarding fluoride and nitrite, both parameters are identified as POCs in Lorax (2022a) but occur at lower concentrations relative to their BC WQG (as compared to sulphate and ammonia) in Project contact waters and are considered lower priority within the context of the Brine Management Work Plan. For example, Post-Closure concentrations for both parameters were ≤2.2× their 80% BC WQG in all contact waters evaluated, except for fluoride in UWS SCP, which had a maximum predicted concentration that exceeded the corresponding 80% BC short-term WQG by a factor of 6.3 (Lorax 2022a). The relative F contribution from UWS SCP to the Project area is low compared to other Project sources (*e.g.,* pit walls). The water quality model currently assumes that the Membrane WTP does not treat F; as such, there is virtually no difference in predicted Post-Closure F concentrations at receiving environment station WQ28 with and without Membrane Treatment (Figure 2-3; Lorax 2022c). Once the WTP is operating, a degree of F treatment can be expected.

For comparison, Post-Closure nitrite concentrations at WQ28 are somewhat higher in the model scenario without Membrane Treatment compared to the Base Case that includes Membrane Treatment (Figure 2-4; Lorax 2022c) although predicted concentrations in both scenarios remain well below the BC long-term WQG. Nitrite is an intermediate nitrogen species in the nitrification pathway for ammonia and is expected to readily attenuate within mine site flow paths. Based on the above considerations, nitrite and fluoride will continue to be evaluated as part of model output but are not considered priority parameters that will drive the Brine Management Work Plan (Lorax 2022b).

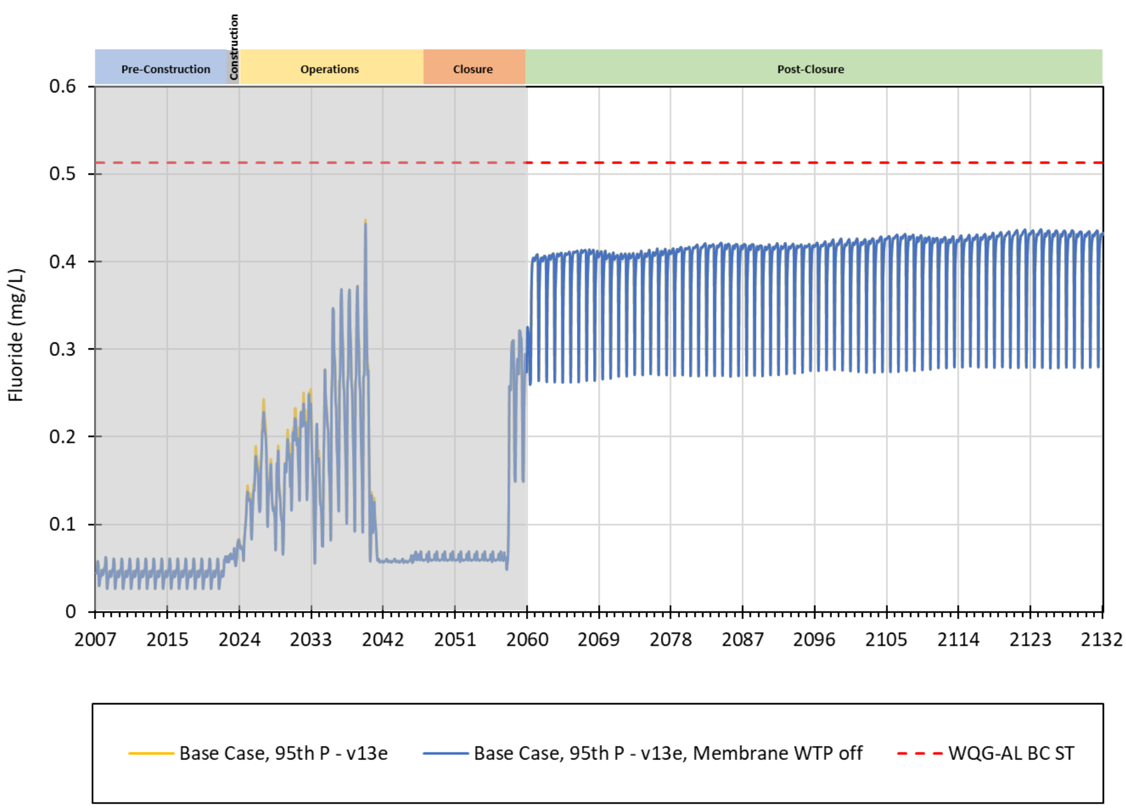


Figure 2-3: Fluoride (F) predictions at WQ28 for the Post-Closure phase (non-shaded area) for water quality model Base and Untreated Effluent cases ("Membrane WTP off"; Lorax 2022c). Values reflect the 95th percentile concentrations for the v13e Variable Climate Case, Base Case source term model. British Columbia short-term water quality guideline for aquatic life (WQG-AL BC ST) calculated using the lowest monthly median baseline concentration for WQ28 hardness.

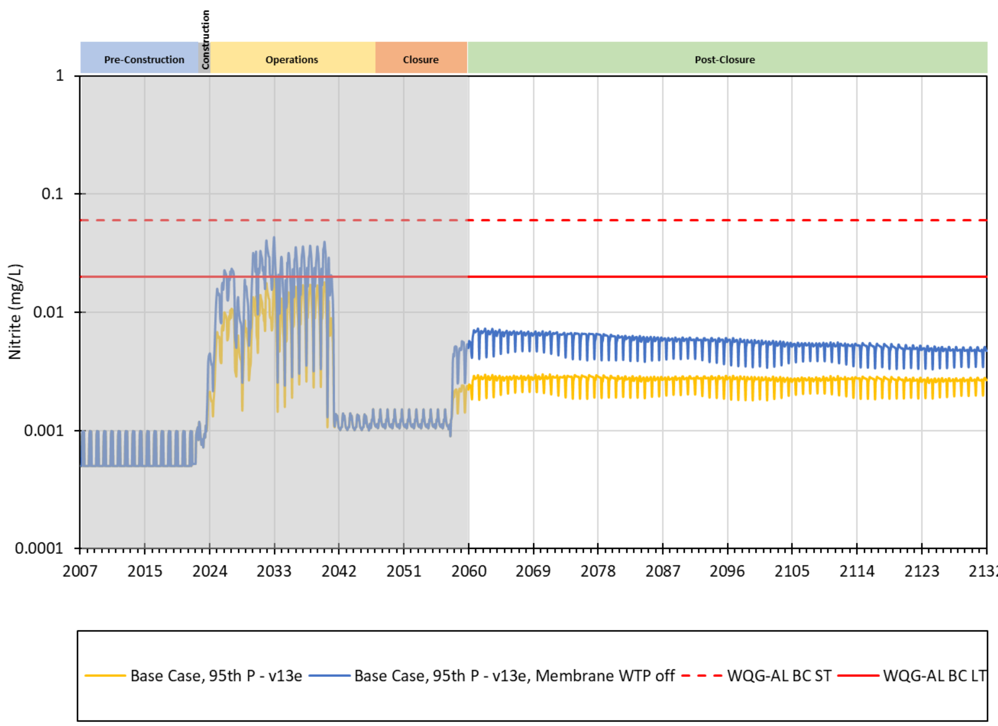


Figure 2-4: Nitrite (as nitrogen) predictions at WQ28 for the Post-Closure phase (non-shaded area) for water quality model Base and Untreated Effluent cases ("Membrane WTP off"; Lorax 2022c). Values reflect the 95th percentile concentrations for the v13e Variable Climate Case, Base Case source term model. British Columbia short-term water quality guideline for aquatic life (WQG-AL BC ST) calculated using the lowest monthly median baseline concentration for WQ28 hardness.

As a general note, POCs were identified based on BC WQGs calculated using baseline hardness concentrations rather than corresponding predicted hardness concentrations, which will be higher than baseline values (Lorax 2022a). This approach was used based on discussions between BW Gold and BC Ministry of Environment (ENV) prior to the submission of the Joint *Mines Act/Environmental Management Act* Permits Application. In those discussions, ENV conveyed that baseline hardness values should be considered for guideline calculations. It is emphasized that the use of baseline hardness values to screen water quality model predictions introduces a high degree of conservatism to the POC screening process. It is recommended that evaluation of water management options as part of the Brine Management Work Plan consider BC WQGs calculated using corresponding predicted hardness as a more accurate approach to evaluating acceptable water management options.

3. Conclusion

Overall, it is recommended that sulphate and ammonia be the prioritized as parameters of interest considered in the Brine Management Work Plan evaluations. Membrane treatment is identified as the preferred treatment method for both parameters in the Project Post-Closure phase. Peak ammonia concentrations are anticipated to take a shorter time to decay in mine waters compared to sulphate, potentially resulting in lower long-term environmental risk associated with this parameter. As priority parameters of interest identified for the Brine Management Work Plan, sulphate and ammonia should be evaluated for mitigation and management options that ultimately minimize the Project need for Membrane Treatment following mine closure.

4. Closure

This memorandum was prepared by Lorax for the sole use of BW Gold Ltd. in response to Task 4 of the Brine Management Work Plan (Lorax 2022b).

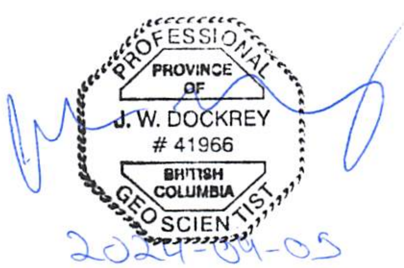
Sincerely,

Lorax Environmental Services Ltd.

Prepared by:

Meghan Goertzen, M.Sc., R.P.Bio.
Senior Toxicologist

Reviewed by:



John Dockery, M.Sc., P.Geo.
Senior Geoscientist

Engineers and Geoscientists British Columbia Permit to Practice Number: 1001840.

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Lorax Environmental Services Ltd. (Lorax), 2022c. Technical Memorandum: Response to Round 4 Review Comment 102. Prepared for BW Gold Ltd. Oct. 21, 2022.

Lorax Environmental Services Ltd. (Lorax), 2022d. Technical Memorandum: Water Balance/Water Quality Model Update. Prepared for BW Gold Ltd. June 29, 2022.

Appendix E: Treatment Efficiency Investigations

BQE Water

MEMORANDUM

TO:	Alastair Tiver (BW Gold Ltd.)
FROM:	Veneil Sundar, P.Eng. (BQE Water)
DATE:	September 03, 2024
SUBJECT:	**411c Workplan 6c: Evaluate Treatment Optimizations of High TDS Influent at BW Gold's Blackwater Project**

This memo was prepared in support of the brine management workplan 411c. Lorax drafted a technical memorandum (Lorax A, 2022) that provides detailed background on the workplan and a summary table of near-term and long-term evaluations.

1. Objectives

The overall objective of this work was to develop cost estimates for the preferred treatment options identified in 6a (Appendix A) and 6b (Appendix B) scopes of work. The specific objectives were to:

- Develop a list of viable treatment options for each phase of operation based on lab testing results from 6a and 6b scopes of work.
- Summarize capital cost, operating cost, sulphate removal, brine generation, and solid generation for each option.
- Determine the preferred treatment option for each phase of operation based on cost, performance, waste generation, and treatment risks.

2. Determination of Options

The base case membrane treatment process does not include gypsum removal as a solid byproduct, therefore overall sulphate removal can be considered as 0%; any precipitated gypsum solids are free to redissolve because they are deposited into the tailings storage facility during operations and into Pit Lake during post-closure. In the 6c scope of work, considered options are built up from the base case treatment process with add-on unit operations that increase overall sulphate removal. Lab programs covered in 6a and 6b scopes of work tested a variety of add-on unit operations including:

1. Gypsum removal applied to the base case membrane treatment process.
2. Additional stages of reverse osmosis with gypsum removal.
3. Sulf-IXC™ applied to final membrane retentate.
4. Barium carbonate applied to final membrane retentate.

A brief description of each add-on unit operation is provided below:

Gypsum Removal Applied to Base Case Membrane Treatment Process
Membrane retentate generated by the base case treatment process undergoes gypsum desaturation and dewatering to remove a portion of sulphate balanced by calcium. This stage of operation contains two sub-stages operating at 50% water recovery each to achieve an overall water recovery of 75%. Desaturation is nominally operated at neutral pH but can be operated at high pH to remove sulphate balanced by magnesium. Operating desaturation at high pH is not ideal because it significantly increases reagent costs and the portion of sulphate balanced by magnesium is small.

One Additional Stage of Reverse Osmosis with Gypsum Removal
Desaturated membrane retentate undergoes one additional stage of reverse osmosis treatment with gypsum desaturation and dewatering to remove majority of sulphate balanced by calcium. The additional stage of operation contains two sub-stages operating at 50% water recovery each to achieve an overall water recovery of 94%. As discussed previously, sulphate balanced by magnesium can also be removed by operating desaturation at high pH.

Sulf-IXC™ Applied to Final Membrane Retentate
Final gypsum desaturated retentate is dosed with carbon dioxide to lower the pH and passed through ion exchange columns to remove a portion of sulphate balanced by sodium. Sulphate removed by Sulf-IXC™ is converted to a gypsum solid byproduct.

Barium Carbonate Applied to Final Membrane Retentate
Final gypsum desaturated retentate is dosed with barium carbonate and agitated for an extended period to remove a portion of sulphate balanced by sodium. Sulphate removed by barium carbonate is converted to a barite (barium sulphate) solid byproduct.

2.1 Operations Phase

The operations phase base-case treatment process is depicted in Figure 2-1.

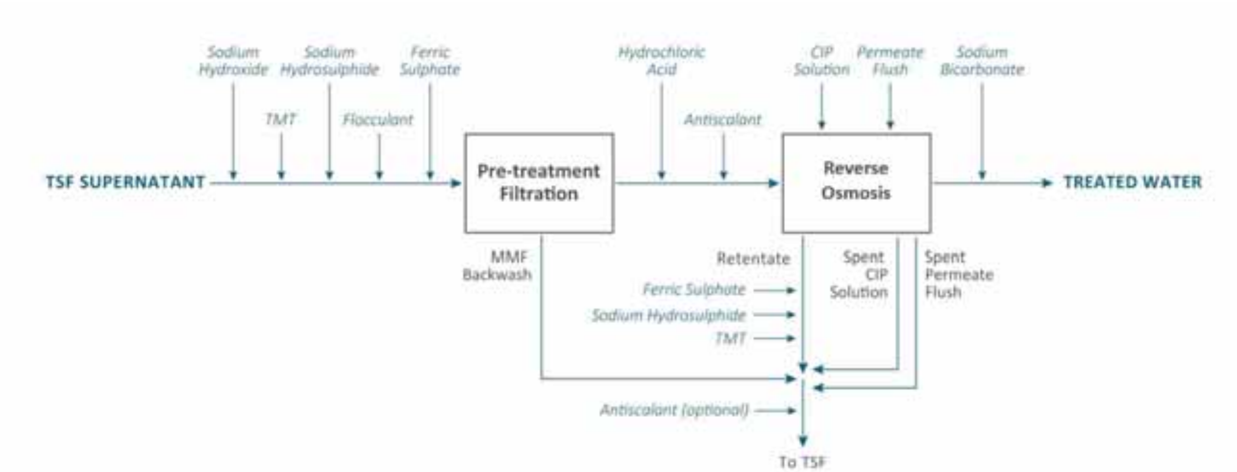


Figure 2-1: Operations Phase Membrane WTP

Both desaturation and dewatering equipment need to be added to the base case treatment process to achieve gypsum removal. Table 2-1 summarizes all the options considered for the operations phase treatment system.

Table 2-1: Operations Phase Treatment System Options

Option	Primary Treatment Process (Removal of SO4 Balanced by Ca)	Final Retentate Treatment Process (Removal of SO4 Balanced by Na)
1 - base	1-stage RO	None
2	1-stage RO w/ gypsum removal	None
3	2-stage RO w/ gypsum removal	None
4	1-stage RO w/ gypsum removal	Sulf-IXC™
5	2-stage RO w/ gypsum removal	Sulf-IXC™
6	1-stage RO w/ gypsum removal	Barium Carbonate
7	2-stage RO w/ gypsum removal	Barium Carbonate

2.2 Post-Closure Phase

The post-closure phase base-case treatment process is depicted in Figure 2-2.

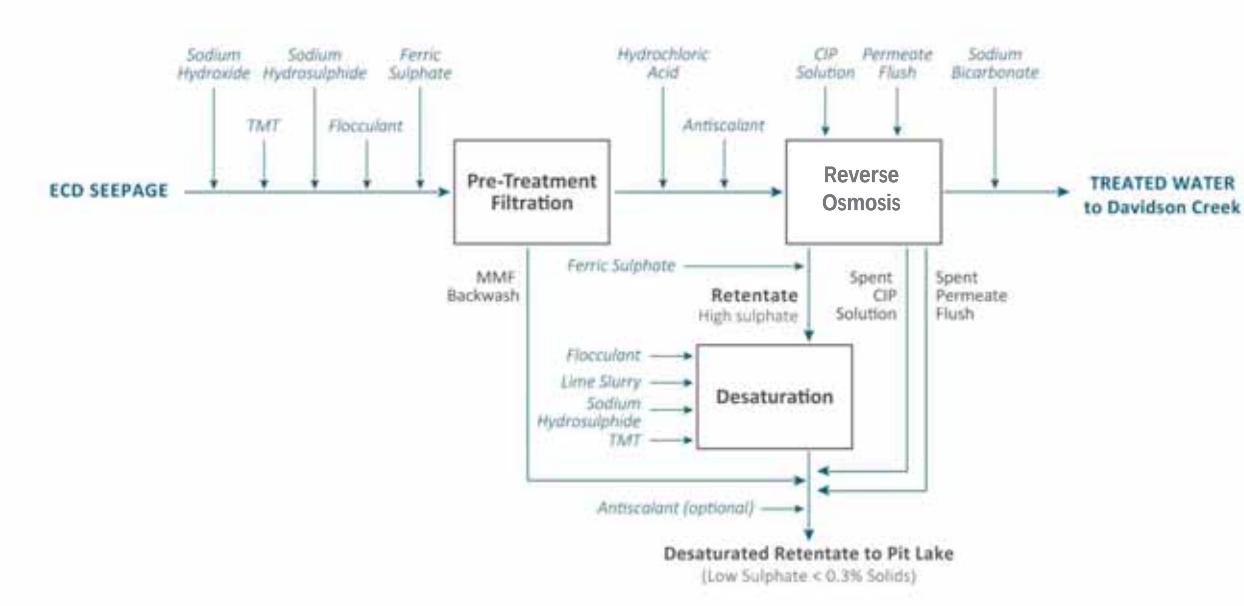


Figure 2-2: Post-Closure Phase Membrane Water Treatment Plant (WTP)

Only dewatering equipment needs to be added to the base case treatment process to achieve gypsum removal. Table 2-2 summarizes all the options considered for the post-closure phase treatment system.

Table 2-2: Post-Closure Phase Treatment System Options

Option	Primary Treatment Process (Removal of SO4 Balanced by Ca)	Final Retentate Treatment Process (Removal of SO4 Balanced by Na)
1 - base	1-stage RO	None
2	1-stage RO w/ gypsum removal	None
3	2-stage RO w/ gypsum removal	None
4	1-stage RO w/ gypsum removal	Sulf-IXC™
5	2-stage RO w/ gypsum removal	Sulf-IXC™
6	1-stage RO w/ gypsum removal	Barium Carbonate

Option	Primary Treatment Process (Removal of SO4 Balanced by Ca)	Final Retentate Treatment Process (Removal of SO4 Balanced by Na)
7	2-stage RO w/ gypsum removal	Barium Carbonate

3. Summary of Methodology

3.1 Capital Cost Estimate

Preliminary factored capital cost estimates (Class 5) were prepared using the following methodology:

- Process equipment cost was estimated using a cost database developed for water treatment equipment by BQE based on previous projects. Importantly, the database includes recent quotations for most equipment used at Blackwater including the reverse osmosis unit.
- Installed costs for process equipment are estimated using installation factors. These factors represent the ratio of total installed equipment cost to the original equipment purchase price and vary depending on the type of equipment and extent of modularization. The installation factors include the equipment, on-site construction materials and labour including mechanical, piping, electrical, and construction management. The factors have been derived from previous installed plants and projects with detailed estimates prepared in conjunction with construction contractors. The installation factors are 1.9 for highly modular equipment and 3.0 for loose shipped equipment.
- Equipment shipping cost was estimated at 6% of the equipment purchase price based on data from past BQE projects.
- The cost of the WTP building and civil construction was based on a recent BC-based WTP project where quotations were obtained for a tensioned fabric building including erection costs and a civil construction estimate prepared by a construction contractor. Cost per unit building area ($925/m^2) was derived from the recent project and then applied to the Blackwater WTP area.
- Engineering, procurement, project management services are estimated by using the total cost of a detailed estimate recently prepared for a similar facility in the Yukon.
- A 30% contingency was applied to the cost estimate to account for the preliminary nature of the estimate.

3.2 Operating Cost and Byproduct Generation Estimate

Preliminary operating cost and byproduct generation estimates were prepared based on the following assumptions:

- Operations phase
  - P95 membrane WTP influent operations (v13e, two cell pit lake) (Lorax B, 2023)
  - 214 operating days per year
  - Plant availability of 90%
  - MMF media replacement every 5 years
  - Cartridge filter replacement daily
  - Membrane element replacement every 3 years
  - Reagent consumption rates based:
    - Plant feed rate of 72 L/s

    - Stage 1 retentate rate of 18 L/s
    - Stage 2 retentate rate of 4.5 L/s
    - Desaturation operation at neutral pH
- Post-closure phase
  - P95 membrane WTP influent post-closure (v13e, two cell pit lake) (Lorax B, 2023)
  - 365 operating days per year
  - Plant availability of 98.5%
  - MMF media replacement every 5 years
  - Cartridge filter replacement daily
  - Membrane element replacement every 3 years
  - Reagent consumption rates based:
    - Plant feed rate of 190 L/s
    - Stage 1 retentate rate of 47.5 L/s
    - Stage 2 retentate rate of 11.875 L/s
    - Desaturation operation at neutral pH

The following items are not included in the operating cost estimate:

- Reagent shipping
- Building HVAC
- Transportation and storage of precipitated sulphate solids
- Operating labor

Reagent unit costs used for developing operating cost estimates are summarized in Table 3-1.

Table 3-1: Summary of Reagent Unit Costs

Reagent	Strength	Units	Unit Cost
Flocculant	100%	$CAD/tonne	$6,000
Ferric Chloride	100%	$CAD/tonne	$1,350
Sodium Hydrosulphide	40%	$CAD/tonne	$3,500
Organosulphide (TMT)	15%	$CAD/tonne	$5,250
Sodium Hydroxide	100%	$CAD/tonne	$900
Hydrated Lime	90%	$CAD/tonne	$380
Sodium Bicarbonate	100%	$CAD/tonne	$1,400
Antiscalant	40%	$CAD/tonne	$6,000
CIP* – Acidic	35%	$CAD/tonne	$600
CIP – Alkali	2%	$CAD/tonne	$9,800
Carbon Dioxide	99.5%	$CAD/tonne	$400
Barium Carbonate	100%	$CAD/tonne	$1,500
MMF Media	100%	$CAD/tonne	$600
Cartridge Filter Element	-	$CAD/element	$350
RO Membrane Element	-	$CAD/element	$750

*CIP = clean-in-place chemical for membrane cleaning

4. Results and Discussions

The operating timeframe is decades long for both the operations phase and post-closure phase; therefore, a greater emphasis is placed on operating costs instead of capital cost when comparing options. Regarding sulphate removal, the recommended treatment process should be able to remove sulphate balanced by calcium, magnesium, and sodium. For the post-closure phase, water recovery should be maximized to extend pit lake storage life.

4.1 Operations Phase

Table 4-1 contains summarized costs and byproduct generation estimates for each treatment option considered for the operation phase treatment process.

Table 4-1: Operations Phase Sulphate Removal Treatment Options Comparison

Option	Description	CX $M CAD	OX $M CAD	SO4 Removed %	Brine m3/year	Gypsum dmt/year	Barite dmt/year
1-base	1 Stage RO	$8.0	$0.82	0%	300000	0	0
2	1 Stage RO + Gypsum Removal	$11.5	$0.88	24%	300000	1700	-
3	2 Stage RO + Gypsum Removal	$13.8	$1.12	34%	75000	2300	-
4	1 Stage RO + Gypsum Removal + Sulf-IXC™	$17.8	$1.18	37%	300000	2500	-
5	2 Stage RO + Gypsum Removal + Sulf-IXC™	$19.1	$1.22	44%	75000	3000	-
6	1 Stage RO + Gypsum Removal + $BaCO_3$	$15.0	$2.22	47%	300000	1700	2100
7	2 Stage RO + Gypsum Removal + $BaCO_3$	$15.8	$2.12	54%	75000	2300	1900

4.2 Post-Closure Phase

Table 4-2 contains summarized costs and byproduct generation estimates for each treatment option considered for the post-closure phase treatment process.

Table 4-2: Post-Closure Phase Sulphate Removal Treatment Options Comparison

Option	Description	CX $M CAD	OX $M CAD	SO4 Removed %	Brine m3/year	Gypsum dmt/year	Barite dmt/year
1-base	1 Stage RO	$24.2	$3.58	0%	1469000	0	0
2	1 Stage RO + Gypsum Removal	$25.7	$3.60	8%	1469000	700	-
3	2 Stage RO + Gypsum Removal	$32.4	$4.29	41%	368000	3700	-
4	1 Stage RO + Gypsum Removal + Sulf-IXC™	$35.0	$4.38	23%	1469000	2100	-
5	2 Stage RO + Gypsum Removal + Sulf-IXC™	$38.7	$4.51	50%	368000	4500	-
6	1 Stage RO + Gypsum Removal + $BaCO_3$	$31.0	$7.08	36%	1469000	700	3500
7	2 Stage RO + Gypsum Removal + $BaCO_3$	$35.4	$6.90	59%	368000	3700	2300

4.3 Treatment Process Selection & Discussion of Risks

The preferred treatment process for both phases is option 5: 2 Stage RO + Gypsum Removal + Sulf-IXC™. This option is recommended for the following reasons:

- 2 Stage RO provides maximum water recovery of 94%, which extends pit lake storage life and reduces the size of the downstream treatment process (Sulf-IXC™).
- 2 Stage RO provides maximum gypsum removal (34-41% of total sulphate).
- Sulf-IXC™ removes a portion of sulphate balanced by sodium (9-10% of total sulphate).

- Sulf-IXC™ operating cost is 30-40% lower than barium carbonate.

The risks and mitigation measures associated with multistage reverse osmosis and Sulf-IXC™ are discussed in the following sub-sections.

4.3.1 Multistage Reverse Osmosis Risks & Mitigation Measures

As with any reverse osmosis system, the primary risk is membrane fouling. The immediate effect of membrane fouling is an increase in pumping power required to maintain permeate production rates; it can also lead to an increase in salt passage and eventual decline in permeate water quality. During normal operation, membrane elements are expected to foul as they are exposed to suspended or sparingly soluble materials contained in the feedwater. It is important to identify the different types of foulants as early as possible to ensure the optimal chemical formulation is selected for antiscalant dosing and cleaning regimes; specialty laboratories can perform membrane autopsies and cleaning studies to identify foulants and optimize cleaning procedures. Based on the feedwater quality at Blackwater, the expected foulants are calcite and gypsum.

Manufacturers of membrane elements publish technical manuals that provide guidance on cleaning procedures for reverse osmosis systems (Hydranautics, 2020) (Dupont, 2022). Recommended cleaning solution volumes and reagent strengths for heavy fouling were applied for RO system design to develop conservative estimates for cleaning time and operating cost. Each reverse osmosis system is composed of one or multiple RO modules and each RO module is cleaned individually. Table 4-3 summarizes the cleaning schedule, cost, and required downtime for 1 stage and 2 stage RO in a typical month.

Table 4-3: Membrane Cleaning Schedule Based on Operating Phase and # of RO Stages

Operating Phase	# RO Stages	CIP Cost	Required Downtime	Stage RO Module	Days of the Month																														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Operations	1	$0.07/m3	4%	Stage 1 A	C							P							C							P									
Operations	2	$0.08/m3	9%	Stage 1 A	C							P							C							P									
				Stage 2 A		C							P							C							P								
Post-Closure	1	$0.06/m3	0%	Stage 1 A	C							P							C							P									
				Stage 1 B		C							P							C							P								
				Stage 1 C			C							P							C							P							
				Stage 1 D				C							P							C							P						
Post-Closure	2	$0.08/m3	0%	Stage 1 A	C							P							C							P									
				Stage 1 B		C							P							C							P								
				Stage 1 C			C							P							C							P							
				Stage 1 D				C							P							C							P						
				Stage 2 A					C							P							C							P					
				Stage 2 B						C							P							C							P				

C: 8 hour clean-in-place (CIP) cycle with acid, alkali, and permeate solutions
P: 8 hour clean-in-place (CIP) cycle with permeate solution only

The operations phase RO system does not contain any standby RO modules and therefore must incur downtime to complete clean-in-place cycles. This arrangement is acceptable because high availability is not required during the operations phase of the project. The RO system is designed to operate only 7 months of the year at 90% availability. An additional 5 months of operation is available in case extra time is needed for membrane cleaning or more water needs to be discharged from site.

The post-closure RO system contains one standby RO module for each stage so that full production can be maintained while a single RO module remains offline for cleaning – for this reason, the required cleaning downtime during post-closure is specified as 0%. The RO system is designed to operate year-round at 98.5% availability which necessitates the need for standby RO modules.

Clean-in-place unit costs presented in Table 4-3 show the variation in cleaning cost as RO stages and standby RO modules are added to the design. The number of membrane elements in the second RO stage is a fraction of the membrane elements in the first RO stage – this means that the extra cleaning solution volume required to clean 2 stage RO is only marginally higher than the cleaning solution volume required to clean 1 stage RO. The proposed schedule serves as a starting point for operation; in reality, the schedule may be adjusted based on real-time operating data. Ultimately, cleaning is recommended before any of the following operating conditions are realized:

- Normalized permeate flow decreases by more than 10%
- Normalized permeate quality decreases by more than 10%
- Normalized pressure drop increase is greater than 15%

4.3.2 Sulf-IXC™ Risks & Mitigation Measures

Sulf-IX™ is an industrially proven technology that removes gypsum from feedwater using ion exchange resins. Sulf-IXC™ is a variation of Sulf-IX™ that incorporates carbon dioxide injection to remove sodium sulphate in addition to gypsum. Carbon dioxide injection for sodium sulphate removal has not been proven on an industrial scale and remains as one of the primary risks with the proposed alternative treatment option. The main limitation of the technology is that sodium sulphate removal is limited by carbon dioxide solubility, and carbon dioxide solubility varies with temperature – higher solubility is observed at lower temperatures. At full scale, the degree of sodium sulphate removal achieved will depend on the average water temperature in the tailings storage facility and pit lake. BQE has tested Sulf-IXC™ on room temperature water at bench scale and achieved positive results with the treatment process (9-10% removal of total sulphate). Water temperatures will be cooler at site and a marginal improvement in performance is expected.

One challenge of operating Sulf-IX™ plants is the solution balancing that is required to (1) compensate for the fact that the anion circuit is undersized compared to the cation circuit, (2) maintain neutral pH in the effluent discharge and, (3) avoid tank overflows. In the version of Sulf-IXC™ proposed for Blackwater, the cation circuit is eliminated because the portion of gypsum in the feedwater is small compared to sodium sulphate; majority of gypsum has already been removed upstream by multistage RO and gypsum desaturation circuits. The deletion of the cation circuit reduces cost and simplifies the operability of the plant.

For ion exchange systems it is important to differentiate between initial breakthrough and full breakthrough; initial breakthrough occurs when sulphate first starts to leak through the ion exchange column into the effluent stream (resin partially saturated), whereas full breakthrough occurs when the effluent sulphate concentration equals the feed sulphate concentration (resin fully saturated). Initial breakthrough is often applied when low discharge limits are needed for direct discharge to environment – this can lead to a relatively high regeneration frequency which increases reagent consumption and operating costs. Alternatively, full breakthrough is applied when the primary objective is mass load removal and low discharge limits do not need to be maintained for environmental discharge. At

Blackwater, full breakthrough can be applied to reduce operating costs since retentate is returned to the tailings storage facility and pit lake – the focus is mass load removal of sulphate.

4.3.3 Long-term Storage of Gypsum Solids

Gypsum solids generated by the treatment system need to be placed in a long-term storage facility to ensure sulphate is not re-released into the water storage facilities at site. These solids can be characterized as non-toxic and may have beneficial uses beyond long-term storage. The provided solids generation estimates are based on 95th percentile water qualities, therefore, it is expected that actual solids generation rates realized at site are lower than estimated values. Table 4-4 provides mass and volume estimates based on 50% moisture content.

Table 4-4: Gypsum Solid Generation Estimates, 50% Moisture w/w

Operation Phase	Treatment Process	Gypsum Tonne/year	Gypsum m^3/year
Operations	2 Stage RO + Gypsum Removal + Sulf-IXC™	6,000	4,300
Post-Closure	2 Stage RO + Gypsum Removal + Sulf-IXC™	9,000	6,400

These estimates are provided to BW Gold to assist with their investigation into possible long-term storage locations and methods.

5. Conclusions

The main conclusions that stem from the 411c Workplan 6c work are:

1. Gypsum desaturation can be run at high pH to remove sulphate balanced by magnesium.
2. For the operations phase, both desaturation and dewatering need to be added to the base case treatment process to achieve gypsum removal.
3. For the post-closure phase, only dewatering needs to be added to the base case treatment process to achieve gypsum removal.
4. The preferred treatment process for both phases is 2 Stage RO + Gypsum Removal + Sulf-IXC™ for the following reasons:
    a. 2 Stage RO provides maximum water recovery of 94%, which extends pit lake storage life and reduces the size of the downstream treatment process (Sulf-IXC™).
    b. 2 Stage RO provides maximum gypsum removal (34-41% of total sulphate).
    c. Sulf-IXC™ removes a portion of sulphate balanced by sodium (9-10% of total sulphate).
    d. Sulf-IXC™ operating cost is 30-40% lower than barium carbonate; Sulf-IXC™ can be utilized to full breakthrough of the IX resins to maximize efficiency and save on operating costs.
5. The primary risk associated with multistage RO is membrane fouling, particularly fouling caused by calcite and gypsum.
    a. High importance must be placed on identifying foulants early in the project – early engagement with specialty laboratories is needed to identify foulants and optimize cleaning regimes.

   b. Membrane CIP system is designed conservatively assuming heavy fouling and weekly cleaning cycles.
   c. Standby RO modules have been included where high availability is required (post-closure) to ensure that full production rates can be maintained while running cleaning cycles.
   d. Membrane cleaning unit cost is proportional to the total number of membrane elements in the system.
6. The primary risk associated with Sulf-IXC™ is lack of industrial scale operating experience with carbon dioxide injection for sodium sulphate removal.
   a. Bench scale test work has been completed on room temperature water that shows that the technology works – improved performance is expected at lower water temperatures as carbon dioxide solubility increases.
   b. The proposed Sulf-IXC™ process is simplified by eliminating the cation circuit.
7. Gypsum solids must be placed in a long-term storage facility to ensure sulphate is not re-released into water storage facilities on site.
   a. Gypsum solids generation rates are 4,300 m3/year for the operations phase and 6,400 m3/year for the post-closure phase.

6. Recommendations

BQE recommends the integration of option 5 (2 Stage RO + Gypsum Removal + Sulf-IXC™) into the water quality and water balance model to determine the long-term impact on sulphate inventory at Blackwater. The integration can be executed stepwise where the impact of 1 Stage RO + Gypsum Removal is determined first before applying a second stage of RO + Gypsum Removal and Sulf-IXC™:

1. 1 Stage RO + Gypsum Removal
2. 2 Stage RO + Gypsum Removal
3. 2 Stage RO + Gypsum Removal + Sulf-IXC

The design of water treatment is based on water quality predictions which are based on assumptions. One of these is the performance of the cyanide destruction process which will greatly affect the TSF water quality in the short term and long term. Furthermore, the chemistry of the process leach solution during actual operation is likely to vary depending on the ore, and the cyanide destruction process must be able to respond to these changes. Understanding this and having expertise in CN destruction, BQE recommends the following action items to ensure that contaminants contained in process water and TSF are managed and controlled successfully as planned:

1. Review design of the cyanide destruction circuit from the controls and operational perspective to avoid process upsets that would impact TSF water quality.
2. Review specifications used for procurement of all CN destruction reagents to check for impurities unaccounted for in the water quality predictions.
3. Implement water quality monitoring program for the TSF and mill process water to provide early warning for any deviations or trends that would impact water treatment if/when implemented.
4. Periodically review the performance of the cyanide destruction system.

Bench scale testing program to determine the degree of sodium sulphate removal that can be achieved with the following currently proposed treatment technologies is recommended:

1. The Membrane WTP uses reverse osmosis (RO) membranes that achieves high rejection efficiency for all parameters. Alternatively, implementation of a nanofiltration (NF) membrane that achieves lower rejection efficiencies may be useful for bleeding sodium sulphate from site over time, and ultimately has the potential of reducing the total sodium sulphate inventory at Closure. The test program will evaluate methods of increasing sodium passage through the NF membrane and replacing sodium sulphate inventory with calcium sulphate which has a substantially lower solubility.
2. Bench testing of Sulf-IXC in near-term evaluation 6 demonstrated an ability to partially remove sodium sulphate as gypsum. Overall sodium sulphate removal depends on the solubility of CO_2 which is temperature and pressure dependent – CO_2 solubility is maximized at low temperature and high pressure. Bench testing to date was executed at room temperature and under atmospheric conditions. The test program will evaluate improvements in the ability to remove sodium sulphate by optimizing operating temperature and pressure.

7. References

Dupont. (2022). *Cleaning Procedures for FilmTec™ Elements.*

Hydranautics. (2020). *Foulants and Cleaning Procedures for composite polyamide RO/NF Membrane Elements (TSB107.27).*

Lorax A. (2022). *Response to Round 3 Comment 411(c).*

Lorax B. (2023). *Membrane WTP influent WQ for BQE_Jan2023.xlsx.*

8. Closure

We trust that the water treatment near term investigations satisfy the requirements of the closure and post-closure management plan. Should you have any questions regarding this document please do not hesitate to contact Veneil Sundar (vsundar@bqewater.com), at your convenience.

Signed,

X

Veneil Sundar

Manager, Process Engineering

Appendix A – 411c Workplan 6a: Laboratory Testing to Assess Potential Improvements to Membrane Water Treatment

BQE Water

MEMORANDUM

TO:	Alastair Tiver and Travis Desormeaux, Artemis Gold
FROM:	BQE Water
DATE:	July 14, 2023
SUBJECT:	**411c Workplan 6a: Laboratory Testing to Assess Potential Improvements to Membrane Water Treatment at BW Gold's Blackwater Project**

1. Objectives

The overall objective of this laboratory test work was to assess potential improvements to the brine management plan. The specific objectives were to:

- Evaluate ion exchange (IX) calcium-removal softening pretreatment to decrease gypsum scaling potential and increase RO treatment water recovery.
- Test and compare the performances of two different, commonly available RO membranes for water treatment.
- Assess and verify that RO-treated effluent (RO permeate) can meet British Columbia Water Quality Guidelines or Metals and Diamond Mining Effluent Regulations (BCWQG/MDMER) limits.

2. Summary of Methodology

2.1 Feed Water Chemistry

A synthetic solution was prepared to match the chemistry of the modeled P95 Membrane WTP Influent Operations (v13e, two cell lake), and it was sampled and analyzed to ensure that the solution chemistry closely matched the target concentrations for the main constituents before utilizing the synthetic solution for laboratory test work.

Table 2-1 compares the projected influent operations phase composition with the prepared synthetic water showing that the synthetic water was on target, particularly for the major ions with relatively high concentrations such as calcium, sodium, and sulphate, that would have the greatest impact on IX or RO operations and subsequent gypsum desaturation chemistry. Because the modeling performed to develop predicted WTP influent water chemistry did not include alkalinity as a parameter, alkalinity in the membrane WTP influent for the operations phase was calculated based on ion/charge balance, and the alkalinity in the synthetic water used in the laboratory testing was adjusted accordingly.

Table 2-1. Feed Water Chemistry

Constituent	Units	P95 Membrane WTP Influent, Operations Phase	BQE Synthetic Water
Ammonia (as N)	mg/L	14.9	15.7
Chloride	mg/L	2.1	7.0
Fluoride	mg/L	0.5	<1.0
Nitrate (as N)	mg/L	18.5	18.0
Nitrite (as N)	mg/L	0.1	0.1
Sulphate	mg/L	3,115	3,193
Calcium, dissolved	mg/L	473	473
Magnesium, dissolved	mg/L	16.2	8.2
Manganese, dissolved	mg/L	1.3	1.39
Potassium, dissolved	mg/L	55.8	60.5
Sodium, dissolved	mg/L	974	990
Zinc, dissolved	mg/L	2.6	1.8
Alkalinity, Total (as $CaCO_3$)	mg/L	223	198
pH	-	7.1-7.9	8.0

2.2 Reverse Osmosis (RO)

Two different types of RO membranes, sea water (SW) and brackish water (BW) membranes, were tested in the laboratory. The SW membrane used in the test work was model M-S2521A- 2.5”x 21” from Applied Membranes Inc., while the BW membrane tested was model BW30XFRL-4”x 40” from DuPont.

2.3 RO Brine Desaturation

After RO treatment, gypsum seed crystals were added to RO brine (retentate) samples to facilitate gypsum precipitation and desaturation. Samples from the RO brine desaturation were analyzed to evaluate the efficacy of using gypsum desaturation of the RO brine to remove sulphate as solid gypsum.

2.4 Ion Exchange (IX) Softening Evaluation

RO membrane facilities that treat waters with high calcium and sulphate concentrations are generally limited in water recovery by gypsum scaling on the membranes (i.e., the water recovery is limited by the extent of gypsum supersaturation in the RO brine, such that higher gypsum saturation in the WTP influent necessitates operating the RO system at lower water recovery to mitigate gypsum scaling of the membranes.) Because gypsum formation requires both calcium and sulphate, it is possible to lower the gypsum scaling tendency of the WTP influent by IX softening pretreatment to remove calcium to improve RO recovery.

For example, membrane modeling calculations show that the P95 RO WTP influent water (Table 2-1) could theoretically be operated at approximately 76% recovery without scaling the RO membranes with proper dosing of an antiscalant. If the influent calcium concentration were reduced from the modeled P95 value of 473 mg/L to 50 mg/L via IX softening, approximately 95% RO water recovery can be achieved. Therefore, one goal of the laboratory test work was to evaluate whether IX pretreatment softening would be a viable strategy to increase overall water recovery and improve brine management by decreasing the volume of RO brine.

3. Results and Discussions

3.1 Reverse Osmosis (RO)

The projected P95 feed water manganese concentration is 1.39 mg/L; at this concentration, manganese rather than gypsum scaling would become the limiting factor for RO recovery given the feed water chemistry shown in Table 2-1. Therefore, it was assumed that the RO water treatment process would implement a Mn removal pre-treatment step, and the Mn concentration for the RO treatment feed water was reduced to <1 mg/L for the RO laboratory testing.

3.1.1 SW element

Table 3-1 presents the composition of RO feed water and permeate concentrations for the main constituents. The table also compares the permeate quality against the BCWQG/MDMER limits. As evident from the results, the SW membrane successfully produced a permeate stream with concentrations below the discharge limits stated in the BCWQG/MDMER for all constituents.

Table 3-1: SW RO Treatment Performance at 76% Water Recovery

Constituent	Units	RO Feed	Permeate	BCWQG/ MDMER
Chloride	mg/L	5.22	<0.10	150
Fluoride	mg/L	<1.00	<0.10	0.51
Sulphate	mg/L	2,460	4.8	128
Nitrate (as N)	mg/L	13.5	0.5	3.0
Nitrite (as N)	mg/L	<0.100	<0.010	0.02
Ammonia (as N)	mg/L	13.8	0.84	1.53/0.50*
Calcium, dissolved	mg/L	394	0.7	-
Magnesium, dissolved	mg/L	6.54	0.01	-

Constituent	Units	RO Feed	Permeate	BCWQG/ MDMER
Manganese, dissolved	mg/L	0.51	0.01	0.662
Potassium, dissolved	mg/L	51.7	0.2	-
Sodium, dissolved	mg/L	812	5.1	-
Alkalinity, Total (as $CaCO_3$)	mg/L	186	8	-
pH	-	7.74	8.8	-

*As unionized ammonia

3.1.2 BW element

Table 3-2 presents the composition of feed water and permeate for the main constituents and compare the permeate quality with BCWQG/MDMER limits. The permeate stream from BW membrane treatment meets the discharge limits stated in the BCWQG/ MDMER for all constituents.

Table 3-2: BW RO Treatment Performance at 73% Water Recovery

Constituent	Units	RO Feed	Permeate	BCWQG/ MDMER
Chloride	mg/L	5.96	0.33	150
Fluoride	mg/L	<1.00	<0.10	0.51
Sulphate	mg/L	2,700	1.8	128
Nitrate (as N)	mg/L	15.7	0.867	3.0
Nitrite (as N)	mg/L	<0.100	<0.010	0.02
Ammonia (as N)	mg/L	13.5	0.609	1.53/0.50*
Calcium, dissolved	mg/L	405	<0.20	-
Magnesium, dissolved	mg/L	7	<0.010	-
Manganese, dissolved	mg/L	0.45	0.005	0.662
Potassium, dissolved	mg/L	48.5	0.27	-
Sodium, dissolved	mg/L	803	5.12	-
Alkalinity, Total (as $CaCO_3$)	mg/L	184	7	-
pH	-	7.74	9.03	-

*As unionized ammonia

Both SW and BW membranes produced high quality permeate that meets BCWQG/ MDMER limits at the water recoveries tested. However, the BW membrane was able to achieve similar treated water quality as SW membrane at lower feed pressure, which translates into lower operational costs. Based on this analysis, it is recommended that BW rather than SW membranes be used for the full-scale RO WTP.

3.2 Gypsum Desaturation Treatment

Gypsum desaturation laboratory tests were performed using the BW RO membrane retentate. Figure 3-1 shows the decrease in solution conductivity over time during the gypsum desaturation process for the BW retentate. Conductivity can be monitored to track the process of gypsum desaturation because it correlates directly with ion concentrations in solution. As the supersaturated RO retentate precipitates gypsum and removes calcium and sulphate from solution, a corresponding decrease in conductivity is observed. After the solution conductivity stabilizes and no longer decreases, the gypsum desaturation process is deemed complete.

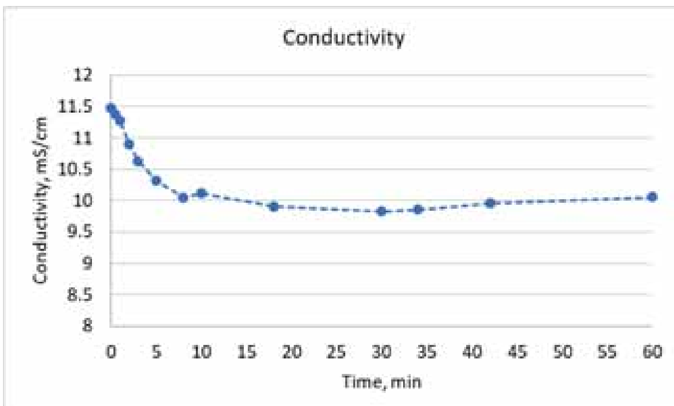


Figure 3-1: Monitoring Conductivity to Track Gypsum Desaturation of BW RO Retentate

Table 3-3 summarizes the gypsum desaturation results. Gypsum desaturation efficiency is related to calcium sulphate, as the sulphate associated with other major cations such as sodium and magnesium is soluble. Based on these considerations, approximately quantitative gypsum desaturation was achieved, i.e., ~100% sulphate associated with calcium at concentrations above gypsum saturation precipitated as gypsum and was removed from solution.

Table 3-3: BW RO Retentate Gypsum Desaturation Results

Parameter	Unit	Value
Feed Conductivity	mS/cm	11.5
Effluent Conductivity	mS/cm	10.1
Feed Sulphate	g/L	7.9
Effluent Sulphate	g/L	6.0
Gypsum Desaturation	%	~100

3.3 IX Softening

Based on BQE's experience, S108Na IX resin was selected for the softening laboratory tests because of its ability to be regenerated with sodium sulphate solution, which is a major constituent of the RO retentate stream; using the RO retentate as the regenerant could eliminate the added expenses of using fresh sodium sulphate regenerant in the process.

Table 3-4 presents the loading results of two IX loading cycles using the S108Na IX resin. L1 represents the calcium results from the first loads (before IX resin regeneration), and L2 represents the results after regeneration using a gypsum-saturated sodium sulphate solution that mimics RO retentate. L1 shows that the resin was able to remove 58% of Ca from the influent solution, reaching the breakthrough at 144 bed volumes (BVs). (Breakthrough is defined here by the effluent calcium concentration reaching the feed calcium concentration.) L2 exhibited a faster breakthrough at 96 BV, which shows the impact of regenerating with gypsum-saturated sodium sulphate solution: The calculated Ca removal efficiency decreased from 58% with L1 to 47% with L2.

Table 3-4: IX Loading Summary

Parameter	Unit	L1	L2
Breakthrough BV	BV	144	96
Ca Removal Efficiency	%	58	47

Table 3-5 shows the low regeneration efficiency of 24% when using gypsum-saturated sodium sulphate as the regenerant. This means that only 24% of the calcium that was captured during loading was removed in the regeneration process, which would mean that subsequent loading of the regenerated IX resin would remove less calcium.

Table 3-5: IX Regeneration Efficiency

Parameter	
Regeneration Efficiency	24%

Based on these results, conducting IX softening pretreatment with IX resin (S108Na) to increase RO water recovery is not recommended due to the short loading cycle and inefficient regenerations that would lead to higher operating costs and operational complexity.

Another reason to recommend against conducting IX softening pretreatment is that while it would increase the RO recovery, the RO brine generated from the process would contain a higher proportion of sulphate that is balanced by sodium rather than calcium. As discussed in Sections 2.3 and 3.2, sulphate that is balanced by calcium that is above gypsum saturation can be precipitated and removed from solution as gypsum via the desaturation process. Sodium-associated sulphate cannot be removed from solution as gypsum and would require other more expensive and complicated treatment processes. Therefore, while IX pretreatment to remove calcium would improve brine management by decreasing the volume of RO brine generated, the sulphate in the brine would be more difficult and expensive to remove and manage.

4. Conclusions

The main conclusions that stem from the 411c Workplan 6a laboratory test work are:

1. Both BW and SW RO membranes produced treated water that complies with BCWQG/MDMER discharge limits.
2. BW RO membrane is recommended for the full-scale WTP due to lower operating pressure and resulting lower operating costs compared to SW RO membranes while maintaining similar RO-treated water quality.
3. Desaturation of the BW RO brine stream achieved quantitative gypsum desaturation – i.e., sulphate that is associated with calcium that is above gypsum saturation limits precipitated as gypsum and was removed from solution from the desaturation process.
4. IX softening to remove calcium and achieve higher RO water recovery is not recommended due to the short loading cycle, high required regeneration frequency, and inefficiency of the regeneration using RO brine, which negatively impacts the overall economics of the water treatment process. Furthermore, IX softening would replace calcium with sodium, which leads to more sulphate that is balanced by sodium instead of calcium and would render sulphate management and removal for the RO brine more difficult.

Appendix B – 411c Workplan 6b: Laboratory Investigation of Sulphate Precipitation and Removal from RO Brine

BQE Water

MEMORANDUM

TO: Alastair Tiver and Travis Desormeaux, Artemis Gold

FROM: BQE Water

DATE: July 14, 2023

SUBJECT: **411c Workplan 6b: Laboratory Investigation of Sulphate Precipitation and Removal from RO Brine**

1. Objectives

The overall objective of this work was to evaluate methods to precipitate and remove sulphate from RO brine/retentate. The specific objectives were to:

- Evaluate gypsum desaturation from RO brine for one and two-stage RO processes.
- Evaluate Sulf-IXC ion exchange treatment of gypsum-desaturated RO brine to remove additional sulphate that cannot be removed via gypsum desaturation alone, especially sodium-associated sulphate.
- Evaluate barium carbonate treatment of gypsum-desaturated RO brine to remove additional sulphate that cannot be removed via gypsum desaturation alone, including sodium-associated sulphate.
- Provide proof-of-concept and laboratory data to support sulphate removal estimates and associated capital and operating cost estimates calculations for these treatment processes for 411c Workplan 6c work (Evaluate Treatment Optimizations for High TDS Influent).

2. Results and Discussions

2.1 Feed Water Chemistry

Table 2-1 compares the projected post-closure composition with the prepared synthetic water, which shows that the synthetic water was on target for all major ions such as calcium, sodium, and sulphate. Because the chemical modeling to predict P95 Membrane WTP Influent Post-Closure water chemistry did not include alkalinity as a parameter, BQE calculated the expected alkalinity based on ion/charge balance to prepare the synthetic water. It was assumed that the manganese concentration would be decreased by pre-treatment to below 1 mg/L to protect the membrane from manganese scaling, and the synthetic water was made with 0.7 mg/L Mn.

Table 2-1: Feed water Chemistry

Constituent	Units	P95 Membrane WTP Influent Post-Closure	BQE Synthetic Water
Ammonia (as N)	mg/L	4.31	4.57
Chloride	mg/L	2.96	5.99
Fluoride	mg/L	0.67	1.17
Nitrate (as N)	mg/L	1.05	1.48
Sulphate	mg/L	911	933
Calcium, dissolved	mg/L	185	205
Magnesium, dissolved	mg/L	8.80	7.15
Manganese, dissolved	mg/L	3.17	0.70
Potassium, dissolved	mg/L	56	60
Sodium, dissolved	mg/L	207	225
Zinc, dissolved	mg/L	2.6	2.1
Alkalinity, Total (as $CaCO_3$)	mg/L	-	130
pH	-	6.6-7.7	7.8

2.2 Base Case Treatment

The base case corresponds to Stage 1 RO membrane treatment followed by gypsum desaturation of the retentate stream (Figure 2-1). The RO treatment was conducted with brackish water (BW) membrane selected in the 6a phase work. The RO and desaturation procedures also followed the methodology described in the 6a write-up.

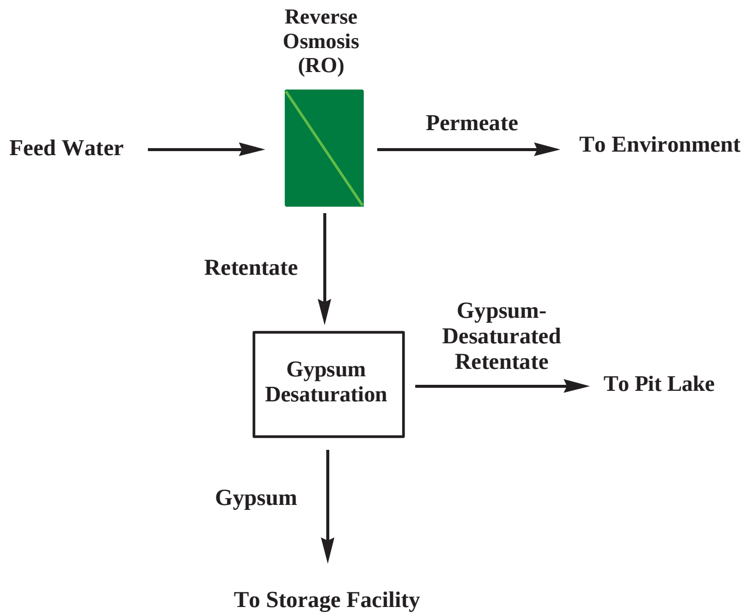


Figure 2-1. Simplified block flow diagram (BFD) for base case

Table 2-3 presents the compositions of the feed water, permeate, and retentate obtained in the Stage 1 RO. The table also compares the permeate quality against the BCWQG/MDMER discharge limits. As evident from the results, the Stage 1 RO successfully produced a permeate stream with concentrations below the BCWQG/MDMER discharge limits for all constituents.

Table 2-2: Stage 1 RO Treatment Performance at 87% Water Recovery

Constituent	Units	RO Feed	Permeate	Retentate	BCWQG/ MDMER
Chloride	mg/L	6.0	<0.10	45.4	150
Fluoride	mg/L	1.2	<0.10	8.3	0.51
Sulphate	mg/L	933	1	5,650	128
Nitrate (as N)	mg/L	1.5	0.083	10.8	3.0
Nitrite (as N)	mg/L	<0.100	<0.010	<0.100	0.02
Ammonia (as N)	mg/L	4.6	0.273	33.3	1.53/0.50*
Calcium, dissolved	mg/L	205	<0.2	1,576	-
Magnesium, dissolved	mg/L	7.2	<0.01	54.9	-
Manganese, dissolved	mg/L	0.7	0.00062	5.4	0.662
Potassium, dissolved	mg/L	60	0.53	460	-
Sodium, dissolved	mg/L	225	2.52	1,714	-

Constituent	Units	RO Feed	Permeate	Retentate	BCWQG/ MDMER
Alkalinity, Total (as $CaCO_3$)	mg/L	130	4.9	967	-
pH	-	7.82	7.76	7.92	-
Conductivity	µS/cm	1,842	17.2	8,230	-

*As unionized ammonia

Table 2-4 summarizes the conditions and result of the Stage 1 RO gypsum desaturation stage. The precipitation of gypsum in the desaturation process led to a decrease in conductivity from 9.97 to 6.72 mS/cm over 60 minutes. Sulphate removal in this process is due to gypsum precipitation, as the sulphate associated with other cations such as sodium and magnesium is soluble.

Table 2-3: Stage 1 RO Retentate Desaturation Results

Parameter	Unit	Value
Feed Conductivity	mS/cm	9.97
Initial Sulphate	mg/L	5,650
Effluent Conductivity	mS/cm	6.72
Effluent Sulphate	mg/L	3,980
Desaturation Efficiency	%	100

2.3 Secondary Treatment

The secondary treatment aimed to evaluate different options to increase the overall sulphate removal. The test work was conducted with synthetic desaturation effluent from Stage 1 RO.

2.3.1 Stage 2 Reverse Osmosis (RO)

Stage 2 RO involves membrane treatment (same element as stage 1) plus desaturation of the second stage RO retentate stream (Figure 2-2) to increase water recovery and sulphate removal compared to the base case.

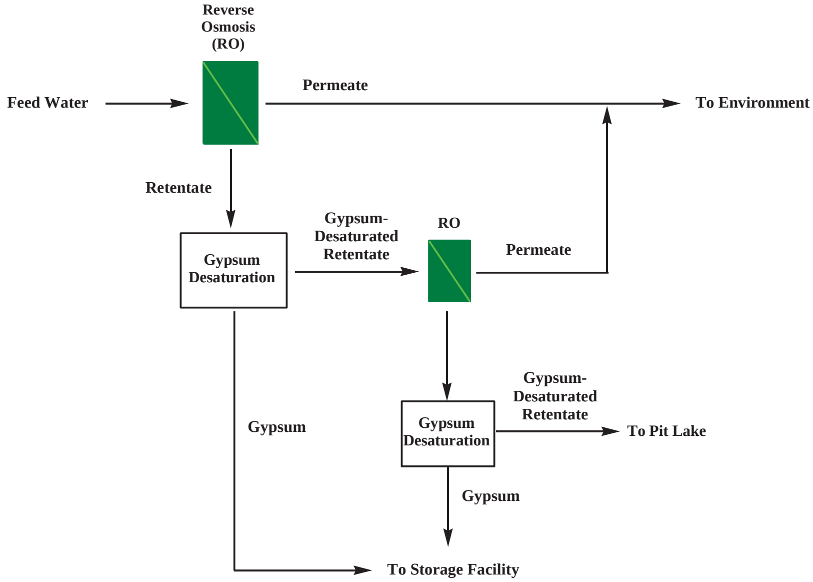


Figure 2-2. Simplified BFD depicting two-stage RO retentate gypsum desaturation treatment process

Table 2-6 presents the obtained composition of feed water, permeate, and retentate of the Stage 2 RO. The table also compares the permeate quality against the BCWQG/MDMER limits. As shown, the Stage 2 RO is able to produce a permeate stream with concentrations below the BCWQG/MDMER discharge limits.

Table 2-4: Stage2 RO Performance at 75% Water Recovery

Constituent	Units	RO Feed	Permeate	Retentate	BCWQG/MDMER
Chloride	mg/L	37	0.64	149	150
Fluoride	mg/L	<10.0	<0.10	40	0.51
Sulphate	mg/L	3,670	2.9	9,910	128
Nitrate (as N)	mg/L	7.4	0.696	28	3.0
Ammonia (as N)	mg/L	30	1.92	118	1.53/0.50*
Calcium, dissolved	mg/L	416	<0.20	1,692	-
Magnesium, dissolved	mg/L	13	<0.010	53	-
Manganese, dissolved	mg/L	0.7	0.00028	2.7	0.662
Potassium, dissolved	mg/L	407	2.63	1,648	-
Sodium, dissolved	mg/L	1150	8.93	4,653	-
Alkalinity, Total (as $CaCO_3$)	mg/L	455	23.8	1,779	-
pH	-	8.2	9.5	8.1	-

Constituent	Units	RO Feed	Permeate	Retentate	BCWQG/MDMER
Conductivity	µS/cm	6,900	60.46	16,080	-

*As unionized ammonia

Table 2-7 shows the Stage 2 RO desaturation conditions and results. Over the course of 60 minutes, the conductivity decreased from 16.16 to 14.39 mS/cm.

Table 2-5: Stage 2 RO Retentate Desaturation Results

	Unit	Value
Feed Conductivity	mS/cm	16.16
Initial Sulphate	mg/L	9,910
Effluent Conductivity	mS/cm	14.39
Effluent Sulphate	mg/L	8,120
Desaturation Efficiency	%	100

2.3.2 Sulf-IXC Treatment

Sulf-IXC treatment as secondary treatment to remove sulphate was examined in the laboratory testing; a single-stage RO process using Sulf-IXC treatment instead of a second stage RO to increase sulphate removal and water recovery is shown in Figure 2-3. Sulf-IXC was selected as a sulphate-removal process to test because it can remove sodium-associated sulphate that cannot be removed via gypsum precipitation.

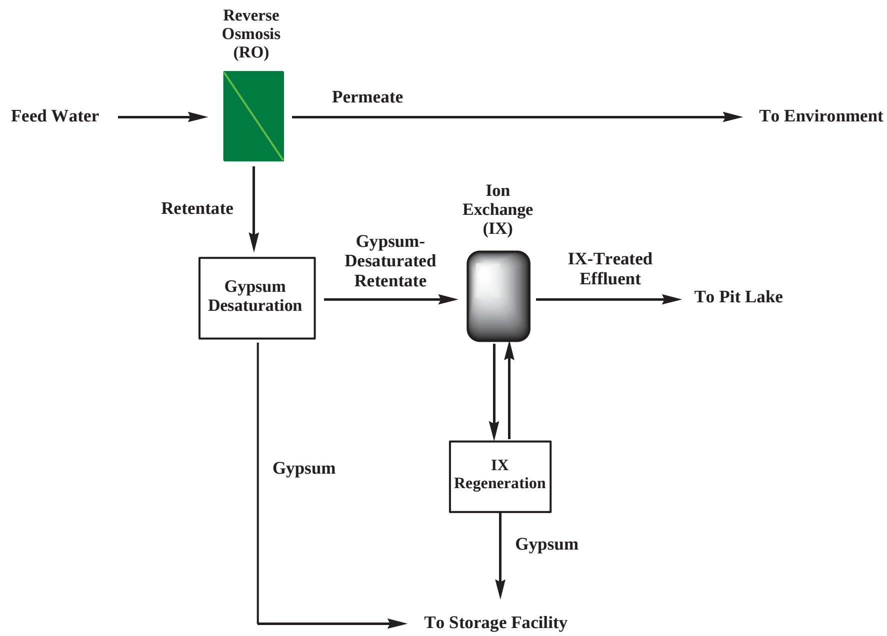


Figure 2-3. Simplified BFD showing one-stage RO and Sulf-IXC secondary sulphate removal process

As a general description, the Sulf-IXC process uses a strong base anion (SBA) resin and CO_2 gas to remove sulphate. During the loading and regeneration phases of the laboratory testing, samples were taken at specific times for in-house sulphate measurement (HACH). Table 2-8 summarizes the loading results, which show that Sulf-IXC removed ~16% of the influent sulphate during the testing.

Table 2-6: Summary of Sulf-IXC Loading

Parameter	Unit	Loading
Breakthrough BV	BV	110
SO_4^{2-} Removal Efficiency	%	16%

As shown in Table 2-9, the overall regeneration efficiency was 100%: i.e., all sulphate captured during loading was removed from the resin.

Table 2-7: Sulf-IXC Regeneration Efficiency

Parameter	
Regeneration Efficiency	100%

From the Sulf-IXC results, it is concluded that the process can remove sulphate from the influent with a high regeneration efficiency.

2.3.3 $BaCO_3$ Precipitation

Barium carbonate addition was investigated as another option for sulphate removal from the Stage 1 RO desaturation effluent (Figure 2-4). Barium carbonate treatment was selected as a sulphate-removal process to test because it can remove sodium-associated sulphate that cannot be removed via gypsum precipitation. And $BaCO_3$ was chosen instead of other commonly available barium reagents such as $BaCl_2$ because it does not add other undesirable ions such as chloride to the treated water.

To assess its efficiency, two tests were carried out targeting 30% and sulphate 80% removal. The stoichiometric amounts of $BaCO_3$ powder were added into beakers, which were agitated for 2 hours before sampling to determine sulphate removal efficiency.

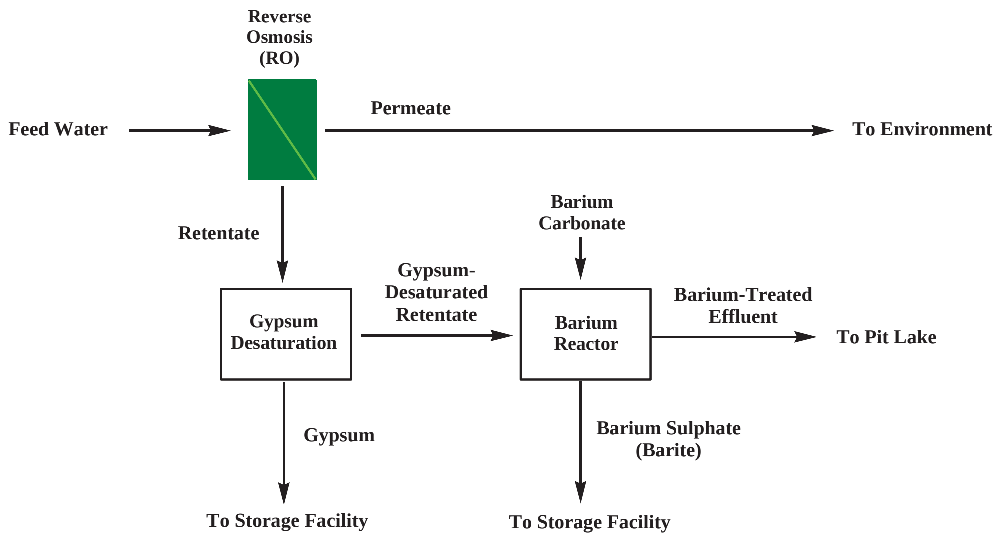


Figure 2-4. Simplified BFD showing one-stage RO and barium carbonate secondary sulphate removal process

The results in Table 2-10 show that, by adding 30% of stoichiometric $BaCO_3$ to remove sulphate, approximately 130% of the theoretical amount of sulphate was removed within 2 hrs. The higher than 100% theoretical sulphate removal was likely due to experimental or analytical error or a combination of both. When 80% of the stoichiometric amount of $BaCO_3$ was added, approximately 80% of the theoretical amount of sulphate was removed in 2 hours. The results suggest that the kinetics of sulphate removal using $BaCO_3$ are slower when a higher stoichiometric amount of sulphate is targeted for removal. This is consistent with the relative insolubility of $BaCO_3$.

Table 2-8: Summary of $BaCO_3$ Precipitation with 2 Hours Reaction Time

Parameter	Unit	30% of Stoichiometry	80% of Stoichiometry
$BaCO_3$ Dosage	g/L	2.6	6.9
[SO_4^{2-}] in Feed	mg/L	4,240	4,240
[SO_4^{2-}] in Effluent	mg/L	2,620	1,500
SO_4^{2-} Removed	g/L	1.6	2.7
Removal Efficiency*	%	130	80

*Based on sulphate removed versus theoretical sulphate removal for amount of added barium

3. Conclusions and Future Workplan 6c Evaluation

The preceding sections discuss laboratory testing results of various sulphate removal and management options. The test work provided proof-of-concept for the technical viability of all of the scenarios tested as well as test results that can inform 411c Workplan 6c sulphate removal estimates and associated capital and operating cost estimates for these treatment processes.

Based on the laboratory testing results, the conclusions are:

1. The Base Case Stage 1 RO plus gypsum desaturation achieved can remove sulphate by precipitating gypsum in the RO retentate gypsum desaturation process.
2. The Base Case plus Stage 2 RO achieved higher overall water recovery and sulphate removal compared to Base Case Stage 1 RO.
3. The Base Case plus Sulf-IXC option achieved higher sulphate removal compared to the Base Case and has approximately the same overall water recovery as the Base Case. It can also remove sulphate that is associated with sodium.
4. The Base Case plus barium carbonate addition can achieve higher sulphate removal compared to the Base Case and can also remove sulphate that is associated with sodium. The overall sulphate removal depends in barium carbonate dosage, and the overall kinetics of using barium carbonate to remove sulphate is relatively slow and takes at least two hours due to the low solubility of barium carbonate.

For Scope 6c work, the treatment scenarios evaluated in Scope 6b work plus other variations of sulphate removal options will also be evaluated for brine generation, solids generation, and capital and operating costs. Additional treatment scenarios that will also be evaluated via calculations are two-stage RO plus Sulf-IXC (Figure 3-1) and two-stage RO plus barium carbonate treatment (Figure 3-2).

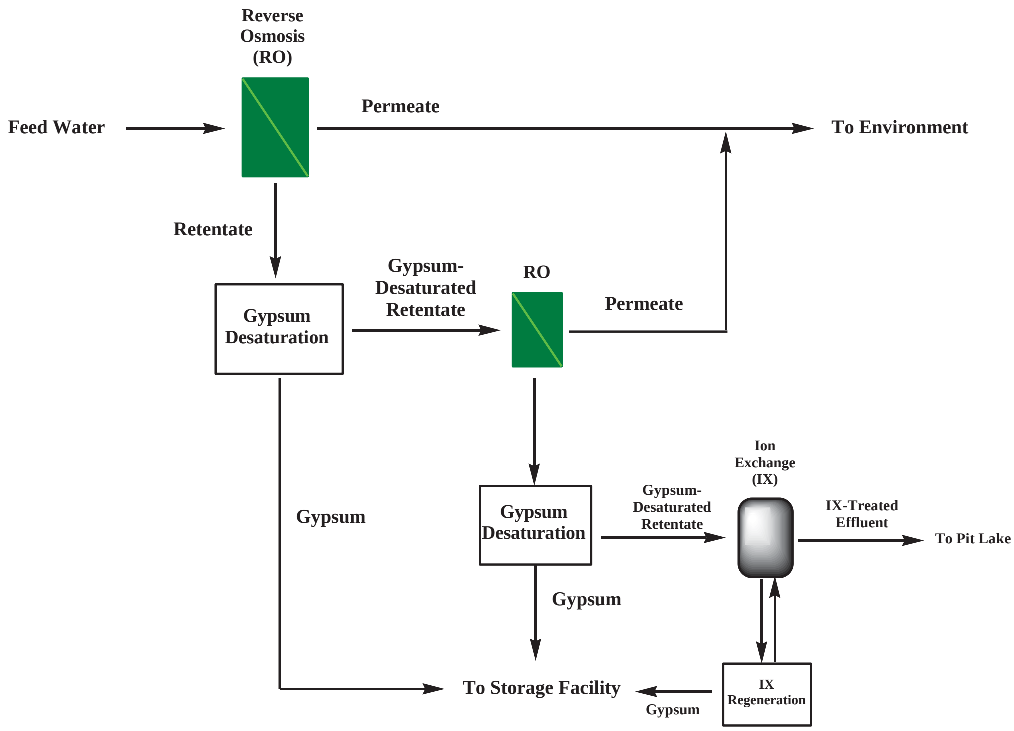


Figure 3-1. Simplified BFD showing two-stage RO and Sulf-IXC secondary sulphate removal process

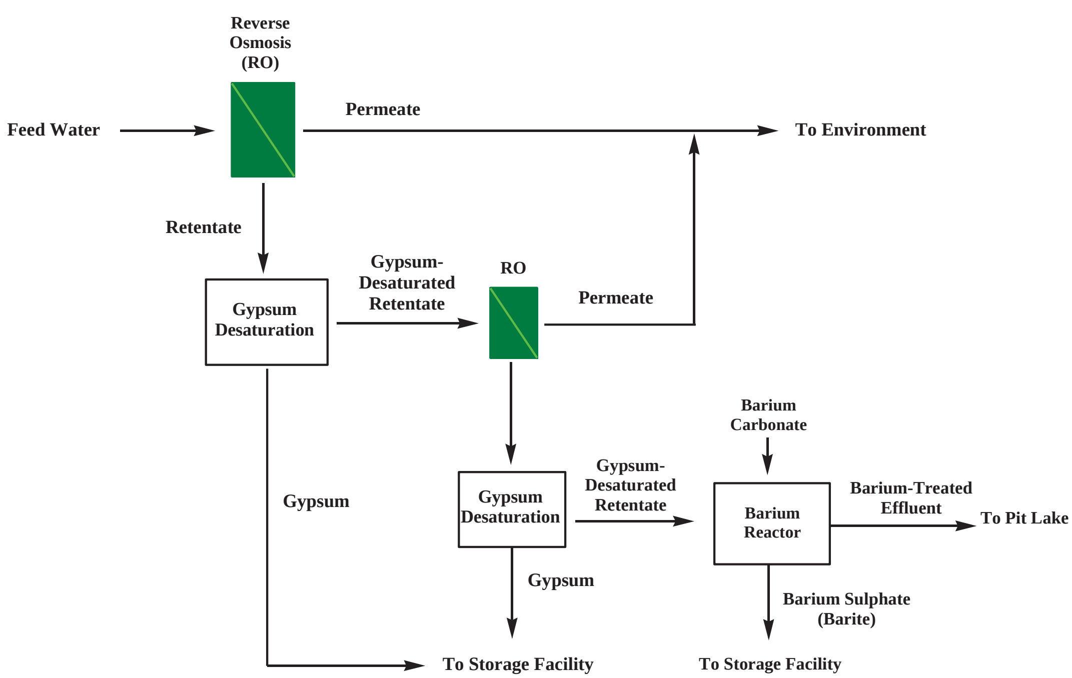


Figure 3-2. Simplified BFD showing two-stage RO and barium carbonate secondary sulphate removal process

Appendix F: February 15, 2017 Blackwater Gold Project: Water Treatment Responses for Comments 1266, 1271, 1272, and 1273.

Memorandum

Date: February 15, 2017

To: Ryan Todd, Manager Environment Blackwater Gold Project

From: ERM Consultants Canada

Subject: **Blackwater Gold Project: Water Treatment Responses for Comments 1266, 1270, 1271, 1272, and 1273**

1. INTRODUCTION

This memorandum responds to comments provided by Kelly Sexsmith, SRK, on behalf of the BC Ministry of Energy and Mines (MEM), and Sean Shaw, MEM, on November 1, and October 7 and 20, 2016, with respect to New Gold Inc.'s (New Gold) Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS; October 2015). Provided below are responses to comment #1266, 1270, 1271, 1272, and 1273 on the proposed alternate active water treatment and implications for the surface water quality and aquatic resources effects assessment submitted on August 12, 2016 (ERM 2016a, 2016b). The comments have been replicated below for completeness. Owing to the interconnectedness of the comments, one response has been provided instead of addressing each comment individually.

2. BC MINISTRY OF ENERGY AND MINES COMMENTS

BC MEM/Kelly Sexsmith Comment (#1266)

Additional comments on wetlands will be provided by MEM under separate cover. However, SRK notes that the source terms assigned to flows passing through the wetlands were extremely low and are not considered to be realistic. Since almost all of the flows discharged to the receiving environment in the post-closure period are assigned wetland effluent chemistry, this likely results in non-conservative receiving water quality predictions. New Gold should complete additional modelling using more realistic effluent concentrations for all of the flows that are routed through wetlands at post-closure, and should update the effects assessment accordingly. In the absence of appropriate data to support the wetland performance, performance data from more conventional treatment methods should be considered for this purpose.

BC MEM/Sean Shaw Comment (#1270)

The information provided on the proposed passive treatment systems is not sufficiently detailed and does not provide support or confirmation that the proposed water quality targets are achievable. Additional information is required to demonstrate that proposed wetlands and rock drains would be able to effectively achieve the proposed discharge quality for the project. Evidence of achievability of proposed treatment efficiencies, such as conservative analogue information on influent/effluent concentrations from other mine sites and/or bench/pilot scale testing data should be provided.

BC MEM/Sean Shaw Comment (#1271)

In the absence of additional detail and supporting information on passive treatment systems, New Gold should provide plans for alternative primary mitigation whose performance can be substantiated at the EA stage (for example - active water treatment). Under this scenario, wetlands could be proven-up during operations with detailed, systematic, research and piloting work. The initial permitting of the project would be based on the alternate achievable technology.

BC MEM/Sean Shaw Comment (#1272)

If alternate mitigation, such as active water treatment, is proposed, conceptual design info is required at the EA stage. A conceptual plan for active water treatment at the EA stage should include the following criteria (EA Information Requirement):

- *i. Description of the treatment system and site location;*
- *ii. Information on the treatment method(s), treatment capacity, retention times, materials and reagents used, reagent sourcing and transport and operational requirements;*
- *iii. Demonstration of treatment effectiveness (pilot testing and/or industry examples);*
- *iv. Estimate of influent and effluent flows and water quality;*
- *v. Assessment of performance risks for collection and treatment;*
- *vi. Assessment of system performance under variable conditions;*
- *vii. Volumes and characteristics of by-product waste produced and disposal methods;*
- *viii. Maintenance and replacement plans;*
- *ix. Contingency plans in the event of plant shutdown, etc.;*
- *x. Proposed monitoring programs;*
- *xi. Time schedule for construction and commissioning, and*
- *xii. Capital and operating cost estimation*

BC MEM/Sean Shaw Comment (#1273)

If required, water quality predictions and effects assessment for post-closure should be updated based on the predicted performance of the alternative primary mitigation plans.

3. NEW GOLD RESPONSE

3.1 Context

Water management is a key consideration in the engineering design of the proposed Blackwater Gold Project (the Project). New Gold has consulted with working group members, including MEM, on waste and water management during the pre-application, screening, and review phases. Designing for closure is detailed in the Reclamation and Closure Plan (Section 2.6 of the Application/EIS) and the proposal for passive wetland treatment at Post-Closure has been an integral feature of the Project design and effects assessment since the original submission of the Application/EIS for screening in June 2014.

Wetland treatment is a key feature of Operations, Closure, and Post-Closure water quality management at various mines in British Columbia and Canada, including the Mt. Milligan (central BC, Centerra Gold), Musselwhite (northwestern ON, Goldcorp Inc.), and Campbell (Red Lake, ON, Goldcorp Inc.) mines.

In October and November 2016, New Gold received comments from MEM and the Ministry of Environment (MOE) indicating that the information provided to date on the Closure and Post-Closure water treatment system was insufficient to support the surface water quality effects assessment. Follow up conversations with MEM indicated that it was unlikely that New Gold could provide adequate information on the proposed treatment systems (i.e. treatment wetlands) in the absence of a pilot treatment system that would allow for MEM to support a provincial environmental assessment decision on the Application/EIS. In response to these review comments, New Gold has assessed active water treatment for Closure and Post-Closure, and has prepared information on updates to Closure and Post-Closure water management, updated surface water quality model results, and assessed the implications on the surface water quality and related effects assessments previously completed.

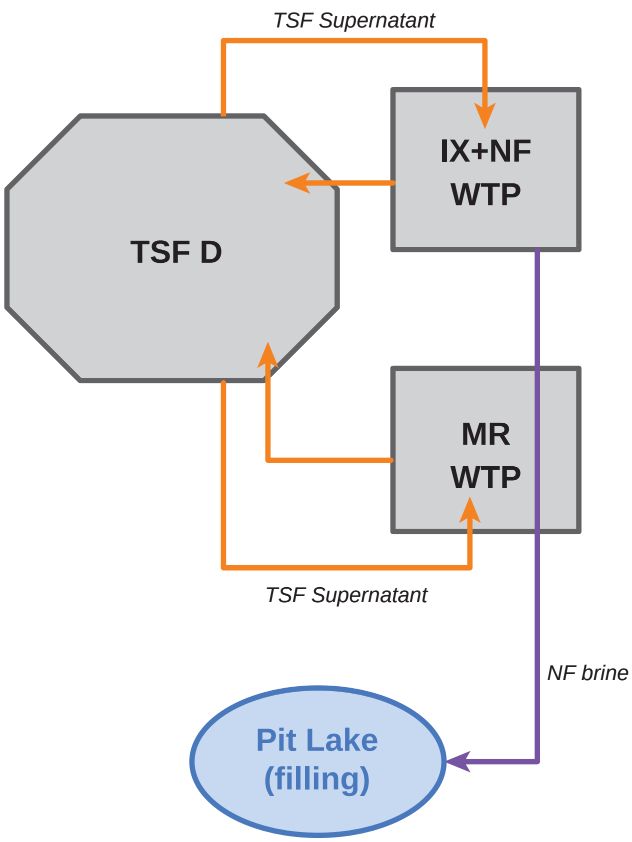
This work is intended to demonstrate that water can be actively managed in Closure and Post-Closure to protect the environment; however, New Gold remains interested in the concept of constructed treatment wetlands and other alternative water treatment systems at Closure and Post-Closure. Passive wetland treatment could be used as a primary treatment system or for polishing effluents from chemical-mechanical treatment plants. New Gold is interested in building and operating a pilot demonstration wetland during Project operations to support life-of-mine closure planning.

3.2 Updated Water Management

Alternate water management and integration of active water treatment systems in Closure and Post-Closure has been considered to demonstrate that effluent of acceptable quality can be discharged from the Project in Post-Closure in the absence of wetland treatment systems. As previously presented in the August 12, 2016, submission, no discharge of surface water is proposed for Closure, as surplus contact water at the mine site is directed towards filling of the open pit. The active water treatment systems have been sited to minimize the duration of treatment and volume of water requiring treatment in order to reduce future Project liabilities. A conceptual diagram of the alternate Closure and Post-Closure water management and active water treatment is presented in Figures 3.2-1 and 3.2-2; further details on water treatment engineering are provided in Section 3.3.

Figure 1.2-1

Conceptual Model of Proposed Active Water Management and Treatment Alternatives, Closure

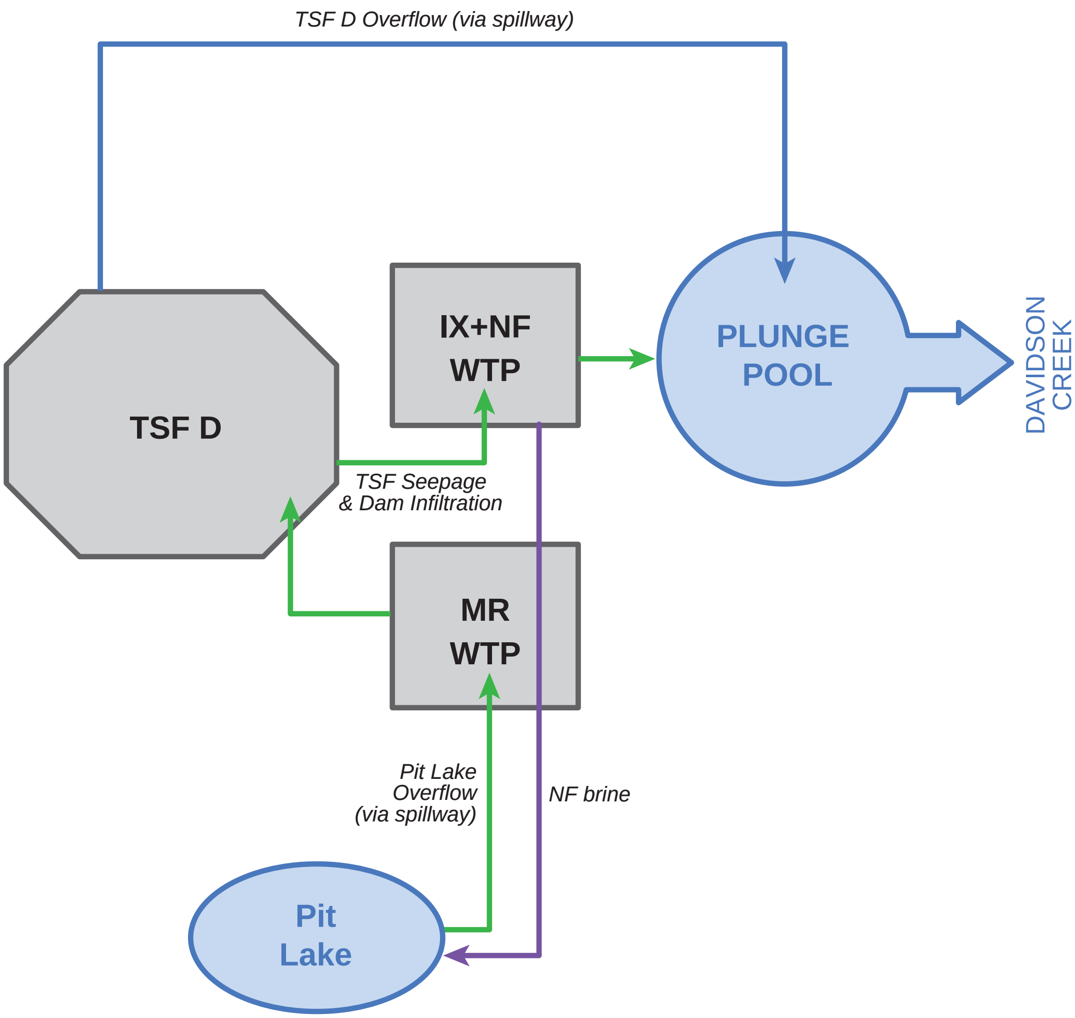


Alternative Active Treatments in Closure:

- MR WTP for TSF D supernatant (Year 31 through 37)
- IX+NF WTP for TSF D supernatant (Year 38 through 41)
- MR WTP for NF brine (Year 38 through 41)

Conceptual Model of Proposed Active Water Management and Treatment Alternatives, Post Closure

ERM



Alternative Active Treatments in Post-Closure:

- MR WTP for pit lake overflow (Year 42+)
- IX+NF WTP for TSF Dam D seepage and infiltration (Year 42+), augmented by TSF D supernatant up to 149 L/s.
- MR WTP for NF brine (Year 42+)

Changes relative to the August 12, 2016 submission affect water management during Closure and Post-Closure. Key components of these phases which remain unchanged are:

- Closure (Year 18 through 41): during this phase, active water management will include the pumping of TSF C supernatant and flows captured at the Environmental Control Dam (ECD) to the open pit. No surface contact water will be discharged to the receiving environment during this phase; and
- Post-Closure (Year 42 onwards): during this phase, the open pit will overflow to TSF D. TSF D supernatant will discharge via a spillway to the receiving environment. Flows captured at the ECD will be released to the receiving environment after treatment.

The key changes relative to the August 12, 2016 submission include (Figures 3.2-1 and 3.2-2):

<u>During Closure</u>

- Active treatment on a recycle loop of TSF D supernatant for:
  - dissolved metals (Year 31 through 37) by a 285 L/s metals removal water treatment plant (MR WTP); and
  - sulphate, ammonia, and dissolved metals by an ion exchange and nanofiltration (IX + NF) WTP (Year 38 through 41).

<u>During Closure and Post-Closure</u>

- Deposition of a constant 37 L/s flow of nanofiltration (NF) brine from the IX+NF WTP at depth in the pit lake, after active treatment by MR WTP (Year 38+).

<u>During Post-Closure</u>

- No consideration of the expected beneficial water treatment provided by previously proposed passive treatment systems in TSF C, TSF D, or downstream of the TSF at the ECD site;
- direct release to the plunge pool of runoff from the Dam D shell and natural catchment runoff at the ECD site, thus minimizing the volume of ECD site inflows requiring treatment;
- keeping the Northern and Southern diversions active into Post-Closure, minimizing inflows to TSF D from background runoff;
- active treatment of up to 209 L/s of open pit overflow to TSF D by MR WTP (Year 42+); and
- active treatment of 149 L/s of infiltration through Dam D, non-contact groundwater flows, and seepage from TSF D collected at the ECD site by an IX+NF WTP (Year 42+). To maintain a constant 149 L/s inflow to the IX+NF WTP in low flow months, the WTP influent is augmented by TSF D supernatant as required.

Consistent with the August 12, 2016 submission, at Post-Closure, water discharged over the TSF D spillway, discharged from the ECD site, and untreated surface runoff below Dam D will be blended at the plunge pool prior to direct release to Davidson Creek.

3.3 Alternate Active Water Treatment

The effluent treatment requirements to achieve acceptable effluent quality at the plunge pool upstream of Davidson Creek (Figure 3.2-1) in Post-Closure include removal of dissolved metals, sulphate, and ammonia. Two active water treatment systems are proposed to provide removal of these parameters during Closure and Post-Closure: an MR WTP and an IX-NF WTP (Table 3.3-1). Each of these active treatment systems is described in the following sections.

Table 3.3-1. Summary of Alternate Active Water Treatments

Proposed Treatment Technology	Treatment Capacity	Effluent Concentrations of Key Parameters	Associated Technical Appendix
MR WTP	maximum capacity of 285 L/s; flow rates can be scaled depending on site-specific requirements	Antimony: 0.00168 mg/L Arsenic: 0.00032 mg/L Cadmium: 0.0000025 mg/L Copper: 0.0001 mg/L Manganese: 0.00077 mg/L Zinc: 0.0005 mg/L	Appendices A and B
IX+NF WTP	149 L/s	Ammonia: 0.2 mg/L (Closure); 4 mg/L (Post-Closure) Sulphate: 21 mg/L (Closure); 80 mg/L (Post-Closure) Dissolved metals: 99% removal	Appendix C

Options analyses and preliminary water treatment designs were developed based on the predicted water quality and flow of mine affected water in the absence of proposed Closure and Post-Closure passive treatment systems and considered the following:

- **Appendix A:** McCue. 2017. Active Water Treatment Options Evaluation for Post-Closure Mining Affected Water for the Blackwater Project.
- **Appendix B:** McCue. 2016. Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant for the Blackwater Gold Project.
- **Appendix C:** BioteQ. 2017. Sulphate Removal from Blackwater Tailings Storage Facility Supernatant and Seepage during Closure and Post-closure.

3.3.1 Metals Removal Water Treatment Plant

Various options for metal removal were investigated in Appendix A; however, the MR WTP proposed is the same technology proposed in August 2016 for the Operations phase discharge of pit water (Appendix B) due to the following benefits:

- conventional two-stage lime and ferric sulphate water treatment process;

- opportunity to reuse infrastructure from the Operations phase; and
- estimated effluent quality has been validated through a bench scale test program completed in the fall of 2016, further described in Appendix A.

The MR WTP will be used to treat TSF D supernatant on a recycle loop for seven years during Closure and to treat seasonal open pit overflow to TSF D during Post-Closure. The MR WTP will also be used to treat the NF brine waste product from the IX+NF WTP prior to deposition at depth in the pit lake.

The chemical treatment program consists of pH adjustment, chemical precipitation and coagulation using hydrated lime and ferric sulphate, flocculation, and final pH neutralization prior to discharge, if required. A series of containerized units will be used for reagent addition and mixing with final settling occurring in ponds sized to manage design flows and estimated quantities of sludge. Sludge can be mechanically removed as needed and transported to a designated area in the TSF for final long term storage.

Table 3.3-2 presents estimated effluent quality from the MR WTP based on the results of the bench scale test program.

Table 3.3-2. MR WTP Effluent Quality

Parameter	Predicted Treated Effluent Concentration (mg/L)	Parameter	Predicted Treated Effluent Concentration (mg/L)
Aluminium	0.0578	Lead	0.000025
Antimony	0.00168	Manganese	0.00077
Arsenic	0.00032	Mercury	NR
Barium	0.0144	Molybdenum	0.000171
Beryllium	0.00005	Nickel	0.00025
Boron	0.005	Selenium	0.000025
Cadmium	0.0000025	Silver	0.00001
Chromium	0.00005	Thallium	0.00001
Cobalt	0.00005	Uranium	0.000005
Copper	0.0001	Zinc	0.0005
Iron	0.005		

Note: NR = No removal predicted
Source: McCue 2017 (Appendix A). Results of Test 5D (two-stage hydroxide and ferric sulphate) were used to set the treated effluent concentration.

In addition to the treated effluent concentrations presented in Table 3.3-2, a maximum sulphate concentration of 1,448 mg/L was applied to flows treated at the MR WTP. This maximum concentration represents the solubility limit of sulphate in the presence of hydrated lime, which will be used in the MR WTP; the concentration was established using PHREEQC equilibrium modelling software.

Further design and operating details can be found in Appendices A and B. Capital and operating cost estimates have been generated and can be provided to MEM upon request for the purposes of reclamation security bonding estimation.

3.3.2 Ion Exchange and Nanofiltration Water Treatment Plant)

Preliminary design of the IX+NF WTP focussed on sulphate removal. Five different active treatment technologies were considered (Appendix C); however, the IX+NF WTP technology was selected for the following reasons:

- the IX+NF WTP can remove sulphate to required levels;
- this technology is proven on industrial scale on water with similar water quality to Blackwater TSF supernatant and seepage;
- waste products (i.e., a stable gypsum residue and brine) can be managed on site;
- avoids exposing the project to exotic and/or very expensive reagents that would be used in large quantities such as barium and aluminum based chemicals; and
- ability to achieve significant coincident reduction in ammonia and dissolved metals concentrations.

The IX+NF WTP was designed with a capacity of 149 L/s to manage TSF D seepage flows, non-contact groundwater, and infiltration through Dam D which reports to the ECD site in Post-Closure. Total TSF D seepage flows and infiltration through Dam D are frequently less than the 149 L/s capacity of the IX+NF WTP, particularly during low flow months when concentrations in the TSF D spillway are typically greatest due to reduced dilution by background runoff. Consequently, TSF D supernatant is used to augment the influent to the IX+NF WTP up to the maximum capacity of 149 L/s.

During Closure, the TSF D supernatant will be treated with the IX+NF WTP on a recycle loop for four years (Year 38 to 41) to improve water quality prior to discharge in Year 42 over the TSF D spillway to the plunge pool.

Sulf-IX is a two-stage ion exchange process that selectively removes calcium and sulphate. The resin operates in up-flow fluidized beds and does not require any pre-treatment. The only waste product from this step is a non-hazardous high purity gypsum solid by-product that can be stored in the TSF, used for reclamation, or disposed of in an on-site landfill.

The Sulf-IX system has been proven on an industrial scale at the Freeport-McMoRan Copper and Gold mine in Arizona. This demonstration-scale plant effectively removed calcium balanced sulphate at a variety of concentrations. Climatic differences between Arizona and British Columbia, including temperature, are not expected to impair the effectiveness of the Sulf-IX system. Further details of the demonstration plant are available in Appendix C.

The current preliminary design includes a NF treatment step subsequent to the Sulf-IX treatment. NF is primarily intended to remove sulphate balanced by sodium and potassium. Coincidentally, nanofiltration will also reduce ammonia concentrations and remove approximately 99% of dissolved metals in the water. Further details of metal removal by NF treatment are provided in Appendix C.

The brine produced by the NF system, constituting a constant 37 L/s of the total 149 L/s influent to the IX+NF WTP, will be stored at depth in the open pit. Due to high concentrations of metals in the NF brine, combined with available capacity at the MR WTP after Year 37, the brine will be treated by the MR WTP prior to deposition in the open pit. This added treatment step will limit the impact of the brine on pit water quality, including concentrations of water quality parameters in pit seepage to Creek 661.

The combination of Sulf-IX and NF is expected to achieve effluent with a sulphate concentration of approximately 21 mg/L during Closure and approximately 80 mg/L during Post-Closure. Ammonia concentrations in the IX+NF WTP effluent are expected to be approximately 0.2 mg/L in Closure and 4 mg/L in Post-Closure.

Further design and operating details can be found in Appendix C. Capital and operating cost estimates have been generated and can be provided to MEM upon request for the purposes of reclamation security bonding estimation.

3.3.3 Effluent Monitoring

Monitoring will occur at the outflow of each WTP during periods of discharge for flow rates, general parameters including pH and total suspended solids (TSS), nutrients (e.g., ammonia), sulphate, and dissolved metals.

Monitoring will also occur at the plunge pool for the same suite of parameters prior to final discharge to Davidson Creek.

Additional monitoring required for WTP operations is further described in Appendices A, B, and C. Specifics of the effluent monitoring program will be further developed during permitting.

3.3.4 Contingencies

In the event that effluent quality does not meet permitted levels, effluent can be rerouted to either the MR WTP or to the IX+NF WTP for additional treatment if additional capacity remains.

Additional available contingencies or opportunities include:

- in pit treatment (e.g., nutrient or carbon amendment) applied either to TSF supernatant discharges to the pit during Closure or to the pit directly in Closure and/or Post-Closure;
- treatment of TSF supernatant and/or pit water using the SO_2/Air system in the process plant;
- addition of a sulphide precipitation train to the MR WTP;
- construction of a permeable reactive barrier (PRB) to treat seepage from TSF D;

- pumping and disposal of TSF D seepage at depth in open pit (with/without nutrient addition); and
- collection of West Dump toe seepage, treatment at the MR WTP, and/or discharge at depth in the pit lake.

When planning for contingencies and adaptive management, it should also be noted that two key processes, which were included in the August 12, 2016 submission, have not been included in this assessment and have resulted in conservative predictions of water quality (further discussion of surface water quality modelling in Section 3.4):

- construction of closure wetlands within TSF C and D during reclamation; and
- further removal of water quality parameters in the constructed wetland downstream of Dam D.

3.3.5 Limitations

Disposal of NF brine at depth in the pit lake is included in the updated surface water quality model. At inflow rates of 37 L/s, it will take approximately 200 years for the lower layer of the pit lake to fill with the NF brine and for the brine chemistry to affect the surface mixed layer of the pit lake. To assess whether the presence of brine in the pit lake overflow would result in effects on surface water quality downstream of TSF D, the watershed model was extended to Year 332, representing 290 years of Post-Closure.

There are substantial limitations to producing modelling results for approximately 300 years into the future. To ensure that water quality predictions remain conservative, four key processes were not included in this assessment, despite the likelihood of these processes being observed on the modelled timescale:

- subsurface attenuation of water quality parameters in seepage, notably seepage from TSF C to TSF D, from TSF D to the ECD site, and from TSF D and the pit lake to Creek 661 and Davidson Creek;
- reduction of loadings from the TSF tailings mass over time due to “flushing” (e.g., sulphate associated with sodium will be primarily present in the tailings pore water and will be removed in the first pore volume exchange);
- natural biological attenuation processes (e.g., sorption to organic matter, sulphate reduction) in the TSF supernatant, tailings porewater, and pit lake; and
- “burn out” of sulphide minerals in the pit highwall, West Dump, and Dam D.

3.4 Updated Surface Water Quality Modelling

The primary objectives of the updated surface water quality modelling were to:

1. predict WTP influent concentrations in the absence of all previously proposed passive water treatment as presented in the August 12, 2016 submission (e.g., rock drains and treatment wetlands);

2. predict Project effluent concentrations based on active water treatment as described in Sections 3.2 and 3.3 (Figures 3.2-1 and 3.2-2);
3. provide a comparison of Project effluent quality based on active water treatment relative to the passive treatment system proposed in the August 12, 2016 submission; and
4. predict the concentrations of total and dissolved metals, nutrients, and anions within the receiving environment considering active water treatment as the primary mitigation.

3.4.1 Summary of Watershed Model Updates

Surface and groundwater flows in the updated surface water quality model are generally consistent with the Life of Mine watershed model developed by Knight Piésold Ltd. (KP) and detailed in the August 12, 2016 submission. The following water balance changes were made to allow integration of the alternate water management and active water treatment discussed in Sections 3.2 and 3.3:

- the Northern and Southern diversions remain in place in Post-Closure, directing TSF area non-contact flows to Davidson Creek instead of allowing flows to enter the TSF. This change reduces the volume of water entering the TSF and consequently reduces the spillway flows, without affecting downstream flows in Davidson Creek;
- treatment recycle loops were added to TSF D in Closure, to treat TSF supernatant with MR and IX+NF as described in Sections 3.2 and 3.3;
- inflows to the ECD site in Post-Closure were split, with capture systems at the ECD adjusted to collect only groundwater flows. This resulted in TSF D seepage, non-contact groundwater, and Dam D infiltration flows reporting to the IX+NF WTP while Dam D runoff and background catchment runoff were released to the downstream plunge pool without treatment. This differs from the August 12, 2016 submission in which all inflows to the ECD site reported to the constructed treatment wetland;
- TSF D supernatant was used in Post-Closure to augment the IX+NF WTP influent to a maximum capacity of 149 L/s, if TSF D seepage, non-contact groundwater, and Dam D infiltration flows were less than 149 L/s. TSF D spillway flows continued to discharge directly to the plunge pool;
- NF brine produced by the IX+NF WTP (a constant flow of 37 L/s) was directed to the lower layer of the pit lake;
- the watershed model was extended to Year 332 to capture the effects of progressively filling the open pit with the NF brine; and
- overflows from the open pit to TSF D and from TSF D to the plunge pool in Post-Closure increased due to the increased volume of water in the pit lake from brine deposition.

Further details of updated watershed modelling are provided in Appendix D (KP 2017).

3.4.2 Summary of Water Quality Model Updates

The surface water quality model updates included:

- integration of the alternate water management and active water treatment discussed in Sections 3.2 and 3.3 (Section 3.4.2.7);
- updates to source terms (Sections 3.4.2.1 to 3.4.2.4);
- updates to pit modelling, including reevaluation of the depth of the surface mixed layer (Section 3.4.2.3);
- additional equilibrium modelling (Section 3.4.2.5); and
- reevaluation of cyanide and nitrogen removal rates (Section 3.4.2.6).

3.4.2.1 Tailings Beach Source Terms

In the August 12, 2016 submission, tailings beaches in TSF C and TSF D were conservatively assumed to be reclaimed at the start of Post-Closure, in Year 42. In the updated model, the tailings beaches were assumed to be reclaimed at the start of Year 21, to align the updated water quality model more closely with expected timing of reclamation activities. Geochemical loading from beach runoff and infiltration to TSF C and TSF D during the first three years of Closure was calculated using the first 24 weeks of whole ore leach (WOL) tailings humidity cells rates scaled to the mass of exposed tailings on the beach. This approach was consistent with the geochemical loadings applied during Closure in the August 12, 2016 submission, and during Operations in both modelled iterations. For the remainder of Closure, the source term for beach runoff and infiltration is equivalent to background catchment runoff since a vegetated till cover will be placed on the beach, as represented by average monthly baseline water quality of station WQ10. Tailings beach source terms during Operations and Post-Closure were unchanged from the August 12, 2016 submission.

3.4.2.2 Waste Rock Source Term Updates

As discussed in Section 5.1.3 of the August 12, 2016 submission, geochemical source terms representing waste rock loadings in Closure were represented by steady state humidity cell leaching rates, or the last 10 observations when steady state conditions were not included. These values were inclusive of final leach data where available, generated from a final flushing of accumulated metals upon termination of the humidity cell test.

As the final leach cycle loadings were frequently an order of magnitude higher than other steady state values, the inclusion of these data represented a substantial source of conservatism in waste rock source terms, particularly for the Closure and Post-Closure phases considered in this current modelling, and for NAG4 material deposited in the West Dump. As there is no mechanism for these metal loadings to be released in one flush from the West Dump, as the West Dump will not be dismantled or flooded, final leach data were excluded from waste rock source terms in the model update.

3.4.2.3 Updated Pit Modelling

Due to the potential effects of depositing high-salinity NF brine at a constant rate into the lower layer of the open pit in Closure and Post-Closure, the chemical evolution of the pit lake was reassessed. Lorax Environmental (Lorax) undertook an assessment of the brine concentrations provided in Appendix C. Based on the results of that assessment and a review of existing literature, the depth of the upper mixed layer was changed from 40 m (August 12, 2016 submission) to 3 m (Lorax 2017; Appendix E). As it will take approximately 200 years for the brine entering the pit lake to reach the surface mixed layer, the temporal domain of the water quality model was extended to Year 332.

Additionally, due to the change in depth of the upper mixed layer, pit lake seepage was assumed to be 100% sourced from the lower layer in Post-Closure (Appendix D). This is conservative, due to the influence of NF brine in the lower layer, and represents an update from the August 12, 2016 submission, in which the source of seepage was distributed between the two layers.

3.4.2.4 Background Water Quality Source Term Updates

In the updated watershed model, the Northern and Southern diversions were maintained into Post-Closure, representing a flow of non-contact water to the ECD site in Post-Closure. Consistent with the August 12, 2016 submission, the source term for background surface flows to the ECD site was equivalent to average monthly baseline water quality of station WQ10. However, due to naturally high aluminum concentrations in baseline samples collected at WQ10, aluminum concentrations in this source term were replaced with values measured at WQ9 in Chedakuz Creek. This change was necessary to accurately capture the natural attenuation that was observed during baseline studies along Davidson Creek.

3.4.2.5 Updated Equilibrium Modelling

In the August 12, 2016 submission, geochemical equilibrium modelling was performed to estimate parameter-specific relative attenuation factors (RAs; %), which were applied in the predictive surface water quality model to impose solubility constraints on predicted concentrations of water quality parameters. RAs were based on predicted solubility limits because the concentrations estimated by mass balance GoldSim modelling were oversaturated for some predicted equilibrium phases.

Geochemical equilibrium modelling was performed using PHREEQC, which is a geochemical modelling software developed by the United States Geological Survey (Parkhurst and Appelo 2013).

In the updated surface water quality model, equilibrium modelling was updated for the following Project sites:

- the West Dump, due to updates to geochemical source terms for waste rock (see Section 3.4.2.2);
- Dam D, due to updates to the watershed model which have affected the monthly distribution of flows at the Project site; and
- the pit lake upper and lower layers, due to updates to water quality predictions and the inclusion of brine inflows for the open pit, and changes to the depth of the surface mixed layer (see Section 3.4.2.3).

One addition included in the updates to equilibrium modelling was the incorporation of surface complexation to hydrous ferric oxide (HFO) as a final step in the equilibrium reaction. Otherwise, the overall general approach, assumptions and application of results of equilibrium modelling for Dam D, the West Dump, and the open pit are as presented in the August 12, 2016 submission.

The following limitations with this approach have been identified subsequent to the August 12, 2016 submission:

- the application of an RA factor instead of a solubility cap on concentrations of water quality parameters has the potential to introduce conservatisms in the model results for parameters with very high concentrations; and
- because PHREEQC does not factor precipitation reaction kinetics into its equilibrium predictions, some of the mineral phases predicted to reach saturation may not be observed due to slow reaction kinetics.

Additionally, equilibrium modelling was performed for TSF D. Geochemical equilibrium modelling results for TSF D were not included in the August 12, 2016 submission, due to the treatment effects of the constructed treatment wetland in TSF D in Post-Closure. Median TSF D supernatant concentrations during Post-Closure were used as inputs to PHREEQC. Solutions were equilibrated under atmospheric conditions allowing thermodynamically appropriate mineral phases to precipitate, e.g., barite, calcite, chalcedony, diaspore, $FeCO_3$, apatite, hematite, hydroxylapatite, and manganite. In addition, surface complexation to HFO was included. All models were run using the minteq.v4 database.

As described in the August 12, 2016 submission and above, RAs were calculated for metal concentrations in TSF D during Post-Closure by comparing the PHREEQC output concentrations to the input values. RAs were applied in GoldSim on a monthly timestep throughout Post-Closure to the predicted concentrations of surface water quality parameters in TSF D supernatant. Predicted concentrations of parameters were not allowed to drop below background (mean monthly surface water quality at baseline surface water quality station WQ10, representing concentrations in background surface runoff reporting to TSF D). Predicted concentrations that were lower than background were either set to background or the initial input concentrations (if background concentrations > initial input concentrations, then initial input concentrations were substituted).

3.4.2.6 Cyanide Degradation and Nitrogen Cycle Rates

The August 12, 2016 submission included a subset of natural degradation reactions that are anticipated to occur in the TSF based on experimental ageing test results. Specifically, the degradation of total cyanide was assumed to contribute to loading of ammonia to the TSF supernatant. However, the evolved ammonia was assumed to behave conservatively based on conservation of mass, and was not further transformed. Similarly, WAD (weak acid dissociable) cyanide was also assumed to behave conservatively based on conservation of mass, and was not further transformed.

However, the oxidation of ammonia is well known to naturally occur at environmentally relevant rates (e.g., Chapra 2007, Wetzel 2000, SRK 2011). Analogue Post-Closure site data were provided for Goldcorp's Equity Silver Mine in north central British Columbia (New Gold 2016) to assess the potential for natural ammonia oxidation and WAD cyanide degradation. The Equity Mine is approximately 140 km northwest of the Project site, would experience similar hydrological and climatic conditions, and employed a cyanide leach process during its operations; it therefore is a reasonable analogue for anticipated Post-Closure tailings pond water quality for the Blackwater Project.

Assessment of Post-Closure WAD cyanide and ammonia concentrations from available site analogue data indicated degradation of ammonia and WAD cyanide occurs under environmental conditions expected at the Blackwater Project (Figure 3.4-1, New Gold 2016); the GoldSim model was correspondingly updated to include ammonia oxidation and WAD cyanide degradation reactions. Rate constants, equations and empirical relationships specific to ammonia oxidation kinetics were sourced from Chapra (2007) and Wetzel (2000). A first order ammonia oxidation rate constant (0.1 day^{-1}), was included based on empirical studies summarized in Chapra (2007). This rate constant was modified in the GoldSim model to account for the known temperature-dependency of ammonia oxidation rates.

Analogue site data also indicated that under environmental conditions expected to occur at the Blackwater Project, WAD cyanide would be expected to degrade to concentrations below method detection limits (<0.0025 mg/L) within the first year of Closure. Further, WAD cyanide degrades at a similar rate as total cyanide concentrations (Figure 3.4-1). Thus, model updates here assumed that WAD cyanide degraded at the same rate as incorporated for total cyanide in the August 12, 2016 submission, which was based on an exponential degradation rate derived from experimental ageing test results. As a conservative assumption, modelled cyanide degradation reactions did not include the formation of metal-cyanide complexes and subsequent further reduction of metals concentrations through precipitation or co-precipitation. Metal concentrations in the TSF were reduced by equilibrium modelling as described in Section 3.4.2.5.

3.4.2.7 Water Treatment

Tables 3.3-1 and 3.3-2 present the estimated effluent quality and design flow rates of the MR WTP and the IX+NF WTP. WTP capacities were selected to optimize the removal of chemical load.

3.4.3 Summary of Model Predictions

In the updated surface water quality model, active treatment occurs in Closure and Post-Closure, representing a change from the assumptions in the August 12, 2016 submission during these two Project phases. Consequently, model predictions in the following sections are updated for Closure and Post-Closure, where applicable.

3.4.3.1 TSF D Supernatant and Plunge Pool

Monthly summary statistics of predicted TSF D supernatant water quality during Closure are presented in Table 3.4-1. Predicted concentrations are inclusive of natural dilution following the end of Operations, in addition to treatment of TSF D supernatant on a recycle loop through the IX+NF WTP and MR WTP, as described above.

In Post-Closure, concentrations of water quality parameters in the TSF D spillway to the downstream plunge pool will reflect concentrations in TSF D supernatant, inclusive of attenuation due to equilibrium modelling, as described in Section 3.4.2. Monthly summary statistics for water quality parameters in this overflow are presented in Table 3.4-2.

Loadings to the downstream plunge pool in Post-Closure will include flows from the TSF D spillway, treated effluent from the IX+NF WTP at the ECD site, runoff from the Dam D embankment, and background surface runoff, including the Northern and Southern diversions. Monthly summary statistics of predicted surface water quality in the downstream plunge pool are presented in Table 3.4-3.

3.4.3.2 Receiving Environment

Water management changes to incorporate active treatment in Closure and Post-Closure resulted in changes to model predictions for TSF D, the ECD site, and the open pit, for these two mine phases. As effluent from the IX+NF WTP, TSF spillway flows, and pit seepage will only report to the receiving environment in Post-Closure, model predictions were only updated for this mine phase. Model predictions for Construction, Operations, and Closure in the downstream receiving environment remain as presented in the August 12, 2016 submission.

<u>Davidson Creek</u>

TSF spillway flows and IX+NF WTP effluent will mix with background runoff at the plunge pool in Post-Closure, prior to flowing to Davidson Creek. Monthly summary statistics of predicted surface water quality in Davidson Creek during Post-Closure are presented in Tables 3.4-4 and 3.4-5 for WQ26 and WQ7, respectively.

<u>Creek 661</u>

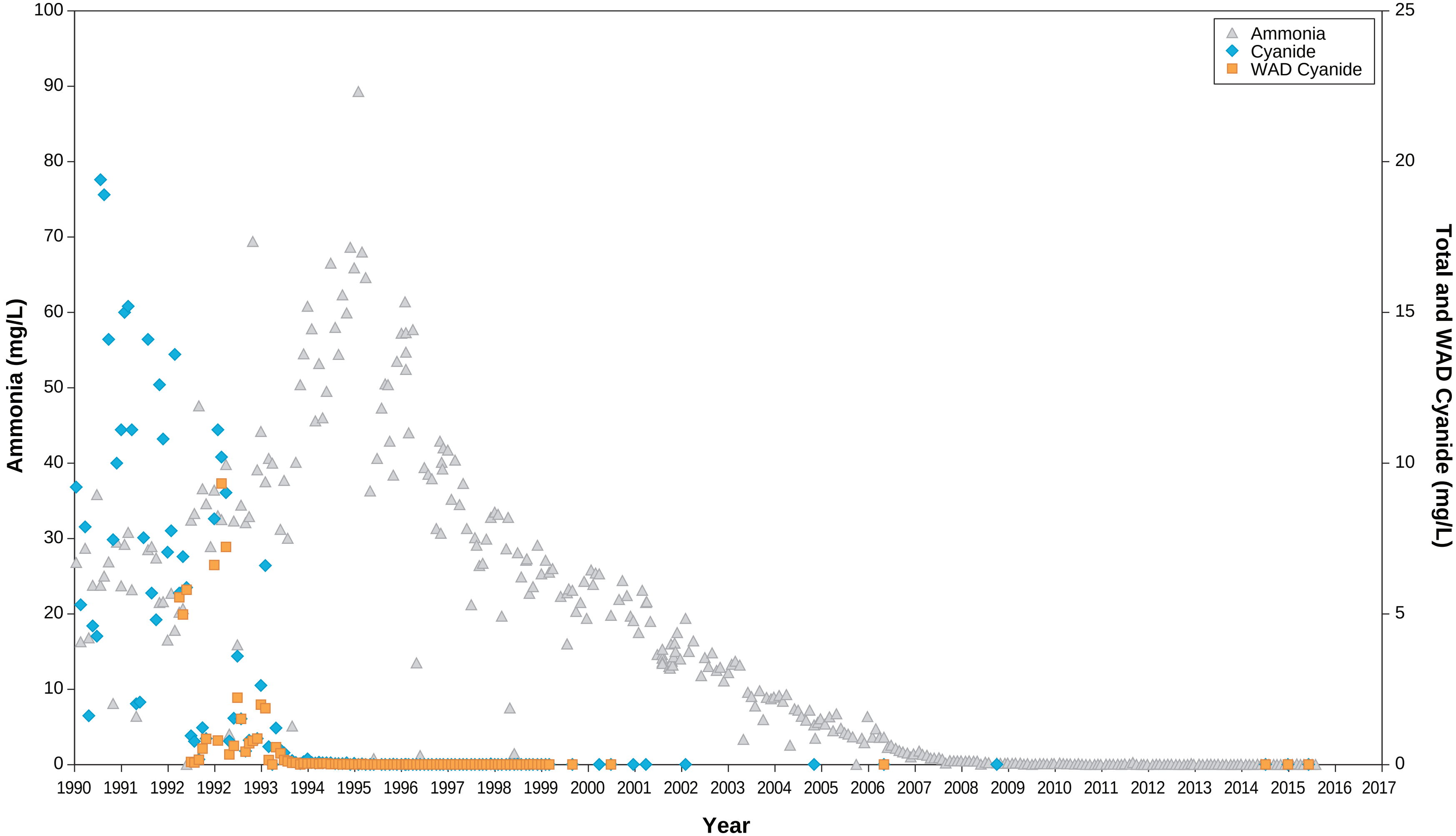
Seepage from the pit lake, inclusive of updated pit modelling as described in Section 3.4.2, is predicted to report to Creek 661 in Post-Closure. Consequently, since the updated modelling includes changes to pit lake water quality, Creek 661 predictions were updated. Monthly summary statistics of predicted surface water quality in Creek 661 during Post-Closure are presented in Tables 3.4-6 and 3.4-7 for WQ5_US and WQ5_DS, respectively.

<u>Chedakuz Creek</u>

Monthly summary statistics of predicted surface water quality in Chedakuz Creek are presented in Table 3.4-8 for WQ9, downstream of the confluence with Davidson Creek. This node represents the final assessment node within the modelling domain.

Figure 3.4-1

Summary of Long-Term Analogue Site Data; Ammonia, Total Cyanide, and WAD Cyanide Concentrations



Notes: Cody Meints, personal communication, December 16, 2016
Concentrations are for Goldcorp's Equity Silver Mine, north central British Columbia.

Table 3.4-1. Summary Statistics of Base Case Predicted TSF D Supernatant Water Quality, Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Alkalinity Min	47.3	48.6	50.1	50.9	38.7	34.7	36.4	39.7	41.4	43.1	44.5	45.9
Alkalinity Mean	67.6	68.3	69.4	68.9	57.3	53.5	54.4	55.8	57	57.9	58.8	59.8
Alkalinity Median	55.5	56.9	59	60.1	48.7	44.4	45.5	47.8	49.3	50.2	51.6	53
Alkalinity 95th Percentile	122	120	119	118	98.5	94.1	94.7	95.2	93.7	92.3	91.4	90.6
Chloride Min	2.21	2.27	2.35	2.02	1.88	1.84	1.89	1.97	2.03	2.06	2.1	2.15
Chloride Mean	3.02	3.08	3.17	3.16	2.62	2.43	2.45	2.52	2.57	2.61	2.66	2.72
Chloride Median	2.6	2.67	2.76	2.78	2.22	2.06	2.1	2.18	2.24	2.3	2.36	2.45
Chloride 95th Percentile	5.66	5.58	5.55	5.53	4.38	3.84	3.7	3.71	3.69	3.67	3.68	3.72
Fluoride Min	0.0347	0.0352	0.0356	0.0357	0.0322	0.0325	0.0345	0.0355	0.035	0.0347	0.0344	0.0343
Fluoride Mean	0.0434	0.0437	0.0444	0.0441	0.04	0.0411	0.043	0.0438	0.0434	0.0433	0.0432	0.0433
Fluoride Median	0.0446	0.0449	0.0456	0.0454	0.0405	0.0413	0.0435	0.0445	0.0441	0.0441	0.044	0.0442
Fluoride 95th Percentile	0.0466	0.0469	0.0474	0.0475	0.0446	0.0455	0.0472	0.0471	0.0466	0.0464	0.0462	0.0463
Sulphate Min	250	256	263	268	221	204	203	214	221	227	234	242
Sulphate Mean	491	497	506	499	409	377	382	393	402	408	415	425
Sulphate Median	378	395	411	408	309	286	291	306	320	332	348	361
Sulphate 95th Percentile	1070	1060	1040	1040	853	792	783	785	773	761	756	754
Ammonia as N Min	0.568	0.557	0.532	0.508	0.376	0.3	0.261	0.253	0.292	0.375	0.467	0.536
Ammonia as N Mean	0.881	0.835	0.804	0.76	0.554	0.438	0.38	0.369	0.426	0.543	0.675	0.776
Ammonia as N Median	0.772	0.768	0.748	0.68	0.499	0.416	0.359	0.346	0.393	0.504	0.626	0.713
Ammonia as N 95th Percenti	1.31	1.25	1.26	1.29	0.811	0.603	0.53	0.527	0.614	0.772	0.971	1.14
Nitrate as N Min	14.6	15.8	17.3	18.5	15.7	13.5	12.9	12.6	12.3	12	12.4	13.4
Nitrate as N Mean	29.2	31.2	33.5	34.7	28.1	25	24.3	24.2	24	24.2	25	26.2
Nitrate as N Median	24.6	25.8	28	30.4	25.3	23	22.4	21.1	20.6	21.6	22.3	23.2
Nitrate as N 95th Percentile	49.6	53.2	54.3	58.3	43.7	38.6	39.9	41.3	41	40.8	42.2	43.3
Nitrite as N Min	0.00261	0.00268	0.00273	0.00257	0.00235	0.00248	0.00254	0.0026	0.00258	0.00256	0.00256	0.00257
Nitrite as N Mean	0.00702	0.00677	0.00654	0.0062	0.00525	0.00486	0.00469	0.00456	0.00441	0.00425	0.00413	0.00404
Nitrite as N Median	0.00282	0.00288	0.00294	0.00297	0.00264	0.0027	0.00279	0.00281	0.00279	0.00276	0.00276	0.00276
Nitrite as N 95th Percentile	0.0207	0.0196	0.0187	0.0177	0.0134	0.0112	0.0103	0.00986	0.00932	0.00883	0.00843	0.00809
Acidity Min	5.43	5.52	5.61	4.62	4.02	3.57	3.79	4.21	4.55	4.87	5.18	5.32
Acidity Mean	9.6	9.64	9.69	9.47	7.85	7.41	7.59	7.82	7.94	8	8.08	8.16
Acidity Median	6.14	6.28	6.41	6.49	5.14	4.6	4.84	5.13	5.37	5.57	5.77	5.97
Acidity 95th Percentile	26.4	26	25.7	25.6	21.3	20.3	20.3	20.3	19.8	19.4	19.1	18.8

(continued)

Table 3.4-1. Summary Statistics of Base Case Predicted TSF D Supernatant Water Quality, Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L) ***(cont'd)***												
Total Cyanide Min	0.00986	0.00987	0.00987	0.00896	0.00733	0.00824	0.00892	0.00965	0.00986	0.00986	0.00985	0.00986
Total Cyanide Mean	0.0303	0.0273	0.0267	0.0267	0.0234	0.0223	0.0223	0.0225	0.0227	0.0228	0.0231	0.0235
Total Cyanide Median	0.00991	0.00992	0.00992	0.00991	0.00963	0.00984	0.0099	0.0099	0.00989	0.0099	0.00991	0.0099
Total Cyanide 95th Percentile	0.139	0.0944	0.0793	0.0752	0.061	0.055	0.0529	0.0527	0.0524	0.0526	0.0535	0.0548
WAD Cyanide Min	0.00243	0.00243	0.00244	0.00226	0.0019	0.00227	0.00242	0.00244	0.00245	0.00244	0.00243	0.00241
WAD Cyanide Mean	0.00247	0.00247	0.00247	0.00246	0.00238	0.00255	0.00254	0.00248	0.00247	0.00247	0.00247	0.00247
WAD Cyanide Median	0.00247	0.00247	0.00247	0.00247	0.0023	0.0024	0.00247	0.00247	0.00247	0.00247	0.00247	0.00248
WAD Cyanide 95th Percentil	0.0025	0.00249	0.0025	0.00251	0.00302	0.00335	0.00274	0.00249	0.00249	0.00248	0.00248	0.00249
Dissolved Metals (mg/L)												
Aluminum Min	0.065	0.0607	0.0568	0.0533	0.0643	0.0823	0.091	0.089	0.0846	0.0788	0.074	0.0696
Aluminum Mean	0.113	0.109	0.105	0.0987	0.0996	0.12	0.131	0.131	0.126	0.121	0.116	0.112
Aluminum Median	0.113	0.108	0.102	0.0883	0.0937	0.118	0.127	0.126	0.123	0.118	0.114	0.111
Aluminum 95th Percentile	0.177	0.173	0.17	0.169	0.153	0.168	0.18	0.182	0.176	0.17	0.166	0.162
Antimony Min	0.00586	0.00592	0.00595	0.00589	0.00396	0.00385	0.00425	0.00468	0.00502	0.00531	0.00555	0.00574
Antimony Mean	0.0258	0.0258	0.0258	0.0251	0.0207	0.0189	0.0189	0.0192	0.0193	0.0192	0.0191	0.0191
Antimony Median	0.0112	0.0114	0.0116	0.0102	0.00861	0.00819	0.00865	0.00936	0.00994	0.0104	0.0107	0.011
Antimony 95th Percentile	0.111	0.11	0.109	0.107	0.0847	0.0742	0.0708	0.07	0.0683	0.0667	0.0655	0.0645
Arsenic Min	0.00213	0.00214	0.00215	0.00214	0.00145	0.00145	0.0016	0.00175	0.00187	0.00196	0.00204	0.0021
Arsenic Mean	0.00846	0.00831	0.00818	0.00788	0.00649	0.00602	0.00606	0.00614	0.00615	0.00611	0.00609	0.00608
Arsenic Median	0.00448	0.00455	0.00462	0.0041	0.00348	0.00318	0.00336	0.0037	0.00396	0.00414	0.00427	0.00438
Arsenic 95th Percentile	0.0289	0.0281	0.0274	0.0269	0.0216	0.0196	0.0191	0.0189	0.0184	0.0178	0.0175	0.0172
Barium Min	0.00678	0.00682	0.00692	0.00704	0.00612	0.00593	0.00614	0.00644	0.00656	0.00663	0.00668	0.00664
Barium Mean	0.0136	0.0136	0.0138	0.0138	0.0118	0.0114	0.0117	0.012	0.0122	0.0122	0.0123	0.0124
Barium Median	0.011	0.0113	0.0116	0.0114	0.00962	0.0093	0.00943	0.0098	0.01	0.0102	0.0103	0.0105
Barium 95th Percentile	0.0303	0.0298	0.0295	0.0296	0.025	0.0243	0.0246	0.0247	0.0243	0.0239	0.0236	0.0234
Beryllium Min	0.0000496	0.0000489	0.0000483	4.74E-05	4.04E-05	4.35E-05	4.78E-05	0.0000502	0.0000502	0.00005	0.0000501	0.0000487
Beryllium Mean	0.0000814	0.0000803	0.0000795	7.68E-05	6.75E-05	7.04E-05	7.53E-05	0.0000772	0.0000773	0.0000768	0.0000766	0.0000764
Beryllium Median	0.0000741	0.0000743	0.0000747	6.73E-05	5.88E-05	0.00006	6.46E-05	0.0000689	0.0000708	0.0000719	0.0000727	0.0000735
Beryllium 95th Percentile	0.000136	0.000133	0.00013	0.000126	0.000117	0.000131	0.000143	0.000146	0.000144	0.000141	0.000139	0.000135
Boron Min	0.00395	0.00402	0.00411	0.00422	0.00354	0.00332	0.00334	0.00351	0.0036	0.00367	0.00376	0.00386
Boron Mean	0.027	0.0265	0.0262	0.0256	0.0229	0.0231	0.0239	0.0238	0.0233	0.0226	0.0221	0.0217
Boron Median	0.00658	0.00661	0.00669	0.00637	0.0055	0.00504	0.0052	0.00542	0.00556	0.00572	0.00594	0.00619
Boron 95th Percentile	0.123	0.12	0.118	0.118	0.107	0.114	0.119	0.118	0.114	0.11	0.107	0.105

(continued)

Table 3.4-1. Summary Statistics of Base Case Predicted TSF D Supernatant Water Quality, Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Cadmium Min	0.0000913	0.0000915	0.0000912	9.01E-05	6.06E-05	0.000061	6.82E-05	0.000075	0.0000802	0.0000843	0.0000876	0.00009
Cadmium Mean	0.000691	0.000682	0.000675	0.000659	0.000584	0.000591	0.000614	0.000616	0.000607	0.000593	0.000581	0.000571
Cadmium Median	0.000204	0.000207	0.00021	0.000184	0.000155	0.000147	0.000156	0.000169	0.000179	0.000187	0.000194	0.000199
Cadmium 95th Percentile	0.00313	0.00317	0.00313	0.00314	0.00282	0.00295	0.00306	0.00305	0.00296	0.00286	0.00279	0.00273
Calcium Min	46	47.2	48.4	49.4	40.8	37.7	37.7	39.7	40.9	42	43.4	44.7
Calcium Mean	83.8	85.2	87	86.2	70.4	65	66	68.1	69.9	71.2	72.7	74.5
Calcium Median	73.9	77.3	80.9	81.3	62.8	58.2	58.9	61.7	63.6	65.5	67.7	71
Calcium 95th Percentile	129	128	128	128	106	98.8	98.4	99.3	98.5	97.7	97.5	97.8
Chromium Min	0.000401	0.0004	0.000398	0.000392	0.000277	0.000307	0.000338	0.000358	0.000369	0.00038	0.000391	0.000398
Chromium Mean	0.00142	0.00141	0.00139	0.00135	0.0012	0.00125	0.00133	0.00135	0.00133	0.00131	0.00131	0.0013
Chromium Median	0.000825	0.000837	0.000847	0.000741	0.000633	0.000604	0.000647	0.0007	0.000731	0.000758	0.00079	0.00081
Chromium 95th Percentile	0.00478	0.00469	0.00459	0.00448	0.00438	0.00495	0.0054	0.00548	0.00537	0.00524	0.00505	0.00488
Cobalt Min	0.00158	0.00163	0.00169	0.00174	0.00118	0.00109	0.00115	0.00123	0.00131	0.00139	0.00145	0.00152
Cobalt Mean	0.00724	0.00724	0.00728	0.00717	0.006	0.00565	0.00571	0.00578	0.00581	0.00579	0.00582	0.00587
Cobalt Median	0.00366	0.00378	0.00392	0.00354	0.00307	0.00295	0.00301	0.00312	0.00323	0.00331	0.0034	0.00351
Cobalt 95th Percentile	0.0276	0.0269	0.0265	0.0263	0.022	0.021	0.021	0.0209	0.0204	0.0199	0.0196	0.0194
Copper Min	0.000218	0.000211	0.000205	0.000194	0.000206	0.00023	0.000249	0.000253	0.000247	0.000238	0.00023	0.000224
Copper Mean	0.0561	0.0523	0.0488	0.045	0.0369	0.0326	0.0306	0.0286	0.0266	0.0247	0.023	0.0216
Copper Median	0.000407	0.000401	0.000397	0.000355	0.000355	0.000388	0.000408	0.000419	0.000421	0.000414	0.000408	0.000407
Copper 95th Percentile	0.244	0.23	0.218	0.207	0.162	0.144	0.136	0.131	0.123	0.116	0.11	0.105
Iron Min	0.03	0.0278	0.0271	0.0271	0.0343	0.0397	0.0411	0.0414	0.0402	0.0378	0.0353	0.0327
Iron Mean	0.164	0.162	0.162	0.159	0.142	0.143	0.146	0.148	0.148	0.146	0.144	0.143
Iron Median	0.0851	0.0826	0.0817	0.0732	0.0751	0.0836	0.0872	0.0894	0.09	0.0885	0.0874	0.0861
Iron 95th Percentile	0.596	0.624	0.653	0.671	0.536	0.481	0.467	0.466	0.457	0.449	0.445	0.442
Lead Min	0.0000997	0.0000999	0.0000997	9.87E-05	6.75E-05	0.00007	7.71E-05	0.000083	0.0000881	0.0000922	0.0000957	0.0000985
Lead Mean	0.00625	0.00583	0.00546	0.00503	0.00406	0.00351	0.00325	0.00303	0.00283	0.00263	0.00246	0.00231
Lead Median	0.000199	0.000201	0.000203	0.00018	0.000154	0.000149	0.000156	0.000167	0.000176	0.000183	0.000188	0.000194
Lead 95th Percentile	0.0268	0.0253	0.0239	0.0227	0.0173	0.0147	0.0136	0.0129	0.0122	0.0114	0.0109	0.0103
Magnesium Min	2.83	2.9	2.97	3.01	2.49	2.29	2.3	2.43	2.5	2.59	2.67	2.75
Magnesium Mean	4.96	5.06	5.17	5.14	4.24	3.96	4.03	4.15	4.26	4.34	4.43	4.53
Magnesium Median	4.38	4.55	4.78	4.81	3.75	3.53	3.63	3.77	3.88	3.98	4.1	4.24
Magnesium 95th Percentile	8.21	8.19	8.2	8.26	6.87	6.49	6.51	6.58	6.53	6.48	6.47	6.48

(continued)

Table 3.4-1. Summary Statistics of Base Case Predicted TSF D Supernatant Water Quality, Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Manganese Min	0.38	0.392	0.412	0.436	0.302	0.276	0.284	0.303	0.326	0.342	0.355	0.367
Manganese Mean	0.861	0.877	0.908	0.917	0.754	0.688	0.691	0.711	0.733	0.743	0.754	0.77
Manganese Median	0.857	0.885	0.926	0.851	0.733	0.633	0.64	0.688	0.743	0.784	0.808	0.831
Manganese 95th Percentile	1.53	1.53	1.54	1.57	1.31	1.22	1.21	1.22	1.22	1.21	1.21	1.21
Mercury Min	0.00000289	0.00000283	2.83E-06	2.82E-06	2.67E-06	2.97E-06	3.11E-06	3.12E-06	0.00000308	0.00000301	0.00000296	0.00000293
Mercury Mean	0.00000623	0.00000614	6.12E-06	5.98E-06	5.48E-06	5.74E-06	5.96E-06	6.02E-06	0.00000596	0.00000586	0.00000579	0.00000575
Mercury Median	0.00000477	0.00000478	4.84E-06	4.83E-06	4.22E-06	4.44E-06	4.59E-06	4.67E-06	0.00000471	0.00000469	0.00000471	0.00000475
Mercury 95th Percentile	0.0000142	0.0000138	0.0000136	1.37E-05	1.25E-05	1.34E-05	0.000014	0.0000141	0.0000138	0.0000134	0.0000132	0.0000129
Molybdenum Min	0.00455	0.00465	0.00475	0.00482	0.00336	0.00314	0.00335	0.00362	0.00386	0.00407	0.00425	0.00442
Molybdenum Mean	0.0161	0.016	0.0161	0.0157	0.0129	0.0119	0.012	0.0123	0.0124	0.0125	0.0126	0.0127
Molybdenum Median	0.00883	0.00904	0.00926	0.0083	0.00713	0.00692	0.00718	0.00753	0.00784	0.00805	0.00827	0.0085
Molybdenum 95th Percentile	0.0575	0.0561	0.055	0.0542	0.0436	0.0396	0.0386	0.0383	0.0375	0.0368	0.0364	0.0361
Nickel Min	0.000671	0.00068	0.000712	0.000738	0.000563	0.000562	0.000585	0.00061	0.000631	0.000644	0.000654	0.000663
Nickel Mean	0.00464	0.00445	0.00432	0.00416	0.00358	0.00343	0.00342	0.00335	0.00324	0.00311	0.00301	0.00292
Nickel Median	0.00119	0.00121	0.00126	0.00118	0.00106	0.00101	0.00103	0.00108	0.00113	0.00114	0.00115	0.00116
Nickel 95th Percentile	0.0181	0.0173	0.0167	0.0164	0.014	0.014	0.0142	0.014	0.0134	0.0128	0.0124	0.012
Phosphorus Min	0.0719	0.0725	0.0728	0.0724	0.0598	0.0574	0.0594	0.0635	0.0658	0.0673	0.0692	0.0708
Phosphorus Mean	0.185	0.185	0.185	0.181	0.157	0.158	0.166	0.17	0.171	0.171	0.171	0.172
Phosphorus Median	0.117	0.119	0.123	0.124	0.0955	0.0896	0.0939	0.0989	0.103	0.107	0.111	0.114
Phosphorus 95th Percentile	0.522	0.508	0.493	0.486	0.469	0.529	0.57	0.579	0.569	0.557	0.546	0.53
Selenium Min	0.000311	0.000309	0.000308	0.000303	0.000254	0.000257	0.000278	0.000298	0.000302	0.000305	0.000308	0.000304
Selenium Mean	0.000575	0.000573	0.000573	0.000556	0.000465	0.00045	0.000468	0.000484	0.000491	0.000493	0.000498	0.000502
Selenium Median	0.000479	0.000487	0.000496	0.000492	0.0004	0.000391	0.000413	0.000432	0.000442	0.00045	0.000462	0.000471
Selenium 95th Percentile	0.00107	0.00105	0.00103	0.00101	0.000813	0.000747	0.000742	0.000749	0.000738	0.000727	0.00072	0.000714
Silver Min	0.0000203	0.0000199	0.0000196	1.91E-05	1.67E-05	1.87E-05	2.07E-05	0.0000213	0.0000213	0.000021	0.0000208	0.0000201
Silver Mean	0.000037	0.0000369	0.0000369	3.59E-05	3.12E-05	3.18E-05	3.36E-05	0.0000345	0.0000347	0.0000346	0.0000347	0.0000347
Silver Median	0.000033	0.000033	0.000033	3.24E-05	2.74E-05	2.83E-05	3.01E-05	0.0000314	0.0000317	0.0000318	0.0000321	0.0000323
Silver 95th Percentile	0.000071	0.0000721	0.0000714	7.09E-05	5.83E-05	5.56E-05	5.64E-05	0.000057	0.0000562	0.0000554	0.0000549	0.0000545
Thallium Min	0.000067	0.0000667	0.0000663	6.53E-05	4.55E-05	4.92E-05	5.48E-05	0.0000588	0.0000617	0.0000638	0.0000655	0.0000666
Thallium Mean	0.000271	0.000267	0.000263	0.000255	0.000228	0.000236	0.00025	0.000254	0.000252	0.000247	0.000244	0.000241
Thallium Median	0.000139	0.000141	0.000143	0.000125	0.000105	0.000099	0.000106	0.000116	0.000124	0.000128	0.000133	0.000137
Thallium 95th Percentile	0.000965	0.00093	0.0009	0.000892	0.000892	0.00099	0.00107	0.00108	0.00106	0.00103	0.00101	0.000991

(continued)

Table 3.4-1. Summary Statistics of Base Case Predicted TSF D Supernatant Water Quality, Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Uranium Min	0.000352	0.000359	0.000367	0.000373	0.000262	0.000272	0.000292	0.000306	0.000318	0.000329	0.000337	0.000345
Uranium Mean	0.00215	0.00212	0.00209	0.00205	0.00183	0.00187	0.00196	0.00196	0.00192	0.00188	0.00184	0.00182
Uranium Median	0.000821	0.000845	0.000872	0.000795	0.000695	0.00066	0.000682	0.000719	0.000748	0.000761	0.000777	0.000797
Uranium 95th Percentile	0.00873	0.00849	0.0083	0.00836	0.00781	0.00854	0.00903	0.00909	0.00888	0.00865	0.00845	0.00828
Zinc Min	0.0257	0.0265	0.0274	0.028	0.0192	0.0183	0.0192	0.0206	0.0218	0.0228	0.0238	0.0248
Zinc Mean	0.0737	0.0743	0.0754	0.0742	0.0615	0.0576	0.0584	0.0595	0.0601	0.0603	0.0609	0.0617
Zinc Median	0.0576	0.0597	0.0619	0.056	0.0476	0.0421	0.0432	0.0466	0.0498	0.0522	0.054	0.0557
Zinc 95th Percentile	0.189	0.187	0.185	0.185	0.157	0.151	0.152	0.152	0.149	0.145	0.143	0.142

Table 3.4-2. Summary Statistics of Base Case Predicted TSF D Spillway Water Quality, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Alkalinity Min	48.3	49.3	49.8	46.8	14	17.7	27.3	35.7	46.4	40.6	41.9	43.9
Alkalinity Mean	70.2	73.1	78	67.4	36.6	33.2	34.9	49.3	65.7	62.7	64.1	65.8
Alkalinity Median	86.5	86.6	86.8	51.7	38.8	33.5	34.8	46.4	73.1	53.8	50	61.9
Alkalinity 95th Percentile	88	88	88.1	88	42	38.6	45	71.5	84.4	86.8	87.6	87.8
Chloride Min	3.91	4.12	4.17	1.66	1	1.71	1.58	1.84	3.36	3.23	3.13	3.6
Chloride Mean	18.4	19.5	21.5	15.6	8.07	7.45	6.08	9.98	14.6	16.1	16.7	17.4
Chloride Median	16.6	18.9	22.9	12.2	8.75	7.82	6.04	8.98	13	13.7	13.4	15.4
Chloride 95th Percentile	30.9	31	31	30.8	12.2	11.2	11	20.4	27	29.3	30.4	30.6
Fluoride Min	0.0168	0.0168	0.0169	0.0169	0.0386	0.0317	0.0366	0.0182	0.0188	0.0172	0.0168	0.017
Fluoride Mean	0.0288	0.0274	0.0248	0.035	0.0422	0.0327	0.0433	0.0205	0.0324	0.0311	0.0298	0.0301
Fluoride Median	0.0216	0.0213	0.0206	0.0417	0.0415	0.0327	0.0428	0.0207	0.03	0.0343	0.0361	0.0321
Fluoride 95th Percentile	0.0412	0.0408	0.0405	0.0594	0.0492	0.0328	0.0472	0.0213	0.0428	0.0421	0.0398	0.0422
Sulphate Min	513	543	553	160	51	156	141	194	374	432	411	474
Sulphate Mean	1300	1390	1560	1110	469	419	379	694	1030	1120	1170	1220
Sulphate Median	1820	1830	1860	585	517	427	402	562	1230	908	777	1100
Sulphate 95th Percentile	1920	1920	1920	1920	588	534	662	1380	1760	1880	1910	1910
Ammonia as N Min	0.682	0.903	0.924	0.0745	0.0631	0.0635	0.135	0.403	0.3	0.197	0.215	0.512
Ammonia as N Mean	12.4	13.8	16.5	11.2	0.493	0.274	2.57	6.52	10.4	10.3	10.8	11.3
Ammonia as N Median	21.6	22	22	2.7	0.743	0.0929	1.65	6.39	14.4	6.5	4.07	9.28
Ammonia as N 95th Percenti	22	22	22	22	0.801	0.936	7.41	15.8	20.4	21.7	22	22
Nitrate as N Min	2.92	3	3.06	0.354	0.115	0.338	0.352	0.443	0.795	2.49	2.44	2.74
Nitrate as N Mean	4.21	4.34	4.55	3.44	2.75	2.57	1.57	2.29	3.21	3.79	3.89	4.07
Nitrate as N Median	3.89	4.05	4.25	3.59	2.96	2.61	1.5	2.36	3.12	3.47	3.64	3.77
Nitrate as N 95th Percentile	6.43	6.5	6.56	6.39	3.59	3.42	3.04	3.92	5.17	5.97	6.23	6.3
Nitrite as N Min	0.00248	0.00258	0.00175	0.00245	0.00246	0.00155	0.00153	0.00159	0.00157	0.00155	0.00155	0.00162
Nitrite as N Mean	0.00494	0.00527	0.0056	0.00492	0.00268	0.0016	0.00213	0.00311	0.00407	0.00404	0.00416	0.00428
Nitrite as N Median	0.00679	0.00683	0.00685	0.00378	0.00263	0.00156	0.00191	0.00305	0.00503	0.00309	0.00251	0.0038
Nitrite as N 95th Percentile	0.00705	0.00706	0.00707	0.00707	0.00323	0.00177	0.00337	0.00548	0.00657	0.00691	0.007	0.00702
Acidity Min	0.988	0.988	0.988	0.085	0.0266	0.086	0.207	0.246	0.219	0.718	0.924	0.982
Acidity Mean	4.35	4.08	3.5	3.1	5.43	4.99	2.28	2.41	2.92	4.21	4.24	4.46
Acidity Median	4.12	3.65	2.78	2.5	5.87	5.16	0.977	1.23	2.08	4.98	5.1	4.77
Acidity 95th Percentile	7.67	7.55	7.36	6.86	7.19	6.68	6.16	6.45	6.71	7.25	7.08	7.51

(continued)

Table 3.4-2. Summary Statistics of Base Case Predicted TSF D Spillway Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L) ***(cont'd)***												
Total Cyanide Min	0.012	0.0128	0.0128	0.00956	0.00838	0.00845	0.0081	0.0105	0.01	0.0095	0.00902	0.0109
Total Cyanide Mean	0.0779	0.0858	0.101	0.0697	0.012	0.00986	0.0204	0.0425	0.0652	0.0659	0.069	0.0717
Total Cyanide Median	0.0859	0.0974	0.118	0.0209	0.0118	0.00937	0.0134	0.0356	0.0628	0.0471	0.0333	0.0648
Total Cyanide 95th Percentile	0.158	0.159	0.159	0.158	0.0153	0.0121	0.051	0.105	0.139	0.15	0.156	0.157
WAD Cyanide Min	0.00268	0.00274	0.00275	0.00243	0.0024	0.00233	0.00241	0.00258	0.00253	0.0025	0.00252	0.00261
WAD Cyanide Mean	0.00663	0.00711	0.00803	0.00623	0.00257	0.0025	0.00333	0.00467	0.00597	0.00592	0.0061	0.00625
WAD Cyanide Median	0.00973	0.00987	0.00988	0.0034	0.00261	0.00242	0.00305	0.00464	0.00733	0.00463	0.00382	0.00557
WAD Cyanide 95th Percentil	0.00988	0.00988	0.00988	0.00988	0.0027	0.00279	0.00498	0.00779	0.00932	0.00975	0.00985	0.00987
Dissolved Metals (mg/L)												
Aluminum Min	0.00656	0.00648	0.00649	0.00649	0.0853	0.0914	0.0641	0.0211	0.00846	0.00716	0.00661	0.00661
Aluminum Mean	0.0116	0.00986	0.00999	0.0161	0.117	0.116	0.0901	0.0482	0.0172	0.0204	0.0193	0.0152
Aluminum Median	0.0128	0.00938	0.00946	0.0206	0.105	0.113	0.0943	0.0489	0.0169	0.0236	0.0248	0.0155
Aluminum 95th Percentile	0.0133	0.0132	0.0133	0.0219	0.214	0.137	0.1	0.0625	0.0226	0.0291	0.0278	0.02
Antimony Min	0.0084	0.0084	0.0084	0.000746	0.000254	0.000757	0.000885	0.00113	0.00183	0.00608	0.00781	0.0083
Antimony Mean	0.0123	0.0125	0.0126	0.00974	0.00918	0.00828	0.00481	0.00667	0.0091	0.0112	0.0115	0.012
Antimony Median	0.0117	0.0119	0.0121	0.0105	0.0101	0.00845	0.00444	0.00649	0.00969	0.0105	0.0107	0.0113
Antimony 95th Percentile	0.0182	0.0184	0.0186	0.018	0.0114	0.0105	0.00995	0.0115	0.0145	0.0168	0.0175	0.0177
Arsenic Min	0.0005	0.000426	0.000471	0.000711	0.000307	0.00025	0.000405	0.000479	0.000472	0.000464	0.000418	0.00044
Arsenic Mean	0.00145	0.00153	0.00177	0.00148	0.000338	0.000269	0.000608	0.000977	0.0013	0.00129	0.0013	0.00133
Arsenic Median	0.00214	0.00215	0.00218	0.000905	0.000352	0.000253	0.00053	0.000961	0.0016	0.000984	0.000744	0.00115
Arsenic 95th Percentile	0.0023	0.00231	0.00231	0.0023	0.000361	0.000331	0.00104	0.00176	0.00213	0.00225	0.00227	0.00228
Barium Min	0.00802	0.00798	0.00791	0.00911	0.00522	0.00414	0.00548	0.0067	0.00792	0.00657	0.00668	0.00759
Barium Mean	0.0164	0.0173	0.0193	0.0163	0.00567	0.00503	0.00745	0.0114	0.015	0.0143	0.0147	0.0154
Barium Median	0.023	0.0231	0.0231	0.0109	0.00571	0.00501	0.00668	0.0113	0.0177	0.0114	0.00964	0.014
Barium 95th Percentile	0.0234	0.0234	0.0235	0.0235	0.00604	0.00539	0.0114	0.0185	0.0221	0.0231	0.0233	0.0234
Beryllium Min	0.00000705	0.00000705	7.06E-06	7.54E-06	4.79E-05	4.63E-05	3.34E-05	0.0000176	0.00001	0.00000788	0.00000721	0.00000708
Beryllium Mean	0.0000294	0.0000271	0.0000225	3.14E-05	4.92E-05	4.96E-05	4.57E-05	0.0000392	0.0000327	0.0000329	0.0000321	0.0000313
Beryllium Median	0.000017	0.0000167	0.0000158	4.52E-05	4.89E-05	4.99E-05	4.74E-05	0.0000399	0.0000278	0.0000391	0.0000433	0.0000341
Beryllium 95th Percentile	0.0000488	0.0000483	0.0000475	4.98E-05	4.99E-05	4.99E-05	4.98E-05	0.0000491	0.0000495	0.0000496	0.0000495	0.0000491
Boron Min	0.00758	0.00801	0.0081	0.00388	0.00131	0.00285	0.00255	0.00353	0.00565	0.00636	0.00614	0.00706
Boron Mean	0.0198	0.0213	0.024	0.0174	0.00651	0.00578	0.00585	0.0109	0.016	0.017	0.0177	0.0185
Boron Median	0.0274	0.0276	0.0281	0.00806	0.00725	0.0058	0.00571	0.00891	0.0186	0.0134	0.0112	0.0168
Boron 95th Percentile	0.032	0.032	0.0321	0.0319	0.00799	0.00702	0.0111	0.0218	0.028	0.0304	0.0314	0.0316

(continued)

Table 3.4-2. Summary Statistics of Base Case Predicted TSF D Spillway Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) *(cont'd)*												
Cadmium Min	0.00000922	0.00000968	9.74E-06	8.1E-06	9.94E-06	7.68E-06	7.69E-06	8.32E-06	0.00000869	0.0000083	0.00000842	0.00000883
Cadmium Mean	0.0000248	0.0000267	0.0000302	0.000023	1.05E-05	8.41E-06	1.12E-05	0.0000165	0.0000218	0.0000219	0.0000226	0.0000234
Cadmium Median	0.0000361	0.0000363	0.0000366	1.12E-05	1.08E-05	8.14E-06	9.75E-06	0.000016	0.0000267	0.000017	0.000014	0.000021
Cadmium 95th Percentile	0.000038	0.000038	0.0000381	0.000038	0.000011	9.86E-06	1.77E-05	0.0000292	0.0000352	0.0000371	0.0000376	0.0000378
Calcium Min	70.9	75.4	76.5	36.9	11.9	28.4	27.3	37.6	59.7	58.9	57.3	65.5
Calcium Mean	196	211	239	172	60.1	52.2	56.8	107	160	168	175	183
Calcium Median	291	295	295	75.4	67.5	51.7	51.3	91.1	197	130	107	164
Calcium 95th Percentile	295	295	295	295	75.1	63.8	105	214	274	290	294	295
Chromium Min	0.0000872	0.0000872	0.0000872	8.73E-05	0.000204	0.000185	0.00013	0.000102	0.0000908	0.0000893	0.0000876	0.0000872
Chromium Mean	0.000202	0.000188	0.000161	0.000175	0.000293	0.000279	0.000194	0.000179	0.000174	0.000216	0.000214	0.00021
Chromium Median	0.000117	0.000115	0.000111	0.000143	0.000303	0.000281	0.000151	0.000139	0.000127	0.000251	0.000283	0.00024
Chromium 95th Percentile	0.00033	0.000313	0.000315	0.000314	0.000322	0.000309	0.000296	0.000295	0.000303	0.000338	0.000334	0.000332
Cobalt Min	0.00115	0.00139	0.00141	0.000508	0.000431	0.000396	0.000521	0.000891	0.000719	0.000603	0.000624	0.000966
Cobalt Mean	0.0128	0.0142	0.0169	0.0115	0.000897	0.000635	0.00276	0.00674	0.0107	0.0107	0.0112	0.0117
Cobalt Median	0.0219	0.0224	0.0224	0.00274	0.000962	0.000526	0.00169	0.00649	0.0146	0.00692	0.00453	0.00971
Cobalt 95th Percentile	0.0224	0.0224	0.0224	0.0224	0.00126	0.00117	0.00754	0.0161	0.0207	0.022	0.0223	0.0224
Copper Min	0.0000792	0.0000754	0.0000832	8.37E-05	0.000266	0.000255	0.000201	0.000118	0.0000867	0.0000524	0.0000743	0.0000836
Copper Mean	0.0000906	0.0000902	0.0000991	0.000148	0.000372	0.000288	0.000255	0.000189	0.000115	0.0000742	0.0000864	0.000146
Copper Median	0.0000861	0.0000893	0.0000995	0.000187	0.000365	0.000289	0.000263	0.000191	0.000115	0.0000657	0.0000792	0.000156
Copper 95th Percentile	0.000108	0.000108	0.000108	0.000196	0.000459	0.000291	0.000274	0.000224	0.000128	0.000105	0.000107	0.000194
Iron Min	0.0253	0.0244	0.0208	0.0357	0.0529	0.0535	0.0602	0.0601	0.0445	0.0555	0.0441	0.0273
Iron Mean	0.048	0.0503	0.0548	0.0515	0.078	0.0741	0.0663	0.0678	0.055	0.0607	0.055	0.047
Iron Median	0.0639	0.0643	0.0652	0.0401	0.0733	0.0731	0.0663	0.0681	0.058	0.0591	0.0481	0.0431
Iron 95th Percentile	0.0691	0.0692	0.0692	0.0691	0.119	0.0802	0.0671	0.0686	0.066	0.0681	0.0687	0.0689
Lead Min	0.0000268	0.0000273	0.0000274	3.32E-05	2.54E-05	2.51E-05	2.53E-05	0.000026	0.000076	0.0000271	0.0000827	0.0000289
Lead Mean	0.0000589	0.0000629	0.0000703	5.97E-05	2.65E-05	2.57E-05	0.000032	0.0000428	0.00008	0.000054	0.0000952	0.0000572
Lead Median	0.0000828	0.0000831	0.000084	3.98E-05	0.000027	2.52E-05	2.94E-05	0.0000423	0.00008	0.0000433	0.000101	0.0000507
Lead 95th Percentile	0.000087	0.0000871	0.0000871	0.000087	2.72E-05	2.76E-05	4.58E-05	0.0000693	0.0000852	0.0000854	0.000104	0.0000869
Magnesium Min	3.82	3.98	4.03	3.44	1.14	1.78	1.99	2.88	3.45	3.34	3.36	3.62
Magnesium Mean	9.43	10.1	11.4	8.68	3.25	2.85	3.23	5.7	8.11	8.25	8.55	8.86
Magnesium Median	13.8	14	14	4.13	3.52	2.83	2.86	5.17	9.91	6.43	5.36	8.01
Magnesium 95th Percentile	14	14	14	14	3.9	3.39	5.43	10.4	13	13.7	13.9	13.9

(continued)

Table 3.4-2. Summary Statistics of Base Case Predicted TSF D Spillway Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) *(cont'd)*												
Manganese Min	0.153	0.204	0.208	0.0163	0.0147	0.0138	0.0306	0.0919	0.0683	0.0444	0.0492	0.115
Manganese Mean	2.91	3.25	3.89	2.63	0.116	0.0637	0.604	1.53	2.45	2.41	2.54	2.65
Manganese Median	4.96	4.98	5.03	0.652	0.17	0.0217	0.384	1.48	3.32	1.53	0.957	2.13
Manganese 95th Percentile	5.43	5.46	5.46	5.43	0.2	0.229	1.81	3.81	4.85	5.21	5.37	5.39
Mercury Min	0.00000337	0.00000338	4.24E-06	3.53E-06	3.34E-06	2.91E-06	3.26E-06	3.32E-06	0.00000329	0.00000328	0.00000328	0.00000391
Mercury Mean	0.00000794	0.00000848	9.76E-06	7.6E-06	4.68E-06	3.04E-06	4.21E-06	5.72E-06	0.00000719	0.00000715	0.00000735	0.00000787
Mercury Median	0.00000694	0.00000812	0.0000103	4.77E-06	4.59E-06	2.97E-06	3.81E-06	5.15E-06	0.00000686	0.00000585	0.00000491	0.00000676
Mercury 95th Percentile	0.0000144	0.0000145	0.0000145	1.43E-05	5.76E-06	3.4E-06	6.53E-06	0.0000104	0.0000129	0.0000137	0.0000142	0.0000143
Molybdenum Min	0.00796	0.00835	0.00855	0.00266	0.000741	0.00212	0.00206	0.00286	0.00543	0.0068	0.0065	0.00742
Molybdenum Mean	0.0165	0.0175	0.0194	0.0141	0.00673	0.00593	0.00513	0.00899	0.0132	0.0144	0.0149	0.0156
Molybdenum Median	0.0228	0.023	0.0231	0.00828	0.0075	0.00599	0.0058	0.00742	0.0153	0.0119	0.0106	0.0145
Molybdenum 95th Percentile	0.0231	0.0231	0.0231	0.0231	0.00844	0.00734	0.00816	0.0167	0.0214	0.0227	0.023	0.023
Nickel Min	0.000191	0.000242	0.000262	0.000122	0.000242	0.000234	0.000198	0.000282	0.000134	0.0000842	0.000138	0.000155
Nickel Mean	0.00274	0.00305	0.00364	0.00251	0.000334	0.000278	0.000713	0.00157	0.00232	0.00227	0.00241	0.00249
Nickel Median	0.00474	0.00482	0.00482	0.000687	0.000388	0.00024	0.000518	0.00154	0.00319	0.00145	0.000966	0.00206
Nickel 95th Percentile	0.00483	0.00484	0.00484	0.00484	0.0004	0.000417	0.00174	0.00353	0.00448	0.00476	0.00482	0.00483
Phosphorus Min	0.00178	0.00173	0.0018	0.00211	0.00851	0.00483	0.0037	0.00254	0.00205	0.00191	0.00179	0.00183
Phosphorus Mean	0.00341	0.00327	0.00298	0.00368	0.00869	0.00509	0.00461	0.00405	0.00352	0.00358	0.00354	0.00352
Phosphorus Median	0.00224	0.00225	0.00231	0.00468	0.00867	0.00512	0.00475	0.00406	0.00295	0.0041	0.00445	0.00378
Phosphorus 95th Percentile	0.0049	0.00486	0.0048	0.00499	0.00875	0.00512	0.00498	0.00492	0.00496	0.00496	0.00495	0.00493
Selenium Min	0.000268	0.000269	0.000269	0.000221	0.000218	0.000211	0.000286	0.000273	0.000268	0.000267	0.000267	0.000268
Selenium Mean	0.000348	0.000341	0.000324	0.00031	0.000374	0.000355	0.000329	0.000324	0.000324	0.000349	0.000349	0.000352
Selenium Median	0.000303	0.000303	0.000295	0.000296	0.000389	0.000357	0.000301	0.0003	0.000297	0.000372	0.000385	0.000371
Selenium 95th Percentile	0.000445	0.000435	0.000431	0.00041	0.000416	0.000398	0.000409	0.000404	0.000418	0.000442	0.000434	0.000443
Silver Min	0.0000118	0.0000118	0.0000118	1.19E-05	2.08E-05	2.14E-05	1.98E-05	0.0000149	0.0000126	0.000012	0.0000118	0.0000118
Silver Mean	0.0000176	0.0000168	0.0000152	1.84E-05	2.47E-05	2.48E-05	2.35E-05	0.0000211	0.0000188	0.0000188	0.0000185	0.0000183
Silver Median	0.0000121	0.0000119	0.0000119	2.34E-05	2.46E-05	0.000025	0.000024	0.0000212	0.0000164	0.0000211	0.0000226	0.0000195
Silver 95th Percentile	0.0000245	0.0000243	0.000024	2.49E-05	0.000025	0.000025	2.49E-05	0.0000247	0.0000248	0.0000248	0.0000248	0.0000247
Thallium Min	0.0000688	0.0000689	0.0000689	2.88E-05	2.62E-05	2.88E-05	3.06E-05	0.000032	0.0000344	0.0000566	0.0000657	0.0000683
Thallium Mean	0.000108	0.000105	0.0000981	0.000086	0.000112	0.000104	6.39E-05	0.0000704	0.0000825	0.000103	0.000105	0.000109
Thallium Median	0.000104	0.0000989	0.0000889	8.59E-05	0.000122	0.000106	0.000047	0.0000582	0.0000745	0.000114	0.000111	0.000115
Thallium 95th Percentile	0.000149	0.000146	0.000144	0.000131	0.000134	0.000127	0.000122	0.000122	0.00013	0.000145	0.00014	0.000147

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Table 3.4-2. Summary Statistics of Base Case Predicted TSF D Spillway Water Quality, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Uranium Min	0.000836	0.000885	0.000899	0.00054	0.000241	0.000476	0.000417	0.000518	0.000721	0.000686	0.000677	0.00077
Uranium Mean	0.00268	0.00291	0.00333	0.00238	0.000727	0.00064	0.000788	0.00148	0.00222	0.0023	0.00239	0.00249
Uranium Median	0.00388	0.0039	0.00397	0.00091	0.000787	0.000625	0.000624	0.00126	0.00266	0.00174	0.00138	0.00222
Uranium 95th Percentile	0.00451	0.00452	0.00453	0.0045	0.000889	0.000756	0.0016	0.00309	0.00397	0.00429	0.00444	0.00446
Zinc Min	0.0126	0.0204	0.0171	0.00233	0.00376	0.00332	0.00349	0.0103	0.00543	0.00442	0.00533	0.00888
Zinc Mean	0.206	0.231	0.274	0.186	0.0108	0.00678	0.0436	0.11	0.172	0.171	0.18	0.187
Zinc Median	0.358	0.363	0.363	0.0457	0.015	0.00381	0.0284	0.108	0.239	0.108	0.0688	0.153
Zinc 95th Percentile	0.366	0.366	0.366	0.366	0.016	0.0177	0.124	0.264	0.339	0.359	0.364	0.365

Table 3.4-3. Summary Statistics of Base Case Predicted Downstream Plunge Pool Water Quality, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Alkalinity Min	99.2	101	100	61	49.4	36.4	51.7	88	86.2	73.6	77.9	93.6
Alkalinity Mean	113	113	112	126	71.2	50	78.3	101	113	106	108	110
Alkalinity Median	116	115	114	144	61.7	44.6	80	101	116	115	114	114
Alkalinity 95th Percentile	121	119	118	152	119	70.7	101	116	124	125	123	121
Chloride Min	6.44	6.76	6.86	3.44	2.89	2.45	3.64	5.44	5.13	4.71	4.79	6.11
Chloride Mean	10.1	10.4	10.6	9.68	6.56	5.27	6.53	8.32	9.08	9.29	9.48	9.85
Chloride Median	10.3	10.5	10.7	9.85	6.71	5.35	6.47	8.31	9.21	9.45	9.63	9.99
Chloride 95th Percentile	12.1	12.4	12.6	12.3	9.03	7.09	9.1	10.5	10.9	11.4	11.6	11.9
Fluoride Min	0.0353	0.0359	0.0368	0.0364	0.041	0.0302	0.0369	0.0207	0.0339	0.0336	0.032	0.0363
Fluoride Mean	0.0371	0.0378	0.0391	0.0407	0.0429	0.0317	0.0404	0.0208	0.0357	0.0357	0.0335	0.0384
Fluoride Median	0.0369	0.0376	0.039	0.0395	0.0427	0.0319	0.0405	0.0208	0.0355	0.0351	0.033	0.0382
Fluoride 95th Percentile	0.0394	0.0403	0.0418	0.0463	0.0446	0.0322	0.0428	0.0209	0.0386	0.0386	0.0352	0.0409
Sulphate Min	79.2	80.5	80.2	64.2	30	46.2	41.6	61.9	72	74.5	76	77.8
Sulphate Mean	101	94	90.4	141	259	165	84.1	85.3	95.7	134	118	109
Sulphate Median	85.3	85.7	84.9	84	282	170	64.9	72.5	78	82.6	90.8	84.4
Sulphate 95th Percentile	138	125	111	353	357	249	187	139	206	225	184	153
Ammonia as N Min	2.59	2.76	2.81	0.535	0.372	0.46	0.875	2.2	1.79	1.42	1.62	2.39
Ammonia as N Mean	3.25	3.36	3.43	2.75	0.736	0.879	1.96	2.75	2.97	2.76	2.93	3.11
Ammonia as N Median	3.39	3.46	3.51	3.34	0.591	0.695	2.08	2.73	3.13	3.18	3.2	3.32
Ammonia as N 95th Percenti	3.62	3.65	3.68	3.63	1.58	1.61	2.74	3.28	3.43	3.49	3.52	3.58
Nitrate as N Min	1.24	1.24	1.22	1.26	0.546	0.675	0.523	0.802	0.979	1.08	1.14	1.17
Nitrate as N Mean	1.48	1.49	1.52	1.64	1.79	1.25	0.966	1.14	1.27	1.48	1.44	1.45
Nitrate as N Median	1.44	1.45	1.48	1.51	1.91	1.23	0.893	1.1	1.21	1.46	1.41	1.42
Nitrate as N 95th Percentile	1.77	1.81	1.85	2.32	2.35	1.83	1.44	1.57	1.66	1.94	1.74	1.75
Nitrite as N Min	0.00444	0.00476	0.00385	0.00299	0.00295	0.00191	0.0022	0.00329	0.00296	0.00265	0.00282	0.00344
Nitrite as N Mean	0.00493	0.00519	0.00438	0.00463	0.00324	0.00226	0.00309	0.00374	0.00393	0.00376	0.00389	0.00404
Nitrite as N Median	0.00505	0.00526	0.00445	0.00506	0.00311	0.0021	0.00319	0.00373	0.00406	0.0041	0.00412	0.00422
Nitrite as N 95th Percentile	0.00521	0.0054	0.0046	0.00523	0.00394	0.00286	0.00374	0.00419	0.00431	0.00436	0.00439	0.00444
Acidity Min	6.05	5.95	5.86	5.05	5.81	3.39	3.77	5.85	5.96	5.72	5.58	6.14
Acidity Mean	7.48	7.3	7.14	9.92	7.64	4.52	5.43	7.02	7.57	7.77	7.73	7.67
Acidity Median	7.45	7.28	7.12	10.8	7.12	4.35	5.27	6.93	7.53	7.86	7.8	7.67
Acidity 95th Percentile	8.65	8.41	8.22	12.4	11.6	5.87	7.58	8.6	8.91	9.28	9.18	8.95

(continued)

Table 3.4-3. Summary Statistics of Base Case Predicted Downstream Plunge Pool Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L) ***(cont'd)***												
Total Cyanide Min	0.0303	0.0319	0.0324	0.0125	0.0118	0.0104	0.014	0.0264	0.0233	0.0199	0.0212	0.0285
Total Cyanide Mean	0.0371	0.0382	0.039	0.0326	0.015	0.0141	0.0241	0.0317	0.0341	0.0326	0.034	0.0358
Total Cyanide Median	0.0382	0.0391	0.0396	0.038	0.0136	0.0125	0.0248	0.0313	0.0353	0.0359	0.0364	0.0374
Total Cyanide 95th Percentile	0.0411	0.0415	0.0418	0.0414	0.0223	0.0203	0.0322	0.0373	0.039	0.0396	0.0401	0.0406
WAD Cyanide Min	0.00556	0.00577	0.00583	0.00306	0.00278	0.00294	0.00348	0.00509	0.0046	0.00414	0.0044	0.00532
WAD Cyanide Mean	0.00638	0.00652	0.00661	0.00578	0.00331	0.00349	0.00481	0.00577	0.00604	0.00579	0.00599	0.00621
WAD Cyanide Median	0.00655	0.00665	0.00671	0.00651	0.00312	0.00327	0.00496	0.00575	0.00623	0.00629	0.00632	0.00646
WAD Cyanide 95th Percentil	0.00684	0.00687	0.00693	0.00687	0.00436	0.00441	0.00578	0.00642	0.00661	0.00669	0.00672	0.00679
Dissolved Metals (mg/L)												
Aluminum Min	0.000601	0.000491	0.000408	0.00226	0.0412	0.0222	0.00728	0.00202	0.00128	0.00123	0.000956	0.000803
Aluminum Mean	0.0013	0.00082	0.000626	0.00673	0.0696	0.0517	0.0189	0.00571	0.00284	0.00548	0.00397	0.00232
Aluminum Median	0.000745	0.000597	0.000486	0.004	0.0718	0.0583	0.0148	0.00356	0.0019	0.002	0.00195	0.00114
Aluminum 95th Percentile	0.00269	0.00163	0.00119	0.0171	0.0839	0.0673	0.0432	0.0135	0.0088	0.013	0.00883	0.00489
Antimony Min	0.000368	0.000355	0.000343	0.000438	0.00041	0.000327	0.000323	0.000328	0.000373	0.000396	0.000393	0.000387
Antimony Mean	0.000922	0.00071	0.00059	0.00208	0.00527	0.00311	0.00107	0.000815	0.00095	0.00187	0.00145	0.00117
Antimony Median	0.000497	0.000468	0.000423	0.000616	0.00572	0.00322	0.000439	0.000445	0.000467	0.000599	0.00075	0.000535
Antimony 95th Percentile	0.00197	0.0016	0.00122	0.00708	0.00727	0.00482	0.0035	0.00208	0.00369	0.00418	0.00314	0.00238
Arsenic Min	0.000223	0.000198	0.000193	0.000353	0.000315	0.000252	0.000287	0.000275	0.000262	0.000263	0.000245	0.000231
Arsenic Mean	0.000247	0.000212	0.000208	0.000445	0.000359	0.000259	0.000321	0.000304	0.000289	0.000303	0.000273	0.000254
Arsenic Median	0.000238	0.000207	0.000204	0.000387	0.000351	0.000256	0.000317	0.000305	0.000281	0.000281	0.000261	0.000244
Arsenic 95th Percentile	0.000285	0.000236	0.000234	0.000644	0.000443	0.000271	0.000351	0.000332	0.000353	0.000366	0.00031	0.000286
Barium Min	0.00132	0.00124	0.00117	0.00138	0.00278	0.00231	0.00189	0.00165	0.00163	0.00135	0.0013	0.00134
Barium Mean	0.00196	0.00173	0.00158	0.0033	0.0043	0.00355	0.00301	0.00242	0.00248	0.00241	0.0022	0.00211
Barium Median	0.00172	0.00154	0.00146	0.00211	0.00449	0.00376	0.00286	0.00245	0.0022	0.00182	0.0018	0.00177
Barium 95th Percentile	0.00301	0.00264	0.00233	0.00749	0.00464	0.00405	0.00394	0.00317	0.00456	0.00413	0.00343	0.00322
Beryllium Min	0.00000707	0.00000666	6.27E-06	6.37E-06	2.62E-05	2.66E-05	1.58E-05	0.0000111	0.00000907	0.00000851	0.00000799	0.00000752
Beryllium Mean	0.0000115	0.0000102	9.27E-06	1.73E-05	0.000041	3.97E-05	2.69E-05	0.0000175	0.0000148	0.0000173	0.0000153	0.0000132
Beryllium Median	0.00000984	0.00000889	8.41E-06	1.05E-05	0.000043	4.19E-05	2.54E-05	0.0000177	0.000013	0.0000124	0.0000121	0.0000107
Beryllium 95th Percentile	0.0000188	0.0000167	0.0000147	0.000041	4.41E-05	4.43E-05	3.61E-05	0.0000237	0.0000287	0.0000312	0.0000252	0.0000212
Boron Min	0.000498	0.000491	0.000487	0.000679	0.000619	0.000558	0.000516	0.000563	0.000507	0.000507	0.000504	0.00057
Boron Mean	0.00083	0.000702	0.000632	0.00175	0.0036	0.00233	0.00099	0.000854	0.000851	0.00139	0.00114	0.00106
Boron Median	0.000557	0.000542	0.000524	0.00079	0.00386	0.00245	0.000595	0.000619	0.000548	0.000628	0.000717	0.000675
Boron 95th Percentile	0.00148	0.00126	0.00103	0.00495	0.00474	0.00338	0.00249	0.00164	0.00254	0.00282	0.00217	0.00182

(continued)

Table 3.4-3. Summary Statistics of Base Case Predicted Downstream Plunge Pool Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Cadmium Min	0.00000501	0.00000478	4.52E-06	7.55E-06	1.02E-05	7.62E-06	6.52E-06	6.15E-06	0.00000595	0.00000602	0.0000058	0.00000545
Cadmium Mean	0.0000054	0.00000505	4.76E-06	7.84E-06	1.11E-05	7.82E-06	6.89E-06	6.42E-06	0.00000623	0.00000651	0.00000622	0.00000582
Cadmium Median	0.00000524	0.00000493	4.67E-06	7.81E-06	1.09E-05	7.77E-06	6.81E-06	6.39E-06	0.00000611	0.00000618	0.000006	0.00000562
Cadmium 95th Percentile	0.00000587	0.00000551	5.16E-06	8.11E-06	0.000013	8.19E-06	7.16E-06	6.75E-06	0.00000699	0.00000726	0.00000677	0.00000635
Calcium Min	6.01	5.95	5.9	5.78	4.22	4.18	5	5.44	6.07	5.74	5.65	5.74
Calcium Mean	9.26	8.08	7.42	15.2	32.2	20.2	9.3	8.02	9.47	13.9	11.6	10.2
Calcium Median	6.54	6.36	6.3	6.35	34.7	21.1	5.81	5.86	6.64	6.96	7.71	6.69
Calcium 95th Percentile	15.5	13.5	11.4	44.8	43.4	30	22.6	15	24.9	27.4	21.2	17.2
Chromium Min	0.0000293	0.0000277	0.0000262	3.25E-05	0.000126	0.00011	5.64E-05	0.0000421	0.0000363	0.0000541	0.0000518	0.0000319
Chromium Mean	0.0000497	0.0000424	0.0000377	8.68E-05	0.000228	0.000189	9.83E-05	0.0000663	0.0000604	0.000107	0.0000951	0.0000594
Chromium Median	0.0000371	0.0000338	0.0000321	4.34E-05	0.000238	0.0002	8.76E-05	0.0000608	0.0000469	0.0000749	0.0000746	0.0000419
Chromium 95th Percentile	0.0000857	0.0000741	0.0000621	0.000235	0.000265	0.000224	0.00016	0.000103	0.000142	0.000188	0.000153	0.0001
Cobalt Min	0.000273	0.000278	0.000275	0.000223	0.000122	0.000157	0.000142	0.000211	0.000245	0.000258	0.000263	0.000269
Cobalt Mean	0.000285	0.000285	0.000286	0.000297	0.000301	0.000217	0.000201	0.000244	0.000264	0.000288	0.000283	0.000285
Cobalt Median	0.000284	0.000284	0.000286	0.000288	0.000328	0.000217	0.0002	0.000244	0.00026	0.000282	0.000284	0.000287
Cobalt 95th Percentile	0.000293	0.000294	0.000296	0.000373	0.000363	0.000273	0.000255	0.000269	0.000294	0.000333	0.000304	0.000299
Copper Min	0.0000132	0.0000119	0.0000141	2.67E-05	0.000249	0.000157	0.000088	0.0000514	0.0000252	0.0000113	0.000014	0.0000307
Copper Mean	0.0000202	0.0000171	0.00002	6.96E-05	0.000337	0.000232	0.000148	0.0000804	0.0000398	0.0000199	0.0000245	0.0000524
Copper Median	0.0000176	0.0000152	0.0000183	0.000043	0.000343	0.000245	0.000141	0.0000814	0.0000351	0.0000152	0.0000199	0.0000429
Copper 95th Percentile	0.0000314	0.0000266	0.0000305	0.000163	0.000362	0.000258	0.000199	0.000108	0.0000738	0.0000338	0.0000386	0.0000835
Iron Min	0.00414	0.00378	0.00316	0.00515	0.0603	0.0471	0.0216	0.0155	0.00863	0.00991	0.00759	0.0047
Iron Mean	0.00622	0.00533	0.00425	0.0128	0.0756	0.065	0.0361	0.0242	0.0137	0.0195	0.0139	0.00761
Iron Median	0.00544	0.00475	0.00393	0.00808	0.0755	0.0673	0.0342	0.0244	0.012	0.0142	0.0111	0.00633
Iron 95th Percentile	0.00961	0.00819	0.00621	0.0296	0.0817	0.0719	0.0482	0.0325	0.0255	0.0349	0.0225	0.0117
Lead Min	0.00000795	0.00000752	7.14E-06	1.13E-05	2.19E-05	1.72E-05	1.23E-05	0.0000103	0.0000182	0.00000966	0.0000211	0.00000889
Lead Mean	0.00000972	0.00000895	8.37E-06	1.67E-05	2.35E-05	2.15E-05	1.64E-05	0.0000128	0.0000263	0.0000131	0.0000355	0.0000115
Lead Median	0.00000905	0.00000842	8.01E-06	1.33E-05	2.36E-05	2.23E-05	1.59E-05	0.0000128	0.0000236	0.0000113	0.0000292	0.0000103
Lead 95th Percentile	0.0000126	0.0000116	0.0000106	2.84E-05	2.44E-05	2.31E-05	1.99E-05	0.0000151	0.0000462	0.0000189	0.000055	0.0000153
Magnesium Min	0.577	0.558	0.527	0.502	0.513	0.456	0.474	0.522	0.594	0.541	0.539	0.527
Magnesium Mean	0.846	0.766	0.696	1.18	1.91	1.31	0.819	0.769	0.892	1.06	0.953	0.846
Magnesium Median	0.725	0.676	0.635	0.691	2.01	1.38	0.703	0.708	0.756	0.707	0.738	0.664
Magnesium 95th Percentile	1.29	1.17	1.02	2.88	2.42	1.79	1.47	1.14	1.77	1.89	1.55	1.32

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Table 3.4-3. Summary Statistics of Base Case Predicted Downstream Plunge Pool Water Quality, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) *(cont'd)*												
Manganese Min	0.0477	0.0506	0.0514	0.0123	0.0108	0.0111	0.0189	0.0422	0.0346	0.0286	0.0314	0.0446
Manganese Mean	0.0618	0.0636	0.0649	0.0546	0.019	0.0192	0.039	0.0537	0.0576	0.0538	0.0567	0.0596
Manganese Median	0.0637	0.0648	0.0656	0.0655	0.016	0.0159	0.0404	0.0539	0.0597	0.0603	0.0609	0.0624
Manganese 95th Percentile	0.07	0.0706	0.0711	0.0731	0.0374	0.034	0.0545	0.0633	0.0665	0.068	0.0689	0.0696
Mercury Min	5.36E-07	5.07E-07	7.4E-07	5.23E-07	2.93E-06	1.62E-06	1.08E-06	7.84E-07	6.56E-07	6.24E-07	5.92E-07	6.66E-07
Mercury Mean	8.64E-07	7.76E-07	1.08E-06	1.33E-06	4.07E-06	2.37E-06	1.8E-06	1.23E-06	0.00000106	0.00000122	0.00000109	0.00000114
Mercury Median	7.61E-07	7.05E-07	1.02E-06	8.49E-07	4.19E-06	2.5E-06	1.72E-06	1.23E-06	0.00000096	9.25E-07	8.94E-07	9.65E-07
Mercury 95th Percentile	0.00000133	0.0000012	1.61E-06	2.99E-06	4.29E-06	2.63E-06	2.39E-06	1.62E-06	0.00000193	0.0000021	0.00000173	0.00000178
Molybdenum Min	0.000436	0.000422	0.000437	0.000443	0.000207	0.000286	0.000363	0.000405	0.000448	0.000417	0.000425	0.000423
Molybdenum Mean	0.000797	0.000649	0.000591	0.00154	0.00362	0.00222	0.000854	0.000693	0.000821	0.00139	0.00113	0.000936
Molybdenum Median	0.000457	0.000442	0.000455	0.000471	0.00394	0.00231	0.000414	0.000413	0.000467	0.000537	0.000653	0.000511
Molybdenum 95th Percentile	0.00151	0.00126	0.00102	0.00506	0.005	0.00339	0.00247	0.00154	0.00268	0.00298	0.00227	0.00175
Nickel Min	0.0000678	0.0000735	0.0000789	0.000102	0.00019	0.000166	0.000119	0.000116	0.0000796	0.0000586	0.0000918	0.0000674
Nickel Mean	0.0000754	0.0000793	0.0000822	0.000104	0.000219	0.000198	0.000136	0.000129	0.0000867	0.0000732	0.000092	0.0000757
Nickel Median	0.0000766	0.0000803	0.0000826	0.000103	0.000222	0.000204	0.000134	0.00013	0.0000875	0.0000771	0.000092	0.0000774
Nickel 95th Percentile	0.0000801	0.0000821	0.0000835	0.000109	0.000225	0.00021	0.000151	0.000142	0.0000889	0.000082	0.0000923	0.0000813
Phosphorus Min	0.00112	0.00108	0.000995	0.00137	0.00555	0.00313	0.00204	0.00162	0.00139	0.00134	0.00128	0.0012
Phosphorus Mean	0.00152	0.0014	0.00127	0.00226	0.00754	0.00425	0.00299	0.00218	0.00189	0.00211	0.00192	0.0017
Phosphorus Median	0.00137	0.00128	0.00119	0.00171	0.0078	0.00443	0.00287	0.00219	0.00173	0.00168	0.00163	0.00148
Phosphorus 95th Percentile	0.00217	0.00199	0.00176	0.00421	0.00796	0.00464	0.00379	0.00271	0.00312	0.00334	0.0028	0.00242
Selenium Min	0.0000459	0.0000436	0.0000413	3.31E-05	0.000117	0.000113	9.64E-05	0.0000697	0.0000578	0.0000547	0.0000516	0.0000488
Selenium Mean	0.0000779	0.0000678	0.0000611	0.000109	0.000269	0.000219	0.000169	0.000112	0.0000975	0.000122	0.000106	0.0000902
Selenium Median	0.0000622	0.0000565	0.0000537	5.02E-05	0.000282	0.000233	0.000157	0.000109	0.0000807	0.0000791	0.0000788	0.0000675
Selenium 95th Percentile	0.000132	0.000116	0.0000994	0.000311	0.000321	0.000269	0.000245	0.000161	0.000209	0.000233	0.000185	0.000153
Silver Min	0.00000353	0.00000334	3.15E-06	3.12E-06	1.29E-05	1.33E-05	7.91E-06	5.52E-06	0.00000452	0.00000424	0.00000398	0.00000376
Silver Mean	0.00000574	0.00000508	4.63E-06	8.73E-06	2.07E-05	1.98E-05	1.34E-05	8.72E-06	0.00000738	0.00000861	0.00000762	0.00000655
Silver Median	0.00000491	0.00000443	0.0000042	5.18E-06	2.16E-05	0.000021	1.27E-05	8.82E-06	0.00000645	0.00000616	0.00000601	0.00000531
Silver 95th Percentile	0.00000937	0.00000834	7.31E-06	0.000021	2.23E-05	2.21E-05	0.000018	0.0000118	0.0000143	0.0000156	0.0000126	0.0000106
Thallium Min	0.00000569	0.00000545	5.22E-06	6.18E-06	1.59E-05	1.49E-05	9.88E-06	7.72E-06	0.0000068	0.00000663	0.00000633	0.00000598
Thallium Mean	0.000013	0.0000103	8.67E-06	2.67E-05	7.04E-05	0.000049	2.24E-05	0.0000149	0.0000148	0.0000251	0.00002	0.0000161
Thallium Median	0.00000707	0.0000066	0.0000063	7.93E-06	7.59E-05	5.17E-05	1.73E-05	0.0000109	0.00000864	0.00000997	0.0000114	0.00000852
Thallium 95th Percentile	0.0000268	0.0000221	0.0000173	8.97E-05	9.33E-05	6.83E-05	5.12E-05	0.0000305	0.0000492	0.0000552	0.0000416	0.0000319

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Table 3.4-3. Summary Statistics of Base Case Predicted Downstream Plunge Pool Water Quality, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Dissolved Metals (mg/L) ***(cont'd)***												
Uranium Min	0.0000884	0.0000836	0.0000868	8.31E-05	0.000104	0.000114	0.000087	0.0000782	0.0000842	0.0000795	0.0000796	0.0000788
Uranium Mean	0.000132	0.000114	0.000112	0.000201	0.00041	0.000298	0.000148	0.000113	0.000128	0.000177	0.000152	0.000134
Uranium Median	0.000104	0.0000959	0.0000995	9.95E-05	0.000437	0.000312	0.000117	0.0000905	0.0000973	0.0000982	0.000107	0.0000939
Uranium 95th Percentile	0.000211	0.000182	0.000165	0.000542	0.000532	0.000402	0.0003	0.000195	0.000307	0.000333	0.000265	0.000218
Zinc Min	0.00431	0.00596	0.00468	0.00196	0.00338	0.00297	0.0025	0.00512	0.00295	0.00306	0.00358	0.00368
Zinc Mean	0.00504	0.00598	0.00528	0.00476	0.00389	0.00336	0.00371	0.00542	0.00454	0.00458	0.00491	0.00466
Zinc Median	0.00519	0.00598	0.00534	0.00551	0.00369	0.00322	0.00385	0.00541	0.00475	0.00505	0.00519	0.00493
Zinc 95th Percentile	0.00544	0.00601	0.0055	0.0059	0.00495	0.00405	0.00464	0.00572	0.00518	0.00542	0.00553	0.00529

Table 3.4-4. **Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ26, Post-Closure**

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Chloride Min	5.1	5.53	5.65	3.17	2.57	2.23	3.04	4.43	4.41	4.05	3.89	4.74
Chloride Mean	9.19	9.63	9.63	7.18	5.81	4.8	5.69	7.12	7.93	8.23	8.33	8.77
Chloride Median	9.12	9.56	9.49	6.97	5.94	4.86	5.55	7.03	7.92	8.31	8.32	8.7
Chloride 95th Percentile	12.1	12.4	12.4	10.6	8.18	6.59	8.24	9.58	10.2	10.7	11.2	11.7
Fluoride Min	0.0352	0.0358	0.0368	0.0385	0.0407	0.0299	0.0388	0.0212	0.035	0.0344	0.0327	0.0362
Fluoride Mean	0.0403	0.0412	0.0421	0.0486	0.0425	0.0312	0.0431	0.0216	0.0381	0.0374	0.0357	0.0403
Fluoride Median	0.0397	0.0403	0.042	0.0492	0.0424	0.0314	0.0432	0.0216	0.0381	0.0371	0.0352	0.04
Fluoride 95th Percentile	0.045	0.0466	0.0471	0.0541	0.0438	0.0319	0.0455	0.022	0.0403	0.0404	0.0387	0.0439
Sulphate Min	80.6	75.9	66.2	46.2	27.8	46.8	38.2	56.3	62.6	70.6	73.7	76.9
Sulphate Mean	97	93.2	88.9	117	232	151	76	78.4	89.3	123	107	101
Sulphate Median	93.1	92.2	89.6	69.8	245	156	60.9	68	75.6	87.6	90.3	92.3
Sulphate 95th Percentile	123	112	102	324	324	232	156	118	181	203	154	131
Ammonia as N Min	2.08	2.28	2.35	0.497	0.356	0.401	0.734	1.84	1.58	1.26	1.33	1.86
Ammonia as N Mean	3.03	3.19	3.2	2	0.655	0.818	1.74	2.41	2.66	2.52	2.65	2.84
Ammonia as N Median	3.23	3.36	3.16	2.17	0.503	0.669	1.85	2.35	2.73	2.82	2.87	3.07
Ammonia as N 95th Percenti	3.71	3.76	3.77	3.36	1.43	1.54	2.58	3.13	3.35	3.46	3.54	3.64
Nitrate as N Min	1.02	1.04	1.02	0.679	0.458	0.593	0.44	0.65	0.778	0.913	1	1
Nitrate as N Mean	1.33	1.37	1.37	1.25	1.58	1.13	0.828	0.974	1.1	1.3	1.24	1.27
Nitrate as N Median	1.29	1.33	1.35	1.1	1.66	1.09	0.762	0.923	1.06	1.27	1.2	1.24
Nitrate as N 95th Percentile	1.73	1.79	1.83	2.08	2.13	1.67	1.24	1.42	1.49	1.68	1.6	1.66
Nitrite as N Min	0.00383	0.00441	0.00343	0.00286	0.00277	0.00185	0.00221	0.00296	0.00275	0.0025	0.00256	0.004
Nitrite as N Mean	0.00463	0.00503	0.00413	0.00375	0.00302	0.00218	0.00298	0.00342	0.00362	0.00351	0.00361	0.00433
Nitrite as N Median	0.00476	0.00512	0.00409	0.00366	0.00293	0.00206	0.00307	0.00337	0.00368	0.00375	0.00379	0.00441
Nitrite as N 95th Percentile	0.00523	0.00542	0.0046	0.00487	0.00365	0.00277	0.00363	0.004	0.00418	0.00427	0.00434	0.00455
WAD Cyanide Min	0.0049	0.00514	0.00523	0.00301	0.00276	0.00287	0.0033	0.00462	0.00432	0.00393	0.00403	0.00464
WAD Cyanide Mean	0.00603	0.00623	0.00624	0.00483	0.0032	0.0034	0.0045	0.0053	0.00559	0.00543	0.00558	0.00581
WAD Cyanide Median	0.00627	0.00643	0.00619	0.00504	0.00301	0.00321	0.00464	0.00523	0.00567	0.00578	0.00584	0.00609
WAD Cyanide 95th Percentil	0.00684	0.0069	0.00692	0.00644	0.00415	0.00428	0.00551	0.00615	0.00641	0.00656	0.00664	0.00677
Total Metals (mg/L)												
Antimony Min	0.00036	0.00033	0.000275	0.000303	0.000356	0.000316	0.000287	0.000292	0.00032	0.000356	0.000368	0.000363
Antimony Mean	0.000819	0.000656	0.000545	0.00174	0.00469	0.00282	0.000924	0.000712	0.000842	0.00162	0.00122	0.000997
Antimony Median	0.000516	0.00048	0.00042	0.000492	0.00505	0.003	0.000402	0.000406	0.000434	0.000549	0.000673	0.000539
Antimony 95th Percentile	0.00164	0.00138	0.00108	0.00648	0.00665	0.00447	0.00289	0.00169	0.00315	0.00351	0.00243	0.00195

(continued)

Table 3.4-4. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ26, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Arsenic Min	0.000234	0.000222	0.000206	0.000564	0.000487	0.000327	0.000334	0.000318	0.000294	0.00028	0.000265	0.000243
Arsenic Mean	0.000271	0.000246	0.000247	0.00132	0.000531	0.000332	0.000386	0.000371	0.000338	0.000328	0.000309	0.000289
Arsenic Median	0.000261	0.00024	0.000247	0.00122	0.000533	0.000332	0.000383	0.000375	0.000334	0.000314	0.000298	0.00028
Arsenic 95th Percentile	0.000313	0.000281	0.000298	0.00192	0.000586	0.000336	0.000422	0.000408	0.0004	0.000386	0.000355	0.00033
Barium Min	0.00149	0.00137	0.00134	0.00271	0.0038	0.00307	0.00259	0.00222	0.00212	0.0017	0.00155	0.00147
Barium Mean	0.00277	0.00235	0.00237	0.00838	0.0055	0.00427	0.0039	0.00334	0.00336	0.00323	0.00313	0.0031
Barium Median	0.00242	0.00206	0.00245	0.00924	0.00569	0.00445	0.00375	0.00344	0.00325	0.00285	0.0028	0.00273
Barium 95th Percentile	0.00417	0.00358	0.00348	0.0116	0.00587	0.00469	0.00483	0.00416	0.00504	0.00497	0.00474	0.00457
Beryllium Min	0.00000705	0.00000664	6.26E-06	8.98E-06	2.87E-05	2.85E-05	1.88E-05	0.0000139	0.0000114	0.00000979	0.00000851	0.00000752
Beryllium Mean	0.0000152	0.0000133	0.0000132	2.68E-05	4.22E-05	4.07E-05	3.01E-05	0.0000223	0.0000195	0.0000211	0.0000196	0.0000174
Beryllium Median	0.0000129	0.0000113	0.0000136	2.51E-05	0.000044	4.25E-05	2.88E-05	0.000023	0.0000187	0.0000177	0.000017	0.0000147
Beryllium 95th Percentile	0.0000243	0.0000218	0.00002	4.19E-05	4.46E-05	4.48E-05	3.84E-05	0.0000287	0.0000311	0.0000345	0.0000311	0.0000269
Boron Min	0.000634	0.000592	0.000573	0.00215	0.000833	0.000663	0.000621	0.000691	0.000589	0.000939	0.000637	0.000671
Boron Mean	0.00091	0.000775	0.000712	0.00773	0.00353	0.00226	0.00101	0.000951	0.00089	0.00189	0.00116	0.00105
Boron Median	0.0007	0.000652	0.000628	0.00745	0.00386	0.00239	0.000679	0.000755	0.000634	0.00128	0.000831	0.000763
Boron 95th Percentile	0.00143	0.00123	0.00104	0.0118	0.00462	0.00325	0.00222	0.00157	0.0023	0.0032	0.00192	0.00164
Calcium Min	7.82	7.66	7.75	7.94	4.98	5.27	6.6	7.37	8.05	7.68	7.46	7.51
Calcium Mean	11.4	10.2	10	17.1	29.7	19.4	10	9.69	11.3	15	12.8	11.9
Calcium Median	9.03	8.61	9.41	10.4	31.7	20.4	7.1	7.91	9.09	9.39	9.82	8.82
Calcium 95th Percentile	17.1	15.3	13.7	42.6	40.6	28.5	20.8	15.2	24.1	25.9	20.2	17.9
Chromium Min	0.0000298	0.000028	0.0000305	4.33E-05	0.000153	0.000123	9.96E-05	0.0000514	0.0000622	0.0000582	0.0000538	0.0000323
Chromium Mean	0.0000596	0.0000509	0.0000531	0.000115	0.000243	0.000196	0.000159	0.000081	0.0000973	0.000112	0.000106	0.0000801
Chromium Median	0.0000462	0.0000411	0.0000514	0.000087	0.000251	0.000206	0.000155	0.0000775	0.0000885	0.0000862	0.0000895	0.0000627
Chromium 95th Percentile	0.0000983	0.0000864	0.0000806	0.000238	0.000273	0.00023	0.000212	0.000115	0.000172	0.000184	0.000163	0.000127
Cobalt Min	0.000302	0.000314	0.000297	0.000212	0.000167	0.000186	0.000173	0.000241	0.000286	0.000299	0.000281	0.000304
Cobalt Mean	0.000362	0.000373	0.000371	0.000297	0.000306	0.000235	0.00024	0.0003	0.000327	0.000345	0.000344	0.000357
Cobalt Median	0.000366	0.00038	0.00037	0.000276	0.000306	0.000223	0.000238	0.000295	0.000324	0.000341	0.000344	0.000357
Cobalt 95th Percentile	0.000419	0.000425	0.000427	0.000389	0.000366	0.000286	0.000302	0.00036	0.000381	0.000393	0.000402	0.000412
Copper Min	0.0000138	0.00000949	0.0000147	0.000049	0.000314	0.000189	0.000155	0.0000659	0.0000485	0.0000152	0.0000303	0.0000318
Copper Mean	0.000039	0.0000163	0.0000469	0.00016	0.000395	0.000268	0.000249	0.000105	0.0000829	0.0000311	0.0000619	0.0000853
Copper Median	0.0000347	0.0000144	0.0000429	0.000183	0.0004	0.000279	0.000239	0.000109	0.00008	0.0000304	0.0000536	0.0000746
Copper 95th Percentile	0.0000648	0.0000248	0.0000831	0.000217	0.000415	0.000294	0.000318	0.000134	0.000128	0.000045	0.0000954	0.000132

(continued)

Table 3.4-4. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ26, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Iron Min	0.00676	0.00494	0.00445	0.0122	0.121	0.0828	0.0477	0.0357	0.0197	0.0165	0.0117	0.00679
Iron Mean	0.0118	0.00828	0.00816	0.0335	0.144	0.107	0.0764	0.0615	0.0384	0.0397	0.0379	0.0373
Iron Median	0.0103	0.00727	0.00843	0.0287	0.143	0.11	0.0768	0.0639	0.0386	0.0393	0.0346	0.0358
Iron 95th Percentile	0.0179	0.0127	0.0122	0.0587	0.159	0.117	0.0959	0.0785	0.0505	0.0605	0.0624	0.0668
Lead Min	0.00000839	0.00000796	7.59E-06	1.32E-05	6.95E-05	2.67E-05	1.55E-05	0.0000177	0.0000192	0.000011	0.0000216	0.00000933
Lead Mean	0.0000116	0.0000106	0.0000103	2.13E-05	9.63E-05	3.44E-05	2.06E-05	0.0000277	0.0000268	0.0000167	0.0000337	0.0000165
Lead Median	0.0000107	0.00000981	0.0000105	1.87E-05	0.000099	3.54E-05	2.07E-05	0.0000269	0.0000246	0.0000162	0.000029	0.0000153
Lead 95th Percentile	0.0000152	0.0000139	0.0000131	3.31E-05	0.000105	3.73E-05	2.41E-05	0.0000358	0.0000438	0.0000222	0.0000486	0.0000226
Magnesium Min	0.663	0.637	0.629	0.738	0.629	0.558	0.666	0.732	0.817	0.694	0.646	0.623
Magnesium Mean	1.23	1.09	1.11	1.84	1.95	1.37	1.04	1.09	1.28	1.38	1.32	1.27
Magnesium Median	1.07	0.95	1.14	1.67	2.04	1.44	0.924	1.06	1.2	1.13	1.14	1.08
Magnesium 95th Percentile	1.86	1.66	1.71	3.05	2.44	1.84	1.63	1.47	2.05	2.19	2.05	1.87
Manganese Min	0.0546	0.0585	0.0601	0.0158	0.0228	0.0175	0.0253	0.0531	0.0451	0.0373	0.0402	0.0551
Manganese Mean	0.0792	0.0824	0.0826	0.0547	0.0307	0.0278	0.0496	0.0672	0.0727	0.0688	0.0725	0.0775
Manganese Median	0.0831	0.0855	0.0826	0.0584	0.0273	0.0242	0.0517	0.0664	0.0747	0.0757	0.078	0.0821
Manganese 95th Percentile	0.0965	0.0974	0.0965	0.092	0.0508	0.0463	0.0716	0.0831	0.088	0.0905	0.0929	0.0951
Mercury Min	5.58E-07	5.28E-07	7.61E-07	6.71E-07	3.05E-06	1.71E-06	1.37E-06	9.98E-07	8.34E-07	7.42E-07	6.62E-07	6.94E-07
Mercury Mean	0.00000104	9.27E-07	1.23E-06	1.72E-06	4.06E-06	2.4E-06	2.14E-06	1.55E-06	0.00000137	0.00000147	0.00000138	0.0000014
Mercury Median	9.18E-07	8.34E-07	0.0000012	1.47E-06	4.17E-06	2.5E-06	2.06E-06	1.59E-06	0.00000132	0.00000127	0.00000122	0.00000121
Mercury 95th Percentile	0.00000156	0.00000141	1.75E-06	2.96E-06	4.34E-06	2.63E-06	2.68E-06	1.95E-06	0.0000021	0.0000023	0.0000021	0.00000208
Molybdenum Min	0.000579	0.000578	0.000588	0.000593	0.000302	0.00036	0.000452	0.00053	0.000586	0.000559	0.000556	0.00057
Molybdenum Mean	0.000891	0.000782	0.000738	0.00152	0.00332	0.00207	0.000858	0.000777	0.000905	0.00138	0.00111	0.000987
Molybdenum Median	0.000606	0.000602	0.000632	0.000625	0.00357	0.0022	0.000496	0.000545	0.000609	0.000661	0.000748	0.00065
Molybdenum 95th Percentile	0.00148	0.0013	0.00112	0.00472	0.00467	0.00319	0.00216	0.00144	0.00246	0.00264	0.00193	0.00163
Nickel Min	0.0000753	0.0000808	0.000105	0.000135	0.000239	0.000178	0.000162	0.000157	0.0000993	0.0000766	0.000123	0.000109
Nickel Mean	0.0000939	0.0000987	0.000111	0.00014	0.000279	0.000197	0.000185	0.000184	0.000112	0.0000977	0.00013	0.000115
Nickel Median	0.0000974	0.000102	0.000111	0.00014	0.000282	0.0002	0.000187	0.000183	0.000114	0.000104	0.000131	0.000114
Nickel 95th Percentile	0.000107	0.00011	0.000113	0.000145	0.000295	0.000204	0.000201	0.000205	0.000117	0.000109	0.000136	0.000126
Phosphorus Min	0.0018	0.00172	0.00141	0.00283	0.00776	0.00718	0.0042	0.00323	0.00269	0.00241	0.00215	0.00194
Phosphorus Mean	0.00336	0.00299	0.00219	0.00786	0.0108	0.00985	0.00633	0.00481	0.00424	0.00454	0.00424	0.0041
Phosphorus Median	0.00292	0.00261	0.00216	0.0084	0.0111	0.0102	0.00608	0.00495	0.00409	0.00389	0.00376	0.00358
Phosphorus 95th Percentile	0.0051	0.00461	0.00308	0.0108	0.0116	0.0109	0.0079	0.006	0.00643	0.00707	0.00642	0.00608

(continued)

Table 3.4-4. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ26, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Selenium Min	0.0000475	0.0000448	0.0000429	3.53E-05	0.00011	0.000108	0.000114	0.0000871	0.0000724	0.0000631	0.0000556	0.0000502
Selenium Mean	0.0000997	0.0000868	0.0000849	0.000103	0.000245	0.000203	0.000187	0.000141	0.000125	0.000143	0.00013	0.000115
Selenium Median	0.0000814	0.0000722	0.0000856	5.34E-05	0.000257	0.000216	0.00018	0.000141	0.000115	0.00011	0.000109	0.000092
Selenium 95th Percentile	0.000162	0.000145	0.000128	0.00029	0.000296	0.000255	0.000253	0.000188	0.000222	0.000245	0.000213	0.000182
Silver Min	0.00000356	0.00000336	3.18E-06	4.42E-06	0.000017	1.43E-05	9.37E-06	0.0000069	0.00000565	0.00000487	0.00000423	0.00000378
Silver Mean	0.00000759	0.00000666	6.59E-06	1.35E-05	2.53E-05	2.05E-05	1.51E-05	0.0000112	0.00000974	0.0000105	0.00000979	0.00000869
Silver Median	0.00000643	0.00000567	6.82E-06	1.25E-05	2.63E-05	2.14E-05	1.44E-05	0.0000115	0.00000933	0.0000088	0.0000085	0.00000733
Silver 95th Percentile	0.0000121	0.0000109	0.00001	2.14E-05	2.71E-05	2.26E-05	1.92E-05	0.0000143	0.0000155	0.0000172	0.0000155	0.0000134
Thallium Min	0.00000584	0.00000548	5.39E-06	7.3E-06	1.69E-05	1.57E-05	1.12E-05	8.98E-06	0.00000782	0.0000072	0.00000659	0.00000612
Thallium Mean	0.0000138	0.0000112	0.0000101	2.87E-05	6.56E-05	4.68E-05	2.27E-05	0.0000164	0.0000161	0.0000246	0.0000199	0.0000166
Thallium Median	0.00000857	0.00000782	8.57E-06	1.44E-05	7.02E-05	4.95E-05	1.82E-05	0.0000132	0.0000112	0.0000121	0.0000132	0.0000097
Thallium 95th Percentile	0.0000265	0.0000226	0.0000184	8.43E-05	8.68E-05	6.52E-05	4.67E-05	0.0000294	0.0000456	0.00005	0.0000377	0.0000306
Uranium Min	0.000112	0.000107	0.000111	0.000108	0.000135	0.000137	0.000106	0.000102	0.000109	0.000103	0.000102	0.000101
Uranium Mean	0.000163	0.000142	0.000148	0.000217	0.000402	0.0003	0.000155	0.000132	0.000149	0.000188	0.000164	0.000156
Uranium Median	0.000138	0.000126	0.00014	0.000135	0.000424	0.000315	0.000127	0.000113	0.000124	0.000123	0.00013	0.000123
Uranium 95th Percentile	0.000237	0.000206	0.0002	0.000519	0.000517	0.000399	0.000279	0.000196	0.000298	0.000313	0.000249	0.000228
Zinc Min	0.00504	0.00685	0.0057	0.00217	0.00363	0.00315	0.00284	0.00572	0.0035	0.00351	0.00466	0.00528
Zinc Mean	0.00648	0.0076	0.00686	0.00484	0.00414	0.00382	0.00447	0.00642	0.00551	0.00559	0.00646	0.00644
Zinc Median	0.0068	0.00773	0.00682	0.00512	0.00392	0.00363	0.00466	0.00634	0.00564	0.00609	0.0068	0.00676
Zinc 95th Percentile	0.00752	0.0081	0.00762	0.00727	0.00548	0.00486	0.00585	0.00727	0.0068	0.00719	0.00749	0.00733
Dissolved Metals (mg/L)												
Aluminum Min	0.000612	0.000503	0.000421	0.00319	0.0525	0.0306	0.0121	0.00366	0.00182	0.00161	0.0011	0.000816
Aluminum Mean	0.00204	0.00133	0.00106	0.0101	0.0793	0.0592	0.0252	0.00854	0.00394	0.0063	0.00483	0.00298
Aluminum Median	0.00152	0.00105	0.00104	0.00902	0.081	0.0645	0.0224	0.00697	0.00318	0.00353	0.00323	0.00189
Aluminum 95th Percentile	0.0038	0.00247	0.00189	0.0171	0.0891	0.0738	0.047	0.0156	0.00913	0.0129	0.00947	0.00557
Cadmium Min	0.00000527	0.00000497	4.72E-06	7.62E-06	0.00001	7.64E-06	6.74E-06	0.0000064	0.00000637	0.00000625	0.00000599	0.00000564
Cadmium Mean	0.00000576	0.00000539	5.18E-06	7.83E-06	1.07E-05	7.82E-06	7.06E-06	0.0000067	0.00000693	0.00000675	0.00000649	0.00000643
Cadmium Median	0.00000558	0.00000525	5.18E-06	7.77E-06	1.06E-05	7.78E-06	7.01E-06	6.68E-06	0.0000069	0.00000651	0.00000633	0.00000624
Cadmium 95th Percentile	0.00000628	0.00000594	5.63E-06	8.08E-06	1.25E-05	8.17E-06	7.26E-06	6.98E-06	0.00000752	0.00000739	0.00000701	0.00000713
Iron Min	0.00448	0.00412	0.0035	0.00719	0.0639	0.0492	0.0277	0.0237	0.0153	0.0134	0.00908	0.00507
Iron Mean	0.00795	0.00682	0.00599	0.0193	0.0774	0.0658	0.0439	0.04	0.0298	0.0312	0.0268	0.0166
Iron Median	0.00693	0.00601	0.00616	0.0179	0.0769	0.0678	0.0421	0.0417	0.03	0.0303	0.0244	0.0154
Iron 95th Percentile	0.0119	0.0103	0.00849	0.03	0.0828	0.072	0.0554	0.0509	0.0392	0.0479	0.0436	0.0271

Table 3.4-5. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ7, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Chloride Min	4.26	4.61	4.1	2.83	2.32	1.99	2.57	3.69	3.74	3.33	3.11	3.96
Chloride Mean	7.74	8.12	7.9	5.35	5.13	4.36	4.94	6.01	6.68	6.92	6.93	7.37
Chloride Median	7.63	8.03	7.78	4.82	5.22	4.38	4.82	5.92	6.68	6.95	6.92	7.28
Chloride 95th Percentile	10.4	10.7	10.6	8.42	7.39	6.07	7.22	8.32	8.71	9.13	9.56	10.1
Fluoride Min	0.0379	0.0397	0.0405	0.0468	0.0429	0.0311	0.0415	0.0218	0.0377	0.0366	0.0351	0.0388
Fluoride Mean	0.0427	0.045	0.0463	0.0552	0.0446	0.0323	0.0454	0.0224	0.0407	0.0395	0.0382	0.0428
Fluoride Median	0.0425	0.0446	0.0464	0.0558	0.0446	0.0324	0.0455	0.0224	0.0408	0.0393	0.0379	0.0426
Fluoride 95th Percentile	0.0468	0.0499	0.0506	0.0611	0.0462	0.0329	0.0477	0.0227	0.0425	0.0422	0.0411	0.0459
Sulphate Min	66.3	61.9	44.6	29.6	22.8	42.2	32.5	47.4	52.3	59.4	62	63.3
Sulphate Mean	81.4	78.4	73	93.6	204	137	65.3	66.5	75.5	103	87.8	84
Sulphate Median	79.7	77.7	74.2	48.9	217	140	52.8	56.4	62.7	75.6	77.9	77.8
Sulphate 95th Percentile	103	94.6	84	287	290	215	130	100	153	174	126	110
Ammonia as N Min	1.71	1.88	1.72	0.445	0.307	0.34	0.604	1.52	1.34	1.04	1.05	1.52
Ammonia as N Mean	2.53	2.67	2.61	1.42	0.559	0.733	1.49	2.03	2.23	2.11	2.19	2.36
Ammonia as N Median	2.64	2.76	2.61	1.37	0.445	0.607	1.58	1.95	2.27	2.32	2.35	2.5
Ammonia as N 95th Percenti	3.16	3.2	3.24	2.63	1.23	1.39	2.23	2.66	2.85	2.94	3.01	3.1
Nitrate as N Min	0.827	0.847	0.673	0.434	0.373	0.516	0.372	0.535	0.645	0.764	0.787	0.777
Nitrate as N Mean	1.12	1.15	1.13	0.955	1.39	1.02	0.711	0.822	0.927	1.08	1.02	1.07
Nitrate as N Median	1.09	1.11	1.1	0.783	1.43	0.971	0.652	0.778	0.888	1.06	0.981	1.03
Nitrate as N 95th Percentile	1.5	1.55	1.59	1.84	1.93	1.51	1.06	1.22	1.27	1.43	1.36	1.43
Nitrite as N Min	0.00383	0.00425	0.00292	0.00304	0.00281	0.0018	0.00222	0.00271	0.00255	0.00232	0.00233	0.00434
Nitrite as N Mean	0.0045	0.00478	0.00366	0.00406	0.00302	0.00212	0.00288	0.00312	0.00327	0.00318	0.00325	0.00463
Nitrite as N Median	0.00459	0.00483	0.00365	0.00415	0.00294	0.00201	0.00295	0.00305	0.00331	0.00335	0.00337	0.00469
Nitrite as N 95th Percentile	0.00503	0.00514	0.00417	0.00488	0.00357	0.00265	0.00343	0.00363	0.00378	0.00385	0.00391	0.00484
WAD Cyanide Min	0.00448	0.00467	0.0045	0.00295	0.00272	0.00281	0.00315	0.00425	0.00403	0.00368	0.0037	0.00425
WAD Cyanide Mean	0.00545	0.00562	0.00555	0.00415	0.00309	0.00331	0.00421	0.00485	0.00509	0.00495	0.00505	0.00525
WAD Cyanide Median	0.00557	0.00572	0.00556	0.0041	0.00296	0.00315	0.00433	0.00476	0.00514	0.0052	0.00523	0.00542
WAD Cyanide 95th Percentil	0.0062	0.00626	0.0063	0.00558	0.00392	0.00411	0.0051	0.0056	0.00583	0.00594	0.00601	0.00613
Total Metals (mg/L)												
Antimony Min	0.000298	0.000271	0.000185	0.000197	0.000296	0.000288	0.000248	0.000246	0.000272	0.000302	0.000308	0.000302
Antimony Mean	0.000686	0.000551	0.000444	0.00144	0.00413	0.00255	0.000798	0.000609	0.000717	0.00136	0.000997	0.00083
Antimony Median	0.000441	0.000409	0.000354	0.000364	0.0044	0.00274	0.000355	0.000345	0.000367	0.000467	0.000554	0.000462
Antimony 95th Percentile	0.00136	0.00113	0.000878	0.00576	0.00601	0.00415	0.00242	0.00145	0.00265	0.00299	0.002	0.00162

(continued)

Table 3.4-5. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ7, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) *(cont'd)*												
Arsenic Min	0.000257	0.000243	0.000231	0.0005	0.000503	0.000337	0.000364	0.000357	0.000324	0.000304	0.000285	0.000275
Arsenic Mean	0.000293	0.000267	0.000274	0.001	0.000542	0.000341	0.000412	0.000407	0.000365	0.000349	0.000325	0.00032
Arsenic Median	0.000286	0.000263	0.000274	0.00101	0.00054	0.000341	0.00041	0.000412	0.000363	0.000339	0.000317	0.000315
Arsenic 95th Percentile	0.000329	0.000298	0.000317	0.00131	0.000587	0.000344	0.000443	0.000436	0.000414	0.000398	0.000365	0.000357
Barium Min	0.00268	0.00263	0.00242	0.00425	0.00453	0.00343	0.00321	0.00295	0.003	0.00258	0.00247	0.00261
Barium Mean	0.004	0.00373	0.00371	0.00848	0.00606	0.00451	0.0044	0.00402	0.00417	0.004	0.004	0.00421
Barium Median	0.00386	0.00364	0.00379	0.00919	0.00619	0.00462	0.0043	0.00415	0.00411	0.00374	0.00377	0.00401
Barium 95th Percentile	0.00526	0.00488	0.00487	0.0106	0.00638	0.00498	0.00519	0.00467	0.00546	0.00552	0.00545	0.00552
Beryllium Min	0.0000129	0.0000124	0.000012	1.88E-05	3.13E-05	3.06E-05	2.28E-05	0.0000188	0.0000168	0.0000154	0.0000143	0.0000134
Beryllium Mean	0.0000209	0.0000193	0.00002	3.35E-05	4.33E-05	4.17E-05	0.000033	0.0000267	0.0000244	0.0000258	0.0000249	0.0000229
Beryllium Median	0.0000197	0.0000183	0.00002	3.43E-05	4.47E-05	4.32E-05	3.19E-05	0.0000277	0.000024	0.0000234	0.0000231	0.0000212
Beryllium 95th Percentile	0.0000289	0.0000269	0.0000279	0.000043	4.55E-05	4.55E-05	4.01E-05	0.0000319	0.0000335	0.0000374	0.0000351	0.0000312
Boron Min	0.000652	0.000576	0.000616	0.00179	0.000807	0.000804	0.000642	0.000733	0.000577	0.00115	0.000662	0.000642
Boron Mean	0.000881	0.000731	0.000718	0.00557	0.00315	0.00225	0.00098	0.000961	0.000833	0.00198	0.00109	0.00096
Boron Median	0.000707	0.00063	0.000649	0.00615	0.00337	0.00236	0.000695	0.000794	0.000614	0.00149	0.000827	0.000718
Boron 95th Percentile	0.00131	0.0011	0.000988	0.00761	0.00419	0.00316	0.00198	0.00149	0.00202	0.00306	0.00169	0.00146
Calcium Min	9.08	9.04	9.12	9.81	5.19	5.33	6.86	7.89	8.95	8.64	8.33	8.67
Calcium Mean	12.4	11.4	11.5	17.6	26.9	18.1	9.86	9.95	11.8	14.9	12.9	12.6
Calcium Median	10.5	10.2	11.1	12.4	28.4	19.2	7.32	8.46	9.99	10.3	10.5	10.1
Calcium 95th Percentile	17.1	15.7	14.6	39.9	37.2	26.9	19	14.6	22.6	23.7	18.9	17.5
Chromium Min	0.0000466	0.0000702	0.000047	7.65E-05	0.000213	0.000148	0.000129	0.0000657	0.0000755	0.0000711	0.0000724	0.0000606
Chromium Mean	0.000075	0.0000989	0.000072	0.000137	0.000296	0.000214	0.000183	0.0000929	0.000106	0.000119	0.000119	0.000106
Chromium Median	0.0000658	0.0000958	0.0000713	0.000122	0.000304	0.00022	0.000177	0.0000908	0.0000986	0.0000978	0.000107	0.0000945
Chromium 95th Percentile	0.000108	0.000133	0.0000971	0.000232	0.000325	0.00024	0.000228	0.000121	0.000168	0.000178	0.000168	0.000148
Cobalt Min	0.000258	0.000263	0.000207	0.000147	0.000176	0.000176	0.000154	0.000208	0.000245	0.000249	0.000232	0.00026
Cobalt Mean	0.000311	0.000316	0.000309	0.000232	0.000295	0.000223	0.000213	0.000261	0.000282	0.000294	0.000292	0.00031
Cobalt Median	0.000311	0.000317	0.000304	0.000202	0.000294	0.000214	0.00021	0.000257	0.000275	0.000286	0.000294	0.000313
Cobalt 95th Percentile	0.000365	0.000366	0.000371	0.000327	0.000345	0.000274	0.000267	0.000316	0.000331	0.000339	0.000349	0.000362
Copper Min	0.0000365	0.000075	0.0000372	0.0001	0.000382	0.000222	0.000196	0.0000888	0.0000733	0.0000277	0.0000435	0.0000717
Copper Mean	0.0000623	0.0000961	0.0000718	0.000187	0.000458	0.000294	0.000282	0.000126	0.000106	0.0000431	0.0000726	0.000125
Copper Median	0.000061	0.000097	0.0000726	0.0002	0.000459	0.000302	0.000273	0.00013	0.000104	0.0000424	0.0000665	0.000119
Copper 95th Percentile	0.0000863	0.000112	0.000103	0.000234	0.000501	0.000323	0.00034	0.000149	0.00014	0.0000553	0.000101	0.000167

(continued)

Table 3.4-5. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ7, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) *(cont'd)*												
Iron Min	0.0266	0.022	0.0178	0.0488	0.169	0.103	0.0676	0.0597	0.0405	0.0357	0.0336	0.0373
Iron Mean	0.0351	0.0288	0.0265	0.076	0.208	0.125	0.0944	0.0851	0.0594	0.0583	0.0607	0.0692
Iron Median	0.0352	0.0285	0.025	0.078	0.204	0.125	0.0932	0.085	0.0614	0.0579	0.059	0.0692
Iron 95th Percentile	0.0421	0.0345	0.0357	0.0913	0.248	0.139	0.111	0.0997	0.0706	0.0767	0.0845	0.0974
Lead Min	0.0000108	0.0000141	0.00001	3.84E-05	8.93E-05	4.31E-05	1.94E-05	0.0000302	0.0000205	0.0000152	0.0000221	0.000015
Lead Mean	0.000014	0.0000177	0.0000132	5.48E-05	0.000114	5.03E-05	2.43E-05	0.0000406	0.000027	0.0000207	0.0000321	0.0000222
Lead Median	0.0000135	0.0000176	0.0000132	5.59E-05	0.000116	4.98E-05	2.41E-05	0.0000412	0.0000251	0.0000202	0.0000283	0.0000217
Lead 95th Percentile	0.0000171	0.0000212	0.0000164	0.000066	0.00012	5.79E-05	2.75E-05	0.0000479	0.0000413	0.0000255	0.0000435	0.0000281
Magnesium Min	1.09	1.08	1.08	1.49	0.731	0.898	0.832	0.978	1.16	1.04	1.02	1.05
Magnesium Mean	1.66	1.55	1.65	2.43	1.9	1.64	1.17	1.32	1.6	1.68	1.67	1.68
Magnesium Median	1.57	1.48	1.69	2.49	1.98	1.68	1.09	1.31	1.56	1.49	1.54	1.56
Magnesium 95th Percentile	2.21	2.07	2.22	3.14	2.36	1.98	1.68	1.63	2.2	2.38	2.31	2.21
Manganese Min	0.0511	0.052	0.0505	0.0161	0.0237	0.0173	0.0236	0.0473	0.0414	0.0345	0.0369	0.0507
Manganese Mean	0.0719	0.0726	0.0711	0.0445	0.0311	0.0267	0.0447	0.0597	0.0644	0.0611	0.0644	0.0696
Manganese Median	0.0744	0.0745	0.0711	0.0449	0.0281	0.0236	0.0464	0.0588	0.0655	0.0666	0.0683	0.0729
Manganese 95th Percentile	0.0874	0.0864	0.086	0.0754	0.0486	0.0434	0.0643	0.0742	0.0783	0.0806	0.083	0.0856
Mercury Min	9.25E-07	8.92E-07	1.09E-06	1.34E-06	3.61E-06	1.84E-06	1.72E-06	1.31E-06	0.00000118	0.00000109	0.00000102	0.00000105
Mercury Mean	0.0000014	0.00000131	1.61E-06	2.25E-06	4.54E-06	2.47E-06	2.42E-06	1.82E-06	0.00000168	0.00000176	0.0000017	0.00000171
Mercury Median	0.00000133	0.00000126	1.59E-06	2.2E-06	4.61E-06	2.55E-06	2.36E-06	1.88E-06	0.00000165	0.00000162	0.00000159	0.00000158
Mercury 95th Percentile	0.00000186	0.00000175	2.03E-06	3.03E-06	4.7E-06	2.67E-06	2.88E-06	2.15E-06	0.00000224	0.00000248	0.00000234	0.0000023
Molybdenum Min	0.000599	0.000612	0.000626	0.000617	0.000294	0.000351	0.000442	0.000548	0.000607	0.00057	0.000563	0.000587
Molybdenum Mean	0.000861	0.000785	0.000754	0.00141	0.00295	0.0019	0.000793	0.00076	0.00088	0.00125	0.00101	0.000934
Molybdenum Median	0.000625	0.000637	0.00067	0.000651	0.00313	0.00204	0.000487	0.000562	0.000627	0.000655	0.000721	0.000657
Molybdenum 95th Percentile	0.00134	0.00121	0.00106	0.00429	0.00422	0.00297	0.00189	0.00132	0.00218	0.00232	0.00168	0.00149
Nickel Min	0.0000838	0.000103	0.000124	0.000145	0.00029	0.000196	0.000183	0.000188	0.000102	0.0000838	0.000132	0.000125
Nickel Mean	0.0000989	0.000117	0.000129	0.000165	0.000329	0.000214	0.000205	0.000216	0.000114	0.000101	0.00014	0.000133
Nickel Median	0.000102	0.000119	0.000128	0.000168	0.000331	0.000213	0.000206	0.000218	0.000115	0.000106	0.00014	0.000132
Nickel 95th Percentile	0.00011	0.000125	0.000137	0.000177	0.000342	0.000225	0.000218	0.000235	0.000117	0.00011	0.000146	0.000146
Phosphorus Min	0.00358	0.00285	0.0038	0.00595	0.0104	0.0501	0.00691	0.00416	0.00373	0.00348	0.00325	0.0034
Phosphorus Mean	0.00527	0.00417	0.00548	0.00997	0.0133	0.0699	0.00886	0.00564	0.00517	0.00543	0.00524	0.0055
Phosphorus Median	0.00512	0.00397	0.00533	0.0101	0.0134	0.068	0.00871	0.00582	0.00508	0.00499	0.0049	0.0052
Phosphorus 95th Percentile	0.00687	0.00562	0.0072	0.0126	0.0141	0.0916	0.011	0.00659	0.00688	0.00762	0.00717	0.00726

(continued)

Table 3.4-5. Summary Statistics of Base Case Predicted Surface Water Quality at Davidson Creek Assessment Node WQ7, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Selenium Min	0.0000819	0.0000792	0.0000766	7.87E-05	0.000124	0.000125	0.000138	0.000116	0.000105	0.0000964	0.0000899	0.0000849
Selenium Mean	0.000133	0.000122	0.000124	0.000142	0.000243	0.000211	0.000203	0.000166	0.000154	0.000169	0.000159	0.000146
Selenium Median	0.000122	0.000113	0.000123	0.00011	0.000253	0.000223	0.000198	0.000169	0.000147	0.000145	0.000144	0.000131
Selenium 95th Percentile	0.000187	0.000173	0.000181	0.000282	0.000291	0.000256	0.00026	0.000205	0.000232	0.000256	0.000231	0.000204
Silver Min	0.00000648	0.00000625	6.04E-06	9.33E-06	0.000018	1.54E-05	1.14E-05	9.39E-06	0.00000839	0.0000077	0.00000715	0.00000673
Silver Mean	0.0000105	0.00000966	9.98E-06	1.69E-05	2.53E-05	0.000021	1.65E-05	0.0000134	0.0000122	0.0000129	0.0000124	0.0000114
Silver Median	0.00000986	0.00000915	0.00001	1.71E-05	2.62E-05	2.17E-05	1.59E-05	0.0000138	0.000012	0.0000117	0.0000115	0.0000106
Silver 95th Percentile	0.0000144	0.0000135	0.0000139	2.19E-05	0.000027	2.29E-05	0.00002	0.0000159	0.0000167	0.0000187	0.0000175	0.0000156
Thallium Min	0.00000845	0.0000082	7.96E-06	1.15E-05	1.79E-05	1.66E-05	0.000013	0.0000112	0.0000103	0.0000097	0.00000918	0.00000875
Thallium Mean	0.0000156	0.0000135	0.0000129	2.96E-05	6.08E-05	4.47E-05	2.31E-05	0.0000178	0.0000176	0.0000247	0.0000207	0.000018
Thallium Median	0.0000115	0.0000108	0.0000117	1.82E-05	6.44E-05	4.73E-05	1.91E-05	0.0000152	0.0000136	0.0000144	0.0000154	0.0000125
Thallium 95th Percentile	0.0000262	0.000023	0.0000196	7.79E-05	8.08E-05	6.23E-05	4.36E-05	0.0000288	0.0000423	0.0000452	0.000035	0.0000295
Uranium Min	0.000128	0.000124	0.000133	0.000139	0.000145	0.000141	0.000108	0.000104	0.000116	0.000109	0.000108	0.000115
Uranium Mean	0.000174	0.000156	0.000172	0.000233	0.00038	0.000288	0.000151	0.00013	0.000151	0.000182	0.000161	0.000163
Uranium Median	0.000154	0.000144	0.000168	0.000171	0.000398	0.000302	0.000127	0.000114	0.000129	0.000128	0.000134	0.000137
Uranium 95th Percentile	0.000236	0.00021	0.000215	0.000489	0.000486	0.000382	0.000254	0.000184	0.000275	0.000282	0.000229	0.000223
Zinc Min	0.00622	0.0106	0.00567	0.00206	0.00368	0.00435	0.00278	0.00526	0.00304	0.00311	0.00477	0.0054
Zinc Mean	0.00735	0.0111	0.00661	0.00372	0.00415	0.00521	0.00419	0.00589	0.00472	0.00487	0.00625	0.00636
Zinc Median	0.00759	0.0111	0.00658	0.00358	0.00397	0.00522	0.00433	0.00578	0.00479	0.00521	0.0065	0.00663
Zinc 95th Percentile	0.00812	0.0115	0.00734	0.0059	0.00533	0.00611	0.00539	0.00664	0.00587	0.00628	0.00714	0.00712
Dissolved Metals (mg/L)												
Aluminum Min	0.00142	0.00124	0.00103	0.00646	0.0655	0.0422	0.0188	0.00651	0.00309	0.0032	0.00257	0.00187
Aluminum Mean	0.00279	0.0021	0.00179	0.0121	0.0898	0.0681	0.0307	0.0111	0.00507	0.00738	0.00597	0.00389
Aluminum Median	0.00242	0.00194	0.00179	0.0119	0.0913	0.0702	0.0284	0.00996	0.00453	0.00523	0.00475	0.00308
Aluminum 95th Percentile	0.00429	0.00311	0.00281	0.0171	0.0987	0.0833	0.05	0.0169	0.00939	0.0129	0.00991	0.00609
Cadmium Min	0.00000618	0.00000577	0.0000051	8.92E-06	1.04E-05	8.75E-06	6.89E-06	6.55E-06	0.00000694	0.00000644	0.00000621	0.00000622
Cadmium Mean	0.00000678	0.0000063	5.62E-06	1.15E-05	1.11E-05	9.39E-06	7.17E-06	6.82E-06	0.00000751	0.00000689	0.00000667	0.000007
Cadmium Median	0.00000675	0.00000627	5.62E-06	1.21E-05	1.09E-05	9.38E-06	7.15E-06	6.82E-06	0.00000752	0.00000671	0.00000655	0.00000689
Cadmium 95th Percentile	0.00000729	0.00000684	6.22E-06	1.28E-05	1.26E-05	1.01E-05	7.35E-06	7.05E-06	0.0000079	0.00000742	0.00000711	0.00000765
Iron Min	0.012	0.0116	0.0105	0.0316	0.0741	0.0537	0.0357	0.0379	0.0316	0.0275	0.0232	0.0154
Iron Mean	0.0165	0.0156	0.0155	0.0487	0.0851	0.0687	0.0505	0.0539	0.0462	0.0448	0.0413	0.0273
Iron Median	0.0163	0.0155	0.015	0.0487	0.0855	0.0703	0.0495	0.0539	0.0478	0.044	0.04	0.027
Iron 95th Percentile	0.0205	0.0194	0.0207	0.0602	0.0894	0.0749	0.0603	0.0627	0.055	0.0595	0.0574	0.0376

Table 3.4-6. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_US, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Chloride Min	0.401	0.323	0.32	0.196	0.576	0.344	0.473	0.189	0.2	0.233	0.284	0.478
Chloride Mean	0.746	0.821	0.776	0.448	0.618	0.392	0.601	0.413	0.529	0.616	0.67	0.831
Chloride Median	0.734	0.823	0.772	0.364	0.611	0.372	0.571	0.384	0.511	0.592	0.638	0.793
Chloride 95th Percentile	1.12	1.2	1.13	0.901	0.704	0.477	0.849	0.666	0.83	1.08	1.13	1.27
Fluoride Min	0.0576	0.0541	0.054	0.0655	0.057	0.0457	0.063	0.0258	0.0517	0.0563	0.0566	0.0611
Fluoride Mean	0.063	0.0656	0.0663	0.07	0.0575	0.0461	0.0645	0.0266	0.0551	0.0601	0.0573	0.063
Fluoride Median	0.0635	0.0667	0.0673	0.0706	0.0573	0.0461	0.0644	0.0266	0.0553	0.06	0.0574	0.0629
Fluoride 95th Percentile	0.0645	0.068	0.0687	0.0729	0.0583	0.0466	0.066	0.0276	0.057	0.0616	0.058	0.0644
Sulphate Min	12.7	1.61	1.22	1.98	2.71	2.14	3.15	8.99	9.92	7.58	6.63	16.5
Sulphate Mean	34.6	35.9	36.8	18.9	4.78	4.65	10.8	20	27.8	29.6	29.6	33.6
Sulphate Median	33.4	36.8	38.2	15.8	4.41	3.25	8.81	19.6	28.5	29.3	28.6	32.2
Sulphate 95th Percentile	55	57.9	54	45.6	9.41	8.96	24.2	33.1	41.9	53.9	58.9	56.7
Ammonia as N Min	0.136	0.0143	0.01	0.0145	0.0255	0.0632	0.0445	0.109	0.109	0.0804	0.0756	0.169
Ammonia as N Mean	0.365	0.378	0.389	0.196	0.0475	0.0922	0.126	0.223	0.297	0.314	0.32	0.343
Ammonia as N Median	0.351	0.396	0.401	0.163	0.0434	0.0756	0.105	0.218	0.306	0.31	0.315	0.331
Ammonia as N 95th Percenti	0.57	0.6	0.562	0.471	0.0964	0.141	0.264	0.356	0.438	0.561	0.63	0.584
Nitrate as N Min	0.0949	0.0701	0.0692	0.0282	0.0157	0.0217	0.0202	0.0266	0.0315	0.0307	0.0529	0.107
Nitrate as N Mean	0.167	0.167	0.165	0.085	0.0241	0.0314	0.0482	0.0704	0.0983	0.111	0.137	0.173
Nitrate as N Median	0.158	0.163	0.16	0.0661	0.0227	0.0271	0.0426	0.0641	0.0935	0.105	0.128	0.162
Nitrate as N 95th Percentile	0.246	0.251	0.242	0.183	0.0369	0.0504	0.0978	0.125	0.168	0.212	0.241	0.264
Nitrite as N Min	0.00207	0.00152	0.0015	0.00191	0.00341	0.00157	0.00151	0.00152	0.00152	0.00152	0.00151	0.00632
Nitrite as N Mean	0.00281	0.00362	0.00166	0.00211	0.00342	0.00158	0.00153	0.00155	0.00157	0.00157	0.00157	0.00764
Nitrite as N Median	0.00287	0.00385	0.00167	0.00216	0.00341	0.00157	0.00152	0.00155	0.00157	0.00157	0.00157	0.00771
Nitrite as N 95th Percentile	0.00305	0.00408	0.00172	0.0022	0.00345	0.00159	0.00156	0.00159	0.00161	0.00164	0.00165	0.00858
WAD Cyanide Min	0.00254	0.0025	0.0025	0.0025	0.0025	0.0025	0.00251	0.00253	0.00253	0.00252	0.00252	0.00255
WAD Cyanide Mean	0.00261	0.00262	0.00262	0.00256	0.00251	0.00251	0.00253	0.00257	0.00259	0.0026	0.0026	0.00261
WAD Cyanide Median	0.00261	0.00262	0.00262	0.00255	0.00251	0.00251	0.00253	0.00257	0.00259	0.0026	0.0026	0.0026
WAD Cyanide 95th Percentil	0.00268	0.00269	0.00268	0.00265	0.00253	0.00253	0.00258	0.00261	0.00264	0.00268	0.0027	0.00268
Total Metals (mg/L)												
Antimony Min	0.000107	0.000052	0.00005	7.09E-05	5.26E-05	5.31E-05	5.74E-05	0.0000717	0.0000735	0.0000592	0.0000624	0.000126
Antimony Mean	0.000303	0.000314	0.00033	0.000209	7.25E-05	7.81E-05	0.000125	0.000184	0.00024	0.000254	0.000263	0.000298
Antimony Median	0.000278	0.000299	0.000312	0.000174	6.75E-05	6.93E-05	0.00011	0.000167	0.000222	0.000229	0.000232	0.000268
Antimony 95th Percentile	0.000524	0.000556	0.000564	0.000455	0.000107	0.000127	0.000235	0.000327	0.000429	0.000527	0.000553	0.000549

(continued)

Table 3.4-6. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_US, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Arsenic Min	0.000734	0.000605	0.0006	0.0012	0.000478	0.000409	0.000584	0.000707	0.000638	0.000674	0.000889	0.000721
Arsenic Mean	0.000954	0.000982	0.000971	0.00146	0.000495	0.000418	0.000611	0.000762	0.000789	0.000784	0.000965	0.000756
Arsenic Median	0.000969	0.00102	0.001	0.0015	0.000487	0.000415	0.000608	0.000762	0.000803	0.000786	0.000975	0.000753
Arsenic 95th Percentile	0.00102	0.00107	0.00105	0.0016	0.000523	0.000433	0.000661	0.00083	0.000885	0.000841	0.00101	0.000787
Barium Min	0.00559	0.0058	0.00517	0.00703	0.00442	0.00378	0.00428	0.00438	0.005	0.00469	0.00544	0.00619
Barium Mean	0.0057	0.00589	0.00551	0.00754	0.0045	0.00385	0.00434	0.00459	0.0052	0.00488	0.00566	0.00632
Barium Median	0.00567	0.00585	0.00548	0.00766	0.00446	0.00383	0.00431	0.00458	0.0052	0.00486	0.00568	0.00631
Barium 95th Percentile	0.00583	0.00603	0.0057	0.00774	0.00464	0.00398	0.00456	0.0048	0.00535	0.00507	0.00589	0.0065
Beryllium Min	0.0000486	0.0000486	0.0000485	4.89E-05	4.98E-05	4.97E-05	4.93E-05	0.0000491	0.0000487	0.0000486	0.0000487	0.0000488
Beryllium Mean	0.0000494	0.0000494	0.0000493	4.97E-05	4.99E-05	4.99E-05	4.98E-05	0.0000496	0.0000495	0.0000495	0.0000495	0.0000494
Beryllium Median	0.0000494	0.0000494	0.0000493	4.97E-05	4.99E-05	0.00005	4.98E-05	0.0000497	0.0000495	0.0000495	0.0000495	0.0000495
Beryllium 95th Percentile	0.0000497	0.0000499	0.0000497	4.99E-05	0.00005	0.00005	4.99E-05	0.0000498	0.0000498	0.0000499	0.0000498	0.0000497
Boron Min	0.00244	0.00164	0.00225	0.00301	0.000803	0.000733	0.000547	0.00216	0.000692	0.00405	0.0022	0.00234
Boron Mean	0.00261	0.00193	0.00261	0.00335	0.000847	0.000786	0.000673	0.00244	0.00099	0.00436	0.00258	0.00257
Boron Median	0.00258	0.00185	0.00259	0.00336	0.000833	0.000764	0.000641	0.0024	0.000996	0.00433	0.0026	0.00255
Boron 95th Percentile	0.00286	0.00249	0.00285	0.00373	0.000964	0.000882	0.000916	0.00275	0.00129	0.00479	0.003	0.00288
Calcium Min	11	8.26	8.16	11.2	5.09	5.09	7.26	9.24	11.7	11.6	11.7	14.9
Calcium Mean	15.9	15.9	16.6	14.2	5.5	5.56	8.25	11.1	14	14.6	14.7	18.1
Calcium Median	15.8	16.6	17.4	14.3	5.36	5.4	7.88	10.8	14.2	14.3	14.4	17.4
Calcium 95th Percentile	19	19.3	19.4	18.1	6.45	6.35	10.5	12.9	15.9	17.7	18.8	21.7
Chromium Min	0.000423	0.000304	0.0003	0.000685	0.000457	0.000387	0.000465	0.000313	0.000675	0.000439	0.000597	0.000412
Chromium Mean	0.000623	0.000734	0.0007	0.000842	0.000482	0.000402	0.000489	0.000342	0.000883	0.000536	0.00067	0.000442
Chromium Median	0.00064	0.000779	0.00073	0.000864	0.000471	0.000399	0.000487	0.000341	0.000896	0.000537	0.00067	0.000443
Chromium 95th Percentile	0.000675	0.000822	0.000773	0.000934	0.000528	0.000423	0.000517	0.000375	0.000997	0.000577	0.00071	0.000463
Cobalt Min	0.000163	0.0000481	0.000044	0.000053	0.000129	5.85E-05	4.93E-05	0.000129	0.000133	0.0000952	0.0000895	0.000195
Cobalt Mean	0.00038	0.000415	0.00041	0.000236	0.00015	8.53E-05	0.000132	0.000246	0.000322	0.000333	0.000338	0.000369
Cobalt Median	0.000365	0.000433	0.000419	0.000203	0.000145	7.01E-05	0.00011	0.00024	0.000332	0.000328	0.000333	0.000359
Cobalt 95th Percentile	0.000584	0.00064	0.000583	0.000515	0.000202	0.000131	0.000271	0.000381	0.000465	0.000583	0.000652	0.000613
Copper Min	0.00117	0.000264	0.000132	0.000241	0.000626	0.000364	0.000381	0.000165	0.000146	0.0000746	0.000216	0.000217
Copper Mean	0.00233	0.000309	0.000206	0.000273	0.000635	0.000366	0.000395	0.000178	0.000156	0.0000805	0.000243	0.000255
Copper Median	0.00243	0.00029	0.000185	0.000265	0.000636	0.000366	0.000396	0.000178	0.000155	0.0000803	0.000238	0.000252
Copper 95th Percentile	0.00263	0.000464	0.000304	0.000327	0.000638	0.000368	0.000401	0.000185	0.000164	0.0000856	0.000278	0.0003

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Table 3.4-6. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_US, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) *(cont'd)*												
Iron Min	0.117	0.183	0.102	0.194	0.246	0.129	0.127	0.141	0.135	0.0982	0.121	0.155
Iron Mean	0.134	0.191	0.128	0.198	0.249	0.13	0.127	0.146	0.137	0.101	0.131	0.165
Iron Median	0.13	0.188	0.121	0.197	0.248	0.13	0.127	0.145	0.137	0.1	0.129	0.164
Iron 95th Percentile	0.165	0.211	0.16	0.204	0.255	0.131	0.128	0.15	0.138	0.103	0.144	0.176
Lead Min	0.00027	0.000105	0.000065	7.12E-05	6.61E-05	4.77E-05	3.27E-05	0.0000311	0.0000254	0.0000252	0.0000962	0.0000809
Lead Mean	0.000342	0.000128	0.000101	9.35E-05	0.000068	4.91E-05	3.41E-05	0.0000323	0.000026	0.0000258	0.00011	0.000103
Lead Median	0.000348	0.000116	0.0000911	8.77E-05	6.75E-05	4.88E-05	3.42E-05	0.0000323	0.000026	0.0000258	0.000108	0.000101
Lead 95th Percentile	0.000359	0.000208	0.000148	0.00013	6.98E-05	5.13E-05	3.53E-05	0.0000336	0.0000264	0.0000266	0.000128	0.000129
Magnesium Min	2.67	2.43	2.42	2.82	1.21	1.15	1.62	2.06	2.57	2.62	2.8	3.35
Magnesium Mean	3.05	3.06	3.15	3.05	1.25	1.19	1.67	2.2	2.74	2.78	2.93	3.61
Magnesium Median	3.07	3.11	3.23	3.1	1.24	1.18	1.65	2.19	2.74	2.76	2.9	3.59
Magnesium 95th Percentile	3.23	3.26	3.31	3.17	1.34	1.26	1.84	2.34	2.86	2.9	3.09	3.82
Manganese Min	0.0851	0.0712	0.0707	0.0301	0.0144	0.00877	0.0124	0.0307	0.032	0.0226	0.041	0.0798
Manganese Mean	0.117	0.125	0.121	0.0718	0.0198	0.0153	0.0324	0.0596	0.078	0.08	0.102	0.12
Manganese Median	0.111	0.121	0.117	0.0564	0.0189	0.0116	0.0272	0.0587	0.0803	0.0793	0.102	0.116
Manganese 95th Percentile	0.171	0.18	0.164	0.135	0.0314	0.0272	0.0687	0.0984	0.121	0.151	0.176	0.176
Mercury Min	0.00000272	0.00000251	0.0000025	2.92E-06	5.1E-06	2.96E-06	3.24E-06	3.27E-06	0.00000327	0.00000443	0.00000299	0.00000292
Mercury Mean	0.00000315	0.00000315	3.18E-06	3.19E-06	5.13E-06	2.97E-06	3.3E-06	3.36E-06	0.0000034	0.00000492	0.00000321	0.00000315
Mercury Median	0.00000316	0.00000319	3.22E-06	3.23E-06	5.13E-06	2.97E-06	3.29E-06	3.35E-06	0.00000339	0.00000492	0.00000317	0.00000313
Mercury 95th Percentile	0.00000339	0.00000338	3.39E-06	3.37E-06	5.15E-06	3.01E-06	3.39E-06	3.46E-06	0.00000353	0.00000517	0.00000342	0.00000337
Molybdenum Min	0.000455	0.000189	0.00018	0.000544	0.000222	0.000217	0.000367	0.000488	0.0007	0.000616	0.000616	0.000653
Molybdenum Mean	0.000917	0.000938	0.00101	0.000831	0.000251	0.000252	0.000444	0.000634	0.000874	0.000844	0.000852	0.000894
Molybdenum Median	0.000923	0.00102	0.00109	0.000862	0.00024	0.000239	0.000416	0.000607	0.000887	0.000814	0.000817	0.000841
Molybdenum 95th Percentile	0.00119	0.00124	0.00125	0.00115	0.000321	0.000313	0.000624	0.000773	0.00102	0.00109	0.00117	0.00117
Nickel Min	0.000183	0.000193	0.00014	0.000144	0.000251	0.000575	0.00018	0.000162	0.000126	0.0000654	0.000124	0.000204
Nickel Mean	0.000205	0.000215	0.0002	0.000181	0.000255	0.000609	0.000198	0.000185	0.000166	0.00012	0.000183	0.000236
Nickel Median	0.000199	0.000206	0.000195	0.000174	0.000254	0.000599	0.000195	0.000185	0.000168	0.000123	0.000186	0.000235
Nickel 95th Percentile	0.000231	0.00025	0.000248	0.00023	0.000266	0.000666	0.000219	0.000213	0.000196	0.000174	0.000247	0.000284
Phosphorus Min	0.0161	0.00781	0.0075	0.0309	0.0215	0.0272	0.017	0.0233	0.0257	0.0241	0.0264	0.0186
Phosphorus Mean	0.0298	0.0352	0.0308	0.0405	0.0228	0.0288	0.0181	0.0257	0.0328	0.0288	0.031	0.0215
Phosphorus Median	0.031	0.0381	0.0325	0.0418	0.0222	0.0286	0.018	0.0256	0.0332	0.0288	0.0311	0.0216
Phosphorus 95th Percentile	0.0334	0.0409	0.035	0.046	0.0251	0.0312	0.0195	0.0285	0.0367	0.0307	0.0335	0.0236

(continued)

Table 3.4-6. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_US, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Selenium Min	0.000298	0.000298	0.000298	0.000188	0.000216	0.000207	0.000296	0.000299	0.000298	0.000298	0.000298	0.000298
Selenium Mean	0.000299	0.000299	0.000299	0.000205	0.000216	0.000207	0.000297	0.0003	0.000299	0.000299	0.000299	0.000299
Selenium Median	0.000299	0.000299	0.000299	0.000201	0.000216	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Selenium 95th Percentile	0.0003	0.0003	0.0003	0.000231	0.000217	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Silver Min	0.0000246	0.0000246	0.0000246	2.47E-05	2.49E-05	2.49E-05	2.48E-05	0.0000247	0.0000246	0.0000246	0.0000246	0.0000246
Silver Mean	0.0000248	0.0000248	0.0000248	2.49E-05	0.000025	0.000025	2.49E-05	0.0000249	0.0000248	0.0000248	0.0000248	0.0000248
Silver Median	0.0000248	0.0000248	0.0000248	2.49E-05	0.000025	0.000025	2.49E-05	0.0000249	0.0000248	0.0000248	0.0000248	0.0000248
Silver 95th Percentile	0.0000249	0.000025	0.0000249	0.000025	0.000025	0.000025	0.000025	0.0000249	0.0000249	0.000025	0.0000249	0.0000249
Thallium Min	0.0000254	0.000025	0.000025	0.000025	0.000025	0.000025	2.51E-05	0.0000253	0.0000253	0.0000252	0.0000252	0.0000255
Thallium Mean	0.0000265	0.0000266	0.0000266	2.58E-05	2.52E-05	2.52E-05	2.55E-05	0.0000259	0.0000262	0.0000263	0.0000263	0.0000264
Thallium Median	0.0000264	0.0000265	0.0000266	2.56E-05	2.51E-05	2.51E-05	2.54E-05	0.0000258	0.0000262	0.0000262	0.0000262	0.0000263
Thallium 95th Percentile	0.0000276	0.0000277	0.0000277	0.000027	2.53E-05	2.54E-05	2.61E-05	0.0000266	0.0000271	0.0000276	0.0000277	0.0000276
Uranium Min	0.000113	0.000057	0.000055	0.000151	0.000135	0.000112	9.22E-05	0.00012	0.00015	0.000138	0.000145	0.000135
Uranium Mean	0.000209	0.000225	0.000226	0.000216	0.000142	0.000119	0.000107	0.000152	0.000192	0.000181	0.000191	0.000179
Uranium Median	0.00021	0.00024	0.000238	0.000227	0.00014	0.000116	0.000102	0.000146	0.000194	0.000174	0.000182	0.000171
Uranium 95th Percentile	0.000272	0.000292	0.000284	0.00027	0.000161	0.000132	0.000145	0.000187	0.000234	0.000244	0.000249	0.000232
Zinc Min	0.009	0.00701	0.00694	0.00271	0.00347	0.00214	0.00165	0.00319	0.00241	0.00259	0.00475	0.00611
Zinc Mean	0.0128	0.0103	0.0104	0.00553	0.00383	0.00262	0.003	0.00501	0.00553	0.00645	0.00888	0.00865
Zinc Median	0.0126	0.0101	0.0102	0.00442	0.00373	0.00235	0.00266	0.00497	0.0057	0.00636	0.00894	0.0084
Zinc 95th Percentile	0.0162	0.0135	0.0129	0.0095	0.00476	0.0034	0.00523	0.00722	0.00789	0.0106	0.014	0.0125
Dissolved Metals (mg/L)												
Aluminum Min	0.0262	0.0253	0.0221	0.0195	0.153	0.123	0.07	0.0386	0.022	0.0233	0.0318	0.0251
Aluminum Mean	0.0343	0.0345	0.0337	0.0274	0.17	0.135	0.0785	0.0433	0.0251	0.0255	0.0365	0.0327
Aluminum Median	0.0323	0.03	0.0304	0.0254	0.172	0.136	0.079	0.0434	0.0248	0.0253	0.0357	0.0322
Aluminum 95th Percentile	0.0494	0.0659	0.0493	0.0405	0.175	0.139	0.0828	0.046	0.0277	0.0276	0.0426	0.0416
Cadmium Min	0.0000164	0.0000161	0.0000138	1.03E-05	1.07E-05	7.62E-06	7.54E-06	7.62E-06	0.00000763	0.00000759	0.0000164	0.0000165
Cadmium Mean	0.0000198	0.0000203	0.0000194	1.44E-05	0.000011	7.67E-06	7.65E-06	7.79E-06	0.00000789	0.00000791	0.0000187	0.0000197
Cadmium Median	0.0000189	0.0000184	0.000018	1.34E-05	1.09E-05	7.65E-06	7.62E-06	7.78E-06	0.0000079	0.0000079	0.0000185	0.0000194
Cadmium 95th Percentile	0.0000267	0.0000344	0.0000266	2.09E-05	1.14E-05	7.74E-06	7.84E-06	7.99E-06	0.0000081	0.00000828	0.0000218	0.0000236
Iron Min	0.0567	0.0534	0.0453	0.0509	0.134	0.0941	0.0837	0.0757	0.0634	0.0624	0.0696	0.0904
Iron Mean	0.0689	0.068	0.0646	0.0626	0.135	0.0943	0.0871	0.0791	0.0709	0.0661	0.0763	0.097
Iron Median	0.0658	0.0609	0.0594	0.0596	0.135	0.0943	0.0873	0.0792	0.0701	0.0658	0.0753	0.0966
Iron 95th Percentile	0.0926	0.118	0.0899	0.0817	0.136	0.0944	0.0889	0.081	0.0771	0.0696	0.0852	0.105

Table 3.4-7. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_DS, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Chloride Min	0.342	0.357	0.349	0.299	0.536	0.312	0.42	0.0977	0.142	0.278	0.311	0.357
Chloride Mean	0.423	0.444	0.441	0.355	0.548	0.329	0.453	0.142	0.205	0.354	0.39	0.426
Chloride Median	0.412	0.433	0.425	0.343	0.546	0.323	0.449	0.14	0.205	0.355	0.387	0.418
Chloride 95th Percentile	0.506	0.532	0.54	0.46	0.573	0.359	0.491	0.181	0.252	0.423	0.463	0.494
Fluoride Min	0.0539	0.0537	0.0537	0.0544	0.0545	0.0429	0.0567	0.022	0.0454	0.0462	0.0538	0.0542
Fluoride Mean	0.0552	0.0555	0.0554	0.0565	0.0546	0.0432	0.0575	0.0224	0.0464	0.0479	0.0544	0.0554
Fluoride Median	0.0554	0.0557	0.0557	0.0568	0.0546	0.0432	0.0575	0.0224	0.0463	0.0478	0.0543	0.0555
Fluoride 95th Percentile	0.0558	0.0563	0.0563	0.0574	0.0548	0.0434	0.058	0.0228	0.0474	0.0493	0.0547	0.0559
Sulphate Min	5.32	5.87	6.12	2.18	1.89	1.09	1.17	2.73	3.04	2.76	2.57	4.77
Sulphate Mean	8.77	9.62	9.86	5.02	2.31	1.97	3.14	4.75	6.14	6.41	6.85	8
Sulphate Median	8.53	9.26	8.45	4.71	2.18	1.56	2.92	4.78	6.25	6.84	7.2	8.03
Sulphate 95th Percentile	13.1	14.5	13.8	10.4	3.66	3.55	5.4	6.77	8.09	9.48	10.7	11.9
Ammonia as N Min	0.0554	0.0616	0.0645	0.0199	0.0189	0.0279	0.0242	0.0382	0.0355	0.0285	0.0265	0.0467
Ammonia as N Mean	0.0906	0.0998	0.102	0.0502	0.0231	0.0386	0.0452	0.0588	0.068	0.0672	0.0714	0.0805
Ammonia as N Median	0.088	0.0959	0.0862	0.0469	0.0217	0.0344	0.0428	0.0594	0.0692	0.0716	0.0754	0.0806
Ammonia as N 95th Percenti	0.135	0.15	0.142	0.106	0.0372	0.0568	0.0683	0.0785	0.0872	0.0983	0.11	0.121
Nitrate as N Min	0.0774	0.0781	0.078	0.0623	0.0175	0.0174	0.014	0.00946	0.00986	0.0225	0.0639	0.0777
Nitrate as N Mean	0.0926	0.0952	0.0956	0.0751	0.0194	0.0208	0.0213	0.0182	0.0219	0.0368	0.0817	0.0912
Nitrate as N Median	0.091	0.0933	0.0929	0.0723	0.0189	0.0195	0.0207	0.0174	0.0214	0.0371	0.0819	0.0902
Nitrate as N 95th Percentile	0.111	0.116	0.118	0.0992	0.0232	0.0269	0.029	0.027	0.032	0.0511	0.0991	0.107
Nitrite as N Min	0.00155	0.00153	0.00152	0.00155	0.00331	0.00156	0.0015	0.00151	0.00151	0.0015	0.0015	0.00177
Nitrite as N Mean	0.0017	0.00179	0.00153	0.0016	0.00332	0.00157	0.00151	0.00151	0.00151	0.00151	0.00151	0.00248
Nitrite as N Median	0.00172	0.00183	0.00153	0.00161	0.00332	0.00156	0.00151	0.00151	0.00151	0.00152	0.00152	0.00259
Nitrite as N 95th Percentile	0.00176	0.00192	0.00154	0.00162	0.00333	0.00157	0.00151	0.00152	0.00152	0.00152	0.00152	0.00278
WAD Cyanide Min	0.00251	0.00252	0.00252	0.0025	0.0025	0.0025	0.0025	0.00251	0.00251	0.00251	0.0025	0.00251
WAD Cyanide Mean	0.00253	0.00253	0.00253	0.00251	0.0025	0.0025	0.00251	0.00252	0.00252	0.00252	0.00252	0.00252
WAD Cyanide Median	0.00252	0.00253	0.00252	0.00251	0.0025	0.0025	0.00251	0.00252	0.00252	0.00252	0.00252	0.00252
WAD Cyanide 95th Percentil	0.00254	0.00254	0.00254	0.00253	0.00251	0.00251	0.00252	0.00252	0.00252	0.00253	0.00253	0.00254
Total Metals (mg/L)												
Antimony Min	0.0000692	0.0000723	0.0000755	5.88E-05	3.48E-05	3.64E-05	3.52E-05	0.0000381	0.0000373	0.0000339	0.0000525	0.0000673
Antimony Mean	0.000109	0.000116	0.000119	8.33E-05	4.03E-05	4.54E-05	5.29E-05	0.0000613	0.0000686	0.000068	0.0000918	0.000102
Antimony Median	0.000103	0.00011	0.000113	7.65E-05	3.88E-05	4.28E-05	5.05E-05	0.0000587	0.0000657	0.0000654	0.0000884	0.0000977
Antimony 95th Percentile	0.000161	0.000174	0.000182	0.000132	5.04E-05	6.05E-05	0.000074	0.0000862	0.0001	0.000108	0.000139	0.00015

(continued)

Table 3.4-7. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_DS, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) *(cont'd)*												
Arsenic Min	0.000613	0.00061	0.000611	0.000643	0.00039	0.000348	0.000449	0.000459	0.000364	0.000392	0.000622	0.000614
Arsenic Mean	0.000653	0.000654	0.000648	0.000738	0.000393	0.000354	0.000459	0.000484	0.0004	0.000432	0.00066	0.000626
Arsenic Median	0.000659	0.000661	0.000652	0.00075	0.000392	0.000354	0.000459	0.000483	0.000398	0.00043	0.000661	0.000628
Arsenic 95th Percentile	0.000669	0.000675	0.000668	0.000782	0.000403	0.00036	0.000469	0.000508	0.000441	0.000464	0.000684	0.000631
Barium Min	0.006	0.00605	0.00598	0.00624	0.00406	0.0033	0.00389	0.00376	0.00465	0.00448	0.00589	0.00612
Barium Mean	0.00606	0.0061	0.00606	0.00634	0.00408	0.00334	0.00391	0.0038	0.00467	0.0045	0.00598	0.00615
Barium Median	0.00605	0.00609	0.00604	0.00634	0.00407	0.00334	0.00391	0.0038	0.00466	0.0045	0.00598	0.00615
Barium 95th Percentile	0.00616	0.0062	0.00617	0.00639	0.00412	0.00339	0.00393	0.00385	0.00469	0.00451	0.00606	0.00618
Beryllium Min	0.0000497	0.0000497	0.0000497	4.97E-05	4.99E-05	4.99E-05	4.99E-05	0.0000498	0.0000498	0.0000498	0.0000498	0.0000497
Beryllium Mean	0.0000499	0.0000498	0.0000498	4.99E-05	0.00005	0.00005	4.99E-05	0.0000499	0.0000499	0.0000499	0.0000499	0.0000499
Beryllium Median	0.0000499	0.0000499	0.0000499	4.99E-05	0.00005	0.00005	0.00005	0.0000499	0.0000499	0.0000499	0.0000499	0.0000499
Beryllium 95th Percentile	0.0000499	0.0000499	0.0000499	0.00005	0.00005	0.00005	0.00005	0.0000499	0.00005	0.00005	0.00005	0.0000499
Boron Min	0.00262	0.00249	0.00263	0.00277	0.000682	0.00062	0.000516	0.00147	0.000567	0.00375	0.00258	0.0026
Boron Mean	0.0027	0.00263	0.00273	0.00279	0.000692	0.00064	0.000549	0.00151	0.00062	0.00378	0.00269	0.00268
Boron Median	0.00268	0.00259	0.0027	0.00278	0.000688	0.000634	0.000545	0.0015	0.000622	0.00378	0.00269	0.00267
Boron 95th Percentile	0.00283	0.00286	0.00285	0.00285	0.000723	0.000677	0.00059	0.00156	0.000654	0.00381	0.0028	0.00279
Calcium Min	9.32	9.37	9.34	9.06	3.93	3.84	5.34	6.44	8.54	8.73	9.03	9.74
Calcium Mean	9.65	9.71	9.79	9.25	4.01	4.03	5.53	6.66	8.75	9	9.41	9.98
Calcium Median	9.67	9.73	9.74	9.16	3.98	3.98	5.51	6.66	8.76	9.01	9.43	9.95
Calcium 95th Percentile	9.91	10	10.1	9.76	4.3	4.33	5.76	6.78	8.88	9.19	9.68	10.2
Chromium Min	0.000302	0.000298	0.000298	0.00032	0.000313	0.000276	0.00036	0.000184	0.000299	0.000186	0.000318	0.000305
Chromium Mean	0.000346	0.000357	0.000347	0.000386	0.000318	0.000287	0.000371	0.000199	0.000354	0.000226	0.000363	0.000323
Chromium Median	0.000352	0.000365	0.000355	0.000395	0.000316	0.000288	0.000371	0.000198	0.00035	0.000223	0.000364	0.000325
Chromium 95th Percentile	0.000364	0.000386	0.000374	0.000416	0.000333	0.000295	0.00038	0.000212	0.000415	0.000259	0.000392	0.000331
Cobalt Min	0.0000858	0.0000959	0.0000961	5.49E-05	0.000114	4.53E-05	2.96E-05	0.000051	0.0000491	0.0000469	0.0000551	0.0000787
Cobalt Mean	0.000122	0.000135	0.000136	8.54E-05	0.000118	5.47E-05	5.09E-05	0.0000717	0.0000811	0.0000866	0.000102	0.000113
Cobalt Median	0.000119	0.000131	0.000118	8.21E-05	0.000117	5.02E-05	4.84E-05	0.0000723	0.0000824	0.0000912	0.000106	0.000113
Cobalt 95th Percentile	0.00017	0.000186	0.000177	0.000142	0.000133	7.13E-05	7.43E-05	0.0000912	0.0000999	0.000119	0.000143	0.000156
Copper Min	0.000491	0.000442	0.000425	0.000432	0.000651	0.000353	0.000429	0.000216	0.000188	0.000114	0.000406	0.000428
Copper Mean	0.00074	0.000453	0.000442	0.000443	0.000653	0.000355	0.000432	0.00022	0.000192	0.000118	0.000423	0.000439
Copper Median	0.000778	0.00045	0.000438	0.00044	0.000653	0.000355	0.000431	0.00022	0.000192	0.000119	0.000423	0.000436
Copper 95th Percentile	0.000842	0.000473	0.000466	0.000454	0.000654	0.000355	0.000434	0.000222	0.000194	0.000122	0.000442	0.000458

(continued)

Table 3.4-7. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_DS, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Iron Min	0.202	0.213	0.202	0.215	0.228	0.121	0.125	0.122	0.132	0.114	0.194	0.207
Iron Mean	0.206	0.215	0.208	0.216	0.228	0.122	0.125	0.125	0.132	0.115	0.2	0.21
Iron Median	0.205	0.214	0.206	0.215	0.228	0.122	0.125	0.124	0.132	0.116	0.2	0.209
Iron 95th Percentile	0.214	0.217	0.216	0.217	0.23	0.122	0.125	0.127	0.133	0.117	0.207	0.214
Lead Min	0.00023	0.00021	0.000206	0.000201	6.28E-05	3.65E-05	3.93E-05	0.0000267	0.0000251	0.000025	0.000194	0.000203
Lead Mean	0.000246	0.000216	0.000214	0.000208	6.33E-05	3.76E-05	3.98E-05	0.0000271	0.0000252	0.0000252	0.000203	0.000209
Lead Median	0.000248	0.000214	0.000212	0.000206	6.33E-05	3.77E-05	3.98E-05	0.0000271	0.0000252	0.0000252	0.000202	0.000207
Lead 95th Percentile	0.000252	0.000228	0.000226	0.000216	6.39E-05	3.85E-05	4.02E-05	0.0000276	0.0000253	0.0000252	0.000212	0.000221
Magnesium Min	2.49	2.5	2.5	2.5	1.02	0.933	1.3	1.63	2.26	2.26	2.49	2.52
Magnesium Mean	2.53	2.53	2.53	2.53	1.03	0.951	1.31	1.66	2.28	2.29	2.51	2.62
Magnesium Median	2.53	2.53	2.54	2.53	1.02	0.951	1.31	1.66	2.28	2.29	2.51	2.64
Magnesium 95th Percentile	2.54	2.54	2.56	2.54	1.05	0.978	1.33	1.7	2.31	2.31	2.52	2.65
Manganese Min	0.0739	0.0762	0.0759	0.0637	0.0137	0.00611	0.0075	0.0123	0.0118	0.00958	0.0617	0.0726
Manganese Mean	0.0844	0.0877	0.088	0.0735	0.0148	0.0084	0.0127	0.0175	0.0196	0.0191	0.0759	0.0827
Manganese Median	0.0826	0.0854	0.0833	0.0712	0.0145	0.00728	0.012	0.0174	0.0199	0.0201	0.0768	0.0819
Manganese 95th Percentile	0.1	0.104	0.103	0.0911	0.0182	0.0128	0.0191	0.0231	0.025	0.0271	0.0899	0.0962
Mercury Min	0.00000254	0.00000254	2.54E-06	2.55E-06	5.16E-06	2.96E-06	3.24E-06	3.26E-06	0.00000325	0.0000034	0.00000259	0.00000255
Mercury Mean	0.00000261	0.00000261	2.61E-06	2.62E-06	5.17E-06	2.96E-06	3.25E-06	3.28E-06	0.00000328	0.00000357	0.00000265	0.00000261
Mercury Median	0.00000261	0.00000261	2.61E-06	2.62E-06	5.17E-06	2.96E-06	3.25E-06	3.27E-06	0.00000328	0.00000357	0.00000266	0.00000262
Mercury 95th Percentile	0.00000263	0.00000263	2.64E-06	2.64E-06	5.17E-06	2.97E-06	3.27E-06	3.29E-06	0.0000033	0.00000369	0.00000267	0.00000263
Molybdenum Min	0.000295	0.000303	0.000289	0.000275	0.00014	0.000132	0.000213	0.000284	0.00042	0.000323	0.00029	0.000291
Molybdenum Mean	0.000317	0.000323	0.000328	0.000294	0.000145	0.000146	0.000229	0.000302	0.000436	0.000338	0.000308	0.000312
Molybdenum Median	0.000315	0.000322	0.000329	0.000291	0.000143	0.000142	0.000226	0.000302	0.000437	0.000339	0.00031	0.000311
Molybdenum 95th Percentile	0.000335	0.00034	0.000348	0.000325	0.000167	0.000169	0.000246	0.000312	0.000446	0.00035	0.000323	0.000331
Nickel Min	0.000235	0.000238	0.000236	0.000228	0.000247	0.000312	0.000201	0.000155	0.000103	0.0000908	0.000214	0.000238
Nickel Mean	0.000248	0.000252	0.000252	0.00024	0.000249	0.000338	0.000207	0.000159	0.000109	0.000103	0.000233	0.00025
Nickel Median	0.000245	0.000248	0.000249	0.000237	0.000248	0.00034	0.000206	0.000159	0.000109	0.000104	0.000234	0.000248
Nickel 95th Percentile	0.000269	0.000276	0.000272	0.000257	0.000252	0.000361	0.000214	0.000164	0.000112	0.000114	0.000253	0.000265
Phosphorus Min	0.0077	0.00747	0.00746	0.00879	0.0143	0.015	0.0119	0.0124	0.0126	0.0116	0.00908	0.00805
Phosphorus Mean	0.0107	0.0112	0.0103	0.0127	0.0146	0.0162	0.0124	0.0136	0.0145	0.0136	0.0118	0.00974
Phosphorus Median	0.0111	0.0117	0.0107	0.0133	0.0145	0.0164	0.0124	0.0136	0.0144	0.0135	0.0119	0.00996
Phosphorus 95th Percentile	0.0119	0.013	0.0118	0.0146	0.0153	0.0171	0.0128	0.0148	0.0166	0.0152	0.0136	0.0105

(continued)

Table 3.4-7. Summary Statistics of Base Case Predicted Surface Water Quality at Creek 661 Assessment Node WQ5_DS, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Selenium Min	0.0003	0.0003	0.0003	0.000279	0.000219	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Selenium Mean	0.0003	0.0003	0.0003	0.000285	0.000219	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Selenium Median	0.0003	0.0003	0.0003	0.000283	0.000219	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Selenium 95th Percentile	0.0003	0.0003	0.0003	0.000291	0.000219	0.000207	0.000297	0.0003	0.0003	0.0003	0.0003	0.0003
Silver Min	0.0000249	0.0000249	0.0000249	2.49E-05	0.000025	0.000025	0.000025	0.000025	0.0000249	0.0000249	0.0000249	0.0000249
Silver Mean	0.000025	0.0000249	0.0000249	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Silver Median	0.000025	0.0000249	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Silver 95th Percentile	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Thallium Min	0.0000251	0.0000252	0.0000252	0.000025	0.000025	0.000025	0.000025	0.0000251	0.0000251	0.0000251	0.000025	0.0000251
Thallium Mean	0.0000253	0.0000254	0.0000254	2.52E-05	0.000025	2.51E-05	2.51E-05	0.0000252	0.0000252	0.0000252	0.0000253	0.0000253
Thallium Median	0.0000253	0.0000254	0.0000254	2.51E-05	0.000025	0.000025	2.51E-05	0.0000252	0.0000252	0.0000252	0.0000253	0.0000253
Thallium 95th Percentile	0.0000256	0.0000256	0.0000257	2.54E-05	2.51E-05	2.51E-05	2.52E-05	0.0000253	0.0000254	0.0000254	0.0000255	0.0000255
Uranium Min	0.0000788	0.0000811	0.0000758	7.64E-05	0.000107	9.42E-05	6.57E-05	0.0000644	0.0000734	0.0000619	0.0000768	0.0000733
Uranium Mean	0.0000829	0.0000856	0.0000847	8.27E-05	0.000109	9.71E-05	6.88E-05	0.0000678	0.0000784	0.0000652	0.0000801	0.0000783
Uranium Median	0.0000826	0.0000855	0.0000849	8.35E-05	0.000108	9.63E-05	6.85E-05	0.0000676	0.000078	0.000065	0.0000801	0.0000782
Uranium 95th Percentile	0.0000869	0.0000897	0.0000894	8.84E-05	0.000114	0.000102	7.24E-05	0.0000708	0.0000834	0.0000675	0.0000832	0.0000826
Zinc Min	0.0077	0.00729	0.00735	0.00615	0.00297	0.00162	0.00144	0.00229	0.00149	0.00169	0.00626	0.00676
Zinc Mean	0.00826	0.00805	0.00812	0.00689	0.00306	0.00179	0.0018	0.00263	0.00206	0.00232	0.00723	0.00749
Zinc Median	0.00822	0.0079	0.00776	0.00674	0.00304	0.00172	0.00176	0.00264	0.00208	0.00239	0.00731	0.00744
Zinc 95th Percentile	0.00896	0.00919	0.00896	0.00806	0.00333	0.00209	0.00218	0.00298	0.00239	0.00283	0.00811	0.00849
Dissolved Metals (mg/L)												
Aluminum Min	0.0679	0.0679	0.0683	0.0658	0.2	0.163	0.102	0.0575	0.0352	0.039	0.0651	0.0668
Aluminum Mean	0.0701	0.0705	0.071	0.0684	0.204	0.165	0.104	0.0589	0.0364	0.0407	0.0681	0.0692
Aluminum Median	0.0693	0.0698	0.0703	0.0677	0.204	0.165	0.104	0.0589	0.0365	0.0408	0.068	0.0685
Aluminum 95th Percentile	0.0741	0.0753	0.0748	0.0712	0.205	0.167	0.105	0.0599	0.0372	0.0421	0.0715	0.0729
Cadmium Min	0.0000352	0.0000353	0.0000354	3.37E-05	1.01E-05	7.57E-06	7.51E-06	7.54E-06	0.00000753	0.00000752	0.0000329	0.0000348
Cadmium Mean	0.0000362	0.0000365	0.0000367	3.51E-05	1.02E-05	7.58E-06	7.54E-06	7.57E-06	0.00000758	0.00000758	0.0000345	0.0000359
Cadmium Median	0.0000358	0.0000362	0.0000363	3.47E-05	1.02E-05	7.57E-06	7.54E-06	7.57E-06	0.00000758	0.00000758	0.0000344	0.0000356
Cadmium 95th Percentile	0.0000382	0.0000388	0.0000385	3.66E-05	1.03E-05	7.61E-06	7.57E-06	0.0000076	0.00000761	0.00000762	0.0000362	0.0000377
Iron Min	0.121	0.121	0.121	0.119	0.131	0.0932	0.0965	0.0893	0.0947	0.0895	0.118	0.126
Iron Mean	0.125	0.125	0.126	0.123	0.132	0.0933	0.0973	0.0903	0.0979	0.0925	0.123	0.128
Iron Median	0.123	0.124	0.125	0.122	0.132	0.0933	0.0973	0.0904	0.0981	0.0927	0.122	0.127
Iron 95th Percentile	0.131	0.133	0.132	0.127	0.132	0.0933	0.098	0.091	0.0998	0.0949	0.128	0.131

Table 3.4-8. Summary Statistics of Base Case Predicted Surface Water Quality at Chedakuz Creek Assessment Node WQ9, Post-Closure

Month	January	February	March	April	May	June	July	August	September	October	November	December
Anions and Nutrients (mg/L)												
Chloride Min	0.935	0.96	0.805	0.52	0.717	0.613	0.68	0.663	0.588	0.678	0.655	0.857
Chloride Mean	1.46	1.46	1.3	1.34	1.59	1.22	1.19	1.42	1.53	1.57	1.28	1.45
Chloride Median	1.43	1.44	1.3	1.15	1.36	1.1	1.2	1.44	1.54	1.56	1.28	1.43
Chloride 95th Percentile	1.89	1.83	1.6	2.8	3.23	2.17	1.56	1.9	2.02	2.31	1.68	1.83
Fluoride Min	0.0641	0.0649	0.0671	0.0606	0.0572	0.0571	0.0629	0.0547	0.0615	0.0582	0.0596	0.0635
Fluoride Mean	0.0658	0.0663	0.0694	0.0689	0.0648	0.0619	0.0667	0.0565	0.0635	0.0633	0.0633	0.0657
Fluoride Median	0.0659	0.0665	0.0694	0.0698	0.066	0.0625	0.067	0.0563	0.0635	0.0636	0.0636	0.0657
Fluoride 95th Percentile	0.0672	0.0674	0.071	0.0724	0.0696	0.0653	0.0698	0.0583	0.0655	0.0652	0.0647	0.067
Sulphate Min	12.1	11.9	9.41	6.17	6.69	8.21	8.37	7.9	7.11	7.93	9.72	11.6
Sulphate Mean	16.3	15.3	13.6	29.4	55.5	31.9	15.6	16.5	17.7	24.7	17.3	17
Sulphate Median	15.9	15.1	13.1	11.9	45	27.4	12.9	15.6	17	18.3	14.7	15.6
Sulphate 95th Percentile	21.4	18.4	17.7	98.5	134	74.3	26.1	30.3	26.4	45.7	28.4	23.9
Ammonia as N Min	0.245	0.253	0.198	0.0633	0.0389	0.0478	0.0743	0.145	0.108	0.143	0.126	0.191
Ammonia as N Mean	0.362	0.362	0.318	0.225	0.122	0.144	0.243	0.375	0.408	0.371	0.294	0.342
Ammonia as N Median	0.364	0.365	0.321	0.233	0.118	0.146	0.255	0.412	0.445	0.392	0.312	0.343
Ammonia as N 95th Percenti	0.505	0.481	0.393	0.32	0.195	0.238	0.311	0.5	0.563	0.484	0.387	0.451
Nitrate as N Min	0.155	0.144	0.117	0.0663	0.0698	0.0939	0.0772	0.0675	0.0651	0.0787	0.112	0.147
Nitrate as N Mean	0.199	0.191	0.172	0.245	0.37	0.233	0.146	0.178	0.191	0.228	0.174	0.195
Nitrate as N Median	0.195	0.186	0.17	0.154	0.298	0.201	0.133	0.177	0.197	0.198	0.166	0.192
Nitrate as N 95th Percentile	0.255	0.244	0.211	0.718	0.822	0.533	0.245	0.262	0.254	0.416	0.27	0.246
Nitrite as N Min	0.00317	0.00323	0.00232	0.00278	0.00266	0.00225	0.00228	0.00228	0.00224	0.00241	0.0022	0.00369
Nitrite as N Mean	0.00332	0.00337	0.00245	0.00304	0.00283	0.00236	0.00243	0.00248	0.00249	0.00263	0.00238	0.00404
Nitrite as N Median	0.00334	0.00338	0.00247	0.00309	0.00286	0.00235	0.00245	0.0025	0.00253	0.00267	0.0024	0.00406
Nitrite as N 95th Percentile	0.00343	0.00345	0.0025	0.00316	0.00299	0.00244	0.00248	0.00257	0.00261	0.00272	0.00245	0.00427
WAD Cyanide Min	0.00114	0.00114	0.00108	0.000974	0.000928	0.000915	0.00102	0.00109	0.000992	0.00105	0.00101	0.00108
WAD Cyanide Mean	0.00127	0.00128	0.00123	0.00115	0.00107	0.001	0.0011	0.00126	0.00131	0.00129	0.00119	0.00125
WAD Cyanide Median	0.00127	0.00128	0.00122	0.00116	0.00102	0.000996	0.0011	0.00127	0.00134	0.00131	0.0012	0.00124
WAD Cyanide 95th Percentil	0.00147	0.00144	0.00132	0.00134	0.00133	0.00109	0.00117	0.00141	0.00147	0.00141	0.00129	0.00141
Total Metals (mg/L)												
Antimony Min	0.0000744	0.0000721	0.0000603	0.000057	7.06E-05	6.77E-05	7.66E-05	0.0000652	0.0000628	0.0000659	0.0000737	0.00008
Antimony Mean	0.000152	0.000128	0.000107	0.000495	0.00109	0.00057	0.000198	0.000163	0.000174	0.00034	0.000208	0.000178
Antimony Median	0.000112	0.000104	0.0000952	0.000102	0.000873	0.00048	0.000122	0.000122	0.000128	0.000156	0.000145	0.000117
Antimony 95th Percentile	0.000265	0.000229	0.000189	0.0019	0.00275	0.0014	0.000405	0.000429	0.000434	0.000749	0.000425	0.000325

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Table 3.4-8. Summary Statistics of Base Case Predicted Surface Water Quality at Chedakuz Creek Assessment Node WQ9, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) *(cont'd)*												
Arsenic Min	0.000463	0.000454	0.000451	0.000488	0.000501	0.000439	0.000481	0.000484	0.000472	0.000456	0.000456	0.000458
Arsenic Mean	0.000476	0.000465	0.000458	0.00059	0.000511	0.000465	0.000497	0.0005	0.000487	0.000476	0.000481	0.00047
Arsenic Median	0.000477	0.000467	0.000458	0.000578	0.000513	0.000467	0.000498	0.000497	0.000484	0.000476	0.000483	0.000471
Arsenic 95th Percentile	0.000484	0.000472	0.000464	0.000686	0.000516	0.000481	0.000508	0.000518	0.000504	0.000492	0.000489	0.000475
Barium Min	0.00621	0.00614	0.00623	0.00683	0.00629	0.00573	0.00606	0.00582	0.00593	0.00593	0.00617	0.00608
Barium Mean	0.00644	0.0063	0.00638	0.00736	0.00657	0.00614	0.00628	0.00605	0.00619	0.00623	0.00636	0.00632
Barium Median	0.00644	0.0063	0.00637	0.00742	0.00661	0.00614	0.00627	0.00598	0.00614	0.00621	0.00634	0.00631
Barium 95th Percentile	0.0066	0.00644	0.00655	0.00764	0.00671	0.00644	0.0065	0.0063	0.0065	0.00659	0.00657	0.00649
Beryllium Min	0.0000442	0.0000446	0.0000456	4.64E-05	4.76E-05	4.69E-05	4.65E-05	0.0000443	0.0000436	0.0000441	0.0000456	0.0000442
Beryllium Mean	0.000046	0.000046	0.0000465	4.75E-05	4.87E-05	4.85E-05	4.74E-05	0.0000459	0.0000455	0.0000459	0.0000468	0.0000462
Beryllium Median	0.000046	0.000046	0.0000465	4.74E-05	4.88E-05	4.85E-05	4.73E-05	0.0000455	0.0000451	0.0000456	0.0000466	0.0000462
Beryllium 95th Percentile	0.0000472	0.000047	0.0000478	4.89E-05	4.93E-05	4.96E-05	4.87E-05	0.0000479	0.0000479	0.0000483	0.0000482	0.0000476
Boron Min	0.00129	0.00113	0.00118	0.00123	0.00131	0.00128	0.00122	0.00132	0.00114	0.00159	0.00121	0.00128
Boron Mean	0.00135	0.00118	0.00122	0.00219	0.00187	0.00158	0.00129	0.00145	0.0012	0.00178	0.0013	0.00136
Boron Median	0.00134	0.00117	0.00121	0.00196	0.00176	0.00151	0.00125	0.00142	0.00118	0.00175	0.00126	0.00135
Boron 95th Percentile	0.00143	0.00125	0.00127	0.00339	0.00269	0.00202	0.0014	0.00156	0.00135	0.00196	0.00142	0.00144
Calcium Min	18	17.9	18.1	17.3	17	16.3	15.6	15.9	16.5	16.7	17	17.6
Calcium Mean	18.6	18.5	18.8	19.8	20.8	18.5	17.1	17.2	17.6	18.4	18.2	18.4
Calcium Median	18.6	18.5	18.8	18.4	20.2	18.5	17	17	17.5	18.2	18.2	18.5
Calcium 95th Percentile	19.1	18.9	19.3	25.9	26.8	21.3	18.4	18.3	19	20	18.8	19
Chromium Min	0.000148	0.000154	0.000161	0.000162	0.000178	0.000171	0.000162	0.00015	0.000151	0.000153	0.000156	0.000152
Chromium Mean	0.000159	0.000162	0.000167	0.000176	0.000208	0.000187	0.000177	0.00016	0.000162	0.000165	0.000166	0.000163
Chromium Median	0.000159	0.000163	0.000166	0.000171	0.000204	0.000186	0.000176	0.000161	0.000161	0.000163	0.000165	0.000164
Chromium 95th Percentile	0.000166	0.00017	0.000172	0.000197	0.000238	0.0002	0.000186	0.000167	0.000172	0.000181	0.000176	0.000173
Cobalt Min	0.0000679	0.000063	0.0000536	0.000053	5.78E-05	0.000056	4.74E-05	0.0000498	0.0000459	0.0000491	0.0000605	0.0000653
Cobalt Mean	0.0000767	0.0000723	0.0000686	8.23E-05	0.000104	7.64E-05	6.57E-05	0.0000785	0.0000809	0.0000835	0.0000742	0.0000762
Cobalt Median	0.0000783	0.0000707	0.000068	7.16E-05	9.22E-05	7.17E-05	6.66E-05	0.0000806	0.0000855	0.0000789	0.000073	0.0000762
Cobalt 95th Percentile	0.0000881	0.0000817	0.0000776	0.000141	0.000181	0.000112	7.59E-05	0.0000923	0.0000954	0.000106	0.0000873	0.0000888
Copper Min	0.000361	0.000362	0.000351	0.000345	0.000455	0.000408	0.000424	0.00036	0.000356	0.000312	0.000353	0.000362
Copper Mean	0.000378	0.000377	0.000365	0.000412	0.000487	0.000426	0.00044	0.000376	0.000372	0.000357	0.00037	0.000374
Copper Median	0.000378	0.000378	0.000365	0.000413	0.00049	0.000424	0.000439	0.000374	0.000371	0.000358	0.000372	0.000375
Copper 95th Percentile	0.000391	0.000387	0.000375	0.000442	0.000509	0.00044	0.000458	0.00039	0.000389	0.000371	0.000378	0.000387

(continued)

Table 3.4-8. Summary Statistics of Base Case Predicted Surface Water Quality at Chedakuz Creek Assessment Node WQ9, Post-Closure (continued)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Iron Min	0.0889	0.0851	0.0909	0.0846	0.13	0.0989	0.0992	0.094	0.093	0.087	0.0921	0.09
Iron Mean	0.0965	0.0908	0.0956	0.116	0.136	0.104	0.103	0.1	0.101	0.103	0.106	0.0967
Iron Median	0.0974	0.0913	0.0958	0.123	0.136	0.104	0.102	0.0992	0.0989	0.104	0.106	0.0971
Iron 95th Percentile	0.102	0.0954	0.101	0.133	0.141	0.107	0.108	0.107	0.111	0.117	0.112	0.101
Lead Min	0.0000433	0.0000438	0.0000441	4.51E-05	5.63E-05	4.54E-05	3.99E-05	0.0000444	0.0000455	0.0000447	0.0000453	0.0000448
Lead Mean	0.0000466	0.000047	0.0000464	5.28E-05	6.99E-05	5.24E-05	4.68E-05	0.0000503	0.0000489	0.0000472	0.0000491	0.0000478
Lead Median	0.0000466	0.000047	0.0000462	5.24E-05	6.75E-05	5.27E-05	4.69E-05	0.0000502	0.0000487	0.0000473	0.0000488	0.0000476
Lead 95th Percentile	0.0000493	0.0000498	0.0000488	5.76E-05	8.42E-05	5.75E-05	4.99E-05	0.0000542	0.0000519	0.0000499	0.0000526	0.0000507
Magnesium Min	3.93	3.93	3.98	3.76	3.28	3.32	3.46	3.5	3.6	3.56	3.67	3.87
Magnesium Mean	4.1	4.1	4.16	4.08	3.71	3.74	3.72	3.76	3.82	3.84	4.01	4.07
Magnesium Median	4.11	4.12	4.18	4.1	3.78	3.73	3.76	3.75	3.82	3.84	4.03	4.06
Magnesium 95th Percentile	4.24	4.21	4.28	4.3	3.91	3.95	3.95	4.04	3.99	4.08	4.15	4.2
Manganese Min	0.0297	0.0283	0.0272	0.0225	0.0255	0.0232	0.0245	0.0267	0.0272	0.027	0.0287	0.0293
Manganese Mean	0.0321	0.0306	0.0302	0.03	0.0274	0.0252	0.0277	0.0314	0.0322	0.0312	0.0322	0.0321
Manganese Median	0.0321	0.0307	0.0304	0.031	0.0273	0.025	0.028	0.0314	0.0329	0.0316	0.0327	0.0322
Manganese 95th Percentile	0.035	0.033	0.0317	0.0336	0.0291	0.0273	0.0299	0.0343	0.0358	0.0345	0.034	0.0342
Mercury Min	0.00000286	0.00000289	3.05E-06	3.04E-06	3.21E-06	0.000003	3.06E-06	0.0000029	0.00000284	0.00000289	0.00000299	0.00000289
Mercury Mean	0.000003	0.000003	3.12E-06	3.15E-06	3.53E-06	3.07E-06	3.12E-06	0.000003	0.00000297	0.000003	0.00000305	0.00000304
Mercury Median	0.000003	0.00000301	3.11E-06	3.14E-06	3.47E-06	3.08E-06	3.12E-06	2.99E-06	0.00000294	0.00000298	0.00000305	0.00000304
Mercury 95th Percentile	0.00000307	0.00000306	3.18E-06	3.29E-06	3.9E-06	3.13E-06	3.19E-06	3.12E-06	0.00000315	0.00000314	0.00000313	0.00000312
Molybdenum Min	0.00054	0.000543	0.000554	0.000547	0.000487	0.000501	0.000494	0.000521	0.000545	0.000533	0.000524	0.000535
Molybdenum Mean	0.000589	0.000578	0.000581	0.000826	0.00114	0.000802	0.000583	0.000577	0.000601	0.000699	0.000611	0.000601
Molybdenum Median	0.000555	0.000558	0.00057	0.000564	0.001	0.000726	0.000532	0.000543	0.000562	0.00056	0.000559	0.000557
Molybdenum 95th Percentile	0.000661	0.000643	0.000633	0.00174	0.00219	0.00131	0.000699	0.000733	0.000775	0.000951	0.000745	0.000692
Nickel Min	0.000217	0.000219	0.000235	0.00021	0.00027	0.000243	0.000246	0.000247	0.000223	0.000193	0.000223	0.000223
Nickel Mean	0.000223	0.000222	0.000241	0.000247	0.000279	0.000247	0.000252	0.000251	0.000231	0.000211	0.000242	0.000227
Nickel Median	0.000224	0.000223	0.000241	0.000253	0.000278	0.000248	0.000252	0.000251	0.00023	0.000213	0.000243	0.000226
Nickel 95th Percentile	0.000227	0.000225	0.000245	0.000262	0.000289	0.000251	0.000256	0.000255	0.000239	0.000216	0.000247	0.000229
Phosphorus Min	0.0168	0.0165	0.0187	0.0159	0.0177	0.0211	0.0174	0.0163	0.0161	0.0161	0.0165	0.0172
Phosphorus Mean	0.0172	0.017	0.0196	0.0208	0.0193	0.0294	0.0178	0.0169	0.0167	0.0175	0.017	0.0176
Phosphorus Median	0.0172	0.017	0.0197	0.0215	0.0194	0.0302	0.0178	0.0169	0.0167	0.0176	0.017	0.0176
Phosphorus 95th Percentile	0.0175	0.0172	0.0204	0.0228	0.0201	0.0366	0.0183	0.0173	0.0172	0.0182	0.0173	0.018

(continued)

Table 3.4-8. Summary Statistics of Base Case Predicted Surface Water Quality at Chedakuz Creek Assessment Node WQ9, Post-Closure (completed)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Total Metals (mg/L) ***(cont'd)***												
Selenium Min	0.000236	0.000238	0.00025	0.000223	0.000235	0.00023	0.00025	0.000238	0.000234	0.00024	0.000248	0.000236
Selenium Mean	0.000251	0.000251	0.000255	0.000239	0.000253	0.000244	0.000256	0.000248	0.000246	0.000252	0.000256	0.000253
Selenium Median	0.000251	0.000252	0.000254	0.000233	0.000251	0.000242	0.000254	0.000248	0.000243	0.000251	0.000255	0.000253
Selenium 95th Percentile	0.000259	0.000258	0.000259	0.000267	0.000273	0.000258	0.000263	0.000258	0.000267	0.000267	0.000265	0.000261
Silver Min	0.0000221	0.0000223	0.0000228	2.32E-05	2.43E-05	2.35E-05	2.32E-05	0.0000222	0.0000218	0.000022	0.0000228	0.0000221
Silver Mean	0.000023	0.000023	0.0000233	2.38E-05	2.52E-05	2.43E-05	2.37E-05	0.0000229	0.0000228	0.000023	0.0000234	0.0000231
Silver Median	0.000023	0.000023	0.0000232	2.38E-05	2.52E-05	2.43E-05	2.36E-05	0.0000227	0.0000225	0.0000228	0.0000233	0.0000231
Silver 95th Percentile	0.0000236	0.0000235	0.0000239	2.45E-05	2.59E-05	2.48E-05	2.43E-05	0.000024	0.0000239	0.0000241	0.0000241	0.0000238
Thallium Min	0.0000226	0.0000227	0.0000232	2.36E-05	2.46E-05	2.43E-05	2.38E-05	0.0000227	0.0000225	0.0000229	0.0000233	0.0000226
Thallium Mean	0.000024	0.0000238	0.0000239	2.82E-05	3.46E-05	2.94E-05	2.52E-05	0.000024	0.0000239	0.0000258	0.000025	0.0000244
Thallium Median	0.0000237	0.0000237	0.0000238	2.44E-05	3.25E-05	2.83E-05	2.45E-05	0.0000238	0.0000236	0.0000246	0.0000242	0.0000239
Thallium 95th Percentile	0.0000256	0.000025	0.0000245	4.21E-05	5.02E-05	3.74E-05	2.71E-05	0.0000263	0.0000278	0.00003	0.0000268	0.0000261
Uranium Min	0.000101	0.000098	0.000105	0.000107	0.000098	9.65E-05	9.12E-05	0.000093	0.0000959	0.000095	0.000096	0.0000971
Uranium Mean	0.000109	0.000105	0.000111	0.000137	0.000166	0.000132	0.000102	0.0000996	0.000104	0.000113	0.000106	0.000106
Uranium Median	0.000107	0.000104	0.00011	0.000112	0.00015	0.000128	9.76E-05	0.0000977	0.000102	0.000102	0.000102	0.000103
Uranium 95th Percentile	0.00012	0.000114	0.00012	0.000226	0.000271	0.000186	0.000117	0.000117	0.000121	0.000138	0.000119	0.000117
Zinc Min	0.00266	0.0031	0.00259	0.00223	0.00247	0.00218	0.00189	0.00213	0.00189	0.00222	0.00238	0.00234
Zinc Mean	0.00289	0.0035	0.00283	0.00246	0.00275	0.00274	0.00237	0.00277	0.00249	0.00263	0.00269	0.00259
Zinc Median	0.00289	0.00345	0.00284	0.00247	0.00271	0.00285	0.0024	0.00282	0.00259	0.00264	0.00268	0.0026
Zinc 95th Percentile	0.0031	0.0039	0.00298	0.00262	0.00308	0.00331	0.00258	0.00306	0.00283	0.00289	0.00287	0.00285
Dissolved Metals (mg/L)												
Aluminum Min	0.0122	0.0119	0.0117	0.0159	0.0287	0.0233	0.0184	0.0144	0.0135	0.0135	0.013	0.0126
Aluminum Mean	0.0157	0.0154	0.015	0.0192	0.0411	0.0328	0.0241	0.0189	0.0174	0.0176	0.0169	0.0163
Aluminum Median	0.0153	0.0149	0.0146	0.0186	0.0388	0.0313	0.0232	0.0188	0.017	0.0172	0.0163	0.0158
Aluminum 95th Percentile	0.0189	0.0184	0.018	0.0223	0.0552	0.0413	0.0284	0.0224	0.0205	0.0223	0.0204	0.0196
Cadmium Min	0.00000778	0.00000774	7.75E-06	8.23E-06	9.51E-06	8.54E-06	7.92E-06	0.0000078	0.00000786	0.00000778	0.00000779	0.00000777
Cadmium Mean	0.00000819	0.00000815	8.09E-06	9.03E-06	1.05E-05	8.96E-06	8.28E-06	8.17E-06	0.00000828	0.00000815	0.00000815	0.00000821
Cadmium Median	0.00000822	0.00000816	8.08E-06	8.98E-06	1.06E-05	8.97E-06	8.29E-06	8.18E-06	0.00000829	0.00000816	0.00000816	0.00000823
Cadmium 95th Percentile	0.00000856	0.00000851	8.42E-06	9.57E-06	1.13E-05	9.31E-06	8.57E-06	0.0000085	0.00000863	0.00000848	0.0000085	0.00000859
Iron Min	0.0399	0.042	0.0431	0.0419	0.052	0.0473	0.0482	0.0486	0.0504	0.0488	0.0481	0.0433
Iron Mean	0.0426	0.0442	0.0456	0.0558	0.0563	0.0503	0.0514	0.0514	0.0567	0.0591	0.0522	0.0468
Iron Median	0.0427	0.0443	0.0456	0.0588	0.0559	0.0504	0.0511	0.0507	0.0553	0.0592	0.0519	0.047
Iron 95th Percentile	0.0443	0.0459	0.0477	0.0635	0.0604	0.0518	0.054	0.0548	0.0635	0.0678	0.0544	0.048

3.5 Implications for the Surface Water Quality Effects Assessment

Consistent with the surface water quality effects assessment submitted on August 12, 2016, contaminants of potential concern (COPCs) in effluent and the receiving environment were identified.

COPCs were identified to assess the potential for adverse residual effects at the following assessment nodes downstream of Project interactions (Section 3.5.2). Assessment nodes are presented in Figure 3.5-1:

- Davidson Creek, downstream of the ECD site and plunge pool (WQ26);
- Davidson Creek, upstream of the confluence with Chedakuz Creek (WQ7);
- Creek 661, directly downstream of the confluence with Creek 505659 (WQ5_US);
- Creek 661, directly upstream of Tatelkuz Lake (WQ5_DS); and
- Chedakuz Creek, downstream of the confluence with Davidson Creek (WQ9).

3.5.1 Effluent Quality

Predicted effluent quality in the August 12, 2016 submission was compared to results of the updated surface water quality model. Predicted 95th percentile concentrations of surface water quality parameters in the TSF D spillway and in the plunge pool upstream of Davidson Creek in the updated model are compared to the results of the August 12, 2016 submission in Table 3.5-1. Discharges from the plunge pool, inclusive of TSF D spillway flows and WTP effluent, that will be released to the receiving environment in Post-Closure were also assessed for compliance with the MMER (SOR/2002-222; Table 3.5-1). Model results indicated that effluent will meet the MMER limits. These results were consistent with the conclusions of the August 12, 2016 submission. Predicted surface water quality in the TSF D spillway is inclusive of overflow from the TSF in addition to TSF D seepage intercepted by the spillway. During extreme low flow conditions, the dominant load to the spillway is the seepage pathway, and as a result, 95th percentile concentrations of parameters which are high in the seepage source term (e.g., sulphate, ammonia, cyanide) are also predicted to be high in the TSF D spillway. Detailed summary statistics of predicted surface water quality in the TSF D spillway are provided in Section 3.4.3.1.

3.5.2 Receiving Environment Quality

The updated receiving environment quality predictions are inclusive of the alternate active water management and water treatment described in Sections 3.2 and 3.3. Updated surface water quality model results support the conclusion of no significant residual effects described in the August 12, 2016 submission. Tables 3.5-2, 3.5-3, and 3.5-4 identify the change in COPC identification between the August 12 submission and the updated water quality predictions. Further context for the assessment of residual effects is provided in the sections below.

Figure 3.5-1
Surface Water Quality Assessment Nodes

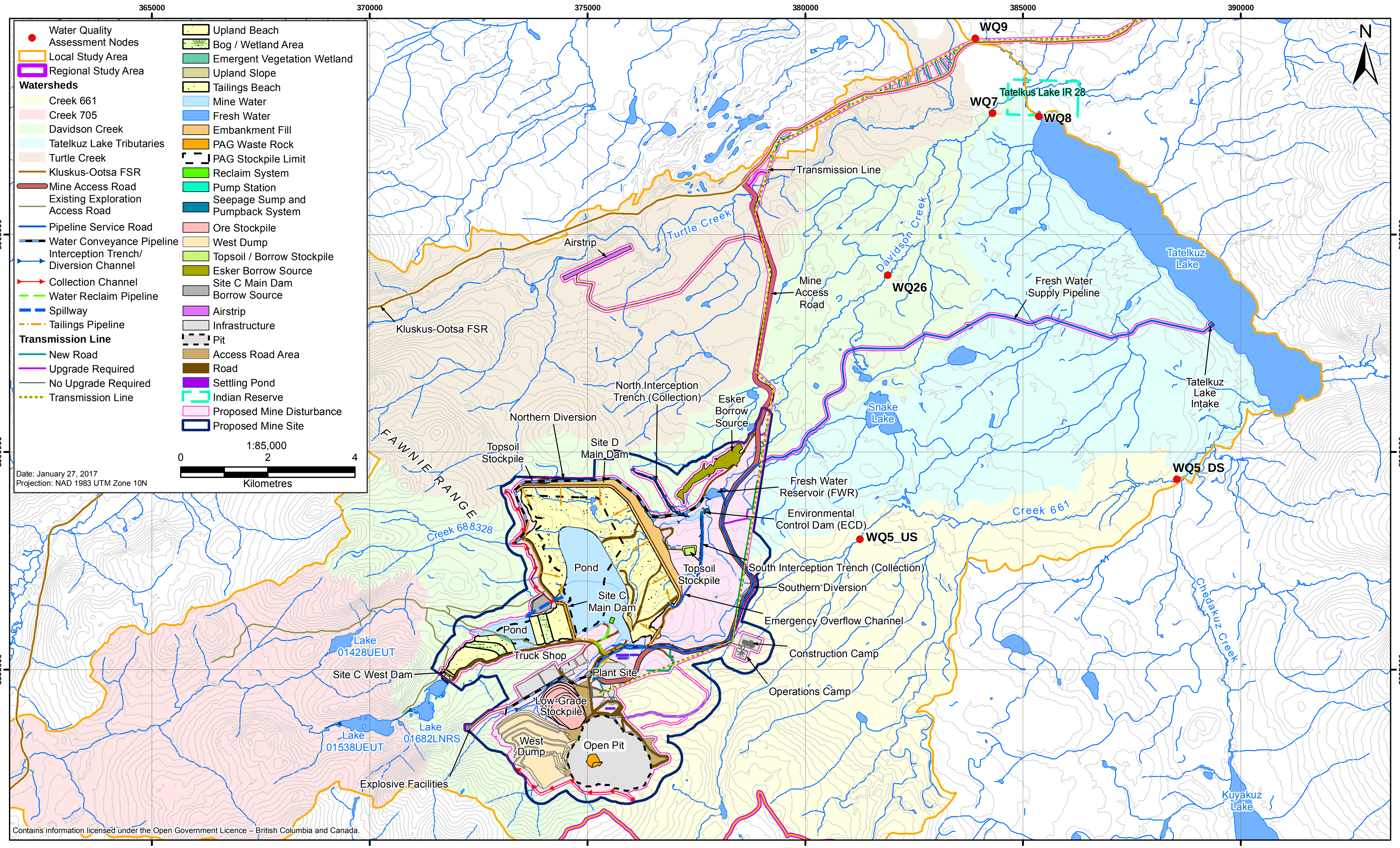

Table 3.5-1. Effluent Quality Comparison, Post-Closure

Water Quality Parameter	MMER Criteria[1] Maximum Authorized Monthly Mean Concentration	MMER Criteria[1] Maximum Authorized Concentration in a Grab Sample	TSF D Overflow (95th Percentile) August 12 Submission	TSF D Overflow (95th Percentile) Updated Submission	Plunge Pool (95th Percentile) August 12 Submission	Plunge Pool (95th Percentile) Updated Submission
Chloride	-	-	3.3	30.1	13.2	11.9
Fluoride	-	-	0.0455	0.0463	0.0433	0.0432
Sulphate	-	-	202	1910	400	300
Ammonia	-	-	1.22	22	0.343	3.61
Nitrate	-	-	0.0651	6.01	0.0397	2.02
Nitrite	-	-	0.00705	0.00703	0.00801	0.00525
Total Cyanide	1.00	2.00	0.00482	0.154	0.00259	0.0408
WAD Cyanide	-	-	0.00269	0.00988	0.00201	0.00682
Aluminum	-	-	0.0466	0.163	0.0433	0.13
Antimony	-	-	0.00336	0.0168	0.00272	0.00616
Arsenic	0.50	1.00	0.000533	0.00237	0.00108	0.000516
Barium	-	-	0.0121	0.0234	0.0271	0.00571
Beryllium	-	-	0.000143	0.00005	0.000113	0.00004
Boron	-	-	0.0497	0.0311	0.0446	0.00433
Cadmium	-	-	0.00005	0.00004	0.00002	0.00001
Calcium	-	-	134	295	335	38.4
Chromium	-	-	0.000494	0.000331	0.000497	0.000253
Cobalt	-	-	0.00142	0.0224	0.000731	0.000345
Copper	0.30	0.60	0.000189	0.000396	0.000263	0.000381
Iron	-	-	0.142	0.118	0.136	0.134
Lead	0.20	0.40	0.000519	0.000118	0.000506	0.000104
Magnesium	-	-	6.78	14	16.8	2.39
Manganese	-	-	0.696	5.31	0.453	0.0695
Mercury	-	-	0.000005	0.000014	0.000007	0.000004
Molybdenum	-	-	0.0103	0.0231	0.0311	0.0044
Nickel	0.50	1.00	0.000495	0.00484	0.0084	0.000292
Selenium	-	-	0.000626	0.000428	0.000779	0.000287
Silver	-	-	0.000061	0.00003	0.00005	0.00003
Thallium	-	-	0.00003	0.000138	0.000264	0.00008
Uranium	-	-	0.000257	0.00439	0.00397	0.000487
Zinc	0.50	1.00	0.0226	0.365	0.00594	0.00598

Notes: All units are mg/L. Concentrations are total values for purposes of comparison with MMER criteria.
Dash (-) indicates no applicable MMER criteria exists.
[1] Source: SOR/2006-239, s. 25.

Table 3.5-2. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Davidson Creek, WQ26

Water Quality Parameter	Occurrence of COPC			Predicted Concentration Range (mg/L)*			
		Frequency		August 12 Submission		Updated Submission	
	Month	August 12 Submission	Updated Submission	Minimum	Maximum	Minimum	Maximum
Ammonia	January	-	100%	-	-	2.08	3.73
	February	-	100%	-	-	2.28	3.76
	March	-	100%	-	-	2.35	3.79
	April	-	76%	-	-	1.6	3.58
	May	-	5%	-	-	1.88	1.89
	June	-	5%	-	-	1.87	1.89
	July	-	52%	-	-	1.85	2.72
	August	-	100%	-	-	1.84	3.15
	September	-	91%	-	-	2.31	3.37
	October	-	85%	-	-	1.8	3.5
	November	-	90%	-	-	1.79	3.61
	December	-	100%	-	-	1.86	3.69
Sulphate	January	86%	-	222	589	-	-
	February	90%	-	230	481	-	-
	March	90%	-	237	407	-	-
	April	38%	21%	219	351	218	349
	May	86%	85%	130	187	168	335
	June	86%	62%	131	222	139	272
	July	90%	15%	136	338	133	162
	August	95%	4%	170	412	165	178
	September	81%	-	227	370	-	-
	October	76%	3%	220	365	220	227
	November	67%	-	227	374	-	-
	December	76%	-	223	381	-	-
WAD Cyanide	January	-	95%	-	-	0.00509	0.00687
	February	-	100%	-	-	0.00514	0.00692
	March	-	100%	-	-	0.00523	0.00696
	April	-	57%	-	-	0.005	0.0067
	July	-	14%	-	-	0.00504	0.00567
	August	-	76%	-	-	0.00503	0.00618
	September	-	91%	-	-	0.00517	0.00643
	October	-	62%	-	-	0.00524	0.0066
	November	-	71%	-	-	0.00501	0.00672
	December	-	85%	-	-	0.00502	0.00683

(continued)

Table 3.5-2. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Davidson Creek, WQ26 (completed)

Water Quality Parameter	Month	Occurrence of COPC: Frequency: August 12 Submission	Occurrence of COPC: Frequency: Updated Submission	Predicted Concentration Range (mg/L)*: August 12 Submission: Minimum	August 12 Submission: Maximum	Updated Submission: Minimum	Updated Submission: Maximum
Dissolved Aluminum	May	24%	85%	0.0504	0.054	0.0733	0.0921
	June	5%	72%	-	0.0508	0.0501	0.0801
Total Antimony	April	-	14%	-	-	0.00612	0.00689
	May	-	30%	-	-	0.00601	0.00677
Total Zinc	January	29%	7%	0.00762	0.00902	-	0.0080
	February	43%	54%	0.00752	0.00956	-	0.0080
	March	48%	10%	0.00758	0.00978	-	0.0080
	April	5%	5%	-	0.00872	-	0.0080
	August	10%	-	0.00758	0.00829	-	-
	November	14%	5%	0.00774	0.00836	-	0.0080
	December	19%	-	0.00785	0.00877	-	-

Note: Dash (-) indicates parameter was not identified as a COPC for that month in all of Post-Closure.
** Presents the range of concentrations (monthly timestep) coincident of COPC occurrence only.*

Table 3.5-3. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Davidson Creek, WQ7

Water Quality Parameter	Month	Occurrence of COPC: Frequency: August 12 Submission	Occurrence of COPC: Frequency: Updated Submission	Predicted Concentration Range (mg/L)*: August 12 Submission: Minimum	August 12 Submission: Maximum	Updated Submission: Minimum	Updated Submission: Maximum
Ammonia	January	-	95%	-	-	1.84	3.22
	February	-	100%	-	-	1.88	3.26
	March	-	100%	-	-	1.72	3.3
	April	-	63%	-	-	1.34	2.73
	July	-	19%	-	-	1.82	2.37
	August	-	95%	-	-	1.59	2.72
	September	-	91%	-	-	1.92	2.89
	October	-	67%	-	-	1.79	3.01
	November	-	85%	-	-	1.55	3.11
	December	-	81%	-	-	1.92	3.18
Sulphate	January	57%	-	221	469	-	-
	February	62%	-	222	382	-	-
	March	62%	-	218	333	-	-
	April	10%	17%	233	246	219	304

(continued)

Table 3.5-3. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Davidson Creek, WQ7 (completed)

Water Quality Parameter	Occurrence of COPC			Predicted Concentration Range (mg/L)*			
		Frequency		August 12 Submission		Updated Submission	
	Month	August 12 Submission	Updated Submission	Minimum	Maximum	Minimum	Maximum
Sulphate *(cont'd)*	May	38%	85%	130	166	147	302
	June	33%	60%	129	198	129	241
	July	81%	7%	129	281	128	139
	August	19%	-	223	336	-	-
	September	48%	-	219	309	-	-
	October	38%	-	223	305	-	-
	November	59%	-	219	310	-	-
	December	48%	-	228	215	-	-
WAD Cyanide	January	-	76%	-	-	0.005	0.00628
	February	-	90%	-	-	0.00502	0.00633
	March	-	81%	-	-	0.00501	0.00637
	April	-	15%	-	-	0.00545	0.0057
	July	-	10%	-	-	0.00508	0.00527
	August	-	33%	-	-	0.00503	0.00568
	September	-	68%	-	-	0.005	0.00587
	October	-	53%	-	-	0.00519	0.00603
	November	-	53%	-	-	0.00522	0.00613
	December	-	57%	-	-	0.00505	0.00623
Dissolved Aluminum	May	43%	85%	0.0546	0.065	0.0817	0.0987
	June	90%	89%	0.0531	0.065	0.0587	0.0903
	July	-	5%	-	-	0.0505	0.0506
Total Antimony	April	-	<1%	-	-	-	0.00601
	May	-	5%	-	-	0.00601	0.00613
Total Zinc	January	-	53%	-	-	0.008	0.008
	February	-	95%	-	-	0.011	0.012

Note: Dash (-) indicates parameter was not identified as a COPC for that month in all of Post-Closure.
** Presents the range of concentrations (monthly timestep) coincident of COPC occurrence only.*

3.5.2.1 Davidson Creek

COPCs identified in Post-Closure at Davidson Creek assessment nodes WQ26 and WQ7 are summarized in Tables 3.5-2 and 3.5-3, respectively. At both sites, ammonia, sulphate, WAD cyanide, dissolved aluminum, total antimony, and total zinc were predicted to have concentrations greater than background concentrations and guidelines and were therefore classified as COPCs.

Table 3.5-4. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Creek 661, WQ5_US

Water Quality Parameter	Occurrence of COPC			Predicted Concentration Range (mg/L)*			
		Frequency		August 12 Submission		Updated Submission	
	Month	August 12 Submission	Updated Submission	Minimum	Maximum	Minimum	Maximum
Dissolved Aluminum	January	5%	5%	-	0.0577	0.0585	0.0599
	February	10%	10%	0.0647	0.0756	0.0649	0.0756
	March	5%	-	-	0.0762	-	-
	May	10%	5%	0.15	0.165	-	0.175
	June	100%	100%	0.125	0.146	0.123	0.139
	July	24%	100%	0.0869	0.0924	0.07	0.0833
	August	5%	-	-	0.0531	-	-
	December	24%	99%	0.0378	0.0418	0.0251	0.0419
Total Zinc	January	100%	100%	0.0105	0.0248	0.009	0.0178
	February	95%	95%	0.00868	0.0217	0.00761	0.0147
	March	95%	95%	0.0109	0.0226	0.00783	0.0156
	April	48%	22%	0.00765	0.0179	0.00751	0.0121
	July	10%	-	0.00758	0.0087	-	-
	August	29%	5%	0.00767	0.0127	0.00888	0.00897
	September	67%	10%	0.00758	0.017	0.00779	0.0108
	October	62%	38%	0.00814	0.0197	0.00758	0.0126
	November	86%	67%	0.00764	0.0205	0.00756	0.0142
	December	100%	72%	0.00759	0.0188	0.00754	0.0127

Note: Dash (-) indicates parameter was not identified as a COPC for that month in all of Post-Closure.
** Presents the range of concentrations (monthly timestep) coincident of COPC occurrence only.*

Nitrate concentrations were also predicted to be greater than background concentrations and guidelines at WQ26, in one model timestep during the entirety of Post-Closure. Consistent with the approach developed for the August 12, 2016 submission, nitrate was not identified as a COPC and is not presented in Table 3.5-2 nor further characterized for residual effects due to the restricted duration, low frequency, and sporadic nature of occurrence (i.e., a single model timestep). It is anticipated that discharge limits will be set during permitting that are protective of the environment and that monitoring and operational water management, including contingencies listed in Section 3.3.4, will avoid intermittent exceedances of the discharge limits.

Sulphate, dissolved aluminum, and total zinc were identified as Post-Closure COPCs in both the August 12, 2016 submission and the updated surface water quality predictions. Updated predicted sulphate concentrations are lower than in the previous assessment and sulphate occurs less frequently as a COPC.

Ammonia, WAD cyanide, and total antimony were new COPCs not identified in the August 12, 2016 submission. Total zinc was also identified as a COPC at WQ7, differing from the August 12, 2016 submission when zinc was only identified as a COPC at WQ26. Ammonia and WAD cyanide concentrations were elevated in Davidson Creek due to high concentrations in unrecoverable seepage from TSF D; the highest frequency of occurrence for both COPCs was observed in months when background flows were lowest. In the August 12, 2016 submission, these two parameters were removed in the constructed treatment wetlands. In the updated water quality model, neither parameter is assumed to be attenuated in the subsurface, and WAD cyanide is assumed not to be removed in the IX+NF WTP. These are conservative assumptions as substantial attenuation of both parameters would be anticipated prior to reaching Davidson Creek (see Section 3.3.5). Furthermore, removal of both these parameters is expected in the wetlands to be established in the TSF during Closure, thereby reducing concentrations in the TSF D overflow that will be blended with seepage at the plunge pool.

Total antimony was identified as a COPC due to predicted concentrations exceeding the Health Canada drinking water quality guideline (0.006 mg/L). Predicted total antimony concentrations were below the BC MOE working water quality guideline for aquatic life (0.009 mg/L) at all times in Davidson Creek during Post-Closure. This result is comparable to the August 12, 2016 submission.

3.5.2.2 Creek 661

Dissolved aluminum and total zinc were identified as COPCs in Post-Closure in Creek 661 and are summarized in Tables 3.5-4 and 3.5-5. Both parameters were also identified as COPCs in the August 12, 2016 submission.

Table 3.5-5. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Creek 661, WQ5_DS

Water Quality Parameter	Occurrence of COPC			Predicted Concentration Range (mg/L)*			
		Frequency		August 12 Submission		Updated Submission	
	Month	August 12 Submission	Updated Submission	Minimum	Maximum	Minimum	Maximum
Dissolved Aluminum	April	5%	10%	-	0.066	0.0658	0.0659
	June	10%	14%	0.163	0.167	0.163	0.167
	July	14%	23%	0.103	0.112	0.102	0.104
Total Zinc	January	100%	100%	0.00812	0.0104	0.0077	0.00909
	February	100%	77%	0.0079	0.0108	0.0075	0.00932
	March	100%	95%	0.00791	0.0111	0.00751	0.00955
	April	48%	19%	0.00756	0.01	0.00751	0.00875
	November	48%	39%	0.00756	0.0092	0.00751	0.00828
	December	71%	43%	0.00757	0.00985	0.00763	0.0087

Note: Dash (-) indicates parameter was not identified as a COPC for that month in all of Post-Closure.
** Presents the range of concentrations (monthly timestep) coincident of COPC occurrence only.*

The primary source of metal loading to Creek 661 is seepage from the open pit. As presented in Tables 3.5-4 and 3.5-5, changes to pit lake modelling, as summarized in Section 3.4.2.3, do not result in substantial changes to model predictions in Creek 661. For most modelled months, updated predictions are lower than the concentrations predicted in the August 12, 2016 submission, with the same or lower frequency of occurrence for all months except July. Consequently, the model updates presented in this memo are not expected to impact the results of the August 12, 2016 surface water quality effects assessment for Creek 661.

3.5.2.3 Chedakuz Creek

As presented in Table 3.5-6, predicted dissolved aluminum concentrations at WQ9 were greater than background concentrations and guidelines during May in 19% of Post-Closure years, and therefore, dissolved aluminum was identified as a COPC. Dissolved aluminum concentrations, however, are expected to remain less than the upper limit of natural variability at WQ9.

Table 3.5-6. Identified Contaminants of Potential Concern (COPCs) in Post-Closure for Chedakuz Creek, WQ9

Water Quality Parameter	Occurrence of COPC			Predicted Concentration Range (mg/L)*			
		Frequency		August 12 Submission		Updated Submission	
	Month	August 12 Submission	Updated Submission	Minimum	Maximum	Minimum	Maximum
Dissolved Aluminum	May	-	19%	-	-	0.0514	0.0582

Note: Dash (-) indicates parameter was not identified as a COPC for that month in all of Post-Closure.
** Presents the range of concentrations (monthly timestep) coincident of COPC occurrence only.*

3.6 Summary and Conclusions

Updated surface water quality modelling has been undertaken in response to comments from MEM indicating that information provided to date on the proposed passive treatment system for Post-Closure was insufficient to support the surface water quality effects assessment. New Gold has prepared information on the following:

- the addition of two active water treatment plants in Closure and Post-Closure: a conventional MR WTP and an IX+NF WTP for metals, sulphate, and ammonia removal of TSF supernatant and seepage and open pit flows (Appendix A, Appendix B, and Appendix C);
- updates to Closure and Post-Closure water management including an updated Life of Mine watershed model (Appendix D);
- an updated assessment of pit stratification with the addition of NF brine (Appendix E); and
- updated surface water quality modelling.

Updated modelling demonstrates that discharges from the Project can be actively managed in Post-Closure to minimize the potential for residual effects in the downstream receiving environment.

Screening of updated Post-Closure water quality predictions was completed to identify parameters with predicted concentrations greater than background concentrations and guidelines. The following COPCs were identified:

- sulphate, ammonia, WAD cyanide, dissolved aluminum, total antimony, and total zinc in Davidson Creek;
- dissolved aluminum and total zinc in Creek 661; and
- dissolved aluminum in Chedakuz Creek.

For most parameters, updated surface water quality model results demonstrate comparable or better water quality than the August 12, 2016 submission. Further, the results of the updated COPC identification support the conclusion of no significant residual effects described in the August 12, 2016 submission. An updated effects assessment for surface water quality will be prepared based on these updated results.

REFERENCES

BioteQ. 2017. *Sulphate Removal from Blackwater Tailings Storage Facility Supernatant and Seepage during Closure and Post-closure.* Prepared for New Gold Inc. by BioteQ Environmental Technologies: Vancouver, BC.

ERM. 2016a. *Blackwater Gold Project: Updated Surface Water Quality Effects Assessment.* Prepared for New Gold Inc. by ERM Consultants Canada Ltd.: Vancouver, BC.

ERM. 2016b. *Blackwater Gold Project: Assessment of Effects related to Project Changes.* Prepared for New Gold Inc. by ERM Consultants Canada Ltd.: Vancouver, BC.

KP. 2017. *Blackwater Gold Project – Updated Watershed Modelling in Support of Water Quality Assessment.* Prepared for New Gold Inc. by Knight Piésold Ltd.: Vancouver, BC.

Lorax. 2017. *Pit Lake Modelling for Blackwater Gold Project: Assumptions Relating to Depth of Surface Mixed Layer in Pit Lake.* Prepared for New Gold Inc. by Lorax Environmental: Vancouver, BC.

McCue. 2016. *Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant for the Blackwater Gold Project.* Prepared for New Gold Inc. by McCue Engineering Contractors: Delta, BC.

McCue. 2017. *Active Water Treatment Options Evaluation for Post-Closure Mining Affected Water for the Blackwater Project.* Prepared for New Gold Inc. by McCue Engineering Contractors: Delta, BC.

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<u>Personnal Communications</u>

New Gold. 2016. Personal communication. Receipt of analogue site data (Equity Silver Mine) via Cody Meints C/O Ryan Todd, 16 December 2016.

— Appendix A —

Active Water Treatment Options Evaluation for Post-Closure Mining Affected Water for the Blackwater Project (McCue 2017)

ACTIVE WATER TREATMENT OPTIONS EVALUATION FOR CLOSURE & POST-CLOSURE MINING AFFECTED WATER FOR THE BLACKWATER GOLD PROJECT

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Appendix D – Summary of Hydroxide/Sulphide Precipitation Bench Test Results for the Blackwater Gold Project

PREFACE

New Gold Inc. (New Gold) submitted an Application for an Environmental Assessment Certificate / Environmental Impact Statement (Application/EIS) in December 2015 for the Blackwater Gold Project which is currently undergoing a coordinated environmental assessment under both the British Columbia *Environmental Assessment Act* and the *Canadian Environmental Assessment Act*. In October 2016, New Gold received comments from reviewers at BC Ministry of Energy and Mines (MEM) indicating that the information provided to date on the proposed passive treatment systems at Post-Closure was insufficient to support the surface water quality effects assessment. In response to these review comments, New Gold has prepared the following information:

- Water treatment technology alternatives and conceptual design information for metals, ammonia, and sulphate treatment presented in this report and the report prepared by BioteQ Environmental Technologies (BioteQ) (BioteQ 2017);

- Updated closure and post-closure water management and surface water quality model results presented in ERM Consultants Canada Ltd. (ERM) report (ERM 2017);

- Summary of the proposed closure and post-closure active water treatment systems to mitigate effects to surface water quality (ERM 2017); and

- Assessment of implications to the environmental effects assessment (ERM 2017).

1.0 INTRODUCTION

McCue Engineering Contractors (McCue) was retained by New Gold Inc. (New Gold) to evaluate active water treatment options for the discharge of mine affected water during closure and post mine closure at the Blackwater Gold Project. The objective of this work was to evaluate the potential effluent quality from active treatment options as an alternative to the passive wetland treatment previously proposed.

This document summarizes:

- Site information relevant to the options evaluation
- Overview of the inlet water sources
- Overview of the discharge water quality targets
- How water treatment processes / technologies were selected and evaluated
- Descriptions of the primary water treatment processes / technologies evaluated
- Identification of feasible options for active water treatment in closure and post-closure

1.1 Project Description

The Blackwater Gold Project is located approximately 160 km southwest of Prince George, BC and is the future site of an open pit mining operation with an expected operating lifespan of 17 years. The tailings storage facility (TSF) is divided into Site C and Site D and is located within the Davidson Creek catchment. Davidson Creek is a trout-bearing stream located near the base of the east side of the Site D Main Dam. Over the life of the mine, the TSF will receive and store the tailings, potentially acid generating (PAG) waste rock, and site-wide mine affected water. Active closure of the mine is planned for years 18 and 42. In post-closure (expected to commence in year 42) the TSF is designed to overflow through a spillway to Davidson Creek.

1.1.1 Climate

A summary of the average temperature and precipitation in the area is presented in Table 1-1 below.

TABLE 1–1: Climate Summary*

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Temp (Celsius)	-7.7	-5.6	-2.1	1.6	6.7	10.4	12.5	11.8	7.2	1.3	-3.5	-7.4
Total Precip (mm)	73	45	39	20	50	66	52	51	47	47	74	72
% Precip as	100	100	100	35	0	0	0	0	0	35	100	100

Snow													

Notes:
mm - millimeters
Precip – precipitation
Data are based on the hydrometeorology study completed by Knight Piésold Ltd.
* "Preliminary Engineering Hydrometeorology Report, Ref. No. VA101-457, 2013"

Based on the climate data, the mean temperature is below zero between November and March. Temperature is a key factor in the application and/or performance of some of water treatment technologies and temperature has therefore been considered in this evaluation.

1.1.2 Freight Transport

Freight to/from the site will be hauled via a controlled forestry/mine access road branching from Highway 16 near Vanderhoof, BC. This road will be open year round. On this basis, freight transport in and out of the mine site does not pose a constraint to water treatment at the site for any of the processes included in the evaluation herein.

2.0 INLET WATER SOURCES

Water treatment options for two mine-affected contact water flow paths were assessed:

- TSF D supernatant - this represents water stored within the TSF, and any other runoff or precipitation intercepted or draining into the TSF

- Overflow from the flooded open pit (Pit Lake) - this represents water stored within the open pit and any other runoff or precipitation intercepted or draining into the open pit

As the water management strategy for the site evolves this evaluation could support other contact water sources that have a similar water quality profile. The general site water quality profile has been predicted as neutral pH and relatively low levels of metals.

2.1 Inlet Water Quality

This options evaluation focused on treatment of nine target dissolved metal parameters identified by ERM Consultants Canada Ltd. (ERM).

These parameters are:

- Dissolved Aluminum (Al)

- Dissolved Antimony (Sb)

- Dissolved Arsenic (As)

- Dissolved Cadmium (Cd)
- Dissolved Chromium (Cr)
- Dissolved Cobalt (Co)
- Dissolved Copper (Cu)
- Dissolved Manganese (Mn)
- Dissolved Zinc (Zn)

Inlet water quality is provided by ERM under separate cover (ERM 2017).

2.2 Inlet Water Quantity

For this evaluation, the maximum inlet flow rate of the Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant Pit Sump WTP of 285 litres per second (L/s) has been used for the closure and post-closure period.

Inlet water quantity is provided by ERM under separate cover (ERM 2017).

3.0 DISCHARGE WATER QUALITY

In the post-closure period the treated effluent will be directly discharged to Davidson Creek or blended with other water streams and discharged to Davidson Creek.

3.1 Discharge Water Quality Targets

For the purpose of the evaluation two times (2x) the BC Ambient Working and Approved Surface Water Quality Guidelines (WQGs) for the protection of freshwater aquatic life were set by ERM as the end of pipe treatment targets based on typical available dilution in Davidson Creek. The targets are summarized in Table 3-1 below. Some of the parameters are hardness or pH dependent and accordingly the targets for these parameters have been indicated as a range.

Table 3-1 – End of Pipe Water Treatment Discharge Targets

Parameter	Guideline
Dissolved Aluminum	0.1
Dissolved Antimony	0.018
Dissolved Arsenic	0.01
Dissolved Cadmium	0.0000352-0.000254
Dissolved Chromium	0.002
Dissolved Cobalt	0.008

Parameter	Guideline
Dissolved Copper	0.004
Dissolved Manganese	1.4 - 1.6
Dissolved Zinc	0.0150

Notes:
mg/L – milligrams per litre
It is assumed the 30-day average hardness is less than 50 mg/L as $CaCO_3$
It is assumed the maximum temperature of Davidson Creek is 15°C

4.0 ACTIVE WATER TREATMENT TECHNOLOGY EVALUATION METHOD

The water treatment technologies included in this evaluation were selected because they have the capacity to treat the target parameters at the projected flow rates.

The evaluation is focused on primary treatment technologies only. Any pre- or post-treatment, have been identified as being required but are not described in detail.

The processes evaluated for one or more of the target parameters include:

- Hydroxide Precipitation
- Sulphide Precipitation
- Hydroxide / Carbonate Integration
- Electrocoagulation
- Ultrafiltration
- Nanofiltration
- Reverse Osmosis
- Ion Exchange

Brief summaries of these technologies / processes are provided in Appendix A.

The options evaluation has been presented in the form of an estimated performance summary table (Appendix B) and a technology / process summary matrix (Appendix C). The proposed passive wetland treatment has been included in the performance table for comparison of the expected effluent quality. Treatment options have been evaluated against the following criteria:

- Performance – ability of the process to remove target parameters to concentrations suitable for direct discharge to Davidson Creek

- Robustness - ability for the process to operate reliably over a wide range of operating conditions (e.g. flow, water quality, temperature)

- Operational Requirements – auxiliary treatment, reagents, operational effort (e.g. manpower)

- Waste Products – type of waste(s) generated and options / methods for waste management

- Commercialization Life Cycle – where the technology is in the commercialization life cycle (e.g. whether or not the technology is commercially available)

- Sustainability – qualitative assessment of footprint, energy requirement, waste quantity and waste toxicity associated with technology

- Acceptance – how widely the technology is used in the mining industry, with a priority on BC, Canada, and finally other jurisdictions

5.0 ACTIVE WATER TREATMENT TECHNOLOGY EVALUATION SUMMARY

Refer to Appendix C for the treatment process summary matrix.

5.1 Performance

The active treatment technology evaluation considered the removal of nine dissolved metal parameters. The performance of active water treatment technologies for metals removal have been compared against the end of pipe treatment targets. The results of this comparison are presented in Table 5-1 below.

Table 5-1: Potential Metal Removal Capabilities

Active Water Treatment Technologies	Al	Sb	As	Cd	Cr	Co	Cu	Mn	Zn
Hydroxide Precipitation (with ferric addition)	0.06	0.002	0.0004	0.000005	0.0001	0.0001	0.0002	0.0008	0.001
Hydroxide/Sulphide Integration (with ferric addition)	0.02	0.008	0.0005	0.000005	0.0001	0.001	0.0002	0.7	0.001
Hydroxide Carbonate Integration (with ferric integration)	0.06	0.002	0.0004	0.000005	0.0001	0.0001	0.0002	0.0008	0.001
Electrocoagulation	91-99%	NI	97%	67.6 - 99%	99%	73.8 - 99%	99.5 - 99%	38 - 99%	98 - 99%
Nanofiltration	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%
Reverse Osmosis	>99%	>99%	>99%	>99%	>99%	>99%	>99%	>99%	>99%
Ion Exchange	NI	>99%	>99%	>99%	>99%	>99%	>99%	>99%	>99%

Notes:
The chemical precipitation performance is based on bench test results provided in Appendix D
Refer to Appendix B for complete list of references
NI - No Information
[yellow] - Indicates the treated effluent is unlikely to meet the lowest discharge target (2X the BC WQG)
[blue] - Indicates the treated effluent concentration is expected to meet the lowest discharge target (to 2X the BC WQG)

Based on performance, chemical precipitation, ion exchange, and reverse osmosis represent viable treatment approaches.

The chemical precipitation performance data is based on the results of a chemical bench test program undertaken by New Gold to validate the Pit Sump WTP design[1]. The test results have been used for this evaluation because the test program used synthetic site water and therefore has site-specific relevance. The test results are provided in Appendix D.

Refer to Sections 6 and 7 for the conceptual closure and post-closure water treatment plans.

[1] During the operations phase, a chemical precipitation WTP will be used to treat groundwater reporting to the open pit and discharge it to Davidson Creek (McCue 2016).

6.0 CONCEPTUAL CLOSURE WATER TREATMENT PLAN

6.1 Closure Period Water Treatment Objective

Due to the highly variable flows during post-closure over the TSF spillway, there is substantial advantage to treat the TSF supernatant in a closed loop system at a constant flow rate to reduce the dissolved metals concentrations to below the end of pipe discharge targets during the closure period (i.e. before the TSF overflows via the spillway at the end of mine closure in year 42).

Treatment of the TSF supernatant during the closure period would provide the following benefits:

- Active treatment would focus on the removal of target parameters without the immediate concern of having to meet end of pipe discharge quality targets
- Active treatment combined with natural processes (e.g. cyanide degradation and nitrification/denitrification) and dilution from runoff and direct precipitation would likely require less effort and therefore be less expensive compared to treatment after the TSF overflows via the spillway
- Once the TSF supernatant water quality is suitable for discharge from the spillway without treatment it could be blended with other contact water sources to potentially reduce water treatment requirements in post-closure
- Creates opportunity for repurposing of the operational Pit Sump WTP equipment and other infrastructure at the mine site for closure water treatment

6.2 Conceptual Dissolved Metals Treatment Plan

Based on the Pit Sump WTP chemical bench test data (Appendix D) and predicted effluent concentrations (Table 5-1), repurposing the Pit Sump WTP equipment is expected to remove dissolved metals to below the end of pipe discharge targets. Based on modelling performed by ERM, operating the Pit Sump WTP on a closed loop basis in the last eight years of closure would result in the reduction of dissolved metals in the TSF D supernatant below the discharge targets. The Pit Sump WTP has sufficient capacity to treat the TSF D supernatant (285 L/s (24,624 m^3/day)).

6.3 Recommendations for Future Work

Recommendations for future work include:

- Verify treatment once representative water is available
- Review and advance the preliminary Pit Sump WTP design based on specific closure design inputs

7.0 CONCEPTUAL POST-CLOSURE WATER TREATMENT PLAN

7.1 Post-Closure Period Water Treatment Objective

The objective in post-closure will be to treat the Pit Lake water prior to it overflowing into the TSF D such that the final TSF supernatant quality is suitable for discharge to Davidson Creek. This will include treating two streams of water: the open pit overflow and brine from the ion exchange/nanofiltration water treatment plant[2]. The final effluent will be a blend of the TSF D supernatant (treated in closure) and treated pit lake overflow.

7.2 Conceptual Dissolved Metals Treatment Plan

Based on the Pit Sump WTP chemical bench test results (Appendix D) and predicted effluent concentrations (Table 5-1), chemical precipitation is capable of the required dissolved metals removal for direct discharge to Davidson Creek in post-closure.

Both hydroxide and hydroxide/sulphide precipitation performance have been compared against the wetland performance predicted by Clear Coast Consulting Ltd. (Clear Coast) (Clear Coast 2016) in Table 7-1 below.

[2] The overall closure and post-closure strategy includes two distinct treatment systems: the chemical precipitation WTP, described in this report, to primarily treat dissolved metals and an ion exchange with nanofiltration system to primarily remove sulphate. A by-product of the latter is a concentrated brine which will be discharged into the open pit lake. Information on the brine water quality can be found in ERM 2017. Details of the ion exchange and nanofiltration plant can be found in Bioteq 2017.

Table 7-1 Active Treatment vs. Wetland Performance

Active Water Treatment Process	Al	Sb	As	Cd	Cr	Co	Cu	Mn	Zn
2 X BCWQG	0.1	0.018	0.01	0.0000352 -0.000254	0.002	0.008	0.004	1.4 – 1.6	0.015
Wetland Treatment	0.02 - 0.04	0.002	0.0005 - 0.001	0.00001 - 0.00002	0.0005	0.0005 - 0.0007	0.0001 - 0.0003	0.45 - 0.50	0.002 –0.006
Hydroxide/ Sulphide Treatment	0.02	0.008	0.0005	0.000005	0.0001	0.001	0.0002	0.7	0.001
Hydroxide Treatment	0.06	0.002	0.0004	0.000005	0.0001	0.0001	0.0002	0.0008	0.001

Notes:
Refer to Appendix C for full list of references and assumptions
Comparison against wetland performance does not include secondary treatment performance

Both passive (i.e. wetlands) and active (i.e. chemical precipitation) systems are capable of meeting the end of pipe discharge targets based on the Table 7-1 performance data.

In post-closure the Pit Lake is expected to overflow and spill into TSF D at a maximum rate of 209 L/s and brine flow rates are expected to be a constant 37 L/s. The pit lake is not expected to overflow during all months in the year. TSF D will overflow through the spillway, discharging to Davidson Creek.

Based on the Pit Sump WTP chemical bench test data (Appendix D) and water quality modelling by ERM (ERM 2017), intercepting and treating the Pit Lake overflow and brine using the Pit Sump WTP with the discharge directed to TSF D will result in a TSF D supernatant quality suitable for direct discharge to Davidson Creek.

If the water quality is not suitable for direct discharge, contingency treatment options would include treatment of additional TSF D supernatant on a closed loop basis using the available capacity of the Pit Sump WTP or addition of metal polishing using other viable technologies such as ion exchange or reverse osmosis.

7.3 Recommendations for Future Work

Recommendations for future work include:

- Verify treatment once representative water is available
- Review and advance the preliminary Pit Sump WTP design based on specific post-closure design inputs

8.0 CLOSURE

We trust the information provided meets your requirements. Please do not hesitate to contact the undersigned at 604-940-2828 if you have any questions.

MCCUE ENGINEERING CONTRACTORS

per:

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APPENDIX A
TECHNOLOGY / PROCESS DESCRIPTIONS

Hydroxide Precipitation

Hydroxide precipitation is a water treatment process involving the addition of an alkali – precipitating agent. The addition of the precipitating agent adjusts the equilibrium chemistry by raising the inlet water pH to 9 to 11.5 resulting in the precipitation of dissolved metals and other ions as relatively insoluble hydroxides. The removal of the dissolved metal depends on the equilibrium constant of the metal hydroxide, the solubility of the given hydroxide, the presence of ligands or chelating agents (e.g. ammonia, cyanide) and the process pH (USACE, 2001). In mining, calcium hydroxide (hydrated lime) is widely used. Sodium hydroxide (caustic) is another chemical reagent commonly used in the water treatment industry for hydroxide precipitation.

The hydroxide precipitation process requires the addition of the alkali precipitation agent as well as a flocculant, and often a coagulant (e.g. ferric sulphate), to enhance the setting and removal of target parameters. The process requires equipment for chemical makedown and injection, contact and mixing, solid/liquid settling, and sludge handling/dewatering.

Sulphide Precipitation

Sulphide precipitation is a water treatment process involving the addition of a sulphide precipitating agent. The addition of the sulphide precipitating agent adjusts the equilibrium chemistry of the inlet water resulting in the precipitation of dissolved metals and other ions as relatively insoluble sulphides.

The removal of a dissolved metal as sulphide is similar to its removal as a hydroxide except sulphides have lower solubilities than hydroxides in alkaline pH range (Wang et al., 2005) and are less likely to resolubilize due to changes in process pH (USACE,2001). As a result of the lower solubilities, the process pH target for a sulphide precipitation process can be less alkaline with the advantage that process pH typically remains within the range suitable for discharge without pH adjustment. Two major sulphide processes exist: soluble sulphide precipitation (SSP) where sodium sulphide, or one of its derivatives, are used, and insoluble sulphide precipitation where ferrous sulphide is used (USACE, 2001).

The sulphide precipitation process requires the addition of the sulphide precipitating agent as well as a flocculant and coagulant to enhance the setting and removal of target parameters. Sulphide precipitation can still occur in the presence of weak chelating agents (USACE, 2001). The process requires equipment for chemical makedown and injection, contact and mixing, solid/liquid settling, and sludge handling/dewatering.

Hydroxide/Sulphide Integration

The use of hydroxide and sulphide precipitation are not mutually exclusive and are often integrated into a single process where both hydroxide and sulphide precipitation can be occurring. The process itself can vary significantly but typically hydroxide precipitation/equilibrium is initially performed then sulphide precipitation is used to enhance the removal of key parameters.

The primary advantage of the hydroxide/sulphide integration is that sludge volumes are less than with sulphide precipitation alone and operating costs should be lower but the same removal efficiencies are observed at the same process pH of a sulphide precipitation process.

Hydroxide/Carbonate Integration

The use of hydroxide and carbonate precipitation can also be integrated into a single process where hydroxide and carbonate co-precipitation is occurring. Generally, the solubilities of metal carbonates are intermediate between metal hydroxides and metal sulphides (USACE, 2001).

The process advantage of the hydroxide/carbonate integration is that the solubility of many carbonates are in between hydroxides and sulfides. As a result, the process pH of a hydroxide/carbonate integration may be lower than a hydroxide process alone. For example, comparable cadmium residual concentrations were observed approximately 2 pH units lower for carbonate than hydroxide treatment (Peters, 1985).

The chemical addition of carbonate is often via sodium carbonate (soda ash) or carbon dioxide sparging.

Electrocoagulation

Electrocoagulation (EC) is a process where water is passed through a cell where a sacrificial metal plate and electrical current are used to form metal oxides and hydroxides. This process also offers ammonia and sulphate removal at varying efficiencies. Once the oxides and hydroxides are formed they are settled or separated in a similar manner to other precipitating practices. The EC process requires less chemical reagent use and results in less sludge generation when compared to chemical precipitation processes.

Membrane Filtration

Membrane filtration is a process in which a semipermeable barrier is utilized to selectively separate certain components from a liquid or gas stream (Singh, 2015). The process is a continuous steady-state operation in which a feed stream is separated into a permeate stream, consisting of the media passing through the membrane, and a retentate stream, consisting of the components separated by the membrane (Mortazavi, 2008).

The transport of substances through a membrane are determined by the permeability of the membrane and a driving force. This driving force can be pressure difference, concentration difference, or electrical potential between the feed and product side of the membrane (Singh, 2015).

Membrane filtration can be classified in terms of the following characteristics (Singh, 2015):

- Size range of permeating species
- Mechanisms of rejection
- Driving forces employed
- Chemical structure and composition of membranes
- Geometry of construction

For the purposes of this evaluation, microfiltration, ultrafiltration, nanofiltration and reverse-osmosis will be discussed.

Ultrafiltration

Ultrafiltration (UF) membranes utilize pore sizes of 0.001 to 0.05 µm. The membrane typical operates under a driving force of 2-5 bar, with sieving as the primary transport mechanism (Singh, 2015).

UF separation is dependent on membrane pore size, solute-membrane interactions, and the shape and size of the macromolecules (Singh, 2015).

The process has been traditionally used for removing high molecular weight organic compounds such as proteins and colloaids and oils (Singh, 2015). It has also been used in mining operations for the separation of and recovery of flotation agents, surfactants and organometallic complexes, or as pretreatment to other membrane processes (Mortazavi, 2008).

The molecular weight cutoff level for UF membranes range from 10,000 to 500,000 Daltons (Allgeier, 2005).

Nanofiltration

Nanofiltration (NF) utilizes a membrane with a pore size < 2 µm. The membrane typically operates under a driving force of 5-15 bar, with sorption-capillary flow as the primary transport mechanism (Singh, 2015).

NF membranes are well designed to provide the rejection of high molecular weight compounds, mono, di- and oligosaccharides, and polyvalent ions (Mortazavi, 2008).

Nanofiltration differs from RO in that it has a lower capacity to remove dissolved substances, particularly for monovalent ions. Although removal efficiencies are lower, it is able to operate at lower pressures than RO (Allgeier, 2005). Consequently, NF can have lower energy consumption rates when compared to conventional RO systems.

Pre-treatment is required upstream of NF processes to prevent fouling, particularly if the water contains elevated levels of hardness (i.e. calcium or magnesium) or total suspended solids (Allgeier, 2005).

Reverse Osmosis

Reverse Osmosis (RO) utilizes a membrane with a pore size of approximately 0.6 nm. The membrane typically operates under a pressure range of 15-100 bar, with preferential sorption-capillary flow as the primary transport mechanism (Singh, 2015).

RO membranes are the tightest membranes in liquid/liquid separation and target the removal of ionic solutes, metals and macromolecules. They are equipped to provide the rejection of high and low molecular weight compounds, NaCl, glucose, and amino acids (Mortazavi, 2008).

Pre-treatment is required upstream of RO processes to prevent fouling, particularly if the water contains elevated levels of hardness (i.e. calcium or magnesium) or total suspended solids (Allgeier, 2005).

The RO process produces a waste brine solution that ranges from 25 to 30 percent of the influent flow in a single system (Allgeier, 2005).

Ion Exchange

Ion exchange is a process in which dissolved ions within a solution are replaced with equivalent amounts of other ions of the same charge. The process allows either all ions to be removed from a solution, or particular ions to be selectively separated (Inmuddin, 2012).

Ion exchange has been used successfully for the removal of ammonia, sulphate, and dissolved metals from wastewater streams. Typically, a zeolite resin is supplied in a packed column which is fed with feed water. Once the resin has reached its saturation point, it is regenerated with a chemical backwash such as sodium hydroxide or hydrochloric acid (Prajapati, J, 2014).

APPENDIX B
TREATMENT PERFORMANCE SUMMARY TABLE

APPENDIX B - TREATMENT PERFORMANCE SUMMARY TABLE

Active Water Treatment Technologies	Aluminum	Antimony	Arsenic	Cadmium	Chromium	Cobalt	Copper	Manganese	Zinc
2 X BCWQG (See Note 3)	0.1	0.018	0.01	0.0000352-0.000254	0.002	0.008	0.004	1.4 – 1.6	0.015
Wetland Treatment (Ref # 1)	0.02 - 0.04	0.002	0.0005 - 0.001	0.00001 - 0.00002	0.0005	0.0005 - 0.0007	0.0001 - 0.0003	0.45 - 0.50	0.002 – 0.006
Hydroxide Precipitation (Ref #2)	**0.06**	0.002	0.0004	0.000005	0.0001	0.0001	**0.0002**	0.0008	0.001
Hydroxide - Sulphide Integration (Ref # 3)	0.02	**0.008**	0.0005	0.000005	0.0001	**0.001**	**0.0002**	**0.7**	0.001
Hydroxide - Carbonate Integration (Ref #2)	**0.06**	0.002	0.0004	0.000005	0.0001	0.0001	**0.0002**	0.0008	0.001
Electrocoagulation (Ref #5)	91 - 99%	NI	97%	67.6 - 99%	99%	73.8 - 99%	99.5 - 99%	38 - 99%	98 - 99%
Ultrafiltration	Ultrafiltration is capable of removal of fine suspended solids that are reported as part of the dissolved concentration due to their size (<0.45 micron)								
Nanofiltration (Ref # 4)	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%	60-80%
Reverse Osmosis (Ref # 4)	99%	99%	99%	99%	99%	99%	99%	99%	99%
Ion Exchange (Ref # 6/7/8)	NI	99%	99%	99%	99%	99%	99%	99%	99%

Notes:

(1) In instances where percent removals were provided the effluent was calculated for comparison purposes using the maximum inlet concentration. The values are

(2) All concentrations are expressed as dissolved concentrations

(3) BCWQG - BC Working and Approved Water Quality Guidelines for freshwater aquatic life (Assuming: hardness < 50 mg/L (as CaCO3); maximum temperature of 1

(4) Treatment performance based on reference #2 and #3 were round up in all cases to one significant digit.

BOLD - Indicates an active treated effluent concentration greater than wetland treatment

- Indicates an active treated effluent concentration greater than 2X the BC WQG

NI - No Information

References:

(1) - Clear Coast. 2016. Updated Passive Treatment System for Post-Closure at the Blackwater Project. Technical Memo.

(2) - McCue Engineering Contractors, 2017. Summary of Synthetic Site Water Bench Testing Result for the Blackwater Gold Project, Test 5D Results for two stage hydroxide process plus ferric sulphate

(3) - McCue Engineering Contractors, 2017. Summary of Synthetic Site Water Bench Testing Result for the Blackwater Gold Project, Test 9 Results for two stage hydroxide/sulphide process plus ferric sulphate

(4) - Based on preliminary modelling provided by Reverse Osmosis System Analysis for FILMTEC Membranes software. Results may vary upon receipt of further influ

(5) - Based on generic performance data from Baker Corporations Kalesco Literature

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APPENDIX C
TREATMENT PROCESS SUMMARY MATRIX

TECHNOLOGY (Ref #X = References)	TECHNICAL FEASIBILITY	ROBUSTNESS	OPERATIONAL REQUIREMENTS			WASTE PRODUCTS			COMMERCIALIZATION LIFE CYCLE	SUSTAINABILITY	ACCEPTANCE
	- Ability of the technology to meet the flows - Ability for the technology to reliably standard operating conditions - Ability of the technology to meet the discharge targets	- Ability for the technology to operate outside of the standard operating conditions (e.g, inlet discharge quality, etc.)							-Idea -Proof of Concept -Product Development -Precommercial Trials & Sales -Commercial Sales	- Footprint - Small/Medium/Large - Energy - Low/Moderate/High - Waste - Small/Medium/Large - Waste Toxicity - Low/Moderate/High/Leachable	- Used and accepted in BC - Used and accepted in Canada - Used and accepted outside Canada - Rarely used and not well understood
			Pretreatment	**Reagents**	**Operational Effort**	**Solid**	**Liquid**	**Management Options or Methods**			
Hydroxide Precipitation (Ref #1)	Readily scalable to treat a wide range of flows Ponds scalable Circular clarifiers scalable Plate clarifiers scalable (200-2000 GPM per clarifier)	Capable of handling variable inlet flows and quality without process upset Changes to water chemistry may require additional pre-treatment/oxidation Solubilities are affected by temperature but the process is not temperature dependent	Preliminary solids separation may be required Oxidation/reduction may be required	Alkali-Hydroxide (hydrated lime/caustic soda) Coagulant Flocculant	Full time operation by qualified personnel	Hydroxide sludge		Sludge handling, dewatering, and disposal required	Commercial Sales	Footprint- Large (clarifiers will reduce footprint) Energy - Moderate (power pumps, mixers, aerators, etc.) Waste - Large quantities requiring long term management (caustic soda will produce less sludge than hydrated lime) Hydroxide sludges may be leachable	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Sulphide Precipitation (Ref # 1)	Readily scalable to treat a wide range of flow Ponds scalable Circular clarifiers scalable Plate clarifiers scalable (200-2000 GPM per clarifier)	Capable of handling variable inlet flows Treatment with this method may require frequent chemical dosing adjustment with changes in inlet water quality Sulphide precipitation is less affected by chelating agents Solubilities are affected by temperature but the process is not temperature dependent	Preliminary solids separation may be required Oxidation/reduction may be required	Chemical sulphide source (e.g. sodium sulphide) Coagulant Flocculant	Full time operation by qualified personnel	Sulphide sludge		Sludge handling, dewatering, and disposal required	Commercial Sales	Footprint- Large (clarifiers will reduce footprint) Energy - Moderate (power pumps, mixers, aerators, etc.) Waste - Large quantities requiring long term management (iron sulphate will generate larger sludge volumes) Sulphide sludges less leachable than hydroxide sludges	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Hydroxide - Sulphide Integration (Ref # 1)	Readily scalable to treat a wide range of flows Ponds scalable Circular clarifiers scalable Plate clarifiers scalable (200-2000 GPM per clarifier)	Capable of handling variable inlet flows Treatment with this method may require frequent chemical dosing adjustment with changes in inlet water quality Sulphide precipitation is less affected by chelating agents Solubilities are affected by temperature but the process is not temperature dependent	Preliminary solids separation may be required Oxidation/reduction may be required	Alkali-Hydroxide (hydrated lime/caustic soda) Chemical sulphide source (e.g. sodium sulphide) Coagulant Flocculant	Full time operation by qualified personnel	Hydroxide/sulphide sludge		Sludge handling, dewatering, and disposal required	Commercial Sales	Footprint- Large (clarifiers will reduce footprint) Energy - Moderate (power pumps, mixers, aerators, etc.) Waste - Large quantities requiring long term management (iron sulphate will generate larger sludge volumes) Sulphide sludges less leachable than hydroxide sludges	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Hydroxide - Carbonate Integration (Ref # 1)	Readily scalable to treat a wide range of flows Ponds scalable Circular clarifiers scalable Plate clarifiers scalable (200-2000 GPM per clarifier)	Capable of handling variable inlet flows and quality without process upset Solubilities are affected by temperature but the process is not temperature dependent	Preliminary solids separation may be required	Alkali-Hydroxide (hydrated lime/caustic soda) Carbonate source (e.g. soda ash) Coagulant Flocculant	Full time operation by qualified personnel	Hydroxide/carbonate sludge		Sludge handling, dewatering, and disposal required	Commercial Sales	Footprint- Large (clarifiers will reduce footprint) Energy - Moderate (power pumps, mixers, aerators, etc.) Waste - Large quantities requiring long term management (carbonate sludges denser than hydroxide sludges)	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Electrocoagulation (Ref # 3)	EC is traditionally used for smaller flows but commercially available units are available at flows of 1200 GPM	Multiple treatment trains would be required in parallel to handle the flows resulting in process redundancies but increased footprint and operator requirements Treatment can be optimized through changes in the cathode/anode material Treatment efficiency may fluctuate depending on the age or fouling of the cathode/anode plates	None	Electricity Sacrificial metal plates Flocculant	Full time operation by qualified personnel	Oxide and hydroxide sludge		Sludge handling, dewatering, and disposal required	Commercial Sales	Footprint - Large as settling/solids separation is still required as part of the process Energy - High Cost as process is driven through electricity Lower quantities of sludge as compared to chemical precipitation Oxide sludges have the potential to pass leachate testing Chemical transport is minimized and TDS is not increased	Technology supplier has installed a single 1200 GPM unit at a mine site in United States Technology is not commonplace in the mining industry

TECHNOLOGY (Ref #X = References)	TECHNICAL FEASIBILITY	ROBUSTNESS	OPERATIONAL REQUIREMENTS			WASTE PRODUCTS			COMMERCIALIZATION LIFE CYCLE	SUSTAINABILITY	ACCEPTANCE
Ultrafiltration	Scalable	Capable of handling turbid water	Coarse filtration, chlorination, in-line coagulation		Routine maintenance required		Reject concentrate	Storage/hauling or additional treatment of reject	Commercial Sales	Effective as pre-treatment for RO/NF	Widely used & accepted inside Canada
Nanofiltration (Ref # 2)	Treatment train is capable of 4000 GPM Multiple treatment trains would have to be installed in parallel to achieve flow Product water recovery of 75-85%	Capable of feed water < 60,000 ppm TDS Variable flows are not accommodated easily	Solids settling or separation Media filtration Softening, dechlorination Micro Filtration, Ultrafiltration	Antiscalant Reagents required for pre-treatment	Full time operation by qualified personnel		Reject Concentrate (15-25 % feed water)	Storage/hauling of brine Treatment or concentrating of brine to reduce brine volume	Commercial sales for smaller flows	Energy consumption < RO	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Reverse Osmosis (Ref # 2)	Single Treatment train capable of 4000 GPM Multiple treatment trains would have to be installed in parallel to achieve flow Product water recovery 70-75 %	Capable of feed water < 10,000 ppm TDS Variable flows are not accommodated easily	Clarifier Softening Antiscalant Greensand filtration Micro Filtration Ultrafiltration		Full time operation by qualified personnel		Reject Concentrate (25-30 % feed water)	Storage/hauling of brine Treatment or concentrating of brine to reduce brine volume	Commercial Sales for smaller flows	High energy requirements compared to other membrane treatments	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada
Ion Exchange	Single treatment train is capable of 1500 GPM Multiple treatment trains would have to be installed in parallel to achieve flow	System can be fouled readily by organics, iron, and manganese Pre-treatment likely required	Clarification Media filtration Iron & manganese removal	Chemicals required for media regeneration (e.g. acid, sodium hydroxide)	Full time operation by qualified personnel	Resin loss/breakage	Brine from bed regeneration	Storage/hauling of brine Treatment or concentrating of brine to reduce brine volume	Commercial Sales for smaller flows	Chemical reuse	Used and accepted in BC Used and accepted in Canada Used and accepted outside Canada

References:

(1) - Department of the Army U.S. Army Corps of Engineers (USACE) 2001, Engineering and Design Precipitation/Coagulation/Flocculation, p.3-1.
(2) - Based on preliminary modelling provided by Reverse Osmosis System Analysis for FILMTEC Membranes software. Results may vary upon receipt of further influent data
(3) - Based on generic performance data from Baker Corporations Kalesco Literature

APPENDIX D
SUMMARY OF HYDROXIDE/SULPHIDE PRECIPITATION BENCH TEST RESULTS FOR THE BLACKWATER GOLD PROJECT

SUMMARY OF HYDROXIDE/SULPHIDE PRECIPITATION BENCH TEST RESULTS FOR THE BLACKWATER GOLD PROJECT

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1.0 INTRODUCTION

McCue Engineering Contractors (McCue) was commissioned by New Gold Inc. (New Gold) to prepare synthetic site water and complete bench scale tests to validate the predicted Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant (WTP) effluent quality presented in the preliminary design report entitled, *"Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant for the Blackwater Gold Project*", dated July 21, 2016.

This report summarizes the synthetic water preparation and bench scale tests performed by McCue between October and December 2016.

2.0 SYNTHETIC WATER PREPARATION

McCue received nine leachate water samples from New Gold on September 1, 2016. The water samples originated from the Blackwater site field bins as described in Sections 2.2.2.3 and 3.2.12 of the *2013 Geochemical Characterization Report*, prepared by AMEC Foster Wheeler (AMEC) (formerly AMEC Environment and Infrastructure) and included as App5.1.3.1A in the *Application for an Environmental Assessment Certificate/Environmental Impact Statement Assessment of Potential Environmental Effects*.

The recorded volume per sample bucket are listed below:

- Sample 606: 5,080 mL
- Sample 2-10: 5,745 mL
- Sample 2-9: 5,400 mL
- Sample 183: 5,610 mL
- Sample 176 Dup: 5,757 mL
- Sample 610: 5,115 mL
- Sample 037-Dup: 5,670 mL
- Sample 537-Dup: 5,875 mL
- Sample Field Blank: 5,420 mL

The water samples, except for the field blank, were mixed together to make one homogenized sample (Raw Water) at McCue's Delta facility. Once homogenized, samples were collected for total metals, dissolved metals, total suspended solids (TSS), anions and nutrients analyses and submitted to ALS Canada Ltd. (ALS) under Chain of Custody. The results of these analyses are summarized in Table 1.

Based on the reported lab results, McCue diluted the homogenized leachate water sample using deionized water at a ratio of 1:4. The concentrations of dissolved antimony, arsenic, barium, chromium and iron were then increased or spiked using laboratory-grade metal salts.

The laboratory-grade metal salts used to prepare the synthetic water are listed below:

- Antimony trichloride, $SbCl_3$
- Arsenic trioxide, As_2O_3
- Barium nitrate, $Ba(NO_3)_2$
- Chromium nitrate nonahydrate, $Cr(NO_3)_3.9H_2O$
- Iron (III) nitrate nonahydrate, $Fe(NO_3)_3.9H_2O$

The intent of the leachate sample dilution and spiking was to prepare a synthetic water sample similar to the modelled WTP inlet water profile provided to McCue by ERM Consultants Canada Ltd. (ERM) and predicted as part of the August 12, 2016 submission to the British Columbia Environmental Assessment Office (BC EAO).

McCue completed four iterations of synthetic water samples to replicate the modelled WTP inlet water profile. The analytical data for the synthetic sample used for bench testing as well as the modelled inlet WTP water profile are summarized in Table 1..

3.0 METAL PRECIPITATION PROCESS VERIFICATION

McCue investigated the efficacy of single stage hydroxide precipitation, two-stage hydroxide precipitation and a two-stage hydroxide/sulphide precipitation process. To remove select non-hydroxide forming metals, ferric sulphate was also incorporated into each process to target metals that co-precipitate with iron during the formation of iron hydroxide.

The metal precipitation process was performed using the following chemicals:

- hydrated lime powder, $Ca(OH)_2$
- ferric sulphate liquid (12% Fe), $Fe_2(SO_4)_3$
- sodium sulphide flake, Na_2S, made into 0.5% sodium sulphide solution

The process verification bench testing was performed over a series of nine tests (e.g. Test 1 through Test 9). In some instances, a single numerical test consisted of four parallel tests. In these instances the test identification number was also provided an alphabetic suffix (e.g. Test 1B). The process verification tests are summarized in the following sections.

3.1 Single Stage Hydroxide Precipitation

The single stage hydroxide precipitation bench testing consisted of the following major steps:

- Addition and rapid mixing of a known dosage of ferric sulphate into synthetic water sample
- Addition and mixing of hydrated lime into synthetic water sample to target pH
- Mixing of sample for 20 minutes
- Settling of sample for 45 minutes

- Collection of supernatant water sample for laboratory analyses

The objective of the single stage hydroxide precipitation bench testing program, consisting of three tests (Test 1, Test 2 and Test 3), was to determine the metals removal rates at a single pH process set-point.

A summary of the three tests are provided below:

- Test 1 – vary process pH while maintaining a constant ferric sulphate dosage
- Test 2 – vary ferric sulphate dosage while maintaining a constant process pH
- Test 3 –vary both pH and ferric sulphate dosage based on the results of Test 1 and Test 2

The process pH, ferric sulphate dosages and analytical results of the single stage hydroxide precipitation program are presented in Table 1.

3.2 Two-Stage Hydroxide Precipitation

The two-stage hydroxide precipitation program consisted of the following major steps:

Stage 1

- Addition and rapid mixing of a known dosage of ferric sulphate into synthetic water sample
- Addition and mixing of hydrated lime into synthetic water sample to target pH
- Mixing of sample for 20 minutes
- Settling of sample for 45 minutes
- Collection of supernatant water sample for Stage 2

Stage 2

- Addition and rapid mixing of a known dosage of ferric sulphate into Stage 1 supernatant water sample
- Addition and mixing of hydrated lime into Stage 1 supernatant water sample to target pH
- Mixing of sample for 20 minutes
- Settling of sample for 45 minutes
- Collection of supernatant water sample for laboratory analyses

The objective of the two-stage hydroxide precipitation bench testing program, also consisting of three tests (Test 4, Test 5 and Test 6), was to maximize the dissolved metals removals as hydroxides through precipitate separation at two different pH set-points.

A summary of the three tests are provided below:

- Test 4:
    - Stage 1 - maintain constant process pH and ferric sulphate dosage
    - Stage 2 - vary process pH with no addition of ferric sulphate
- Test 5:

- Stage 1 - vary ferric sulphate dosage while maintaining constant process pH
- Stage 2 - vary ferric sulphate dosage while maintaining constant pH

- Test 6: vary both pH and ferric sulphate dosages in either stage based on the results of Test 4 and Test 5 but was not required at this time due to the performance of Test 5

The process pH, ferric sulphate dosages and analytical results of the two-stage hydroxide precipitation program are presented in Table 1.

3.3 Two Stage Hydroxide and Sodium Sulphide Precipitation

The two-stage hydroxide and sodium sulphide precipitation program consisted of the following major steps:

Stage 1

- Addition and rapid mixing of a known dosage of ferric sulphate into synthetic water sample
- Addition and mixing of hydrated lime into synthetic water sample to target pH
- Mixing of sample for 20 minutes
- Settling of sample for 45 minutes
- Collection of supernatant water sample for Stage 2

Stage 2

- Addition and rapid mixing of known dosage of sodium sulphide into Stage 1 supernatant water sample
- Mixing of sample for 20 minutes
- Settling of sample for 45 minutes
- Collection of supernatant water sample for laboratory analyses

The objective of the two-stage hydroxide and sulphide precipitation bench testing program, consisting of three tests (Test 7, Test 8 and Test 9), was to maximize the dissolved metals removals through hydroxide precipitation followed by sulphide precipitation without having to elevate the process pH above that which is suitable for discharge to the environment.

A summary of the three tests are provided below:

- Test 7:
    - Stage 1 – maintain constant process pH and ferric sulphate dosage
    - Stage 2 - vary sodium sulphide dosage but maintain process pH
- Test 8:
    - Stage 1 – maintain constant process pH and ferric sulphate dosage
    - Stage 2 - vary process pH while maintaining sodium sulphide dosage
- Test 9 – validate best performing chemical program from above tests

The process pH, ferric sulphate dosages, sodium sulphide dosages and analytical results of the two-stage hydroxide/sulphide precipitation program are presented in Table 1.

4.0 FLOCCULANT TESTING

The bench testing program included the testing of eight commercially available flocculants. Each flocculant and its manufacturer are listed in Table 2.

The selected flocculants were chosen based on the following rationale:

- Floccin products – works well over a large range in inlet water quality conditions with little adjustment to dosage
- Chitovan products – low toxicity
- Magnafloc products – commonly used in mining operations
- Haloklear – biodegradable natural flocculant

The flocculant testing was performed in three stages:

- Pass/Fail testing to determine if the flocculent was capable of developing a durable, rapid settling floc
- Measurement of settling velocity of the short-listed flocculants
- Collection of the supernatant for laboratory analyses

The result of each stage is summarized in the following sub-sections.

4.1 Pass/Fail Testing

The pass/fail testing was performed on a qualitative basis. The results of the pass/fail tests are summarized in Table 3. A pass was considered to be an instance where a visible flocculant formed.

The toxicity information of the four "Pass" products is summarized in Table 4.
Material safety data sheets (MSDS) and complete toxicity reports for the four "Pass" products are appended in Appendix A.

4.2 Settling Velocity

The settling velocity was determined by measuring the volume of solids in one liter of sample capable of settling to the bottom of an Imhoff cone during a 60-minute period. For each test a one-liter sample was prepared following the two-stage hydroxide and sulphide program similar to Test 9. The flocculant was then added to the second stage sample, mixed, and transferred to the Imhoff Cone. The results of the test are summarized in Table 5.

The settling velocity was calculated by determining the settling distance (e.g the height of the cone) over an elapsed time. For these tests a Wheaton Imhoff Cone with a total length of 451 mm was used.

Note that the flocculated mass using Clear Trax 250 was observed to settle in the Pass/Fail test but floated when prepared and transferred to the Imhoff cone.

4.3 Laboratory Analyses

Floccin J and Clear Trax 250 were used to enhance the settling of precipitated solids in two separate tests using the process developed in Test 9. Based on the results of the pass/fail and settling velocity testing, the supernatant of the two samples (Test 10 Floccin J and Test 10 Clear Trax, respectively) were collected and submitted for laboratory analyses. The analytical results are presented in Table 1.

5.0 SLUDGE CHARACTERIZATION

McCue performed physical and chemical sludge characterization of sludge generated from the two-stage hydroxide/sulphide program using Floccin J (J Floc) and Clear Trax 250 (CT Floc).

The physical characterization consisted of volume measurement and total solids testing.

The chemical characterization of the sludge sample consisted of leachate testing of a dewatered sludge sample using the synthetic precipitation leaching procedure (SPLP).

The results of the sludge characterization are presented in Table 6.

6.0 DISCUSSION

6.1 Metal Precipitation Process Verification

As directed by ERM, two times (2x) the BC Ambient Working and Approved Surface Water Quality Guidelines (WQGs) for the protection of freshwater aquatic life were adopted as the end of pipe treatment targets for this assessment.

Due to the parameter-specific relationship between the optimal formation of hydroxides and pH, sufficient removal of multiple parameters, such as cadmium and aluminum, at a single process pH is often unachievable. Table 7 summarizes the results from Test 2C and Test 3A. In Test 3A, the dissolved aluminum concentration was marginally above the treatment target suggesting that a reduction in the process pH would be required to meet the aluminum treatment target. In contrast, the process pH would have to increase to meet the treatment target for cadmium as the results of Test 2C demonstrated.

As a result of the process pH having to vary to achieve sufficient removal of all target parameters, based on these tests a single stage hydroxide precipitation process does not provide sufficient treatment. However this should be investigated further once actual influent is available from the operating mine.

The results of the two-stage bench testing programs demonstrated that the treatment targets could be achieved with either a two-stage hydroxide precipitation process (Test 5D) or a two-stage hydroxide/sulphide precipitation process (Test 9). The results of these tests are summarized in Table 8.

The advantage of the two-stage hydroxide/sulphide precipitation process is that the process pH will remain within the allowable pH range for discharge to the environment, and therefore neutralization would not be required prior to discharge.

Neutralization via CO_2 addition could be used to lower the effluent pH in the event that it is over the allowable pH range for discharge to Davidson Creek.

6.2 Flocculant Testing

Visual floc development and settling tests indicated that the Floccin J product would be a viable settling aid. The laboratory analytical results indicated that the Floccin J product may have increased the dissolved aluminum when compared against a similar test (e.g. Test 9) where Floccin J was not used as a settling aid.

6.3 Sludge Characterization

The results of the preliminary sludge characterization demonstrated that a litre of inlet water yields approximately 0.04L of unconsolidated settled sludge. Note, however, that the total suspended solids in the synthetic water sample was 4.5 mg/L, and the process inlet water might contain a higher solids content. As a result, the sludge volume per unit of inlet water might be higher than measured in this bench test. This should be investigated further once actual influent is available from the operating mine.

Preliminary leachate testing indicated that iron and manganese were leachable from sludge flocculated using Floccin J and Clear Trax 250 when exposed to synthetic rain water. Zinc also leached from the sample flocculated using Clear Trax 250.

7.0 CONCLUSIONS

Based on the results of Test 5D and Test 9, both a two-stage hydroxide precipitation (with ferric sulphate addition) program and a two-stage hydroxide/sulphide precipitation (also with ferric sulphate addition) program were capable of lowering the target dissolved metals concentrations below the end of pipe treatment targets. The bench testing results also demonstrated better metal removal rates and lower dissolved metals concentrations than the preliminary predicted discharge concentrations provided by McCue in the "*Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant for the Blackwater Gold Project*" report, which were theoretical values based on literature.

The bench testing program identified that Floccin J is capable of forming large rapid settling floc. At this time, additional flocculant testing is not recommended. The potential impact on aluminum by Floccin J should be studied further in future design stages. McCue has extensive experience with Floccin J in mining applications and has found that it offers the best performance in reducing turbidity, performs effectively in a variety of tolerance tests, is not susceptible to freezing, and has low toxicity relative to other chemicals.

8.0 CLOSURE

We trust the information provided meets your requirements. Please do not hesitate to contact the undersigned at 604-940-2828 if you have any questions.

MCCUE ENGINEERING CONTRACTORS

per:

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TABLES

TABLE 1

RESULTS OF HYDROXIDE/SULPHIDE PRECIPITATION BENCH TEST RESULT FOR BLACKWATER GOLD PROJECT

				SINGLE STAGE HYDROXIDE						TWO STAGE HYDROXIDE				TWO STAGE HYDROXIDE / SULFIDE						FLOCCULATED TWO STAGE HYDROXIDE /SULFIDE	
Parameters	**Predicted Maximum Inlet**	**Raw Water**	**Synthetic Inlet Water**	**Test 1B**	**Test 1D**	**Test 2A**	**Test 2C**	**Test 3A**	**Test 3D**	**Test 4A**	**Test 4D**	**Test 5A**	**Test 5D**	**Test 7A**	**Test 7D**	**Test 8A**	**Test 8B**	**Test 8C**	**Test 9**	**Test 10 Floccin J**	**Test 10 ClearTrax**
Initial pH	Near neutral to slightly acidic	4.61	4.23	4.02	4.02	4.16	4.16	4.12	4.12	4.27	4.27	4.25	4.25	4.29	4.29	4.25	4.25	4.25	4.30	4.50	4.50
Initial Turbidity (NTU)	NA	13.4	3.4	3.87	3.87	4.15	4.15	3.95	3.95	3.66	3.66	3.80	3.80	3.49	3.49	2.37	2.37	2.37	3.41	2.22	2.22
Sample Volume (mL)				500	500	500	500	1000	1000	500	500	500	500	500	500	500	1000	1000	500	1000	1000
Stage 1																					
12% Ferric Sulphate (mL)	-	NA	NA	0.05	0.05	0.05	0.15	0.3	0	0.15	0.15	0.10	0.15	0.15	0.15	0.15	0.30	0.30	0.15	0.30	0.30
Hydrated Lime (mg)	-	NA	NA	103	195	255	391	342	79	120	140	183	174	194	198	155	305	321	156	310	314
Cut-off pH		NA	NA	8.49	10.85	10.78	10.22	8.07	9.5	6.25	7.42	8.62	7.68	8.01	8.13	7.78	7.82	8	6.54	6.65	6.84
Final pH	-	NA	NA	9.32	10.7	10.82	9.9	7.54	9	7.4	7.38	7.77	7.76	7.60	7.94	7.73	7.55	7.64	6.52	6.64	6.82
Average Final Turbidity (NTU)	-	NA	NA	2.34	2.19	13.27	15.77	8.49	2.01	-	-	-	-	-	-	9.73	9.65	8.63	-	8.92	10.77
Stage 2																					
12% Ferric Sulphate (mL)	-	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0.075	0	0	0	0	0	0	0	0
Hydrated Lime (mg)	-	NA	NA	NA	NA	NA	NA	NA	NA	30	17	22	149	0	0	0	6	26	0	0	0
Cut-off pH		NA	NA	NA	NA	NA	NA	NA	NA	10.02	10.02	10.01	9.86	0	0	0	9.41	9.92	0	0	0
0.5% Sodium Sulphide Solution (mL)	-	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0.05	0.30	0.30	0.60	0.60	0.15	0.30	0.30
Final pH	-	NA	NA	NA	NA	NA	NA	NA	NA	10.02	9.63	9.42	9.46	8.04	8.19	7.84	9.03	9.62	6.84	6.89	7.22
Average Final Turbidity (NTU)	-	NA	NA	NA	NA	NA	NA	NA	NA	3.09	1.13	8.17	18.47	10.53	2.54	10.60	7.95	6.67	2.22	10.06	12.67
Flocculant																					
Floccin J (g)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.289	0
Chitovan Cleartrax 250 (g)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0.290
ALS Lab Work Order No.																					
ALS Lab Work Order No.	NA	L1823575-1	L1861565-1	L1858791-1	L1858791-2	L1859326-1	L1859326-2	L1863418-1	L1863418-2	L1865305-1	L1865305-2	L1865295-1	L1865295-2	L1867358-1	L1867358-2	L1869356-1	L1869356-2	L1869356-3	L1870869-1	L1871739-1	L1871739-2
Physical Tests (mg/L)																					
Total Suspended Solids	-	19.5	4.5	-	-	-	-	6.9	<3.0	-	-	-	-	-	-	7.7	8.7	7.5	-	31.4	10.7
Anions and Nutrients (mg/L)																					
Alkalinity, Bicarbonate (as CaCO3)	-	-	<1.0	-	-	-	-	27	6.7	-	-	-	-	-	-	21.8	21.9	12.4	-	27.4	26.3
Alkalinity, Carbonate (as CaCO3)	-	-	<1.0	-	-	-	-	<1.0	4.2	-	-	-	-	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	-	-	<1.0	-	-	-	-	<1.0	<1.0	-	-	-	-	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Alkalinity, Total (as CaCO3)	-	<2.0	<1.0	-	-	-	-	27	10.9	-	-	-	-	-	-	21.8	21.9	12.4	-	27.4	26.3
Bromide (Br)	-	<0.05	<0.050	-	-	-	-	<0.050	<0.050	-	-	-	-	-	-	<0.050	<0.050	<0.050	-	<0.050	<0.050
Chloride (Cl)	-	<0.5	1.05	-	-	-	-	1.41	1.35	-	-	-	-	-	-	1.59	1.44	1.42	-	8.44	23.4
Fluoride (F)	-	0.071	<0.020	-	-	-	-	0.043	0.021	-	-	-	-	-	-	0.046	0.042	0.043	-	0.04	0.038
Nitrate (as N)	-	0.0114	0.542	-	-	-	-	0.593	0.591	-	-	-	-	-	-	0.627	0.623	0.617	-	0.638	0.628
Nitrite (as N)	-	0.001	<0.0010	-	-	-	-	0.0312	0.006	-	-	-	-	-	-	0.0323	0.0295	0.0317	-	0.0266	0.0281
Sulfate (SO4)	-	127	28.9	-	-	-	-	179	29.2	-	-	-	-	-	-	196	185	181	-	189	181
Dissolved Metals (mg/L)																					
Aluminum (Al)	0.179	7.970	2.21	1.68	0.921	1.67	0.934	0.104	0.636	0.0391	0.0567	0.475	0.0578	0.403	0.168	-	0.245	0.321	0.0161	0.119	0.0323
Antimony (Sb)	0.027	0.008	0.304	0.0669	0.0376	0.071	0.0292	0.00344	0.242	0.00514	0.0051	0.0117	0.00168	0.0175	0.0104	-	0.0134	0.0164	0.0078	0.0129	0.0102
Arsenic (As)	0.035	0.004	0.00864	0.00117	0.00062	0.00582	<0.0005	0.00037	0.00389	0.00042	0.00038	0.00048	0.00032	0.00042	0.00052	-	0.00041	0.00038	0.00043	0.00046	0.00051
Barium (Ba)	0.0133	<0.02	0.025	0.019	0.0223	<0.02	<0.02	0.0255	0.0243	0.0243	0.024	0.0151	0.0144	0.129	0.0188	-	0.0172	0.0161	0.0256	0.018	0.0202
Beryllium (Be)	0.000121	<0.005	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron (B)	0.017	<0.1	<0.1	0.021	0.024	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	0.015	-	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)	0.00736	0.12900	0.0291	0.0000071	0.0000375	0.0000061	0.0000059	0.000239	0.000677	0.0000882	0.00008	0.0000052	<0.000005	<0.000005	<0.000005	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium (Cr)	0.0009	<0.0005	0.0017	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)	0.0072	0.0375	0.0094	<0.0001	<0.0001	<0.0003	<0.0003	0.00032	0.00049	<0.0001	0.00013	<0.0001	<0.0001	<0.0001	0.00014	-	<0.00010	<0.00010	0.00094	0.00021	0.00076
Copper (Cu)	0.00395	0.14700	0.04	<0.0002	0.00021	<0.001	<0.001	<0.0002	0.00031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	<0.00020	<0.00020	<0.00020	0.00029	0.00025
Iron (Fe)	0.372	0.372	0.032	<0.01	<0.01	<0.03	<0.03	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.010	<0.010	<0.010	<0.010	<0.010
Lead (Pb)	0.0818	0.4910	0.106	<0.00005	<0.00005	<0.0005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.000050	<0.000050	<0.000050	<0.000050	0.00012
Manganese (Mn)	3.22	6.10	1.37	0.00024	0.0194	0.00033	<0.0001	0.288	0.485	0.00094	0.00373	0.00108	0.00077	0.0592	0.157	-	0.0546	0.0108	0.624	0.226	0.524
Mercury (Hg)	0.000005	<0.0002	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	-	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)	0.0134	<0.001	<0.001	0.000281	0.000197	<0.001	<0.001	0.000134	0.000082	0.000077	0.000060	0.000185	0.000171	0.000188	0.000180	-	0.000222	0.000202	0.000073	0.000314	0.000449
Nickel (Ni)	0.0135	0.0635	0.0168	<0.0005	<0.0005	<0.001	<0.001	0.0006	0.00125	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00116	-	<0.00050	<0.00050	0.00171	0.00051	0.00085
Selenium (Se)	0.00030	<0.001	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000075	0.000125	-	0.000148	0.000123	<0.000050	0.000079	0.000055
Silver (Ag)	0.000018	0.000057	<0.000020	<0.00001	<0.00001	<0.00002	<0.00002	<0.00001	<0.00001	0.000021	0.000033	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.000010	<0.000010	0.000021	<0.000010	<0.000010
Thallium (Tl)	0.00010	<0.0002	<0.0002	0.000013	0.000014	<0.0002	<0.0002	0.000012	0.000013	0.00001	<0.00001	0.000010	0.000010	<0.00001	<0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	0.000014
Uranium (U)	0.00091	0.00284	0.0006	<0.00001	<0.00001	<0.0002	<0.0002	0.000032	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000017	-	0.000017	<0.000010	<0.000010	0.000059	0.000077
Zinc (Zn)	1.357	18.900	4.23	0.0108	0.0055	0.0125	<0.005	0.0043	0.0189	0.0245	0.0064	0.0011	<0.001	<0.001	<0.001	-	<0.0010	<0.0010	<0.0010	0.000059	0.000077

Note:

"<" - Less than the reported detection limit

"-" - no information

"NA" - Not Applicable

NTU - Nephelometric Turbidity Units

All laboratory reported data expressed in mg/L

Raw Water - Leachate water samples provided by New Gold

Predicted Maximum Inlet: predicted 95th percentile WTP influent numbers provided by ERM in August 2016

TABLE 2
FLOCCULANT PRODUCTS

Product Name	**Charge**	**Product Manufacturer**
Floccin J	Multiple Charge	Integrated Engineers
Floccin WA-40	Multiple Charge	Integrated Engineers
Chitovan 1%	Cationic	Dungeness Environmental
Chitovan Clear Trax 250	Multiple Charge	Dungeness Environmental
Magnafloc 351	Non-ionic	BASF
Magnafloc 455	Cationic	BASF
Maganfloc 1011	Anionic	BASF
Haloklear 1%	Cationic	Dober

TABLE 3
PASS/FAIL TEST

Flocculant Name	Flocculant State	Range of Dosages Attempted	Visual Observations	Pass/Fail	Supernatant Turbidity (NTU)
Floccin J	Solid (Direct addition)	0.289 grams	Good floc formation	Pass	3.57
Floccin WA-40	Solid (Direct addition)	0.266 - 0.496 grams	Pin floc formation	Pass	12.13
Chitovan 1%	Liquid (Direct inject)	1 - 2 mL	No visible effect	Fail	7.27
Chitovan Clear Trax 250	Solid (Direct addition)	0.290 grams	Good floc formation	Pass	5.71
Magnafloc 351	Solid (Makedown/age)	1 - 10 mL	No visible effect	Fail	9.96
Magnafloc 455	Solid (Makedown/age)	1 - 10 mL	Minimal floc formation	Pass	5.5
Maganfloc 1011	Solid (Makedown/age)	1 - 10 mL	No visible effect	Fail	6.63
Haloklear 1%	Liquid (Direct inject)	1 - 10 mL	No visible effect	Fail	6.3

Note:
mL - milliliters

TABLE 4
FLOCCULANT TOXICITY INFORMATION

Toxicity Test	Floccin Product (mg/L)[1]	Chitovan Clear Trax 250 (mg/L)[2]	Magnafloc 455 (mg/L)[3]
Rainbow Trout LC 50	10.8	50.4	NI
Daphnia Magna LC 50	75.2	None*	NI
Fish LC 50	NI	NI	10 - 100
Acute Daphnia EC 50	NI	NI	10 - 100

Notes:
mg/L - milligrams per litre
"*" - Dungeness Environmental has determined that for chitosan based formulations, rainbow trout is the most sensitive species
NI - No Information
LC - Lethal concentration
EC - Effect concentration
[1] Testing done by Nautilus Environmental according to Environment Canada 1/RM/9 and 1/RM/11
[2] Testing done by Nautilus Environmental according USEPA (2002) Method for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms - EPA-821-R-02-012
[3] Based on Magnafloc 455 Material Safety Data Sheet

TABLE 5
SLUDGE VELOCITY RESULTS

Time (minutes)	Floccin J (mL)	Clear Trax 250 (mL)	Magnafloc 455 (mL)	Floccin WA-40 (mL)
0.5	4	0	0	1.5
1	10	0	0	2
2	20	0	0	2
3	21	0	0	2
4	21	0	0	2.5
5	21	0	0	2.5
10	18 (more compact top layer)	0	0	2.5
15	18	0	0	2.5
25	18	0	2	2.5
35	18	0	5	2.5
45	18	0	5	2.5
50	21	0	6	2.75
60	22	0	7	2.75
Comments	Fastest settling time	Floc floated to the top portion of the cone	Minimal settling	Minimal settling
Settling Velocity (m/s)	0.000028	NC	0.000018	0.000011

Notes:
m/s - meters per second
mL - milliliters of sludge at the bottom of an Imhoff Cone
NC - Not Calculated
Settling velocity calculated after an elapsed time of 60 minutes

TABLE 6

RESULTS OF HYDROXIDE/SULPHIDE PRECIPITATION SLUDGE TEST RESULT FOR BLACKWATER GOLD PROJECT

Sample ID	J Floc	CT Floc
Date	22-Dec-16	22-Dec-16
Physical Test		
ALS Lab Work Order No.	L1873354-1	L1873354-2
Total Solids (g/L)	16.3	17.2
Volume (L)	0.04	0.04
Synthetic Precipitation Leaching Procedure (mg/L)		
ALS Lab Work Order No.	L1873537-1	L1873537-2
Extraction Solution Initial pH	4.96	4.96
Parameter		
Aluminum (Al)-Leachable	<0.20	<0.20
Antimony (Sb)-Leachable	<0.20	<0.20
Arsenic (As)-Leachable	<0.20	<0.20
Barium (Ba)-Leachable	<0.50	<0.50
Beryllium (Be)-Leachable	<0.0050	<0.0050
Bismuth (Bi)-Leachable	<0.20	<0.20
Boron (B)-Leachable	<0.10	<0.10
Cadmium (Cd)-Leachable	<0.010	<0.010
Calcium (Ca)-Leachable	6.22	6.97
Chromium (Cr)-Leachable	<0.050	<0.050
Cobalt (Co)-Leachable	<0.010	<0.010
Copper (Cu)-Leachable	<0.010	<0.010
Iron (Fe)-Leachable	0.038	0.09
Lead (Pb)-Leachable	<0.050	<0.050
Lithium (Li)-Leachable	<0.010	<0.010
Magnesium (Mg)-Leachable	0.37	0.25
Manganese (Mn)-Leachable	0.0917	0.102
Mercury (Hg)-Leachable	<0.0010	<0.0010
Molybdenum (Mo)-Leachable	<0.030	<0.030
Nickel (Ni)-Leachable	<0.050	<0.050
Phosphorus (P)-Leachable	<0.30	<0.30
Potassium (K)-Leachable	<2.0	<2.0
Selenium (Se)-Leachable	<0.20	<0.20
Silicon (Si)-Leachable	0.44	0.32
Silver (Ag)-Leachable	<0.050	<0.050
Sodium (Na)-Leachable	4.5	5.1
Strontium (Sr)-Leachable	0.0376	0.0423
Thallium (Tl)-Leachable	<0.20	<0.20
Tin (Sn)-Leachable	<0.030	<0.030
Titanium (Ti)-Leachable	<0.010	<0.010
Vanadium (V)-Leachable	<0.030	<0.030
Zinc (Zn)-Leachable	<0.10	0.18

Note:

"<" - Less than the reported detection limit

All laboratory reported data expressed in mg/L, unless indicated otherwise

Flocculated sludge was generated using a hydroxde/sulphide treatment process similar to Test 9 of the bench testing program

Leachate was generated using the Synthetic Precipitation Leaching Procedure (SPLP)

TABLE 7
SINGLE-STEP HYDROXIDE PRECIPITATION TEST PROGRAM SUMMARY

Parameters	2x BC WQG (mg/L)	Test 2C Results (mg/L)	Test 3A Results (mg/L)
pH	6.5-9	10.22	8.07
Dissolved Aluminum	0.1	0.934	0.104
Dissolved Antimony	0.018	0.0292	0.00344
Dissolved Arsenic	0.01	<0.0005	0.00037
Dissolved Cadmium	0.0000352-0.000254	0.0000059	0.000239
Dissolved Chromium	0.002	<0.001	<0.0001
Dissolved Cobalt	0.008	<0.0003	0.00032
Dissolved Copper	0.004	<0.001	<0.0002
Dissolved Iron	0.7	<0.03	<0.01
Dissolved Lead	0.0034 – 0.004	<0.0005	<0.00005
Dissolved Manganese	1.4 - 1.6	<0.0001	0.288
Dissolved Nickel	0.025	<0.001	0.0006
Dissolved Zinc	0.015	<0.005	0.0043

Notes:
mg/L - milligrams per litre
"<" - Less than reported detection limit
It is assumend the 30-day average hardness of the receiving environment is less than 50 mg/L as $CaCO_3$
It is assumed the maximum temperature of the receiving environment is 15 degrees Celsius
It is assumed the pH of the receiving environment ranges from 7.3 to 7.9

TABLE 8
TWO-STEP TEST SUMMARY

Parameters	2x BC WQG (mg/L)	Test 5D Results (mg/L)	Test 9 Results (mg/L)
pH*	6.5 - 9	7.68-9.86	6.54-6.84
Dissolved Aluminum	0.1	0.0578	0.0161
Dissolved Antimony	0.018	0.00168	0.0078
Dissolved Arsenic	0.01	0.00032	0.00043
Dissolved Cadmium	0.0000352-0.000254	<0.000005	<0.000005
Dissolved Cobalt	0.008	<0.0001	<0.00094
Dissolved Copper	0.004	<0.0002	<0.0002
Dissolved Chromium	0.002	<0.0001	<0.0001
Dissolved Iron	0.7	<0.01	<0.01
Dissolved Lead	0.0034 – 0.004	<0.00005	<0.00005
Dissolved Manganese	1.4 - 1.6	0.00077	0.624
Dissolved Nickel	0.025	<0.0005	0.00171
Dissolved Zinc	0.015	<0.001	<0.001

Notes:
mg/L - milligrams per litre
"<" - Less than reported detection limit
"*" - The 2x the BC WQG is not applicable
It is assumend the 30-day average hardness of the receiving environment is less than 50 mg/L as $CaCO_3$
It is assumed the maximum temperature of the receiving environment is 15 degrees Celsius
It is assumed the pH of the receiving environment ranges from 7.3 to 7.9

APPENDIX A
MATERIAL SAFETY DATA SHEETS
AND
TOXICITY REPORTS

Safety Data Sheet
Magnafloc® 455

1. Product and Company Identification

Company
BASF Canada Inc.
100 Milverton Drive
Mississauga, ON L5R 4H1, CANADA

24 Hour Emergency Response Information
CANUTEC (reverse charges): (613) 996-6666
BASF HOTLINE: (800) 454-COPE (2673)

Synonyms: Not available. Use: flocculation agent

2. Hazards Identification

Emergency overview

Repeated exposure may cause skin dryness or cracking.
Do not inhale dusts.
May cause eye damage.
Caution - Slippery when wet!
Refer to MSDS Section 7 for Dust Explosion information.
Combustible organic powder.
Avoid creating dusty conditions, dust build-up or formation of dust clouds.
Avoid all sources of ignition: heat, sparks, open flame.

State of matter: solid
Colour: off-white
Odour: odourless

Potential health effects

Primary routes of entry:
Eyes
Skin
Inhalation.
Ingestion.

Sensitization:
Based on the ingredients, there is no suspicion of a skin-sensitizing potential.

Chronic toxicity:

Carcinogenicity: None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.
The whole of the information assessable provides no indication of a carcinogenic effect.

Repeated dose toxicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses. The product has not been tested. The statement has been derived from the properties of the individual components.

Reproductive toxicity: Based on the ingredients, there is no suspicion of a toxic effect on reproduction.

Genotoxicity: Based on the ingredients, there is no suspicion of a mutagenic effect.

Signs and symptoms of overexposure:
No significant symptoms are expected due to the non-classification of the product.
No hazard is expected under intended use and appropriate handling.

Potential environmental effects

Aquatic toxicity:
Fish toxicity and aquatic toxicity are drastically reduced by rapid irreversible adsorption onto suspended and/or dissolved organic matter. Acute effects on aquatic organisms are due to the cationic charge of the polymer, which is quickly neutralised in natural water courses by irreversible adsorption onto particles, hydrolysis and dissolved organic carbon. The hydrolysis products are not acutely harmful to aquatic organisms.

Degradation / environmental fate:
Not readily biodegradable (by OECD criteria).

3. Composition / Information on Ingredients

CAS Number	Content (W/W)	Hazardous ingredients
124-04-9	>= 1.0 - <= 5.0 %	adipic acid

4. First-Aid Measures

General advice:
Remove contaminated clothing.

If inhaled:
If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

If on skin:
Wash thoroughly with soap and water.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

If swallowed:
Rinse mouth and then drink plenty of water. Check breathing and pulse. Place victim in the recovery position, cover and keep warm. Loosen tight clothing such as a collar, tie, belt or waistband. Seek medical attention. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions.

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Flash point:	not applicable
Flammability:	not highly flammable
Self-ignition temperature:	not self-igniting

Suitable extinguishing media:
dry powder, foam

Unsuitable extinguishing media for safety reasons:
water jet, carbon dioxide

Additional information:
If water is used, restrict pedestrian and vehicular traffic in areas where slip hazard may exist.

Hazards during fire-fighting:
carbon oxides, nitrogen oxides
The substances/groups of substances mentioned can be released in case of fire. Very slippery when wet.

Protective equipment for fire-fighting:
Wear a self-contained breathing apparatus.

Further information:
The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official regulations.

6. Accidental release measures

Personal precautions:
Use personal protective clothing.

Environmental precautions:
Do not discharge into drains/surface waters/groundwater.

Cleanup:
Spilled product which becomes wet or spilled aqueous solution create a hazard because of their slippery nature.
Avoid raising dust.
For small amounts: Pick up with suitable appliance and dispose of.
For large amounts: Contain with dust binding material and dispose of.

7. Handling and Storage

Handling

General advice:
Breathing must be protected when large quantities are decanted without local exhaust ventilation. Handle in accordance with good industrial hygiene and safety practice. Forms slippery surfaces with water.

Storage

General advice:
Store in unopened original containers in a cool and dry place. Avoid wet, damp or humid conditions, temperature extremes and ignition sources.

Storage stability:
Avoid extreme heat.

8. Exposure Controls and Personal Protection

Personal protective equipment

Respiratory protection:
Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.

Hand protection:
Chemical resistant protective gloves

Eye protection:
Safety glasses with side-shields.

General safety and hygiene measures:
Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Wearing of closed work clothing is recommended. Wear protective clothing as necessary to minimize contact. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Form:	powder	
Odour:	odourless	
Odour threshold:	No data available.	
Colour:	off-white	
pH value:	3.5 - 4.5	(10 g/l)
Melting point:		The substance / product decomposes therefore not determined.
Boiling point:		not applicable
Vapour pressure:		The product has not been tested.
Bulk density:	approx. 600 kg/m3	
Partitioning coefficient n-octanol/water (log Pow):		Study scientifically not justified.
Viscosity, dynamic:		not determined
% volatiles:		not determined
Solubility in water:		Forms a viscous solution.
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.	

10. Stability and Reactivity

Minimum ignition energy:
> 1 J

Conditions to avoid:
Avoid extreme temperatures. Avoid humidity.
Avoid dust formation. Avoid electro-static discharge.

Substances to avoid:
strong acids, strong bases, strong oxidizing agents

Hazardous reactions:
The product is not a dust explosion risk as supplied; however the build-up of fine dust can lead to a risk of dust explosions.

Decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated.

Thermal decomposition:
No decomposition if stored and handled as prescribed/indicated.

Corrosion to metals:
No corrosive effect on metal.

Oxidizing properties:
not fire-propagating

11. Toxicological information

Acute toxicity

Oral:
Type of value: LD50
Species: rat
Value: > 5,000 mg/kg (OECD Guideline 401)

Irritation / corrosion

Skin:
Species: rabbit
Result: non-irritant
Method: OECD Guideline 404

Eye:

Information on: adipic acid
Species: rabbit
Result: Risk of serious damage to eyes.
Method: OECD Guideline 405

Aspiration Hazard:

No aspiration hazard expected.

Other Information:

The product has not been tested. The statements on toxicology have been derived from products of a similar structure and composition.

12. Ecological Information

Fish

Acute:
static
Fish/LC50 (96 h): 10 - 100 mg/l

Aquatic invertebrates

Acute:
daphnia/EC50 (48 h): 10 - 100 mg/l

Degradability / Persistence

Hydrolysis

In contact with water the substance will hydrolyse rapidly.

Environmental mobility:

Information on: cationic polyacrylamide
Assessment transport between environmental compartments:
Adsorption to solid soil phase is expected.

Other adverse effects:

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

13. Disposal considerations

Waste disposal of substance:
Dispose of in accordance with national, state and local regulations.
Dispose of in accordance with local authority regulations.

Container disposal:
Packs that cannot be cleaned should be disposed of in the same manner as the contents. Uncontaminated packaging can be re-used.

14. Transport Information

Land transport
TDG

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

VOC content:

not determined

<u>Federal Regulations</u>

Registration status:

Chemical	DSL, CA	released / listed

WHMIS classification: D2B: Materials Causing Other Toxic Effects - Toxic material

WHMIS classification D2B: Materials Causing Other Toxic Effects - Toxic material

THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

16. Other Information

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

SDS Prepared by:
BASF NA Product Regulations

BASF HOTLINE (800) 454 – COPE (2673)
SDS Prepared on: 2013/09/25

Magnafloc® 455 is a registered trademark of BASF Canada or BASF SE
END OF DATA SHEET

Date: 12/12/2016
Revision: 01

Safety Data Sheet

ChitoVan™ Clear Trax 250

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name:	Dungeness Environmental
Corporate Address:	909 SE Everett Mall Way #A119, Everett, WA 98208
Manufacturer's Telephone:	(425) 481-0600 (Monday-Friday, 8AM-5PM PDT)
Emergency Telephone (24 Hours):	**(206) 390-2432** **+ 1-425-481-0600 (International)**
Material/Trade/Product Name:	**ChitoVan Clear Trax 250**
Synonyms:	Chitosan Lactate
Chemical Name:	Chitosan
Chemical Formula:	Not available
CAS No.:	90-12-76-4
EPA Registration #:	Not applicable
Product Use:	Flocculates contamination in storm water.

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CAS NO.	COMPONENT	%	OSHA HAZARDOUS?
Trade Secret	Trade Secret	60-80	NO
	Trade Secret	40-20	NO

NOTE: See Section 8 for permissible exposure limits.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Fine Dry Powder

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

POTENTIAL HEALTH EFFECTS

EYE: May be mildly irritating to eyes.
SKIN: Not hazardous to skin.
INHALATION: Not likely to be hazardous by inhalation.
INGESTION: Not likely to be hazardous by ingestion.

CHRONIC EXPOSURE/CARCINOGENICITY: None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.
SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye irritation.
AGGRAVATION OF PRE-EXISTING CONDITIONS: None known.

POTENTIAL ENVIRONMENTAL EFFECTS: Material is 100% biodegradable and nontoxic.

SECTION 4: FIRST AID MEASURES

FIRST AID PROCEDURES:

EYE CONTACT: Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.
SKIN CONTACT: Cleansing the skin after exposure is advisable.
INHALATION: If large amounts of fumes are inhaled, remove to fresh air and consult a physician.
INGESTION: Consult a physician if necessary.

NOTE TO PHYSICIANS: None.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not available
AUTOIGNITION TEMPERATURE: Not available
UPPER FLAMMABLE LIMIT: Not available
LOWER FLAMMABLE LIMIT: Not available
FLAMMABLITY CLASS (OSHA): Not applicable
FLAME PROPAGATION/BURNING RATE: Not available
UNIQUE FIRE PROPERTIES: None known.
HAZARDOUS COMBUSTION PRODUCTS: None.
EXTINGUISHING MEDIA: Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.
PROTECTION OF FIREFIGHTERS: Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: See Section 8 (Personal Protective Equipment).
ENVIRONMENTAL PRECAUTIONS: Material is 100% biodegradable and nontoxic.
METHODS FOR CLEANING UP: Dilute with water and hose down.

SECTION 7: HANDLING AND STORAGE

SAFE *HANDLING* RECOMMENDATIONS

VENTILATION: General ventilation should be sufficient under normal conditions.
FIRE PREVENTION: Non-flammable, no special fire protection required.
SPECIAL HANDLING REQUIREMENTS: Avoid eye contact.

SAFE *STORAGE* RECOMMENDATIONS

CONTAINMENT: The container should be kept covered to prevent contamination.
STORAGE ROOM RECOMMENDATIONS: Store in a cool, dry, well-ventilated area away from direct heat.
INCOMPATIBLE MATERIALS: Strong oxidizing material and strong bases.
STORAGE CONDITIONS: Shelf life is indefinite.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation should be sufficient under normal conditions.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE/FACE PROTECTION: Safety glasses recommended.
SKIN PROTECTION: For operations where skin contact can occur, wear impervious clothing such as apron, boots, or whole bodysuit.
HAND PROTECTION: For operations where hand contact can occur, rubber gloves recommended.
RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.
GOOD HYGEIENE/WORK PRACTICES: Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

EXPOSURE GUIDELINES

PERMISSIBLE EXPOSURE LIMITS

INGREDIENT CAS NO.	OSHA		WISHA		ACGIH (TLV)	
	TWA	STEL	TWA	STEL	TWA	STEL
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Gray
PHYSICAL FORM: Powder
pH: Not available

VAPOR DENSITY: Not available
MELTING POINT: Not available
SOLUBILITY IN WATER: Partially Soluble

SHAPE: Granular
ODOR: None
VAPOR PRESSURE: Not available

BOILING POINT: Not available
FREEZING POINT: Not available
SPECIFIC GRAVITY OR DENSITY: Not available

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.
CONDITIONS TO AVOID: None known.
MATERIALS TO AVOID (INCOMPATIBILITY): Strong oxidizing agents and strong bases.
HAZARDOUS DECOMPOSITION PRODUCTS: None known.
HAZARDOUS POLYMERIZATION: Polymerization will not occur

SECTION 11: TOXICOLOGICAL INFORMATION

ORAL LD_{50} (mice): >16g/kg
DERMAL LD_{50} (rabbit): Not available.
SKIN IRRITATION: Not available.
EYE IRRITATION: Not available.
SKIN SENSITIZATION: Not available.
ADDITIONAL INFORMATION: None

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY (in water):

Acute Toxicity

- Rainbow Trout LC 50 – 50.4 mg/L
- Rainbow Trout EC 25 – 37.5mg/L

MOBILITY: Not available.
PERSISTENCE AND DEGRADABILITY: Not available.
BIOACCUMULATIVE POTENTIAL: Not available.
ADDITIONAL INFORMATION: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):

Proper Shipping Name: Not Regulated
Hazard Class: Not Regulated
Identification Number (UN Number): Not Regulated
Packing Group (PG): Not Regulated

SECTION 15: REGULATORY INFORMATION

TSCA STATUS: The substances in this preparation are included on or exempted from the TSCA 8(b) inventory (40 CFR 710).

CERCLA REPORTABLE QUANTITY (RQ):

CHEMICAL NAME	RQ
Not applicable	Not applicable

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):

CHEMICAL NAME	TPQ	RQ
Not applicable	Not applicable	Not applicable

SARA TITLE III SECTION 311/312 HAZARD CATEGORIES: Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

ACUTE HEALTH HAZARD	CHRONIC HEALTH HAZARD	FIRE HAZARD	REACTIVE HAZARD	SUDDEN RELEASE OF PRESSURE
NO	NO	NO	NO	NO

SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

CALIFORNIA PROPOSITION 65: The following chemical(s) is/are known to have reproductive toxicity:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

SECTION 16: OTHER INFORMATION

REVISION INFORMATION:

MSDS sections(s) changed since last revision of document:

 None, this SDS is new, in accordance with OSHA's Hazard Communication Standard directive for GHS alignment.

DISCLAIMER:

** The above information is based upon information Dungeness Environmental believes to be reliable and is supplied for informational purposes only. Dungeness Environmental disclaims any liability for damage which results from the use of the above information and nothing contained therein shall constitute a guarantee, warranty (including fitness for a particular purpose) or representation with respect to the accuracy or completeness of the data, the product described or their use for any specific purpose even if that purpose is known to Dungeness Environmental The final determination of the suitability of the information, the manner of use of the information or product and potential infringement is the sole responsibility of the user.
****

SDS PREPARED BY: Joel Van Ornum, President, Dungeness Environmental

Integrated Engineers, Inc.

MATERIAL SAFETY DATA SHEET

Health	Flammability
1	0
Hazard	Reactivity
1	0

NFPA FIRE HAZARD IDENTIFICATION SYSTEM

I. PRODUCT IDENTIFICATION

Trade Name(s): Floccin J

Generic Name(s): Mixture of Montmorillonite and other proprietary ingredients.

Chemical Name(s): Sodium Montmorillonite and other proprietary ingredients

Manufacturer: Integrated Engineers, Inc. Address: 40308 Greenwood Way Oakhurst, CA 93644	Telephone Numbers: Information: (559) 683-8284 EMERGENCY: (559) 683-8284

II. HAZARDOUS INGREDIENTS

Ingredient	CAS No.	%	Hazard
Crystalline Silica (SiO_2) as Quartz	14808-60-7	<.915%	Low concentrations of crystalline silica (SiO_2) in the form of quartz may be present in airborne Montmorillonite dust. The concentration level of total free silica in airborne Montmorillonite dust is variable depending upon origin of Montmorillonite ore, fineness of product, moisture content of product, local humidity and wind conditions, etc. (See Section VI).

Note: Specific identity of product ingredients withheld as a trade secret. Ingredient identity is available to health professionals and others in accordance with 29 CRF 1910.1200(i). Only the most restrictive data for the ingredients in this product are given here.

III. PHYSICAL DATA

Boiling Point (°F): NA	Specific Gravity (H_2O=1): 2.40-2.50
Vapor Pressure (mm. Hg): NA	Melting Point: Approx. 1450°C
Vapor Density (Air = 1): NA	Evaporation Rate (Butyl Acetate = 1): NA

Solubility in Water: Slightly soluble, forms flocculated suspension.

Density (at 20° C): 89.3 lbs./cu.ft. as dry product.

Appearance and Odor: Blue gray to gray green as moist solid, light tan to gray as dry powder. No odor.

IV. FIRE AND EXPLOSION DATA

Flash Point: NA	Flammable Limits: LEL: NA UEL: NA

Special Fire Fighting Procedures: NA

Unusual Fire and Explosion Hazards: Product will not support combustion.

Extinguishing Media: None for product. Any media can be used for the packaging. Product becomes slippery when wet.

V. REACTIVITY

Stability: Stable

Hazardous Polymerization: None

Incompatibility: none

Hazardous Decomposition Products: Limited amounts of Sulfur Oxide gases may form when product temperature exceeds 760°C. These gases are corrosive oxidizers and are toxic.

NA = Not Applicable ND = Not Determined	Date Prepared : April 13, 2012

VI. HEALTH HAZARD INFORMATION

Routes of Exposure and Effects:

Skin: Prolonged contact may cause irritation and drying resulting in dermatitis.

Eyes: May irritate or burn eyes.

Inhalation: Acute (short term) exposure to dust levels exceeding the PEL/TLV's may cause irritation of respiratory tract resulting in a dry cough.
Chronic (long term) exposure to free silica containing airborne Montmorillonite dust where levels are higher than PEL/TLV's may lead to development of silicosis or other respiratory problems. Persistent dry cough and labored breathing upon exertion are symptomatic.

Ingestion: May irritate gastrointestinal tract.

Permissible Exposure Limits: (for air contaminants)	OSHA PEL (8hr. TWA)	ACGIH TLV
Total dust	ND	ND
Respirable dust	2mg/m^3	2 mg/m^3
Crystalline Quartz (respirable)	10 mg/m^3	0.025 mg/m^3

Carcinogenicity: None of the ingredients are listed by NTP, IARC or OSHA. IARC, 1987, concludes that there is limited evidence suggesting the Carcinogenicity in humans of inhaled crystalline silica (IARC Class 2A).

Acute Oral LD_{5O}: ND	Acute Dermal LD_{5O}: ND	Aquatic Toxicology LC_{5O}: ND

Emergency and First Aid Procedures:

Skin: Wash with soap and water until clean.

Eyes: Flush with water until irritation ceases. If irritation persists contact physician.

Inhalation: Move to area free from dust. If symptoms of irritation persist contact physician. Inhalation may aggravate existing respiratory illness.

VII. HANDLING AND USE PRECAUTIONS

Steps to be Taken if Material is Released or Spilled: Avoid breathing dust; wear respirator approved for silica bearing dust. Vacuum up to avoid generating airborne dust. Avoid using water. Product slippery when wetted.

Waste Disposal Methods: Product should be disposed of in accordance with applicable local, state and federal regulations.

Handling and Storage Precautions: Use NIOSH/MSHA respirators approved for silica bearing dust when free silica containing airborne Montmorillonite dust levels exceed PEL/TLV's. Clean up spills promptly to avoid making dust. Storage area floors may become slippery if wetted.

VIII. INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements: Mechanical, general room ventilation. Use local ventilation to maintain PEL's/TLV's.

Respirator: Use respirators approved by NIOSH/MSHA for silica bearing dust.

Eye Protection: Chemical safety goggles. Use of contact lenses not recommended.

Gloves: As appropriate for industrial work.

Other Protective Clothing or Equipment: As appropriate for industrial work.

IX. SPECIAL PRECAUTIONS

Avoid inhalation of airborne dust.

DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Common Ground Clay (NOIBN)	Hazard Class: Not Hazardous
Hazardous Substance: None	
Cautionary Labeling: None required	Date Prepared: January 24, 2007

Nautilus Environmental, LLC

Toxicity Test Report
Dungeness Environmental: Clear Trax 450 and Chitosan Flake

September/October 2010

Report date: October 19, 2010

Submitted to:

Dungeness Environmental
11805 North Creek Parkway
Bothell, WA 98011

Washington Laboratory
5009 Pacific Hwy East
Suite 2
Tacoma, WA 98424

1.0 INTRODUCTION

Acute toxicity tests were conducted on the products ClearTrax 450 and Chitosan Flake. The acute bioassays were conducted on the products using the test organism *Oncorhynchus mykiss* (rainbow trout). Testing was performed at Nautilus Environmental's Washington Laboratory located in Tacoma, Washington.

2.0 METHODS

2.1 Sample Generation

Dungeness Environmental delivered the products, identified as ClearTrax 450 and Chitosan Flake. ClearTrax 450 was mixed at 500 mg/L for two hours, filtered with a 60 µm filter, and then tested using a concentration series based on that solution. Chitosan Flake was mixed as a 1 percent solution for two hours, filtered with a 60 µm filter, and then tested using a concentration series based on that solution. Product mixture not immediately used for testing was then stored in LDPE cubitainers at 4°C in the dark until use.

2.2 Test Methods

Acute toxicity tests were conducted using rainbow trout according to the procedures presented by USEPA (2002) and are summarized in Table 1.

Table 1. Summary of methods for the 96-hour rainbow trout acute survival tests.

Test initiation date and time		ClearTrax 450: 9/29/2010; 1345h Chitosan Flake: 10/6/2010; 1530h
Test termination date and time		ClearTrax 450: 10/3/2010; 1400h Chitosan Flake: 10/10/2010; 1530h
Test organism		*Oncorhynchus mykiss*
Test organism source		Thomas Fish, Anderson, CA
Test organism age at initiation		ClearTrax 450: 26 days post swim up Chitosan Flake: 33 days post swim up
Test duration		96 hours with solution renewal at 48 hours
Feeding		Trout food during holding time, no feeding 12 hours prior to test or throughout duration of test
Test chamber		8 L plastic beaker
Test solution volume		4 liters
Test temperature		12 ± 1°C
Dilution water		Moderately hard synthetic water
Test concentrations	(mg/L) (%)	Clear Trax 450: 150, 75, 37.5, 18.75, 9.375, laboratory control Chitosan Flake: 1, 0.5, 0.25, 0.125, 0.0625, laboratory control
Number of organisms/chamber		10
Number of replicates		4
Photoperiod		16 hours light/8 hours dark
Aeration		None
Test Protocol		EPA-821-R-02-012
Test acceptability criteria		≥ 90% survival in controls
Reference toxicant		Copper sulfate

3.0 RESULTS

Survival was evaluated in the acute toxicity tests after 96 hours of exposure. Results are summarized in Tables 2 and 3.

The no observed effect concentration (NOEC) for ClearTrax 450 was 37.5 mg/L. The median lethal concentration (LC50) for ClearTrax 450 was determined to be 50.4 mg/L product. There was no mortality in the Chitosan Flake test. The NOEC for Chitosan Flake was 1 percent solution or 10,000 mg/L, which was the highest concentration tested.

Copies of the statistical summaries, laboratory bench sheets, and chain-of-custody form are provided in Appendices A through B.

Table 2. Summary of results for the acute toxicity test for ClearTrax 450.

Species	Concentration (mg/L)	Survival (%)	NOEC[a] (mg/L)	LOEC[b] (mg/L)	LC_{50}[c] (95% CI)[d] (mg/L)
Rainbow trout	0	100	37.5	75	50.4 (47.5-53.3)
ClearTrax 450	9.375	100			
	18.75	100			
	37.5	92.5			
	75	0			
	150	0			

[a]No Observed Effect Concentration, [b]Lowest Observed Effect Concentration, [c]Concentration which causes mortality in 50% of test organisms, [d]95 percent confidence interval

Table 3. Summary of results for the acute toxicity test for Chitosan Flake.

Species	Concentration (%)	Survival (%)	NOEC[a] (%)	LOEC[b] (%)	LC_{50}[c] (%)
Rainbow trout	0	100	1	>1	>1
Chitosan Flake	0.0625	100			
	0.125	100			
	0.25	100			
	0.5	100			
	1	100			

[a]No Observed Effect Concentration, [b]Lowest Observed Effect Concentration, [c]Concentration which causes mortality in 50% of test organisms

4.0 QA/QC

The toxicity tests met the acceptability criteria for performance of control organisms. There were no deviations from the protocols and water quality parameters remained within the ranges specified in the test method throughout the test.

Results for the reference toxicant tests used to monitor laboratory performance and test organism sensitivity are summarized in Table 4. The results for the reference toxicant tests fell within the acceptable range of mean ± two standard deviations of historical test results, indicating that the test organisms were of an appropriate degree of sensitivity. The coefficients of variation (CV) for the tests are also shown in the table.

Table 4. Reference toxicant test results.

Species	Endpoint	Date initiated	LC_{50}	Acceptable Range	CV (%)
Rainbow trout	96h survival	10/8/2010	83.1 µg/L Cu	4.65 - 195	47.7

REFERENCES

Tidepool Scientific Software. 2000-2007. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.6.3revG.

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012. pp. 57-58.

WDOE. 2008. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Washington State Department of Ecology. Water Quality Program. Publication number: WQ-R-95-80, Revised December 2008.

Nautilus Environmental
8664 Commerce Court, Burnaby, BC V5A 4N7

WO#: 12278 - 279

Mr. George Terry
Pure World Solutions INC.
4916 River Reach
Delta, BC
V4K 4A4

July 10, 2012

Dear Mr. Terry:

Re: Toxicity testing on the chemical sample identified as FLOCCIN

Nautilus Environmental is pleased to provide you the results of the 96-h LC50 rainbow trout toxicity test and the 48-h LC50 *Daphnia magna* toxicity test on the above chemical, received on June 12, 2012. Testing was conducted according to Environment Canada 1/RM/9, (1990, with May 1996 and 2007 amendments) and 1/RM/11 (1990, with May 1996 amendments). Rangefinder tests were initially conducted to establish concentrations used for the definitive tests. The appended data is included with the report.

The results of these definitive tests are provided in the tables below and are based on the appended data. All acceptability criteria outlined in the Environment Canada protocols were met.

Table A. Results for the 96-h rainbow trout test.

Sample ID	Collection Date and Time	96-h LC50 (mg/L) [with 95% confidence limits][1]
FLOCCIN	N/A	10.8 [10.2 – 11.4]

[1] Results relate only to the sample tested.

Table B. Results for the 48-h *D. magna* test.

Sample ID	Collection Date and Time	48-h LC50 (mg/L) [with 95% confidence limits][1]
FLOCCIN	N/A	75.2 [60.6 – 93.5]

[1] Results relate only to the sample tested.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

Nautilus Environmental

Jacob Frank, B.Sc.
Laboratory Biologist

Rainbow Trout Summary Sheet

Client: Pure World Solutions

Start Date/Time: June 21 /12 @ 1145

Work Order No.: 12278

Test Species: *Oncorhynchus mykiss*

Test Validity Criteria:

≥ 90% control survival

WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Information:

Sample ID:	FLOCCIN
Sample Date:	N/A
Date Received:	June 12 /12 @ 1630
Sample Volume:	N/A
Other:	Chemical Sample

Dilution Water:

Type:	Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$):	10
Alkalinity (mg/L $CaCO_3$):	8

Test Organism Information:

Batch No.:	041112		
Source:	Miracle Spings		
No. Fish/Volume (L):	10/15L		
Loading Density:	0.49		
Mean Length ± SD (mm):	45 ± 2	Range:	42 - 47
Mean Weight ± SD (g):	0.74 ± 0.09	Range:	0.59 - 0.87

NaNO2 Reference Toxicant Results:

Reference Toxicant ID:	RTNt21
Stock Solution ID:	12Nt01
Date Initiated:	May 24/12
96-h LC50 (95% CL):	3.8 (2.8 - 5.2) mg/L NaNO2

Reference Toxicant Mean and Historical Range: 5.5 (3.0 - 9.9) mg/L NaNO2

Reference Toxicant CV (%): 34

Test Results: The 96-h LC50 is estimated at 10.8 mg/L with 95% confidence limits at 10.24 mg/L - 11.39 mg/L

Reviewed by: JGL

Date reviewed: July 6/12

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Pure World Solutions
Sample I.D. FLOCCIN
W.O. # JBF ~~n/a~~ 12278
RBT Batch #: 04/1/12
Date Collected/Time: n/a
Date Setup/Time: June 21/12 @ 1145h
Sample Setup By: JBF / Am

D.O. meter: DO-1
pH meter: pH-1
Cond. Meter: C-1

Number Fish/Volume: 10/15L
7-d % Mortality: 0.0
Total Pre-aeration Time (mins): N/A
Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Yes

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C			
pH			
D.O. (mg/L)			
Cond. (µS/cm)			

Concentration mg/L	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Control				10	10	10	10	14.0	14.0	14.5	14.5	14.5	10.1	9.3	9.6	9.6	9.6	7.1	7.0	6.9	6.8	7.0	27	35
0.7				10	10	10	10	14.0	14.0	14.5	14.5	14.5	10.1	9.3	9.5	9.5	9.6	7.1	6.9	7.0	6.9	7.0	27	39
1.4				10	10	10	10	14.0	14.0	14.5	14.5	14.5	10.1	9.5	9.6	9.4	9.7	7.0	6.9	6.9	6.9	7.0	27	34
3.8				10	10	10	10	14.0	14.0	14.5	14.5	14.5	10.1	9.5	9.6	9.4	9.8	7.0	6.9	7.0	6.9	6.9	27	35
7.5				10	10	10	10	14.0	14.0	14.5	14.5	14.5	10.1	9.7	9.7	9.5	9.5	7.0	6.8	7.0	7.0	6.9	28	39
15				2	1	1	0	14.0	14.0	14.5	14.5	14.5	10.1	9.9	9.7	9.5	9.6	7.0	6.9	6.9	6.9	7.1	28	73
30				4	1	1	1	14.0	14.0	14.5	14.5	14.5	10.1	9.7	9.7	9.4	9.4	6.9	6.9	6.9	6.9	7.2	29	76
Initials				JBF	〃	〃	JBF	JBF	JBF	〃	〃	JBF	JBF	JBF	〃	〃	JBF	JBF	JBF	〃	〃	JBF	JBF	JBF

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: chemical - greyish made 1500 mg/L stock, pipetted & stirred for 5 min into each respective test concentr

Fish Description at 96? Fish alive appear ok

Other Observations:

Reviewed by: JGL

Date Reviewed: July 6/12

Version 2.1; Issued January 26, 2011.

Nautilus Environmental

CETIS Analytical Report

Fish 96-h Acute Survival Test | **Nautilus Environmental**

Analysis ID:	09-5972-2562	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	25 Jun-12 12:44	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes
Batch ID:	00-8844-8135	**Test Type:**	Survival (96h)	**Analyst:**	
Start Date:	21 Jun-12 11:45	**Protocol:**	EC/EPS 1/RM/13	**Diluent:**	Dechlorinated Tap Water
Ending Date:	25 Jun-12 11:45	**Species:**	Oncorhynchus mykiss	**Brine:**	
Duration:	96h	**Source:**		**Age:**	
Sample ID:	18-2792-6655	**Code:**	6CF3F27F	**Client:**	Pure World Solutions
Sample Date:	25 Jun-12 12:40	**Material:**	chemical	**Project:**	
Receive Date:	25 Jun-12 12:40	**Source:**	chemical		
Sample Age:	NA	**Station:**	Floccin		

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	5.00%	1.033	0.01149	10.8	10.24	11.39

96h Survival Rate Summary

			Calculated Variate(A/B)								
C-mg/L	**Control Type**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	Negative Control	1	1	1	1	0	0	0.0%	0.0%	10	10
0.7		1	1	1	1	0	0	0.0%	0.0%	10	10
1.4		1	1	1	1	0	0	0.0%	0.0%	10	10
3.8		1	1	1	1	0	0	0.0%	0.0%	10	10
7.5		1	1	1	1	0	0	0.0%	0.0%	10	10
15		1	0	0	0	0	0		100.0%	0	10
30		1	0.1	0.1	0.1	0	0	0.0%	90.0%	1	10

96h Survival Rate Detail

C-mg/L	Control Type	Rep 1
0	Negative Control	1
0.7		1
1.4		1
3.8		1
7.5		1
15		0
30		0.1

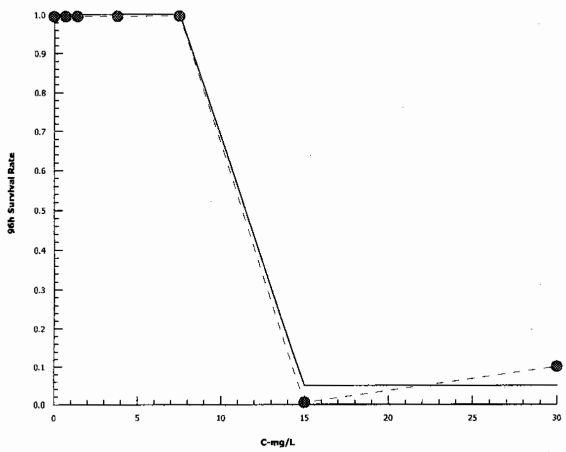
96h Survival Rate Binomials

C-mg/L	Control Type	Rep 1
0	Negative Control	10/10
0.7		10/10
1.4		10/10
3.8		10/10
7.5		10/10
15		0/10
30		1/10

Fish 96-h Acute Survival Test **Nautilus Environmental**

Analysis ID:	09-5972-2562	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	25 Jun-12 12:44	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Graphics



Daphnia magna Summary Sheet

Client:	Pure World Solutions	Start Date/Time:	June 21 /12 @ 1225
Work Order No.:	12279	Test Species:	*Daphnia magna*
		Set up by:	JBF/AWD

Sample Information:

Sample ID:	FLOCCIN
Sample Date:	N/A
Date Received:	June 12 /12 @ 1630
Sample Volume:	N/A

Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.:	060612A
Age of young (Day 0):	< 24 hours
Avg No. young per brood in previous 7 d:	35
Mortality (%) in previous 7 d:	0
Days to first brood:	8

NaCl Reference Toxicant Results:

Reference Toxicant ID:	DM 85
Stock Solution ID:	12Na01
Date Initiated:	June 27 /12
48-h LC50 (95% CL):	4.2 (3.7 - 4.8) g/LNaCL

Reference Toxicant Mean and Historical Range:	4.0 (3.6 - 4.4) g/L NaCL
Reference Toxicant CV (%):	5

Test Results: The 48-h LC50 is estimated at 75.25 mg/L
with 95% confidence limits at 60.56 - 93.49 mg/L

Reviewed by: JGh

Date reviewed: July 6/12

— Appendix B —

Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant for the Blackwater Gold Project (McCue 2016)

PRELIMINARY DESIGN OF PIT SUMP AND PIT PERIMETER DEWATERING WELL NETWORK WATER TREATMENT PLANT FOR THE BLACKWATER GOLD PROJECT

NEW GOLD INC.
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET
VANCOUVER, BC

Prepared by:

McCue Engineering Contractors
203-8291 92 Street
Delta, BC
V4G 0A4

Project No. 019-0004
July 21, 2016

TABLE OF CONTENTS

1.0 INTRODUCTION

McCue Engineering Contractors (McCue) was retained by New Gold Inc. to complete a preliminary design of a water treatment plant (WTP) for mine affected water at the Blackwater Gold Project to support the environmental assessment (EA) for the project.

The proposed WTP will receive pit surface water runoff (pit sump water) and groundwater. After treatment, effluent from the WTP will be discharged to Davidson Creek. The intent is to operate the WTP for approximately seven months of the year from March through September. The purpose of this report is to provide a preliminary description of the design and operation of the WTP.

1.1 Project Description

The Blackwater Gold Project is located approximately 160 km southwest of Prince George, BC and is the future site of an open pit mining operation with a project operating lifespan of 17 years. The general location of the mine site is presented in Figure 1.

The elevation of the ore processing facility and other mine infrastructure (Plant Site) is approximately 1,433 meters above mean sea level (masl.). Figure 2 illustrates the general mine site layout. The mine site will be accessible by a controlled forestry/mine access road branching from Highway 16 near Vanderhoof, BC.

The mine site will include an open pit, ore processing facility, tailings storage facility (TSF), waste rock dump, water management facilities, warehouse, maintenance shop, offices, and accommodation. The TSF is divided into Site C and Site D. An engineered wetland will be constructed at the base of the east side of the Site D Main Dam. This wetland will discharge to Davidson Creek post-closure. Davidson Creek is a trout-bearing stream that also supports spawning of Kokanee in its lower reaches. The TSF will receive and store the tailings, potentially acid generating rock (PAG), and site-wide mine affected water for the Blackwater Gold Project.

1.1.1 Climate

A summary of the average temperature and precipitation in the area is presented below in Table 1-1. The data is based on the hydrometeorology study completed by Knight Piésold Ltd (KPL)[1], which is included as Appendix 5.1.1.1A of the EA Application.

[1] "Preliminary Engineering Hydrometeorology Report, Ref. No. VA101-457, 2013"

TABLE 1 – 1: Climate Summary

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Temp (Celsius)	-7.7	-5.6	-2.1	1.6	6.7	10.4	12.5	11.8	7.2	1.3	-3.5	-7.4
Total Precip (mm)	73	45	39	20	50	66	52	51	47	47	74	72
% Precip as Snow	100	100	100	35	0	0	0	0	0	35	100	100

Notes:
mm - millimeters
Precip – precipitation

1.1.2 Freight Transport

Freight to/from the site will be hauled via a controlled forestry/mine access road branching from Highway 16 near Vanderhoof, BC. This road will be open year round.

1.2 Objective

The objective of the water treatment plant is to treat mine affected water collected from the pit sump and pit perimeter groundwater dewatering wells to a quality suitable for discharge directly to Davidson Creek.

2.0 DESIGN BASIS

The preliminary WTP design has been completed to support the environmental assessment, permitting and planning of the Blackwater Gold Project. At this level of design, an approximate breakdown of the WTP footprint by major components has been provided, as well as preliminary descriptions of the system operational requirements, monitoring plan and emergency response plan.

At the current stage of the project, bench scale testing and validation of the chemical treatment program has yet to be completed to support a detailed design of the WTP. In the absence of this information, several assumptions have been made for the purpose of the preliminary design. Assumptions are listed herein and are based on standard engineering practice, relevant provincial technical guidance documents, and on technical literature with empirical information for the types of treatment incorporated into the WTP. The treatment methods incorporated in the proposed WTP are conventional and a significant amount of information is available. All references have been documented.

Once representative mine affected water is available for the Blackwater Gold Project and the location and orientation of the major WTP components have been selected, the design will be reevaluated and advanced using the site-specific information. Examples of future work are provided below:

- Confirmation of influent volume and quality
- Bench scale testing to develop and validate a chemical treatment program
- Bench scale settling tests
- Bench scale characterization of sludge quality, quantity, and dewatering capability
- Bench scale testing to support auxiliary equipment design (e.g. filtration), if needed
- Pilot scale testing, if needed
- Resizing of major equipment components
- Process equipment location selection

Once completed, the information will form the basis for additional stages of WTP design. The design work will be completed during the early operating phase of the Project, prior to year five.

At present, the design has been completed with the intention of using a two stage settling treatment process combined with a chemical program to enhance the removal of dissolved and total metals. The preliminary design includes two stages of settling to allow for increased flexibility in later design stages. Should bench testing identify a single stage process is suitable, the design and project plan will be amended.

2.1 Design Criteria

2.1.1 Technical Guidance

The preliminary design has been completed in accordance with the following provincial regulatory guidance:

- Technical Guidance 1 of the *Environmental Management Act* – Environmental Impact Assessment and Technical Assessment Report (TG1), prepared by the British Columbia Ministry of the Environment (BC MOE).
- Technical Guidance 7 of the Environmental Management Act – Assessing the Design, Site, and Operation of Sediment Ponds Used in Mining (TG7), prepared by the BC MOE.

2.1.2 Target Parameter Discharge Limits

The end of pipe discharge limits have yet to be established for this project. Discharge quantity and quality summaries and predicted treatment performance data are provided in Sections 2.3 and 3.4, respectively.

2.2 Inlet Water Summary

The WTP inlet water will be collected from the pit sump and the pit perimeter groundwater dewatering wells. The WTP is intended to operate between the months of March to September to minimize the amount of water stored in the TSF by discharging treated water directly to Davidson Creek. During the remainder of the year, or in the event the inlet surge pond has reached its capacity, the water will be pumped to the TSF for reuse in the milling process.

The pit sump will be located within the open pit operation. Additional information on the pit dewatering infrastructure is described in Appendix 2.2A-2- Mine Waste and Water Management Design Report of the EA Application. Water collected in the pit and seepage from the walls will run overland to the pit sump. If necessary, silt fencing or other operational source controls can be installed in the vicinity of the pit sump to limit the total suspended solids loading on the WTP.

The purpose of the pit perimeter wells is to lower the groundwater table adjacent to the pit walls to improve stability. The wells will be sealed at the surface and will be developed in advance of the WTP startup to remove solids introduced during installation, optimize the filter capacity of the sand / gravel pack and to maximize the yield capacity.

2.2.1 Inlet Water Quantity

The WTP is planned to operate between the months of March to September. The mean and maximum homogenized daily flows for the pit sump and pit perimeter dewatering wells during this period have been estimated by ERM Group Inc. (ERM) and are summarized in Table 2-1 below.

Table 2-1 – Pit Sump and Perimeter Groundwater Dewatering Well Flow Summary

	Total Flow (m^3/day)	
Month	**Mean**	**Max**
March	3,643	3,643
April	4,849	5,400
May	23,590	24,624
June	10,154	17,928
July	6,602	10,074
August	5,578	6,051
September	4,948	4,968

Notes:

m^3/day – cubic meters per day
max - maximum

2.2.2 Inlet Water Quality

The estimated WTP inlet water quality from combined sources provided by ERM is summarized in Table 2-2 below.

Table 2-2 – WTP Inlet Water Quality

Parameter	Min	Mean	Median	95th Percentile
Anions and Nutrients (mg/L)				
Chloride	0.15	0.3	0.3	0.5
Fluoride	0.0316	0.105	0.116	0.133
Sulphate	6	15	15	23
Ammonia	0.03	0.97	0.12	4.01
Nitrate	0.11	7.59	0.92	31.64
Nitrite	0.003	0.176	0.022	0.730
Total Dissolved P	0.109	0.28	0.28	0.44
Dissolved Metals (mg/L)				
Aluminum	0.0102	0.0401	0.0263	0.103
Antimony	0.0044	0.0145	0.0147	0.023
Arsenic	0.0054	0.0247	0.0270	0.039
Barium	0.0036	0.0105	0.0116	0.0134
Beryllium	0.000021	0.000050	0.000049	0.000073
Boron	0.0034	0.011	0.0112	0.018
Cadmium	0.000313	0.000892	0.000611	0.00293
Calcium	7	19	19	28
Chromium	0.00011	0.00041	0.00041	0.0007
Cobalt	0.0005	0.0015	0.0013	0.0030
Copper	0.000124	0.00047	0.00028	0.00167
Iron	0.0208	0.065	0.058	0.149
Lead	0.000183	0.00490	0.00047	0.0305
Lithium	0.00188	0.00653	0.00610	0.0114
Magnesium	0.3	0.7	0.7	1.1
Manganese	0.78	2.15	2.26	2.88
Mercury	0.000003	0.000009	0.000009	0.000014
Molybdenum	0.0013	0.0091	0.0086	0.0149
Nickel	0.000818	0.0030	0.0028	0.0057
Phosphorus	0.0604	0.161	0.170	0.215
Potassium	1.4	4.3	4.2	7.1
Selenium	0.000064	0.00014	0.00012	0.00025
Silicon	2.89	8.92	9.82	11.73
Silver	0.000006	0.000015	0.000014	0.000024
Sodium	2.524	8.429	8.899	11.597
Strontium	0.055	0.15	0.15	0.22
Thallium	1.294E-05	3.931E-05	3.763E-05	0.00007
Tin	0.000046	0.000162	0.000155	0.000284
Titanium	0.0034	0.0086	0.0083	0.013

Parameter	Min	Mean	Median	95th Percentile
Uranium	0.00023	0.00061	0.00066	0.00079
Vanadium	0.0004	0.0013	0.0013	0.002
Zinc	0.019	0.106	0.040	0.515

Notes:
mg/L – milligrams per litre

In addition, the preliminary design is based on the following assumptions pertaining to inlet water quality:

- The inlet pH is near neutral to slightly acidic: an inlet pH range between six and seven has been assumed. The pit sump water may be acidic however the pit perimeter well water will likely remain neutral.

- The total suspended solids (TSS) of the homogenized inlet water stream has assumed to be approximately 300 mg/L TSS[2]. In the event the solids loading is significantly higher than estimated, source control practices would be implemented to reduce solids loading into the pit sump in order to bring the inlet TSS into range.

2.3 Discharge Water Summary

The effluent from the WTP will discharge directly into Davidson Creek.

2.3.1 Discharge Water Quantity

The maximum allowable discharge rate to Davidson Creek and associated dilution factor, calculated by KPL, are summarized in the table below by month. The discharge is limited by the stream geometry and seasonal water levels of Davidson Creek.

[2] Assumption provided by Sustainability Engineering

Table 2-3 – Discharge Flow Summary

Month	Maximum Allowable Discharge (L/Sec)	Actual Dilution Factor
March	42	2.0
April	63	2.0
May	285	2.0
June	280	2.0
July	110	2.2
August	60	2.5
September	58	2.0

Notes:
L/Sec – litres per second

2.3.2 Discharge Water Quality

In the absence of bench scale chemical treatment test data, theoretical plant performance has been estimated based on the chemical program and treatment process summarized in Section 3. Refer to Section 3.4 for information on the predicted discharge water quality and associated assumptions. Bench scale testing will be required to verify the treatment performance in advance of detailed system design.

2.4 Sludge Quality Summary

In the absence of sludge quality data, the following assumptions have been made regarding the quality of the sludge to support the preliminary design of the WTP. The assumptions and associated references are summarized below.

Table 2-4 – Sludge Quality Summary

Parameter	Assumed Value	Rationale
Settled Sludge % Solids	1-3%*	Assumed the upper end of settling range (3%) to account for the use of flocculent and coagulants.
Specific Gravity (S.G.)	2.7	Using SG assumption from TG7

Notes:
* - Sludge % solids for a settling pond is based on, "The Science of Treating Acid Mine Drainage and Smelter Effluents", Bernard Aube, P.Eng., M.A.Sc.

3.0 DESIGN

The details of the preliminary design are summarized within this section.

3.1 Process Overview

The general treatment for the mine affected water will consist of a two stage precipitation, coagulation, and flocculation chemical program and solids removal. Each stage of the chemical treatment program will be followed by a settling pond for the settling and storage of flocculated solids. Following the second settling pond the water will be buffered to a suitable pH for discharge to Davidson Creek. The preliminary WTP process flow diagram is illustrated on Figure 3 and the approximate location and footprint of the WTP are illustrated on Figure 4.

Future bench testing will determine whether the two stage treatment process includes hydroxide precipitation optimized at two target pH ranges or whether a hydroxide precipitation followed by sulphide precipitation treatment program will be required.

3.2 Chemical Program

At present, the preliminary chemical treatment program involves the following chemicals.

- pH adjustment – Hydrated Lime
- Precipitant - Hydrated Lime, Sodium Sulfide
- Coagulation – Ferric Sulphate
- Flocculation – To be determined during bench testing
- pH neutralization – Carbon Dioxide (CO_2)

Bench testing will be performed in advance of detailed design to finalize the chemical program. Bench testing work will be designed to:

- Support the selection of the successful chemical program
- Support the selection of the flocculant
- Optimize hydraulic retention times for neutralization, coagulation, and flocculation
- Verify the anticipated performance
- Provide settling rate information to re-evaluate and optimize (e.g. minimize) the settling ponds' footprint
- Characterize the sludge volume and quality at each step

3.2.1 Hydrated Lime

Hydrated lime is an odourless white powder conventionally used for pH adjustment and hydroxide precipitation for metals removal in mine water treatment applications. The hydrated lime will be added to the inlet water stream as a slurry upstream of the neutralization mixing tank. The dosing of the lime will be controlled using a pH probe located in the neutralization mixing tank.

Hydrated lime is also being used in the milling process and SO_2/air treatment of mill tailings and will be readily available at the mine site.

The following precautions will be incorporated as necessary into the detailed design of the hydrated lime slurry preparation and dosing equipment for the WTP:

- Dust suppression and ventilation for dry handling equipment
- Methods / equipment to minimize handling of powdered hydrated lime by equipment operators
- Product transportation and storage requirements (e.g. product must be transported and stored in cool dry place away from acids)
- Safety shower and eyewash station in the vicinity of the makedown equipment

3.2.2 Ferric Sulphate

Ferric sulphate is a reddish brown liquid with an acidic odour used as a conventional coagulant for heavy metal removal in mine water treatment applications. Ferric sulphate will be added inline upstream of the neutralization mixing tank. Dosing of the ferric sulphate will be controlled based on the inlet flow rate to the neutralization tank. The addition of ferric sulphate will aid in the co-precipitation of metals (e.g. arsenic) and aid in coagulation.

Ferric sulphate may also be mixed with sodium sulphide to create a ferrous sulphide slurry that may be used in the sulphide precipitation process.

The following precautions will be incorporated as necessary into the detailed design of the ferric sulphate dosing equipment:

- Ventilation in the storage and dosing areas
- Methods / equipment to minimize handling of liquid
- Product transportation and storage requirements (e.g. product must be stored in dry location away from direct sunlight)
- Safety shower and eyewash station in the vicinity of the makedown equipment

3.2.3 Sodium Sulphide

Sodium sulphide is a flakey solid with a sulfur-like odour. When combined with ferric sulphate it can form ferrous sulphide, which will support the precipitation of heavy metals from solution as insoluble sulphides.

The following precautions will be incorporated in future detailed design of sodium sulphide dosing equipment:

- Dust suppression and ventilation for dry handling equipment
- Ventilation for storage and dosing areas
- Product transportation and storage requirements (e.g. product must be stored in dry location away from direct sunlight)
- Safety shower and eyewash station in the vicinity of the makedown equipment

- Monitoring of dosing system and enclosed spaces for the presence of hydrogen sulphide (H_2S) gas

3.2.4 Flocculant

The flocculent will be selected during bench testing. The selection of the flocculent will be based on the:

- Ability to rapidly develop a durable, rapid-settling flocculated particle
- Toxicity of the flocculant to the environment in the event of a spill or treatment system carry-over
- Robustness of the flocculant to work over a range of operating conditions (e.g. pH, solids loading, mixing times)
- Flocculant preparation and aging requirements
- Handling requirements and worker exposure risk(s)
- Shipping logistics, lead time, and shelf life
- Concentrations and total volumes required
- Cost

Dosing (e.g. concentration and rate) of the flocculant will be identified following the selection of the successful flocculant. Typically, a flocculant is dosed based on predicted performance, the inlet flow rate and potentially adjusted based on inlet turbidity.

3.2.5 Carbon Dioxide

Carbon dioxide (CO_2) is an odourless gas conventionally used to buffer pH in water through the formation of carbonic acid. CO_2 is typically sparged into the closed pipe network and controlled by an inline pH probe.

CO_2 is a simple asphyxiant. The following precautions will be incorporated in future detailed design of the CO_2 dosing equipment:

- Locating storage and dosing areas outside to prevent the accumulation of CO_2 within worker breathing zones
- Equipping pressure vessels with pressure relief valves
- Monitoring the presence of CO_2

3.3 WTP Structures & Major Equipment

The WTP structures are described by major component within this section.

3.3.1 Inlet Retention or Surge Pond

Water from the pit sump and pit perimeter groundwater dewatering wells will be pumped to the WTP inlet retention or surge pond. The purpose of this pond is to receive and temporarily store inlet water for the WTP, homogenize the two inlet water streams, and dampen inlet flow surges. Short term increases in inlet flow above the treatment flow rate will result in an accumulation of water in the inlet surge pond. In the event the inlet surge pond reaches capacity, water would be discharged directly to the TSF.

The table below compares the allowable discharge rate to Davidson Creek (see section 2.3.1) against the mean estimated inlet flow rate to the inlet surge pond.

Table 3-1 – Inlet Flow Summary

	Maximum Allowable Discharge to Davidson Creek	Mean Surge Pond Inlet Flow Rate	Difference Between Discharge and Mean Inlet Flow Rates
Month	**L/s**	**L/s**	**L/s**
March	42	42.2	0.2
April	63	56.1	-6.9
May	285	273	-12
June	280	117.5	-162.5
July	110	76.4	-33.6
August	60	64.6	4.6
September	58	57.3	-0.7

Note:

- Mean Surge Pond Inlet flow rate obtained from Table 2.1
- Negative numbers indicate the net removal of water from the surge pond.
- L/s – litres per second

Based on the difference between the monthly mean predicted inlet flow rates and the monthly allowable discharge flow rates, there will be a surplus of water in March and August. As a result, excess water will be discharged to the TSF.

To minimize the discharge to the TSF, the inlet surplus during the month of March of approximately 400 m^3 could be stored within the inlet surge pond and discharged during the month of April when the mean inlet flow rate is less than the monthly allowable discharge. This would result in the ability to discharge the surplus inlet water.

The inlet surge pond is not intended to be used as a settling pond and therefore the volume and dimensions are not required to comply with TG7. Although not intended as a settling pond, other design guidance from TG7 such as freeboard and spillways will be followed.

The inlet surge pond will be located between the pit sump and the plant site. The dimensions and volume of the pond can be adjusted based on the land area available. At present, the maximum surge pond volume of approximately 25,000 m^3 has been selected based on a maximum predicted inlet flow over a 24-hour period.

A broad area of land between the open pit and the plant site is included as part of the project footprint and considered as part of the effects assessment. It is assumed that the inlet surge pond will be located within the area and would be suitable for use for the inlet surge pond. At the preliminary design stage the details of the pond are as follows:

Table 3-2 Inlet Surge Pond Summary

Description	Design Detail
Total Length (m)	196
Total Width (m)	41
Slope of pond interior	2 Horizontal : 1 Vertical
Freeboard (m)	0.5
Pond Depth (m) (including freeboard)	5
Maximum Storage Volume (m^3)	25,096
Spillway	TBD

The inlet surge pond spillway will be sized to meet the total pumping capacity of all pumps supplying the inlet surge pond. The overflow from the surge pond will be routed through ditches that drain to the TSF.

3.3.2 Neutralization Tank

The objective of the neutralization tank is to rapidly and evenly mix hydrated lime and ferric sulphate to optimize solids formation.

The neutralization mix tank(s) will be located in the vicinity of the Plant Site (refer to Figure 2). Inlet water will be pumped from the inlet surge pond to the neutralization tank(s). At the inlet to these tank(s), hydrated lime and ferric sulphate will be added.

Chemical bench testing will be required in advance of detailed design to determine and size the chemical injection equipment and determine the hydraulic retention time of the tanks. At present, the hydraulic retention for the neutralization tank is based on conservative hydraulic retention times required for chemical treatment of 1-3 minutes[3].

Based on the maximum inlet flow rate of 285 L/s the total tank volume required for neutralization will be between 17.1 m^3 to 51.3 m^3. This volume could be stored in a single or multiple six to ten foot (1.8 m to 3.05 m) diameter filament-wound fiberglass above-ground storage tank(s) (AST's) equipped with a mechanical mixer.

The preliminary design details using a single neutralization tank are as follows:

[3] Eckenfelder, Jr., W.W. (2000). *Industrial Water Pollution Control*. McGraw-Hill Series in Water Resources and Environmental Engineering, 38-156.

Table 3-3 Summary of Neutralization Tank

Description	Detail
Diameter (m)	1.82
Total Height (m)	8.8
Water Depth (m)	7.9
Number of tanks	1
Storage Volume (m^3)	20.75
HRT @ 42 L/s (min)	Refer to Table 4-2
HRT @ 285 L/s (min)	Refer to Table 4-2

Notes:

m – meters
m^3 – cubic meters
min – minutes
L/s – litres per second
HRT – hydraulic retention time

3.3.3 Flocculation Tanks

The objective of the flocculation tank is to provide gentle agitation to encourage flocculation through particle to particle contact. The flocculation mix tanks will be located in the vicinity of the Plant Site adjacent to the neutralization tank. The water will gravity drain from the neutralization tank(s) to the flocculation mix tank farm. The flocculant will be added in line.

Chemical bench testing will be required in advance of detailed design to select the flocculant, size chemical injection equipment, and confirm the total hydraulic retention time of the flocculation tank farm. At present, the total hydraulic retention time is based on conservative hydraulic retention times of between 20-30 minutes[4]. This retention time facilitates both flocculation and chemical equilibrium. The flocculation tanks will each be equipped with a low revolution per minute (RPM) mixer capable of keeping the flocculated particles suspended. Based on the maximum inlet flow rate of 285 L/s, the total volume of the flocculation tankage will be between 342 m^3 to 513 m^3. This volume could be stored in multiple eight to ten foot (2.4 m to 3.05 m) diameter filament-wound fiberglass AST's.

[4] Eckenfelder, Jr., W.W. (2000). *Industrial Water Pollution Control*. McGraw-Hill Series in Water Resources and Environmental Engineering, 38-156.

The preliminary design details of the flocculation tanks are as follows:

Table 3-4 Summary of Flocculation Tank

Description	Design Detail
Diameter (m)	3.05
Total Height (m)	9
Water Depth (m)	7.9
Number of tanks	6
Total Storage Volume (m^3)	345.9
HRT @ 42 L/s (min)	Refer to Table 4-2
HRT @ 285 L/s (min)	Refer to Table 4-2

Notes:
m – meters
m^3 – cubic meters
min – minutes
L/s – Litres per second
HRT – hydraulic retention time

3.3.4 Settling Ponds

Settling ponds and clarifiers are two conventional methods for the removal of the total suspended solids from the water stream at the flow rates predicted for the Blackwater Gold Project. Standard clarifier types for mine water treatment include circular mechanical clarifiers and parallel plate clarifiers. Parallel plate clarifiers were evaluated due to their ability to treat higher flow rates in a smaller footprint and allow for a modular design for the treatment of highly variable inlet flows.

At the current stage of the project, settling ponds have been selected as the primary settling method due to the available space at the site and economic considerations. Clarifiers present a viable alternate method of solids removal in the event future chemical bench testing or other site constraints suggest that settling ponds are no longer practical. As a result, a brief description of clarifiers has been provided at the end of this section.

The preliminary process flow design (Figure 3) includes a two-step chemical program and settling process. The objective of Pond 1 is to settle inlet solids and metals through coagulation, hydroxide precipitation, and flocculation. The target pH within this pond would be between 8-9. The purpose of Pond 2 will be determined during bench testing. It will either be used as a settling basin for a second stage of hydroxide precipitation at a target pH of approximately 11 or a settling basin for sulphide precipitation at a target pH of between 8-9.

The settling ponds have been sized based on two factors:

1. MOE Technical Guidance 7: Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining.

2. The sludge storage zone of each settling pond must capable of storing half of the estimated sludge generated over the seven-month treatment period. Refer to Section 3.4 for the estimated volume of sludge.

Key assumptions for the preliminary design are presented in the Table 3-4 below and the preliminary dimensions and other pertinent design details are presented in Table 3-5. In future stages of work, the pond size will be reevaluated and optimized following the completion of bench scale chemical testing. The minimum surface area of each pond is conservatively estimated using the following equation provided in TG7 (Method A):

$$\text{Surface Area } (A) = Q/V$$

Where:

Table 3-4 Design Assumptions

	POND 1	POND 2
Maximum Inlet Flow (Q):	0.285 m^3/second (Based on maximum system inlet flow rate)	
Critical Settling Velocity (Vsc or V):	0.00083 m/s[5]	0.00002 m/s[6]
Minimum Factor of Safety[6]:	1.2	1.2
Required Minimum Sludge Storage Volume (m^3)	11,630	11,630

Notes:
m^3 – cubic meters

[5] Lawrence K. Wang et al., "Handbook of Environmental Engineering Volume 3 Physiochemical Treatment Processes", Humana Press Inc., Pg. 393
[6] Technical Guidance 7 of the Environmental Management Act – Assessing the Design, Site, and Operation of Sediment Ponds Used in Mining (TG7), prepared by the BC MOE.

Table 3-5 Preliminary Pond Dimensions

	POND 1	POND 2
Interior Width (m)	37.5	60.5
Interior Length (m)	179.5	294.5
Total Pond Depth (m) (including freeboard)	5	3.5
Settling Depth (m)	1.5	1.5
Length to Width Ratio:	5:1	5:1
Minimum Height of Freeboard (m):	0.5	0.5
Slope of Embankment:	2H:1V	2H:1V
Settling Volume (m^3)	8,511	24,105
Minimum Hydraulic Retention Time	Refer to Table 4-3	Refer to Table 4-3
Sludge Storage Volume (m^3)	11,703	21,054
Size Limiting Consideration	sludge storage volume	settling surface area

Notes:
m^3 – cubic meters
hrs - hours

The footprints presented in the table above represent the top of berm interior dimensions. This approximate footprint does not include berm width, access roads, or inlet and outfall structures. It is assumed that any ice cover on the surface of the ponds remaining in March will not affect the pond specifications due to the low relative WTP inlet flow rate and large sludge storage volume available in that month. The potential ice cover on the ponds will be taken into consideration in later stages of the design when inlet/outfall structures are being designed.

Once treatment has been suspended for the year, the settling ponds will be drained and the sediment mechanically removed and transported to the TSF for disposal. The settling ponds will be located southeast of the Plant Site. A broad area of land in this area is included as part of the project footprint and included in the effects assessment. It is assumed that the settling ponds would be located within this area.

The Lamella Plate clarifier model evaluated for this project is capable of inlet flows up to 63 L/sec gallons per minute. To treat the maximum design flow, each pond would be replaced with six clarifiers connected in parallel. In addition to the clarifiers a conventional design would also include clarified water filtration downstream of the clarifiers to provide additional solids removal. Clarifiers would be connected directly to the flocculation mix tanks or potentially have integrated flash and flocculant mix tanks, providing effective treatment can be achieved at reduced retention times.

In a clarifier installation, sludge management is performed on an ongoing basis. In this instance, pumps would draw the sludge from the bottom of the clarifier settling cone and pump the slurry directly to the TSF. In this installation a portion of the underflow could be recycled back to the neutralization tank to reduce chemical consumption and enhance solids removal. The benefit of pumping directly to the TSF is that no further sludge management would be required.

3.3.5 Carbon Dioxide Injection

Carbon dioxide (CO_2) will be used to buffer the pH to an acceptable level for discharge to Davidson Creek. The amount of CO_2 required will be dependent on the selected chemical program. Based on input from Air Liquide, buffering effluent from a pH of 11 to 8.5 will consume approximately 85 to 105 tonnes of CO_2. Substantially less CO_2 is anticipated to be required if a sulphide process is selected. Due to the location of the site and the potential volume of CO_2 required, the CO_2 will be supplied in liquid form and stored in a single AST located in the vicinity of the WTP.

The liquid CO_2 will be vapourized in the vicinity of the tank and sparged as a gas into the CO_2 dissolution skid, located upstream of the monitoring pond. The CO_2 dissolution skid consists of serpentine piping, an inline pH probe, and CO_2 regulator. The inline pH probe is used to regulate the CO_2.

Both the CO_2 AST and dissolution skid will be located outdoors.

3.3.6 Monitoring Pond

The monitoring pond will receive the effluent from the WTP. The pond will dampen short-term WTP discharges and act as the final system control check should the WTP effluent require recirculation through the WTP prior to discharge to Davidson Creek.

The monitoring pond is not intended to be used as a settling pond and therefore the volume and dimensions are not required to comply with TG7. Although not intended as a settling pond, other design guidance from TG7 regarding freeboard and spillways has been followed. The proposed volume of the monitoring pond is approximately 25,000 m^3 to be capable of storing the maximum WTP effluent volume discharged over a one-day period.

Table 3-6 Summary of Monitoring Pond

Description	**Design Detail**
Total Length (m)	196
Total Width (m)	41
Slope of pond interior	2 Horizontal : 1 Vertical
Freeboard (m)	0.5
Pond Depth (m) (including freeboard)	5
Maximum Storage Volume (m^3)	25,096

Notes:

m – meters
m^3 – cubic meters

During detailed design the monitoring pond outlet could be designed to allow for variable static water level control. This consideration would allow for greater operational flexibility and potentially reduce warming of the effluent water prior to discharging to Davidson Creek.

The monitoring pond will be located southeast of the Plant Site in the vicinity of the settling ponds within the same broad area of land included as part of the project footprint and included in the effects assessment.

3.4 Treatment Performance

The estimated effluent concentrations for target parameters is based on technical literature on hydroxide/sulphide precipitation compared against the results from the neutralization testing of potentially acid generating (PAG) waste rock humidity cell leachates for the Blackwater Gold Project completed by Amec Foster Wheeler (AmecFW). The aim of the comparison was to provide site specific context to the theoretical removal efficiencies available in literature for this stage of the project.

Target parameters are identified as metal parameters in Table 2-2 for which there are Working and Approved Water Quality Guidelines (WQGs) developed by the British Columbia MOE.

Table 3-7 summarizes the predicted effluent concentrations by treatment approach as well as summarizes the residual concentrations observed during the neutralization tests.

Table 3.7: Predicted Discharge Concentrations By Chemical Program

		Neutralization Result Range[3]	Single Stage Lime		Neutralization Result Range[3]	Two Stage Lime		Lime/Sulfide Precipitation	
pH	**6-7**	**10.5 - 11**	**10.5 – 11.5**		**8-9, 10.5 -11.5**	**8-9, 10.5 -11.5**		**8-9**	
	Maximum Inlet Conc.[1]		**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**		**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**	**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**
Dissolved Metals (mg/L)									
Aluminum	0.103	0.2-2.6	-	0.103	0.016-0.194	0.05	0.1[6]	0.05	0.05
Antimony	0.023	0.0001-0.0008	NR	NR	0.0001-0.0008	NR	NR	NR	NR
Arsenic	0.039	0.0001-0.0003	0.005	0.005	0.0001-0.0003	0.005	0.005	0.005	0.005
Barium	0.0134	0.003 – 0.01	NR	NR	0.003 – 0.01	NR	NR	0.3	NR
Beryllium	0.000073	0.0001	NR	0.000073	0.0001	NR	NR	NR	0.000073
Boron	0.018	0.01	NR	NR	0.01	NR	NR	NR	0.018
Cadmium	0.00293	0.00001 – 0.003	0.0005	0.0005	0.00001 – 0.003	0.0005	0.0005	0.0005	0.0005
Chromium	0.0007	0.0005-0.0008	NR	0.0007[5]	0.0005-0.0008	NR	NR	NR	NR
Cobalt	0.0030	0.0001-0.0008	-	0.0001[6]	0.0001-0.0008	-	0.0001[6]	-	0.001[6]
Copper	0.00167	0.0005 – 0.002	NR	NR	0.0005 – 0.002	NR	NR	NR	NR
Iron	0.149	0.03 – 0.3	-	0.03[6]	0.03 – 0.3	-	0.03[6]	0.05	0.03[6]
Lead	0.0305	0.00005 – 0.001	0.019	0.019	0.00005 – 0.001	0.019	0.019	0.006	0.006
Manganese	2.88	0.0004 – 0.225	-	0.0042	0.0004 – 0.225	-	0.0042	0.01	0.01
Mercury	0.000014	0.00001 - 0.00001	NR	NR	0.00001 - 0.00001	NR	NR	NR	NR

		Neutralization Result Range[3]	Single Stage Lime		Neutralization Result Range[3]	Two Stage Lime		Lime/Sulfide Precipitation	
pH	**6-7**	**10.5 - 11**	**10.5 – 11.5**		**8-9, 10.5 -11.5**	**8-9, 10.5 -11.5**		**8-9**	
	Maximum Inlet Conc.[1]		**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**		**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**	**Theoretical Minimum Effluent Conc.[2]**	**Predicted Minimum Effluent[4]**
Molybdenum[7]	0.0149	0.00005	-	0.0149	0.00005	-	NR	-	NR
Nickel	0.0057	0.0005 – 0.001	NR	NR	0.0005 – 0.001	NR	NR	0.004	0.004
Selenium	0.00025	0.0001	-	NR	0.0001	-	NR	-	NR
Silver	0.000024	0.00001	NR	NR	0.00001	NR	NR	0.001	NR
Thallium	0.00007	0.00002 – 0.00008	NR	NR	0.00002 – 0.00008	NR	NR	NR	NR
Uranium	0.00079	0.00001 – 0.0009	-	0.00009[6]	0.00001 – 0.0009	-	0.00009[6]	-	NR
Zinc	0.515	0.003 – 0.3	0.05	0.05	0.003 – 0.3	0.05	0.05	0.01	0.01

Notes:

"-" – information unavailable at this time for the specified pH range

NR – No or negligible estimated removal

1- Maximum inlet concentration is based on the modelled 95th percentile WTP inlet concentrations provided by ERM.
2- Indicates the theoretical minimum dissolved concentration attainable through the identified chemical program at the proposed pH and inlet concentration range. This concentration is based on the literature review of following sources:
   a. Eckenfelder, Jr., W.W. (2000). *Industrial Water Pollution Control*. McGraw-Hill Series in Water Resources and Environmental Engineering, 38-156.

    b. Feng, X., Zhang, B., Lee, C., "Effects of Low Temperature on Aluminum (III) Hydrolysis: Theoretical and Experimental Studies"
    c. Alan K. Robinson, Joyce C. Sum, “Sulfide Precipitation of Heavy Metals”, June 1980
    d. Murray C. Scott, “Sulfex™- A New Process Technology For Removal of Heavy Metals from Waste Streams”, 1977
    e. Peters, R., Ku, Y. and Bhattacharyya, D. (1985). Evaluation of Recent Treatment Techniques for Removal of Heavy Metals from Industrial Wastewaters. *AICHE Symposium Series*, 81 (243), 165-196.
    f. Ersoz, M. (2013). *Best Practices Guide on Metals Removal by Treatment.* IWA Publishing, 34.
    g. BioteQ Environmental Technologies, “Metals Removal from Kemess Pit Water Laboratory Testing Final Report”, September 14, 2015

3- Indicated the % removal range observed during the neutralization testing performed at the proposed process pH.
4- Indicates the minimum predicted achievable effluent concentration for the proposed chemical program.
5- The maximum influent concentration is less than the theoretical removal capability of the chemical program.
6- Effluent prediction is based on neutralization test results.
    a. Kavalench, J., (2013) New Gold Inc pH neutralization experiments Trial2 ALS File no. L1260527.

The theoretical and predicted reductions do not account for the following:

- Parameters in Table 3-7 that may increase as a result of the selected chemical program
- Reduced removal as a result of interference such as chelating agents, cyanide, etc.
- Interference of ammonia on chemical precipitation of the parameters in Table 3-7
- The proposed chemical program is not conventional treatment for these parameters; therefore, removal efficiencies are not available in literature.
  - Ammonia
  - Chloride
  - Nitrate
  - Nitrite
  - Sodium
  - Sulphate (less than 2,000 mg/L)

3.5 Sludge Management

Sludge generation estimates and characterization will be developed at the time of chemical bench testing. Once developed, the sludge storage zones within each pond will require re-evaluation.

At present, sludge generation is based on the complete removal of 300 mg/L inlet TSS and the settled sludge properties summarized in Section 2-4. On this basis, it is estimated that between 35.6 m^3 – 241.6 m^3 of sludge will be generated per day based on inlet flow rates between 42 -285 L/s.

Once the sludge properties and volume have been accurately determined in the lab to account for the addition of hydrated lime and iron, and the formation of hydroxide and sulfide precipitates, the sludge storage capacities of the settling ponds may have to be adjusted.

At present, the sludge management plan is to accumulate and store the sludge within the settling ponds during the period of active treatment. In October the overlying water within the settling ponds will be pumped to the TSF and the sludge will be mechanically removed and transported to the TSF for disposal.

The estimated sludge accumulation by month is summarized in Table 3-8.

Table 3-8 Sludge Volume by Month

Month	Estimated Sludge Generated (m^3)
March	1104
April	1602
May	7490
June	7121
July	2891
August	1577
September	1475
Total	**23,260**

3.6 Design Failure Analysis

A preliminary design failure analysis has been completed based on the preliminary process design. The design failure analysis evaluated the following:

- potential major equipment failure
- malfunction of major equipment components
- major changes in process (e.g. process upset)
- major changes in site conditions (e.g. inlet conditions)

The objective of the design failure analysis was to identify potential system failures and include design provisions to control risks to human health and the environment. Table 3-9 summarized the preliminary design failure analysis and associated engineering controls incorporated into the preliminary design to protect human health and the environment.

Table 3-9: Design Failure Analysis

Event/Failure	Engineering Controls
High WTP Inlet Flow	• Short term surges can be stored within the Inlet Surge Pond • Surplus flow will be diverted to the TSF
Low WTP Inlet Flow	• System operation can be converted to batch operation without compromising the effluent quality

High pH Discharge	• pH dissolution skid will include continuous in-line pH monitoring with both high and low level alarms • Monitoring Pond will be capable of buffering short term high pH discharge • High pH discharge can be recirculated through the CO_2 Dissolution Skid • Inlet system flow can be directed to the TSF if CO_2 Dissolution Skid malfunction or failure results in long term WTP shut down • WTP Operator will monitor hydrated lime dosing system, CO_2 dissolution skid, and effluent monitoring pond and make adjustments as necessary
Low pH Discharge water	• pH dissolution skid will include continuous in-line pH monitoring with both high and low level alarms • Carbonic acid is a weak acid and less prone to overdosing than stronger acids • Water can be recirculated to the WTP inlet where it will be dosed with hydrated lime to increase the pH
High Inlet Water Temperature	• Temperature of inlet sources can be measured separately • Reduce pump rate of high temperature water source to reduce inlet temperature to WTP • Divert water to the TSF
High Discharge Water Temperature	• Levels within the inlet and discharge ponds can be adjusted to reduce HRT • Divert water to the TSF
High Turbidity Inlet Water	• Source water from the pit sump and dewatering wells can be individually monitored and diverted to the TSF • Water treatment can be suspended to allow for batch settling within the inlet surge pond • Improved sediment source control can be implemented within the pit to reduce solids loading on the WTP
High Turbidity Settling Pond Discharge	• Prior to discharge, effluent water can be recirculated to the neutralization tank • High turbidity water from Settling Pond 1 will undergo secondary chemical treatment and be discharged into Settling Pond 2 • Operators will routinely check the system to ensure that chemical dosing systems are functioning and will replenish chemical supply

	• Operators will routinely perform jar tests to ensure chemical program is optimized • A chemical flocculant will be used to enhance settling of suspended solids
Failure of Tank or Vessel Failure	• Each tank will be equipped with an inlet and discharge isolation valve to individually isolate tanks from the process system • Inlet flow will be diverted to the TSF, if necessary • Tank pad locations will be graded to drainage ditches that lead to TSF
Failure of Mixer	• Spare parts will be maintained on site to minimize plant downtime • A single tank from the flocculent tank farm can be taken off line through valve control until the mixer is functioning • Inlet flow can be directed to the TSF • Operation and Maintenance Program will outline regular/routine preventative maintenance requirements
Failure of Pump	• Duplex pumping system will ensure partial flow can be maintained • Gravity drainage through system will be used when possible • Flow can be directed to the TSF • Operation and Maintenance program will outline regular/routine preventative maintenance requirements
Chemical Dosing Equipment Failure	• Operation and Maintenance program will outline regular/routine preventative maintenance requirements • Operators will routinely check system to ensure that chemical dosing systems are functioning and replenish chemical supply • Hydrated lime system will be controlled by an in-line pH probe equipped with high and low level alarms • Water can be diverted to the TSF • Refer to high turbidity settling pond discharge • Refer to high and low pH discharge
Operator Illness or Injury	• Additional trained operators will be available as part of mill staff.

Power Failure	• Back-up power source • Water will be diverted to the TSF
Extreme Weather	• Water can be diverted to the TSF
Chemical Spill	• Bunds will be constructed around reagent storage areas to retain spills. • Spill clean-up kits and materials will be readily available in chemical storage and handling areas.

4.0 OPERATION

4.1 Operation Overview

The water treatment plant is expected to run between the months of March to September. Outside of this period, or in the event that the inlet surge pond has reached its maximum capacity, water will be directed to the TSF.

General operation of the system is outlined in the following sections.

4.1.1 Inlet Surge Pond

Water from the pit sump and pit perimeter wells will be pumped to the inlet surge pond. Influent from these sources will be transported via dedicated pipelines, so as to allow operators to troubleshoot potential issues with influent water quality.

During system operation, the pond will act to equalize flow to the water treatment plant, and dampen inlet surges. Operators will direct pond discharge to the water treatment plant. During system shutdown, operators will direct any water collected within the pond to the TSF.

A set of surge pond pumps will distribute water from the pond to either the water treatment plant or the TSF. The pumps will be controlled by variable frequency drives so as to ensure the plant discharge does not exceed monthly discharge flow limits to Davidson Creek. Operators will be required to adjust the pump speed accordingly.

The water level and associated HRT in the Inlet Surge Pond will be controlled by the WTP operator based on field conditions, including weather. During normal operation the water level could be kept between 1 m to 1.5 m to homogenize the inlet water streams and stabilize the effluent flow rate. The remaining pond volume could then be reserved for surge flow retention, water storage during short term WTP shutdowns, or flow recirculation. Table 4-1 summarizes calculated operating and maximum pond water levels and associated hydraulic retentions times at four key WTP discharge rates.

Table 4-1 Hydraulic Retention Time (hours)

Flow Rate	HRT @ Normal Operating Depth	HRT @ Maximum Operating Depth
42 L/s	27.1	166
60 L/s	19	116.2
110 L/s	10.3	63.4
285 L/s	4	24.5

Notes:
HRT – Hydraulic Retention Time
L/s – Litres per second
Normal Operating Depth – Water depth of 1m; Pond Volume of 4,095 m^3
Maximum Operating Depth – Water depth of 4.5m; Pond Volume of 25,096 m^3

As the surge pond will not include artificial mixing, sediment buildup will likely occur, necessitating periodic removal. The pond will require annual sediment removal in October, during periods of system dormancy. At that time the sediment could be mechanically removed and disposed of in the TSF. If significant sediment accumulation in the inlet surge pond is observed, source control activities at the pit sump would be implemented. Also, the normal operating water level in the pond may have to be adjusted to accommodate the sediment deposition.

4.1.2 Chemical Dosing

Water will be pumped from the surge pond to the top of an above ground neutralization tank. Here, hydrated lime and ferric sulphate are injected while a tank mixer provides rapid mixing.

Chemical pumps will automatically dose the incoming water based on the rate of flow, as measured by an influent flowmeter located downstream of the distribution pumps, and a pH probe located within the neutralization tank. Operator oversight will be required to optimize chemical dosage based on jar testing results.

From the neutralization tank, the water will gravity flow to a series of flocculation tanks where flocculation injection and settling of flocculated solids will occur. Chemical pumps will automatically dose the incoming water based on the rate of flow, as measured by the influent flowmeter. Operator oversight will be required to optimize dosage based on operator jar testing results and the visual development of the flocculant.

The bottom of the neutralization tank will be hydraulically connected to the bottom of the flocculation tanks. The flocculation tanks will in turn overflow into the settling ponds. These flocculation tanks will be installed in parallel to provide operational flexibility. Connection of the flocculation tanks in parallel will allow the operator to add/remove tankage to match the inlet water flow rate, which will vary by month. When the flow rate is low, operators will suspend flow to one or more of the flocculation tanks in order to avoid over aging the flocculant and allow for spare flocculation tanks in the event of mixer or tank failure. Table 4-2 summarizes the calculated hydraulic retention times at four key WTP discharge rates.

Table 4-2 Hydraulic Retention Time (minutes)

Flow Rate	HRT of Neutralization Tank	HRT of Flocculation/Mix Tank	Number of Flocculation/Mix Tanks Online
42 L/s	8.2	22.9	1
60 L/s	5.8	32	2
110 L/s	3.1	26.2	3
285 L/s	1.2	20.2	6

Notes:
HRT – Hydraulic Retention Time
L/s – Litres per second
HRT of Flocculation/Mix Tank is calculated using the number of tanks indicated in adjacent column

Water will be gently mixed by reduced speed mixers housed within the tank, then exit the flocculation tanks through a discharge connection located at the top of each unit.

Each flocculation tank will also be equipped with a discharge valve at the bottom of the unit. Periodically, operators will be required to discharge water to the settling pond from these valves in order to minimize accumulation of sediment within the bottom of the tanks. These drains will also permit the draining of the tanks when they are taken off line.

4.1.3 Clarification

Clarification will occur through either single step or two step pond settling, dependent on the selected chemical program. In both instances, water will gravity drain from the flocculation/mix tanks into the settling pond(s) where the flocculated solids will settle.

In a single step process, water will discharge to one settling pond. Operators will adjust the flocculant addition based on TSS measured in the pond effluent, as well as observation of the settling within the pond.

In a two-step settling process, water will be pumped to a secondary set of mix tanks. The tanks will operate similarly to the set of flocculation tanks, and provide an opportunity for further chemical equilibrium and flocculant addition, if necessary, before the water is gravity fed into a second settling pond. The flocculant dosage rate will be dependent on observation of the settling, as well as the TSS measurement taken from the secondary settling pond.

The settling pond pumps will include variable frequency drives and be automated such that their discharge rates will match those of the surge pond distribution pumps.

As described in Section 3.3.4 parallel plate clarifiers could potentially replace the settling ponds should clarifiers be preferable based on the site constraints e.g. available footprint, reduced hydraulic retention time, year-round operation, etc. Table 4-3 summarizes the calculated hydraulic retention times at four key WTP discharge rates.

Table 4-3 Hydraulic Retention Time

Flow Rate	HRT of Pond 1 (hours)	HRT of Pond 2 (hours)	HRT of Clarifier (minutes)	Number of Clarifiers Online
42 L/s	56.3	159.4	7.5	1
60 L/s	39.4	111.6	10.5	2
110 L/s	21.5	60.9	8.6	3
285 L/s	8.3	23.5	6.5	6

Notes:
HRT – Hydraulic Retention Time
L/s – Litres per second
HRT of ponds calculated using the settling volume; the sludge storage volume was excluded.
HRT of clarifiers calculated using parallel plate storage volume; cone volume was excluded
HRTs have accounted for an inlet flow increase and an underflow of 20%
To achieve the same discharge flow rate, clarifier inlet flows should increase by 20% to account for overflow/underflow ratio of 5:1
HRT of clarifiers represents a single stage settling program
HRT of the clarifiers is calculated using the number of clarifiers indicated in adjacent column

Note that the underflow from the clarifiers, estimated at 20%, means that more water will be pumped to the TSF as sludge than with the settling pond(s), even when the average inlet flow rate is less than the allowable discharge flow rate.

4.1.4 pH Buffering

Following clarification, water from the settling pond will be pumped to a dissolution skid which will act to neutralize the pH of the water. Liquid CO_2 will be vapourized in the vicinity of the tank and sparged as a gas into the dissolution skid. Dosing will be automated through a pH sensor integrated to the skid, which will control the rate of CO_2 injection into the water stream.

4.1.5 Monitoring Pond & Outfall

Following pH buffering, the water will flow to the monitoring pond. The pond will dampen short-term, WTP discharges and act as the final system control should the plant effluent require recirculation through the WTP prior to final discharge or diversion to the TSF.

During normal operation, the effluent will discharge, by gravity, through the pond's outfall to Davidson Creek. The maximum allowable discharge flow rate is limited by seasonal creek water levels. Operator oversight will be required to optimize water flow through the treatment plant to ensure the maximum allowable discharge flow rate is not exceeded.

If the treated water is off-specification, the operator will activate the monitoring pond recirculation pump, which will direct water back either to the front end of the process, to the inlet of the CO_2 Dissolution Skid or to the TSF. Operators will also manually close the discharge valve on the outfall piping.

The water depth in the monitoring pond can be controlled by the operator. Table 4-4 summarizes calculated pond depths and corresponding HRTs as well as maximum HRTs for key flow rates.

Table 4-4 Hydraulic Retention Time (hours)

Flow Rate	Operating Pond Depth (m)	HRT @ Maximum Pond Depth	HRT @ Operating Pond Depth
42 L/s	1	166	27.1
60 L/s	1.5	116.2	29.9
110 L/s	2	63.4	22.8
285 L/s	4.5	24.5	24.5

Notes:
HRT – Hydraulic Retention Time
L/s – Litres per second

4.2 System Control Overview

System flow will be automated primarily through the surge pond pumps. Pumps will be equipped with variable frequency drives to allow for flow rate adjustments. Operators will adjust the pump rates depending on the discharge restrictions to Davidson Creek, which will vary based on the month.

Should a two step settling process be utilized, an additional set of pumps within the primary settling pond will be used to continue delivery of water through the system. These pumps will be automated such that their discharge rates will match those of the surge pond pumps.

Chemical dosing of hydrated lime will be controlled by a pH sensor located on the discharge of the neutralization tank, in combination with a flowmeter located upstream of the neutralization tank. Ferric sulphate will also be injected into the inlet stream, and be controlled by the rate of flow entering the neutralization tank. Manual adjustments to both chemicals may be required based on water quality monitoring by the operator.

Flocculant injection will be automated based on the influent flow; however, dosage might need to be adjusted manually based on observed settling, and turbidity measurements taken from the discharges from the settling pond(s).

All tanks will include high level alarms to warn of potential overflows.

Final pH adjustment will be performed through carbon dioxide injection. A pH sensor upstream of the monitoring pond will automate the rate of CO_2 injection to the water stream. A flow switch upstream of the CO_2 injection point will indicate when chemical injection should commence.

4.3 Operator Requirements and Skill Level

A minimum of one operator will be required to be on hand to perform daily oversight of the water treatment system. The operator will be required to perform routine maintenance and ongoing optimization. As a result, the operator will have previous experience maintaining similar types of water treatment systems.

Typical daily operating procedures will be as follows:

- Perform visual inspection of integrity of pond and settling dykes, and determine if seepage is occurring.
- Assess operation of all distribution pumps, and ensure units are cycling appropriately.
- Verify distribution pump discharge rates comply with discharge limits.
- Compare pond level instrumentation readings with visual level observations for discrepancies.
- Replenish ferric sulphate, hydrated lime, and CO_2 as needed.
- Verify flocculent development and perform adjustment of chemical dosing pumps as required.
- Manually verify target pH in the monitoring pond, and adjust dosing pumps as required.
- Perform influent, process instream and effluent sampling as required.

Intermittent operating procedures will be as follows:

- Remove sludge from settling ponds.
- Descale chemical dosing tanks.
- Complete an inventory assessment of consumables.

4.4 Operational Requirements

4.4.1 Utilities - Power & Water

The water treatment plant will be equipped with a main power panel that will distribute power to pumps, mixers, and instrumentation. A main power feed must be available from the site to energize this panel.

The treated process freshwater supply will provide the plant water for reagent make-up purposes. Hydrated lime will be supplied by the mill process or SO_2/air treatment systems.

4.4.2 Freight and Storage of Reagents & Spare Parts

Freight will be by road. As weather conditions are expected to vary, enclosures for the chemical pumps will be provided. System operation will also require the storage of chemicals and spare parts. A suitable storage location will be required.

4.5 Dormancy

During the months of October through February, the water treatment plant will be shut down, with any accumulated water being directed to the TSF.

Temporary planned and unplanned closure procedures are as follows:

- Direct flow from Surge Pond to TSF
- Drain Neutralization Tank and lock mixer
- Drain Flocculation Tanks and lock mixer
- Relocate unused chemical drums to long term heated storage
- Drain settling and monitoring pond
- Relocate recirculation pumps to prevent damage
- Remove probes and store in accordance with manufacturer recommendations

5.0 MONITORING

5.1 System Monitoring Overview

5.1.1 Automated Monitoring

A summary of the automated monitoring incorporated in the treatment plant design is outlined below. Automation will be further evaluated during future stages of system design.

Item	Purpose	Location
Inlet flowmeter	Measure flow from inlet surge pond to neutralization tank	Discharge of surge pond.

Item	Purpose	Location
Surge pond level transmitter	Indicate pond level and provide pump protection for surge pond distribution pumps	Surge pond
Neutralization tank pH sensor	Measure pH of water leaving the neutralization tank	Discharge of neutralization tank.
Neutralization tank level switch	Indicate high water level within neutralization tank	Neutralization tank
Flocculation tank level switch	Indicate high water level within flocculation tank	Flocculation tank
Settling pond level transmitter	Indicate pond water level and provide pump protection for settling pond distribution pumps	Settling pond
Dissolution skid pH sensor	Monitor pH of water leaving dissolution skid	Dissolution skid
Dissolution skid flow switch	Indicate when flow is occurring and engage chemical pump	Dissolution skid
Effluent flowmeter	Monitor effluent flow discharging from plant	Monitoring pond outfall
Hour Meter	Monitor runtime of key pieces of equipment	Main control panel

5.1.2 Manual Monitoring

Operators will perform regular system performance and field water testing to access and optimized system operation. An overview of the monitoring locations for manual field monitoring/sampling can be seen below:

Location	Description	Parameter
Pit sump influent	Influent water quality monitoring	Turbidity, pH
Pit perimeter dewatering well influent	Influent water quality monitoring	Turbidity, pH
Surge pond	Combined inlet water quality monitoring prior to treatment	Turbidity, pH, temperature
Neutralization tank outlet	Chemical program monitoring	Turbidity, pH, jar testing
Flocculation tank outlet	Chemical program monitoring	Turbidity, pH, jar testing
Settling pond(s)	General water quality monitoring	Turbidity, pH, temperature

Monitoring pond influent	General water quality monitoring	Turbidity, pH, temperature, jar testing
Monitoring pond outfall	General water quality monitoring	Temperature, pH, turbidity

5.2 Effluent Monitoring

The Monitoring Pond discharge can be monitored manually prior to the outfall for pH, flow, and turbidity by the system operator on a regular basis or by an automated probe and datalogging unit. In addition to the field monitoring program, water samples could be collected from any of the monitoring locations for laboratory analysis.

6.0 EMERGENCY RESPONSE

6.1 Summary of Potential Risk to Personnel

Upon completion of the detailed WTP design a health and safety assessment will be performed to ensure adequate safety controls, safety supplies, and contingency plans are in place for water treatment plant operators. Health and safety concerns will be addressed following the standard hierarchy of hazard control methods of elimination, substitution, engineering controls, administrative controls and finally personal protective equipment.

Operators and other mine personnel working in the vicinity of the WTP will be made aware of the health and safety hazards unique to the WTP, through a dedicated health and safety plan and operation and maintenance plan. The health and safety plan will reference the mine-wide health and safety, emergency response, and environmental protection programs and contain WTP specific hazard identification, hazard mitigation, and hazard information, such as chemical handling and exposure hazards identified in Section 3.2.

The operation and maintenance plan will contain operator direction for normal operation and operator emergency response such as the information provided in Section 5.1.1 (Preliminary Design Failure Analysis).

6.2 Summary of Potential Environmental Risks

There are potential environmental risks from spills of chemical products stored and handled in the WTP. The WTP operation will require chemical storage and dosing of ferric sulphate solution, hydrated lime, and potentially sodium sulphide, and a flocculant (not specified). Other chemical products, such as lubricants and greases needed for equipment maintenance, will only be stored and used in small quantities and therefore should not pose a potential environmental risk.

To prevent and minimize the accidental release of water treatment chemicals the following factors will be incorporated during future phases of plant design:

- Dedicated chemical storage areas will be reserved that meet the requirements of each chemical.
- Chemical storage areas will be guarded or barricaded from possible physical damage.
- Secondary containment requirements will be evaluated on a site by site basis.
- Chemical storage locations will be isolated from direct pathways to sensitive environments.
- Spill kits with proper absorbent materials will be placed and stored in close proximity to all chemical storage areas.
- Spill risk mitigations identified in the EA will be implemented.

In addition to chemical spills, accidental discharge of off-specification water potentially poses an environmental risk. The system automation and alarms, as well as operator oversight, will control the risk of this event.

6.3 Automated Alarms and Redundancies

The automated alarms and controls are described in Section 5 of this report. The alarms and controls are in place to prevent process upsets and the discharge of off-specification water. Additional alarms and controls will be considered as part of the detailed plant design, which will include a detailed design failure analysis.

At this stage of the design, system redundancies include:

- The Inlet Surge Pond will provide inlet surge dampening to the WTP
- The flocculation tanks will be connected in parallel to achieve the required HRT
- The process can be operated as a batch operation or continuous operation
- When connected in parallel, individual tanks can be taken off-line for maintenance, if required
- The process currently includes two settling ponds to accommodate a two step chemical program
- Effluent monitoring pond will provide short term effluent dampening upstream of the final effluent control

Additional information on the planned plant alarms and redundancies are provided in Sections 3.7 (Automated Monitoring) and 5.1.1 (Preliminary Design Failure Analysis).

6.4 Emergency Response and Contingency Plans

Prior to operation of the WTP an emergency response plan will be developed for the WTP and incorporated into the operation and maintenance manual. The emergency response plan will be integrated with the mine response plan with specific details related to the WTP. An emergency response plan will take into account the following potential emergencies:

- WTP Evacuation Plan including:
    - De-energization of equipment
    - Emergency reporting
    - WTP bypass

- Fire Procedure Plan
- Medical Emergency Plan
- Chemical Release (Spill) Response Plan
- Major WTP Failure

7.0 CLOSURE

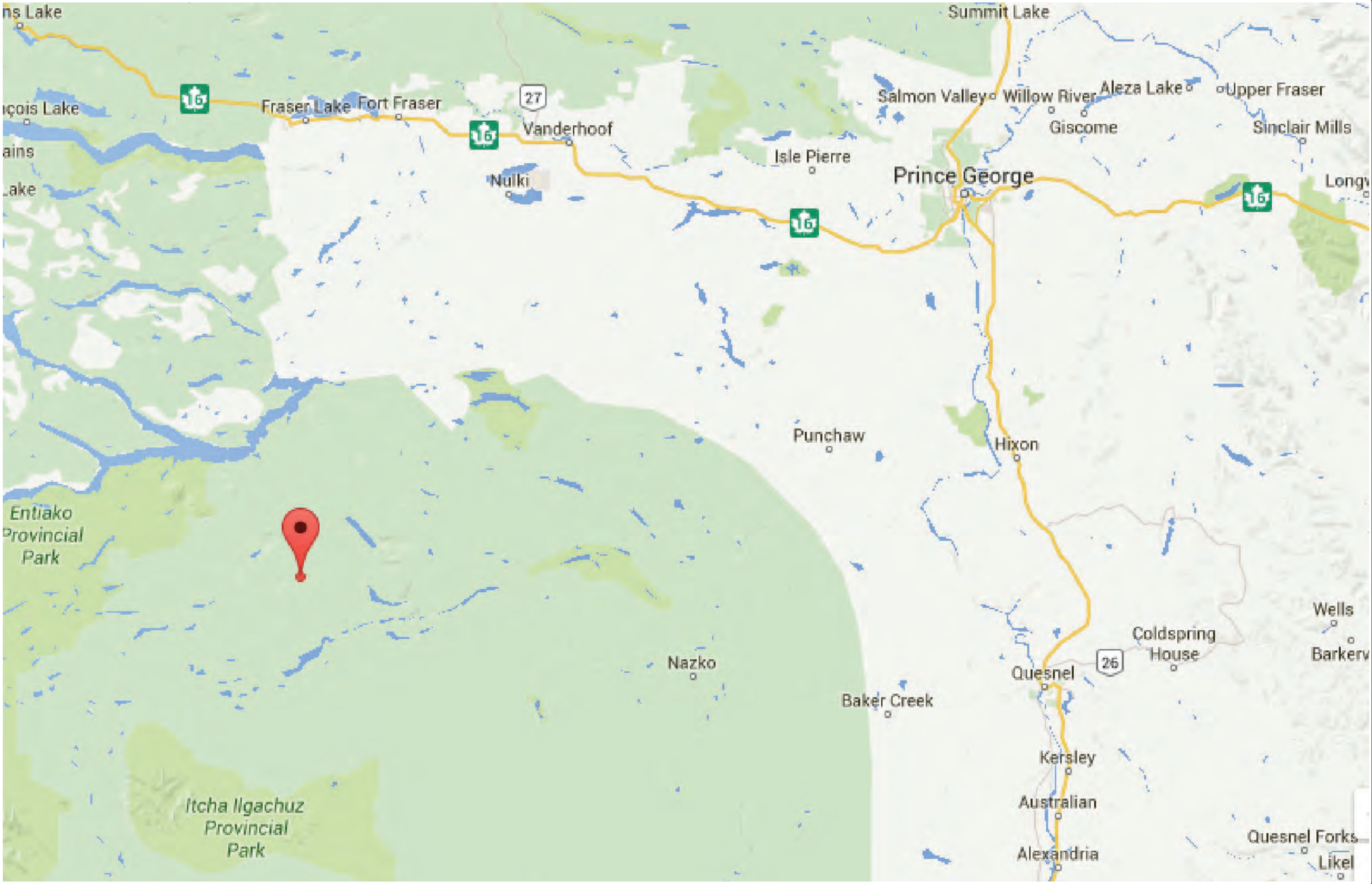
We trust the information provided meets your requirements. Please do not hesitate to contact the undersigned at 604-940-2828 if you have any questions.

MCCUE ENGINEERING CONTRACTORS

per:

Stephen Sumsion, PEng
Project Engineer

Lynda Smithard, PEng
Vice President Engineering



REVISION:	
Site Location	June/2016

NOTES:

: Site Location

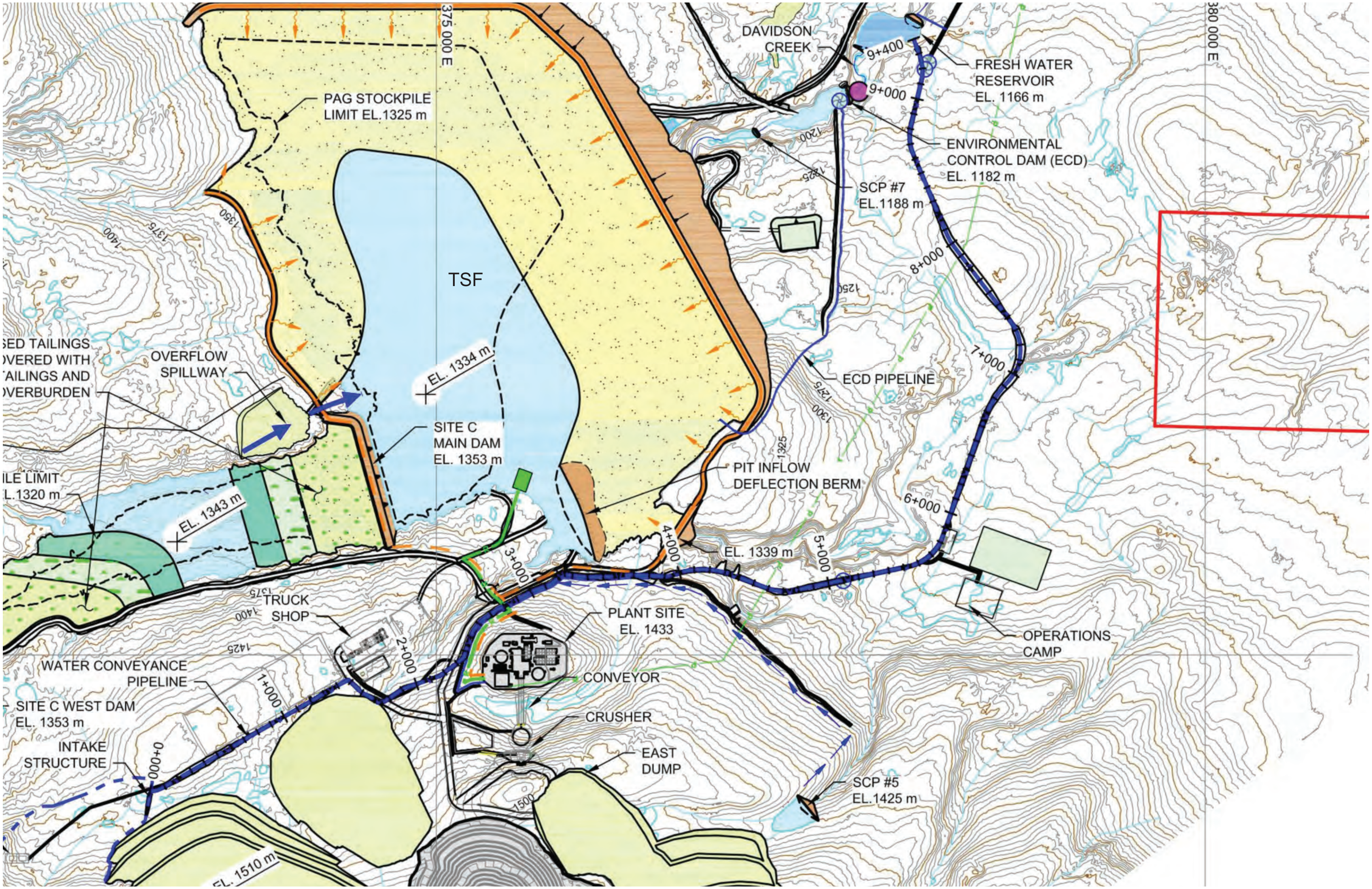
McCUE ENGINEERING CONTRACTORS

Site Location

Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Treatment Plant

CLIENT: **New Gold Inc. Blackwater Gold Project**

DATE: July,21 2016	SCALE: Not to Scale
DATA BY: S. S.	MCCUE JOB NO: 019-0004
DRAWN BY: M.T.	FIG: 1



REVISION:	
Site Plan	June/2016

NOTES:

TSF: Tailings Storage Facility

McCUE ENGINEERING CONTRACTORS

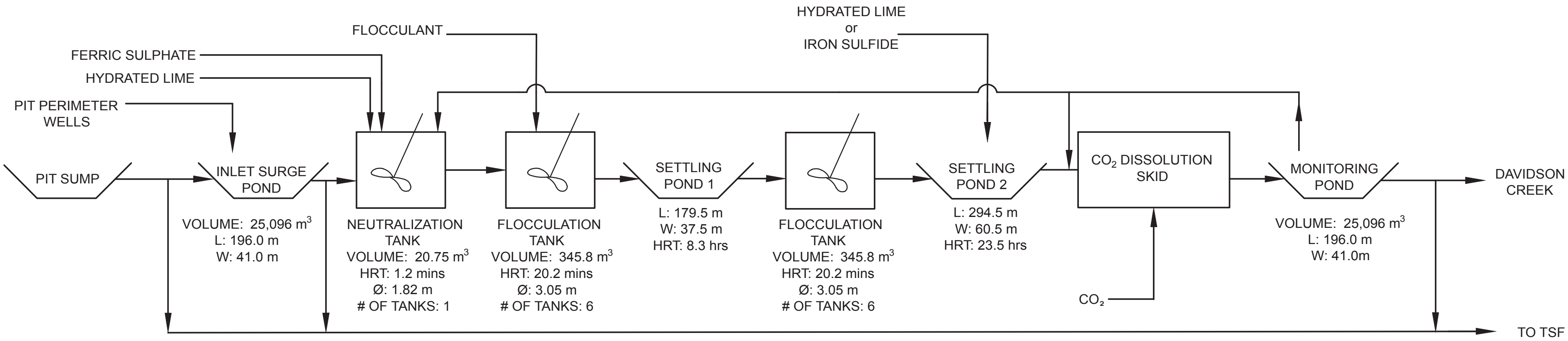
Site Plan

Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant

CLIENT:

New Gold Inc.
Blackwater Gold Project

DATE: June 21, 2016	SCALE: Not to Scale
DATA BY: S. S.	MCCUE JOB NO: 019-0004
DRAWN BY: M.T.	FIG: 2



REVISION:	
Flow Diagram	June/2016
Flow Diagram Version 2	July/2016
Flow Diagram Version 3	July/2016

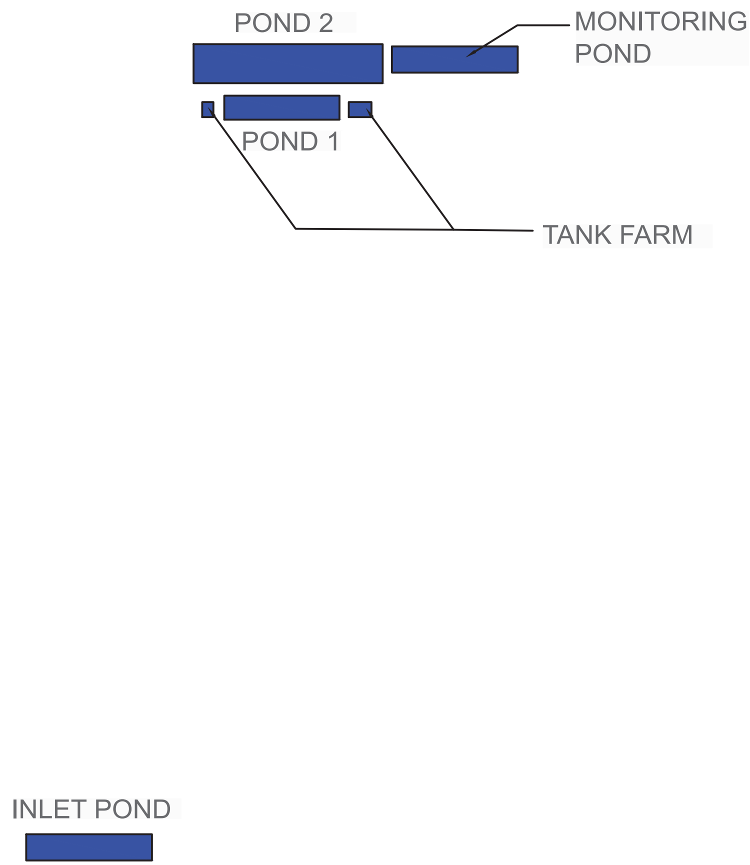
NOTES:
TSF: Tailing Storage Facility
HRT: Hydraulic Retention Time
L: Length
W: Width
Ø: Diameter
CO_2: Carbon Dioxide
: Mixer

McCUE ENGINEERING CONTRACTORS

CLIENT:
New Gold Inc.
Blackwater Gold Project

Process Flow Diagram
Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network Water Treatment Plant

DATE: July 21, 2016	SCALE: NTS
DATA BY: S. S.	MCCUE JOB NO: 019-0004
DRAWN BY: M.T.	FIG: 3



REVISION:

Site Plan	June/2016
Preliminary Design Report - Version 3	July/2016

NOTES:

: Approximate Footprint of WTP Components

McCUE ENGINEERING CONTRACTORS

CLIENT:

New Gold Inc.
Blackwater Gold Project

Water Treatment Plant Footprint
Preliminary Design of Pit Sump and Pit Perimeter Dewatering Well Network
Water Treatment Plant

DATE: July 21, 2016	SCALE: Not to Scale
DATA BY: S. S.	MCCUE JOB NO: 019-0004
DRAWN BY: M.T.	FIG: 4

— Appendix C —

Sulphate Removal from Blackwater Tailings Storage Facility Supernatant and Seepage during Closure and Post-closure (BioteQ 2017)

BIOTEQ

Sulphate Removal from Blackwater Tailings Storage Facility Supernatant and Seepage during Closure and Post-closure

Rev 3

February 14, 2017

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Confidentiality

BioteQ Environmental Technologies Inc. has prepared this document exclusively for New Gold and ERM. The document is strictly confidential and is only for the use of the recipient's authorized personnel.

BioteQ Environmental Technologies Inc.
Vancouver, BC Canada
February 14, 2017

BIOTEQ

Preface

New Gold Inc. (New Gold) submitted an Application for an Environmental Assessment Certificate / Environmental Impact Statement (Application/EIS) in December 2015 for the Blackwater Gold Project, which is currently undergoing a coordinated environmental assessment under both the British Columbia Environmental Assessment Act and the Canadian Environmental Assessment Act. In October 2016, New Gold received comments from reviewers at BC Ministry of Energy and Mines (MEM) indicating that the information provided to date on the proposed passive treatment systems at Post-Closure was insufficient to support the surface water quality effects assessment. In response to these review comments, New Gold has prepared the following information:

- water treatment technology alternatives and conceptual design information for metals, ammonia, and sulphate treatment presented in McCue (2016) and in this report prepared by BioteQ water;
- updated closure and post-closure water management and surface water quality model results presented in ERM (2016);
- summary of the proposed closure and post-closure active water treatment system to mitigate effects to surface water quality presented in ERM (2016); and
- assessment of implications to the environmental effects assessment (ERM 2016).

BIOTEQ

Table of Contents

BIOTEQ

1. Executive Summary

This report presents a conceptual design of an active water treatment plant (WTP) to remove sulphate from the Tailings Storage Facility (TSF) for the Blackwater Project. The WTP will remove sulphate from the TSF supernatant during closure and from a blend of TSF seepage, overflow and other streams during post-closure. The design was developed based on the projected water quality and flow rates provided by ERM. The key aspects of the conceptual design and plant performance can be summarized as follows:

- The sulphate removal plant capacity has been set at 149 L/s based on watershed modelling by ERM
- Five different active treatment technologies were considered and the pros and cons of each were evaluated vis-à-vis project requirements.
- Sulf-IX ion exchange process and the combination of Sulf-IX with nanofiltration (NF) were selected as the two best options for the Blackwater project for the following reasons:
  - » Proven on industrial scale on water with similar water quality to Blackwater TSF supernatant and seepage
  - » Production of stable residue that can be easily managed
  - » Avoiding exposure of the project to exotic and/or very expensive reagents that would be used in large quantities including barium and aluminum based chemicals used for sulphate removal
  - » No risk of acute fish toxicity caused by the process
  - » No risk of calcite formation in the receiving environment
  - » Net reduction in effluent salinity/total dissolved solids (TDS) level minimizing potential impacts on the aquatic life in the creek caused by the dissolved solids from TSF
  - » Ability to achieve significant reduction in NH_4 level reporting to Davidson Creek
- Active treatment by Sulf-IX alone is expected to reduce the concentration of sulphate in the plant effluent by up to 40% compared to no treatment.
- Active treatment by Sulf-IX followed by NF is expected to reduce the concentration of sulphate in the plant effluent by up to 96% compared to no treatment.
- Gypsum produced by Sulf-IX will be thickened and pumped into a separate disposal area within the TSF catchment. Alternatively, it can be dewatered and the resulting cake disposed of in an on-site landfill. Due to its high purity, gypsum produced by Sulf-IX can also be used in reclamation as part of soil covers installed over waste rock piles, or as a soil amendment prior to re-vegetation. It also has potential as off-site feedstock for manufacturing wallboard, bricks, and other construction materials. Gypsum production post closure is expected to be approximately 6,500 dmt/year.
- If the option with NF is employed, then brine solution generated by NF will be pumped into the decommissioned open pit and discharged at depth below the chemocline for permanent storage.

The volume of brine generated during the treatment post closure is expected to be approximately 1,175,000 m^3/year. The design of the NF can be optimized and additional stages of NF added to reduce the volume of brine if required.

- Understanding that water management will evolve during operations and closure of the mine, the actual water quality may differ from predictions and so a definitive recommendation regarding the water treatment process cannot be made at this time. Moreover, biological treatment systems such as wetlands can also play a primary or a supporting role in reducing contaminant levels. The following methodology is provided to inform consideration of an active chemical-mechanical treatment method selection (i.e. without wetland or other biological treatment):

  » Sulf-IX alone is the preferred treatment method because it is less complex and does not generate liquid waste. However, if any of the following conditions exist, then Sulf-IX followed by NF is the preferred option:

    1. NH_4 removal greater than 1 ppm is required and cannot be achieved by another treatment process
    2. The upstream metals removal plant is insufficient to reach discharge targets, requiring NF as a final metals removal stage
    3. Removal of sulphate balanced by calcium achieved by Sulf-IX alone is insufficient
    4. If the pre-treatment objective is to reduce sulphate levels in the TSF supernatant during closure to allow direct discharge into Davidson Creek in post-closure

Based on the water modelling conducted by ERM to date, items 1, 2 and 4 all apply. Therefore, Sulf-IX + NF is the active treatment method currently selected for application at Blackwater.

In summary, the overall approach to sulphate removal at Blackwater using active chemical-mechanical treatment alone is recommended to involve:

- Treatment of TSF supernatant with Sulf-IX and NF during the final 4-years of the closure period
- Treatment of a combination of TSF seepage, supernatant and other streams with Sulf-IX and NF during post-closure as required

2. Terms of Reference

As part of the Environmental Assessment (EA) process for the Blackwater Project, located 160 km Southwest of Prince George, BC regulatory authorities have requested that sulphate removal with an industrially proven active treatment system be incorporated into the mine closure and post closure plans. Subsequently, ERM, acting on behalf of New Gold, contracted BioteQ to recommend and provide a conceptual design of such a sulphate removal treatment system based on BioteQ's experience in this area, and prepare a report to satisfy the EA information requirements.

3. Sulphate Removal Requirements at Blackwater

The sulphate removal requirements at Blackwater stem from the need to maintain water quality in Davidson Creek within acceptable limits during the discharge of excess water from the tailings storage facility (TSF) via spillway and seepage into the creek during post-closure. The following section provides a summary of salient water quality and flows predicted by ERM for developing the conceptual design of an active water treatment plant to remove sulphate.

3.1 TSF Water Management during Closure and Post-Closure

Closure

During closure, TSF D seepage will be collected at the Environmental Control Dam (ECD) for pumping to the open pit. While there will be no TSF D water discharged to the environment during this phase, New Gold has identified an opportunity to reduce the sulphate concentration in the TSF D supernatant during closure by operating an active sulphate removal treatment plant in a closed loop recycle. A process flow for this is illustrated schematically in Figure 3.1 below.

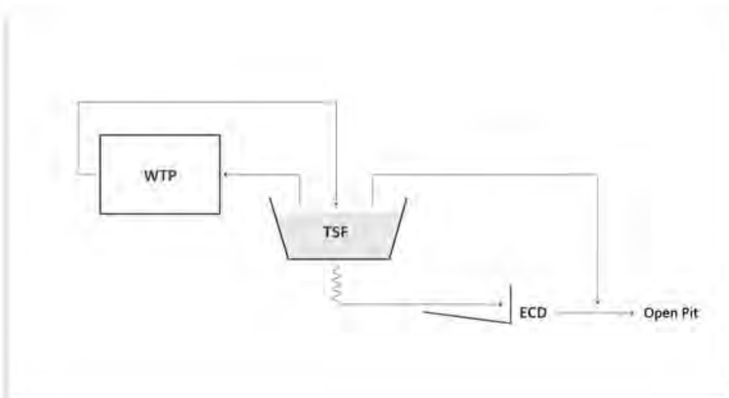


Figure 3.1: TSF Water Management during Closure

The purpose of operating the treatment plant during closure would be to improve the water quality in the TSF D supernatant such that it can be discharged directly without further treatment during post-closure.

Post-Closure

WTP influent during Post-Closure includes the following:

- TSF D seepage
- pit seepage
- TSF D embankment infiltration and toe discharge
- non-contact groundwater
- a portion of TSF D supernatant

Feed water will be treated for sulphate prior to discharge into Davidson Creek, the receiving environment for the project, as shown schematically in Figure 3.2 below.

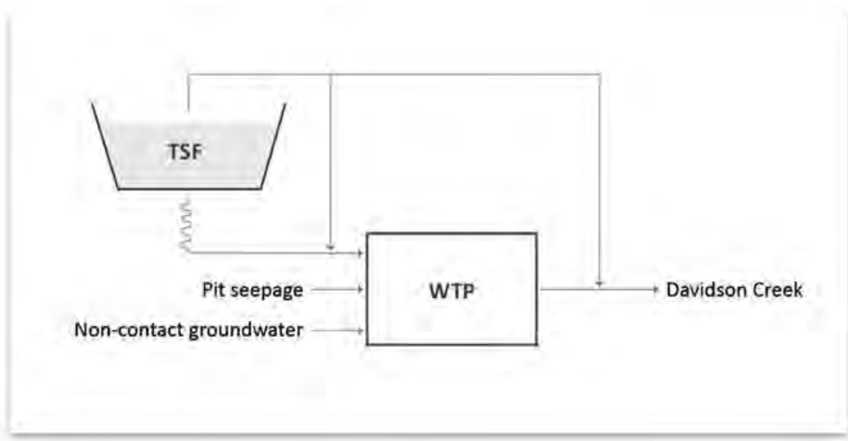


Figure 3.2: TSF Water Management Post-Closure

3.2 Water Quality Predictions for TSF Supernatant and Seepage

Table 3.1 presents the average water quality for the TSF seepage and supernatant, which were provided by ERM. As can be seen from this table, the main constituents accounting for over 98% of the total ionic charge in both TSF supernatant and seepage include: SO_4, Ca, Na, K and Mg. This is not surprising as the supernatant and seepage come from the same source. Although work carried out by Lorax[1] found that the presence of suboxia in the tailings pore water has an effect on the concentration of dissolved constituents such as heavy metals, metal oxianions, and nitrogen species, the effect on Na, K, Mg, Ca, cations and the SO_4 anion that balances these cations is expected to be minimal. It is important to note that based on the data in Table 3.1, **TSF seepage water is expected to be saturated with respect to gypsum** and this will have a significant bearing on the selection of a treatment method to remove sulphate. In contrast, TSF supernatant is expected to be under-saturated with respect to gypsum and generally be more dilute than the seepage mainly due to the influence of surface run-off and precipitation. The TSF seepage and supernatant concentrations considered herein do not include the effect of wetlands to be established in the TSF ponds and downstream of the TSF D dam. Based on the data received from ERM, the total dissolved solids concentrations in the TSF supernatant drop significantly during the first three years (72 months) following the start of closure, and subsequently stabilize and remain more or less constant during the remainder of the closure period. Therefore, only predictions from year 24 onwards were used to calculate the average TSF supernatant water quality during closure to eliminate the effect of the initial concentration drop on the design of potential treatment of TSF supernatant during closure. As discussed further in Sections 5 and 8, it is not necessary to start pre-treating water stored in the TSF early in closure in order to avoid the early higher rates of sulphate release from tailings consolidation seepage and associated excessive treatment costs.

[1] Lorax Environmental. 2015. Blackwater Gold Project: Assessment of Tailings Chemical Stability through Saturated Column Testwork. Prepared for New Gold Inc. by Lorax Environmental Services, July 2015.

Data shown in Table 3.1 were used as the basis for the conceptual design of the sulphate removal plant.

Table 3.1: Summary of Average Water Quality in TSF Supernatant & Seepage

CONSTITUENT	TSF D Supernatant during Closure (years 24 to 41)		WTP Influent Post Closure	
	mg/L	meq/L	mg/L	meq/L
Sulphate (SO_4)	540	11.2	1,176	24.5
Calcium (Ca)	128	6.4	237	11.9
Sodium(Na)	66	2.9	205	8.9
Potassium (K)	40	1	123	3.2
Magnesium (Mg)	6.7	0.6	12	1.0
Ammonia (NH_4-N)			13	1.0
IONIC BALANCE CLOSURE		102.8%		105.6%

Data presented in Table 3.1 indicate that cations and anions balance within +/- 6%. In both cases there are more anions than cations indicating that some small amount of cationic charge is missing from the balance. However, this level of accuracy is acceptable for the scoping level design of the WTP presented in this report.

3.3 Water Treatment Hydraulic Capacity

Figure 3.3 shows the volume of TSF D supernatant during closure, as predicted in August 2016[2].

[2] Knight Piésold Limited. 2016. Blackwater Gold Project. Life of Mine Watershed Model Report.

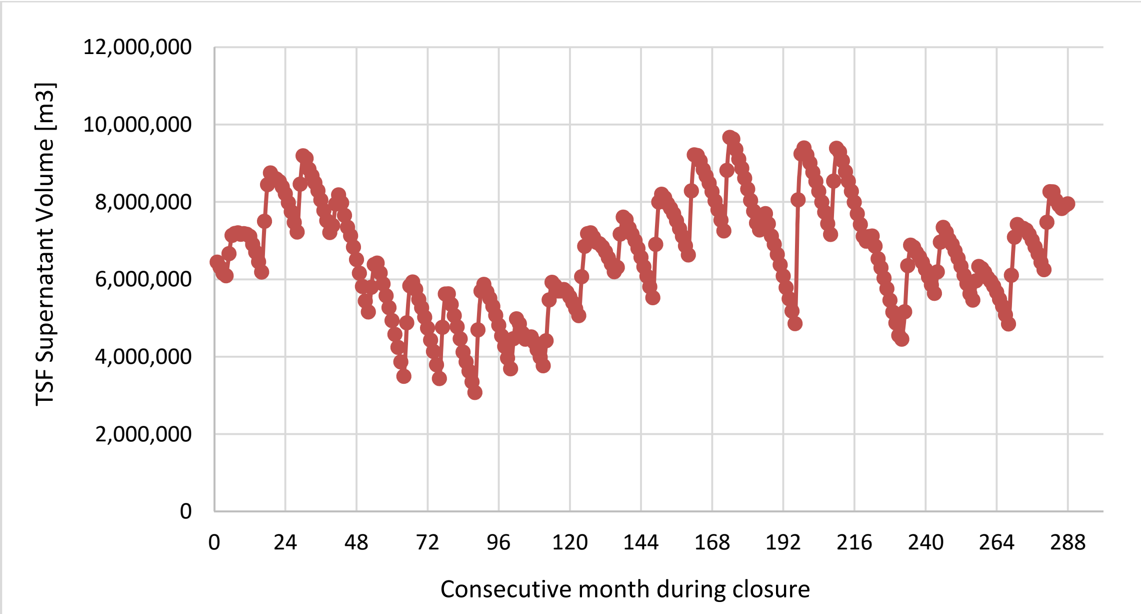


Figure 3.3: Volume of TSF Supernatant during Closure (years 18 to 41)

The inventory of supernatant in the TSF fluctuates between 3.1 and 9.6 M m^3 and is expected to be approximately 8 Mm^3 at the end of the closure period.

- The hydraulic capacity of the plant was determined by KP's watershed modelling and is fixed at a flow rate of 149 L/s. This flow rate will be held constant by blending the following feed streams together during post closure:
    - TSF D seepage
    - pit seepage
    - TSF D embankment infiltration and toe discharge
    - non-contact groundwater
    - a portion of the TSF D supernatant

3.4 N-NH_4 in TSF Supernatant and Seepage

The concentration of NH_4 in the WTP feed post-closure was determined by ERM's modelling to be 13.5 mg/l throughout the year.

Since the pH of the seepage and supernatant is only slightly alkaline, the large majority of total NH_4 will be present in the form of NH_4^+. This being a cation, the presence of NH_4^+ can explain at least partially the deficit of cations identified in Table 3.1 whereby NH_4^+ is one of the "missing cations". The remainder of the total ammonia will be present in the non-ionic form NH_3 which is known to be more toxic than NH_4^+ in terms of fish toxicity.

4. Evaluation of Different Sulphate Removal Technologies

When selecting active water treatment for sulphate, it is important to recognize the following key "first principles":

1. The Law of Conservation of Mass dictates that the mass of sulphate and/or sulphur contained in sulphate removed from water must report to treatment residues. This affects the quantity and quality of residue produced by treatment.

2. The Law of Electro-neutrality that applies to aqueous solutions dictates that when sulphate anions are removed from water, they must either be replaced by other anions or alternatively cations must be removed along with sulphate. This affects the effluent water quality as well as residue production and composition.

Five different active treatment systems to remove sulphate to levels below ~ 1,500 mg/L were considered for the Blackwater Project:

- Biological sulphate reduction
- Ettringite precipitation
- Barite precipitation
- Membrane separation
- Sulf-IX ion exchange

Table 4.1 compares these treatment systems based on the type and quantity of residues generated and the impacts they have on effluent water quality.

Table 4.1 – Sulphate Removal Treatment Options Comparison

Treatment System	Residue Type	Sulphur/Sulphate Form Contained in Residue	Impact of SO_4 Removal on Effluent Quality
Biological SO_4 reduction	solid	Elemental S contained in biosolids	SO_4 replaced by HCO_3, no change in TDS
Ettringite precipitation	solid	$Ca_6Al_2(SO_4)_3OH_{12}.26H_2O$	SO_4 replaced by HCO3 and/or Cl, increase in TDS
Barite precipitation	solid	$BaSO_4$	SO4 replaced by HCO_3 and/or Cl, no change in TDS
Membrane	liquid	SO_4^{2-} balanced by Na^{2+} Ca^{2+}, Mg^{2+} etc in waste brine	Reduction in TDS
Sulf-IX ion exchange	solid	$CaSO_4.2H_2O$	SO_4 and Ca^{2+} removed together, reduction in TDS

When selecting a sulphate treatment system, the balance between sulphate and cations neutralizing the negative charge of sulphate should be considered. This ionic balance helps to quantify the mass of individual sulphate salts, and is especially relevant in the context of the Blackwater Project. The balance of sulphate salts contained in the TSF supernatant and seepage is provided in Table 4.2 for the average water quality presented in Table 3.1.

Table 4.2 – Percent of Total Sulphate Balanced by Cations

Sulphate Salt	Percent of Total SO_4 contained in the TSF Supernatant (closure years 24-40)	Percent of Total SO_4 contained in the WTP Influent post closure
$CaSO_4$	59%	48%
Na_2SO_4	26%	36%
K_2SO_4	9%	13%
$MgSO_4$	5%	4%

From Table 4.2, the largest fraction of total sulphate contained in both waters is balanced by calcium. However, in the TSF supernatant this fraction is almost 60% compared to the seepage where it is less than 50%. This has a bearing on the effluent water quality and the extent of sulphate removal achievable by different treatment systems as explained in Sections 4.1 through 4.5 below.

4.1 Biological Sulphate Reduction

The principal reactions responsible for sulphate removal in engineered active biological sulphate reduction systems are similar to those used in passive wetland systems. However, active treatment systems offer several features that set them apart from passive biological systems as summarized in Table 4.3.

Table 4.3 Key Parameters of Active Biological Treatment Systems

Process Parameter	Features
Electron donor	Ethanol, acetic acid, propionic acid, or H_2
Hydraulic Retention Time	< 24 hours
Temperature Control	Temperature control (i.e., influent heating) implemented to maximize kinetics
SO_4 deportment	All converted to elemental sulphur. H_2S produced under anaerobic conditions in one bioreactor is turned into S in second oxic bioreactor downstream of the first
Residue Generation	Biosolids mixed with elemental sulphur need to be dewatered and disposed in landfills or by land application in order to avoid re-dissolution of sulphur disposed of sub-aqueously and exposed to suboxic conditons

The following description is given for an active biological sulphate reduction system, where reaction (1) is written for ethanol as the carbon source and shows that sulphate is converted into a mixture of hydrogen sulphide and bisulphide at pH ~ 7.5 inside the bioreactor, while carbon contained in ethanol is converted into bicarbonate. Biological treatment systems do not change total dissolved solids (TDS) levels but rather replace sulphate with bicarbonate in the final effluent.

The risk of calcite formation in the receiving environment resulting from a large increase in bicarbonate concentration in the treated effluent must be considered. Reaction (2) shows that sulphide produced in the first treatment stage is oxidized in the second stage to produce elemental sulphur.

$$C_2H_5OH_{(l)} + 1.5\ SO_4^{2-}{}_{(aq)} + 2CO_{2(g)} \rightarrow H_2S_{(l)} + HS^-{}_{(l)} + 2HCO_3^-{}_{(l)} + \text{biomass} \qquad (1)$$

$$H_2S_{(l)} + HS^-{}_{(l)} + O_{2(g)} \rightarrow 2S_{(s)} + OH^-{}_{(l)} + H_2O_{(l)} \qquad (2)$$

Based on reactions (1) and (2) and the typical biomass yield of 0.15 kg/kg SO_4, the amount of solid residue generated by the biological sulphate reduction process is expected to be approximately ~ 0.45 kg dry weight of residue/kg of SO_4 removed. However, since microbial cells contain 70% water and only 30% of organic matter, and since biosolids are notoriously difficult to dewater, the true residue production rate is probably on the order of 2 kg/kg of SO_4 removed.

The main advantages and disadvantages of an active biological sulphate reduction process for the Blackwater Project include the following:

ADVANTAGES

- Proven on industrial scale
- Able to remove SO_4 balanced by Na and K
- No liquid waste production

DISADVANTAGES

- Risk of acute fish toxicity in effluent caused by treatment (BOD/COD/ortho-PO4)
- Risk of calcite formation in the receiving environment caused by high levels of bicarbonate in the treated effluent
- Risk of plant upsets caused by changes in microbial population
- Sensitivity to temperature

Biological treatment systems introduce risks of creating impacts on the downstream aquatic environment including possible acute fish toxicity through any of the following:

- Residual effluent Biological Oxygen Demand (BOD) due to unreacted electron donor, difficult to remove fine biomass, cell debris, or organics released from substrates placed in passive treatment systems leading to oxygen depletion in the receiving environment
- Residual Chemical Oxygen Demand (COD) in effluent caused by the following:

- » Excess free sulphide or polysulphide species which can be toxic at even trace levels
- » Trace amounts of nitrite formed as an intermediary during microbial nitrification under oxidizing conditions such as in polishing aeration treatment, and/or de-nitrification under anoxic or anaerobic conditions
- » Reduction of As(V) and Sb(V) to As(III) and Sb(III), respectively, and possibly also methylated forms of these metalloids
- » Thiosalts formed in biological sulphate reduction systems when redox conditions are not uniform or at optimal levels throughout the bioreactor. Thiosalts are relatively stable but can cause an unexpected pH drop further down in the receiving environment

- Residual phosphorus in effluent. Phosphorus is added to maintain healthy biomass culture inside bioreactors but any unused phosphorus ends up reporting to treatment system effluents. A small mass load of phosphorus released into an oligotrophic phosphorus-limited environment can impact aquatic life downstream by promoting algae blooms.

In BioteQ's opinion, biological treatment systems for sulphate can be very effective in achieving treatment objectives in certain applications. However, the characteristics of the feed water and that of receiving environment need to be taken into careful consideration prior to implementation.

4.2 Ettringite

In its simplest form, sulphate removal by ettringite precipitation involves at least four steps including:

1. Ettringite formation at pH > 11.5 in the presence of aluminum (lime is used for pH control)
2. Solid-liquid separation to remove ettringite solids from the treated water at pH > 11.5
3. Neutralization to pH < 9 suitable for discharge using CO2 (HCl can also be used)
4. Removal of calcium carbonate solids from treated water prior to discharge to comply with TSS discharge limits

The following overall chemical reaction (3) summarizes the entire process.

$$3SO_4^{2-}{}_{(aq)} + 8.xCO_{2(g)} + 6.xCa(OH)_{2(s)} + 2NaAlO_{2(s)} + 26H_2O \rightarrow$$

$$Ca_6Al_2(SO_4)_3OH_{12}.26H_2O(s) + 8HCO_3^-{}_{(l)} + 2Na^+{}_{(l)} + xCaCO_{3(s)} \quad (3)$$

The key ingredient in the ettringite molecule $Ca_6Al_2(SO_4)_3OH_{12}.26H_2O$ is aluminum. Unless aluminum is present in the feed water, an external source of aluminum is required. While there have been suggestions to recycle aluminum within the process to reduce chemical consumption, this has yet to be successfully demonstrated on an industrial scale.

Furthermore, reaction (3) shows that due to the complex ettringite molecule and the need for lime and CO_2 addition, yielding calcium carbonate solids, the mass of solid waste residue generated is greater than 7 kg of residue/kg of SO_4 removed. Finally, reaction (3) shows that sulphate removed by ettringite precipitation from feed water is replaced with bicarbonate in the final effluent and that a net increase in TDS will result from this treatment process unless all aluminum is completely recycled.

The main advantages and disadvantages of ettringite precipitation for the Blackwater Project include the following:

ADVANTAGES

- Able to remove SO_4 balanced by Na and K
- Not sensitive to temperature
- No liquid waste production
- Purely physico-chemical treatment process
- No risk of acute fish toxicity in effluent caused by treatment (BOD/COD)

DISADVANTAGES

- Lack of industrial scale experience with ettringite, especially with the aluminum recycle option
- Significant increase in TDS of treated water as a result of sodium aluminate addition
- Risk of calcite formation in the receiving environment caused by high levels of bicarbonate in the treated effluent
- Large volume and quantity of residue as seen in reaction (3)
- Lack of ettringite solids residue stability at pH < 11 and subsequent release of sulphate and aluminum from the solids, necessitating disposal outside of TSF
- High life cycle cost of treatment

4.3 Barite Precipitation

Unlike ettringite precipitation, barite precipitation has been practiced on an industrial scale by mining and oil & gas industries, but typically only for limited periods of time and/or finite volumes of water requiring treatment. This is due to the high cost of barium reagents and the disposal of barium laden waste residue. As shown in reactions (4) and (5), barium hydroxide and barium chloride are typically used:

$$Ba(OH)_{2\,(s)} + SO_4^{2-}{}_{(aq)} + 2CO_{2(g)} \rightarrow BaSO_{4\,(s)} + 2HCO_3^-{}_{(l)} \qquad (4)$$

$$BaCl_{2\,(s)} + SO_4^{2-}{}_{(aq)} + \rightarrow BaSO_{4\,(s)} + 2Cl^-{}_{(l)} \qquad (5)$$

Sulphate removed by barite precipitation from feed water is replaced with bicarbonate or chloride in the final effluent depending on the type of barium reagent used in the treatment process. Based on reactions (4) and (5), the amount of solid residue generated by barite precipitation is expected to be approximately ~ 2.4 kg of residue/kg of SO_4 removed. The main advantages and disadvantages of barite precipitation for the Blackwater Project include the following:

ADVANTAGES

- Proven on an industrial scale
- Reliable, purely physico-chemical treatment process

- No risk of acute fish toxicity in effluent caused by treatment (BOD/COD)
- Able to remove SO_4 balanced by Na and K
- No liquid waste production

DISADVANTAGES

- Barium laden residue disposal outside of TSF
- Risk of calcite formation in the receiving environment caused by high levels of bicarbonate present in the treated effluent

4.4 Membrane Separation

Membrane separation works on the principle of non-ionized molecules such as H_2O or CO_2 passing through a polymer membrane while all charged ionic species including SO_4^{2-} being rejected. Significant operating pressure is required to drive water through the membrane. The rejected ions report to a "membrane reject" (brine) stream that constitutes anywhere from 10 to 50% of the feed volume, depending on the feed water quality and membrane operating pressure.

Although Reverse Osmosis (RO) membranes are often considered for sulphate removal, nanofiltration (NF) membranes offer significant advantage over RO membranes. NF membranes can achieve a very high degree of SO_4 rejection at significantly lower operating pressures compared to RO. In terms of removal, RO and NF do not discriminate between sodium sulphate, calcium sulphate or potassium sulphate as all salts are rejected with very high efficiency. This provides the advantage of meeting low effluent sulphate limits. However, the disadvantage is that all salts are concentrated in the reject brine and the resultant build-up of Ca and SO_4 in the brine limits the percentage of water recovery. Furthermore, membranes applied in mining applications often require pre-treatment as they are susceptible to potential fouling by constituents including calcium, sulphate, silica, aluminum, iron and manganese, sometimes even at trace levels.

ADVANTAGES

- Proven on industrial scale
- Able to reach extremely low levels of SO_4 in effluent
- No risk of acute fish toxicity in effluent caused by treatment (BOD/COD)

DISADVANTAGES

- Produces large volume of liquid waste that needs to be managed
- Elevated risk of membrane fouling on mine waters with fine suspended solids, elevated calcium hardness and sulphate at gypsum saturation without pre-treatment

4.5 Sulf-IX Ion Exchange

Sulf-IX is a two-stage ion exchange (IX) process that selectively removes calcium and sulphate from mine impacted waters. The process utilizes commercially available IX resins commonly used in conventional large-scale de-mineralization applications. In contrast to these conventional IX applications, Sulf-IX has the following unique features:

- Process is selective for calcium and sulphate, the removal of other ions is minimal. Consequently, only partial demineralization is achieved.
- Resin operates in up-flow fluidized beds which enables the process to treat waters containing fine suspended solids and high levels of hardness, carbonate and sulphate directly without any pre-treatment and without risking reduced process performance due to plugging.
- No liquid waste is generated, gypsum solids are the only by-product.

The rate of residue generation is approximately ~ 4.4 kg of residue/kg of SO_4 removed.

A description of BioteQ's industrial scale experience with Sulf-IX is provided in Appendix A.

ADVANTAGES

- Proven on an industrial scale (details provided in Section 6) and ideally suited for treating gypsum saturated streams with elevated calcium hardness such as the Blackwater TSF seepage
- Purely physico-chemical treatment process
- No liquid waste production
- Net reduction in TDS across the treatment system
- No risk of acute fish toxicity in effluent caused by treatment (BOD/COD)
- No risk of calcite formation in the receiving environment
- Gypsum solid residue is stable under a wide range of conditions and can be disposed of in TSF or a landfill
- No need for pre-treatment and no concern of fouling due to fluidized bed operation
- Not sensitive to temperature

DISADVANTAGES

- Only sulphate balanced by calcium is removed

4.6 Change in NH_4 levels with Different Sulphate Removal Technologies

Table 4.4 summarizes the expected net change in the concentration of NH_4 across the sulphate removal systems discussed in Sections 4.1 through 4.5.

Table 4.4 – Change in NH_4 with Different Treatment Systems

Treatment Technology	NH_4 Removal Change in Concentration between WTP Feed and Discharge
Biological Sulphate Reduction (active)	When used for SO_4 removal alone, NH_4 is expected to increase due to nutrients added for biomass growth and/or organic substrate decomposition. Nitrification and de-nitrification stages could be included in the design to significantly remove NH_4 and other nitrogen species.
Ettringite	No change in NH_4 concentration
Barite	No change in NH_4 concentration
Membrane Separation (RO and NF)	Approximately 85% of total NH_4 will be removed at pH < 8.5
Sulf-IX	Small decrease in concentration, probably less than 1 mg/L due to small co-removal in cation IX

As can be seen from this table, only membrane separation and biological sulphate reduction with nitrification/denitrification can remove a significant quantity of NH_4. Sulf-IX will reduce the concentration of NH_4, but only by ~ 1 mg/L. Ettringite and barite precipitation will not change NH_4 concentration. Biological sulphate removal systems will cause an increase in ammonia concentration across the treatment system unless nitrification and/or de-nitrification stages are incorporated into the system design.

The removal of NH_4 by NF is based on the same principle as the removal of sulphate in that NF membranes "reject" ionized species such as SO_4^{2-} and NH_4^+. While all sulphate is present in ionic form, NH_4 partitions between ionized species (NH_4^+) and non-ionized species (NH_3) depending on solution pH as per reaction (6):

$$NH_4^+{}_{(aq)} \rightarrow NH_3{}_{(aq)} + H^+ \qquad (6)$$

The pKa of reaction (6), i.e. the negative logarithm of the equilibrium constant of reaction (6), depends on water temperature but is generally around pKa ~ 9.3. It follows that at pH < 8.5, the large majority of NH_4 is ionized and present as NH_4^+. Furthermore, NF membranes achieve a greater degree of rejection of divalent ions such as SO_4^{2-} compared to monovalent ions such as NH_4^+. Consequently, NF treatment applied to Blackwater TSF seepage and supernatant can be expected to remove approximately 85% of NH_4.

4.7 Change in Metal Concentrations with Different Sulphate Removal Technologies

ERM's modelling identified several metals and metalloids present in the feed to the sulphate removal treatment plant as potential constituents of concern. These constituents are listed in Table 4.5 together with the respective predicted ranges of concentrations as provided by ERM.

Table 4.5 –Metals and Metalloids of Potential Concern in the feed to Sulphate Removal WTPh

Constituent	Predicated concentration range [ppb]
Aluminum	30 to 100
Antimony	50 to 140
Arsenic	20 to 70
Cadmium	0.45 to 1.9
Zinc	200 to 350

While a detailed discussion of the removal of other constituents of potential concern is outside the scope of this report, a summary of high-level comments is presented in Table 4.8.

Table 4.8 – Comments about Removal of Other Constituents of Potential Concern in Sulphate Removal Plants

Sulphate treatment process	Comments on Removal
Barite	Small amount of aluminum can be expected to co-precipitate and/or adsorb onto barite and be removed from soluton. No appreciable removal of any of the other constituents of potential concern is expected
Ettringite	Most likely will promote Zn removal due to elevated pH. It may help As and Sb removal especially if As(III) and Sb(III) are present. It will likely increase the concentration of aluminum as it is important for ettringite formation.
Biological Systems	May complicate removal of As and Sb downstream of the sulphate removal system if that is required. This is due to the reduction of As(V) and Sb(V) to As(III) and Sb(III) which is known to occur. Neither As_2S_3 nor Sb_2S_3 precipitate at alkali pH. Instead trivalent oxyanions of arsenite and antimonite form in solution. These species typically need to be re-oxidized prior to removal but the rate of oxidation using molecular oxygen is very slow. In addition, biological systems may also produce small amounts of methylated metalloid species. BioteQ has encountered these in a recent project and the removal was very difficult. The system will likely remove some aluminum and this aluminum will report to biomass residue.

Sulf-X	Slight reduction in As and Sb concentrations can be expected in the anionic stage provided that As(V) and Sb(V) are the dominant species present in feed. As(V) and Sb(V) will deport to anion gypsum formed at pH> 12. However, both of these metalloids can be released from gypsum if pH drops. Calcium antimonate is more susceptible to dissolution than calcium arsenate. As(III) and Sb(III) will pass through Sulf-IX as inerts
Membranes	Removal of all constituents can be expected to exceed 99% with the exception of As(III) and Sb(III) oxyanions which will be present as non-ionic species and pass through the membrane at neutral pH. The speciation of As and Sb maybe of importance to the project.

Based on the comments presented in Table 4.8, it may be important to:

a) maximize the removal of arsenic and antimony upstream of sulphate removal, and
b) design the metals removal plant based on the expected speciation of arsenic and antimony

Regarding point b), if an anaerobic environment in the TSF is created then this could lead to the chemical reduction of dissolved As(V) and Sb(V) to the respective trivalent species of As(III) and Sb(III). Furthermore, if biological activity is established in the TSF then there might be a small risk of forming methylated species of both metalloids. Although the risk itself maybe small, the potential impact on treatment selection and performance could be significant. For the purpose of this report, it is assumed that all As and Sb are present in their respective pentavalent forms leading to the rejection of 99% of As and Sb by NF. The same 99% rejection is applied to all other constituents with the exception of ammonia. While this assumption is reasonable to make at the preliminary conceptual stage, it should be noted that the actual percentage rejection will vary for different ions present in the seepage based on their hydration radius/size, ionic charge, and NF operating conditions. A list of ion specific percentage rejection for individual constituents is normally prepared as part of the detailed design of NF systems.

5. Recommended Treatment

5.1 Treatment Method Options

New Gold plans to implement passive wetland treatment as part of their closure and post-closure water management. However, regulatory agencies requested that New Gold evaluate active water treatment systems. The active sulphate removal system requirements set for closure and post closure can be summarized as follows:

- Active treatment system using processes proven on an industrial scale
- Production of stable residue that can be easily managed
- No introduction of new environmental effects or risks through treated effluent discharge

Based on the above analysis of different active treatment systems, two process options have been identified to remove sulphate in the TSF seepage and overflow:

- Sulf-IX
- Sulf-IX followed by NF

These two options were selected for the following reasons:

- Proven on an industrial scale in the mining industry on streams similar in composition to the Blackwater seepage and TSF supernatant
- Avoid exposure of the project to exotic and/or very expensive reagents that would be used in large quantities including barium and aluminum based chemicals
- No risk of downstream acute fish toxicity
- No risk of calcite formation in the receiving environment
- A net reduction in effluent salinity /total dissolved solids (TDS) level as opposed to either no change or an increase in salinity by other methods
- The largest fraction of total sulphate contained in TSF seepage and supernatant is balanced by calcium, enabling the cost effective simultaneous removal of sulphate and TDS. Furthermore, the quantity of sodium sulphate is relatively small and limited to the salt dissolved in tailings pore water compared to calcium sulphate. Calcium sulphate (gypsum) is present not only as dissolved but also as a solid mixed in tailings that can dissolve once the calcium concentration drops below gypsum saturation. Consequently, it can be expected that the rate of the drop in the concentration of sodium sulphate caused by the gradual "wash-out" from the tailings pore water will be faster than the rate of drop in calcium sulphate concentration which will be moderated by gypsum dissolution from tailings solids. From this perspective, Sulf-IX on its own represents a robust option for long term sulphate control at Blackwater post closure since the proportion of calcium sulphate in the seepage water can be expected to increase over time compared to sodium sulphate.
- Ability of both Sulf-IX and NF to remove NH_4
- Ability of NF to remove metals that may require enhanced efficiency of removal downstream of the metals removal plant

Treatment Method 1 – Sulf-IX

A block diagram schematic of Treatment Method 1 is provided in Figure 5.1. The main advantage of Sulf-IX is that it is ideally suited to operate on water with high levels of calcium hardness and sulphate at gypsum saturation with no process risks or potential negative impacts on performance. Moreover, Sulf-IX achieves simultaneous removal of calcium and sulphate, providing a net reduction in TDS across the treatment process. As such, Sulf-IX is an ideal pre-treatment step upstream of a membrane system. Another benefit of Sulf-IX described in Section 4.6 is that it can remove ~ 1 mg/L NH_4 which could be sufficient in situations when NH_4 levels in the feed water are relatively low and/or sufficient dilution downstream of Sulf-IX discharge is available. Finally, the solid residue produced by Sulf-IX is a stable solid gypsum that can be stored in a segregated area of the TSF, re-used for remedial activities, or landfilled.

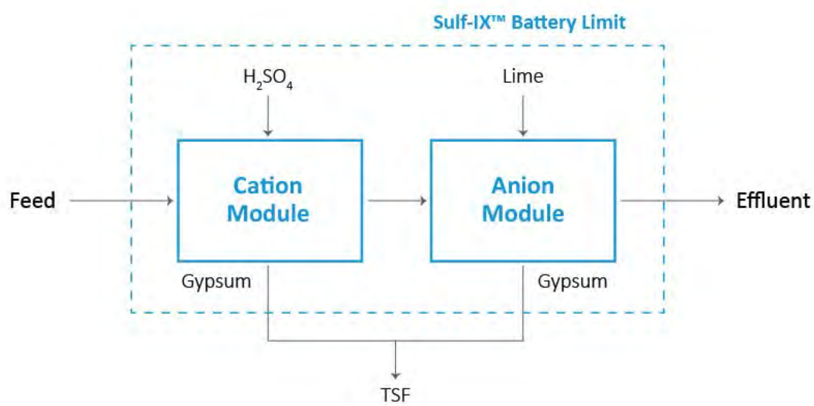


Figure 5.1 – Sulf-IX Block Diagram

Treatment Method 2 – Sulf-IX followed by Nanofiltration

The block diagram schematic of Treatment Method 2 is shown in Figure 5.2. The main advantage of this option is that it achieves a very high degree of sulphate removal by enabling the removal of not only sulphate balanced by calcium but also sulphate balanced by sodium and potassium. Furthermore, NF offers high degrees of metals and ammonia removal as discussed in more detail in Sections 4.6, 5.3, and 5.4.

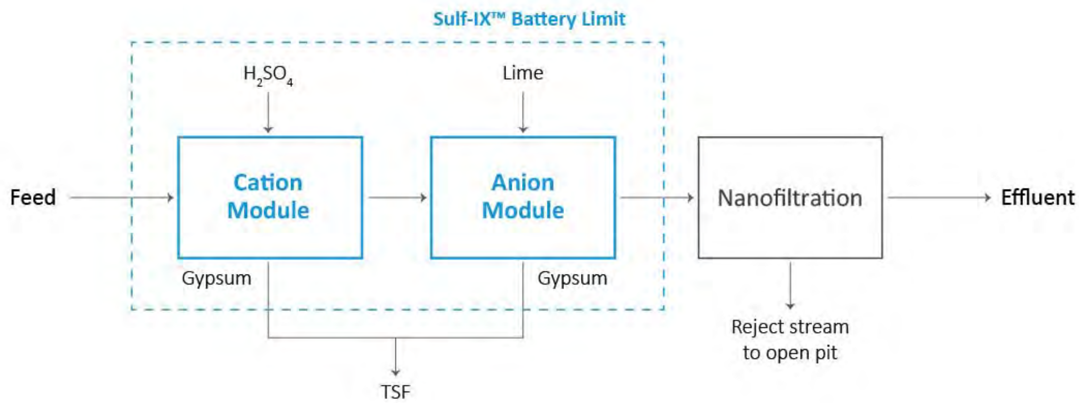


Figure 5.2 – Sulf-IX with NF Block Diagram

As discussed in section 4, a liquid brine waste stream will be produced in the form of a membrane reject. However, this disadvantage is overcome by:

a. Sulf-IX operating upstream of NF which minimizes the volume of reject, and
b. Availability of the open pit for brine disposal at depth.

The waste brine production in mining application of NF systems is typically determined by the concentrations of calcium and sulphate in mine water. This is because these two ions cause gypsum and/or calcite precipitation and fouling inside the NF units. In Treatment Method 2, the volume of waste brine by NF is minimized due to the removal of calcium and sulphate by Sulf-IX operating upstream of NF. This not only greatly reduces the risk of fouling but also reduces the membrane operating pressure as the feed to NF contains a lower level of TDS than the raw feed water. In other words, operating NF directly on TSF seepage would create design and operational challenges that are overcome by Sulf-IX acting as pre-treatment to NF. The NF brine will be directed to the open pit. Similar to the Treatment method #1, gypsum produced by Sulf-IX can be disposed of in a segregated area of the TSF, re-used for remedial activities (i.e. waste dump covers), or landfilled.

5.2 Abatement of SO_4 & NH_4 Achieved by Proposed Water Treatment

The two treatment methods described in Section 5.1 give rise to four different treatment scenarios depending on whether or not active treatment is implemented during closure. Table 5.1 summarizes these four treatment scenarios.

Table 5.1: Four Scenarios of Sulphate Abatement by Active Treatment at Blackwater

Scenario #	Treatment Method	Treatment Process	Treatment During Closure	Post Closure Treatment
1	1	Sulf-IX	No	Yes
2	1	Sulf-IX	Yes, years 38 to 41 only See section 8.1 for details	Yes
3	2	Sulf-IX followed by NF	No	Yes
4	2	Sulf-IX followed by NF	Yes, years 38 to 41 only See section 8.1 for details	Yes

Treatment during Closure

Table 5.2 presents concentrations of the main constituents in the treated effluent discharged from the water treatment plant for the two treatment scenarios during closure, i.e. Scenario #2 and Scenario #4. The concentrations shown in Table 5.2 are based on:

- The TSF supernatant water quality presented in Table 3.1
- Selective removal of calcium sulphate achieved by an industrial scale Sulf-IX plant treating similar water quality
- 95% rejection of sulphate by NF
- 85% rejection of total NH_4 by NF

Table 5.2: Active Treatment Performance during Closure

Treatment Scenario	Treatment Effluent Concentrations (mg/L) during Closure (TSF Supernatant as Plant Feed)						
	SO_4	NH_4	Ca	Na	Mg	K	TDS
No Treatment	540	0.6	128	66	6.7	40	782
Sulf-IX	317	0.6	35	66	6.7	40	554
Sulf-IX + NF	21	0.2	2	4	0.4	3	225

The results presented in Table 5.2 can be summarized as follows:

- Compared to the case when no treatment is implemented, active treatment by Sulf-IX alone can reduce the concentration of sulphate in the TSF supernatant up to 40% by producing effluent containing approximately 320 mg/L of sulphate
- Compared to the case when no treatment is implemented, active treatment by Sulf-IX combined with NF can reduce the concentration of sulphate in the TSF supernatant up to 96% by producing effluent containing approximately 20 mg/L of sulphate
- Using Sulf-IX and/or Sulf-IX combined with NF provides a net reduction in TDS across the treatment plant
- The removal of NH_4 by Sulf-IX is minimal due to the low initial NH_4 concentration in the TSF supernatant

- NH_4 removal by Sulf-IX combined with NF is more efficient producing final effluent containing approximately 0.2 mg/L

During closure, the TSF supernatant could be treated and recycled back to the TSF while brine produced by NF reports to the open pit.

The site water and tailings management will determine the sulphate and ammonia concentrations in the TSF during closure and post-closure. From this perspective, the estimated treated effluent water quality shown in Table 5.2 can be used to inform and further refine the site water and tailings management plan.

5.3 Abatement of SO_4 & NH_4 in the TSF Seepage during Post-Closure

Table 5.3 presents the concentrations without treatment and in the treated effluent for the two Scenarios during post-closure (i.e., Scenario #1 and Scenario #3). The concentrations shown in Table 5.3 are based on the same set of assumptions used in calculating the concentrations in Section 5.3.

Table 5.3: Active Treatment Performance during Post-Closure

Treatment Scenario	Treatment Effluent Concentrations (mg/L) during Post-Closure (Combined WTP Influent as Plant Feed)						
	SO_4	NH_4	Ca	Na	Mg	K	TDS
No Treatment	1,227	13	248	212	12	143	1,855
Sulf-IX	718	12	35	212	12	143	1,133
Sulf-IX + NF	48	3	2	14	1	10	77

The results presented in Table 5.3 can be summarized as follows:

- Sulf-IX alone can reduce the concentration of sulphate in the TSF supernatant up to 40% by producing effluent containing approximately 700 mg/L of sulphate.
- Sulf-IX reduces the gypsum concentration in the feed to NF well below saturation, allowing high efficiency of NF operation.
- Sulf-IX combined with NF can reduce the concentration of sulphate in the TSF supernatant up to 96% by producing effluent containing approximately 50 mg/L of sulphate.
- Using Sulf-IX and/or Sulf-IX combined with NF provides a net reduction in TDS across the treatment plant.
- NH_4 removal by Sulf-IX is limited to approximately 1 mg/L as explained in Section 4.6
- NH_4 removal by Sulf-IX combined with NF is more efficient producing final effluent containing approximately 3 mg/L

Passive wetlands could reduce sulphate and ammonia concentrations further.

5.4 Treatment Method Recommendation

Understanding that water management will evolve during operations and closure of the mine, the actual water quality may differ from predictions and so a definitive recommendation regarding the water treatment process cannot be made at this time. Moreover, biological treatment systems such as wetlands can also play a role in reducing contaminant levels. The following methodology is provided to inform consideration of an active chemical-mechanical treatment method selection (i.e. without wetland or other biological treatment):

» Sulf-IX alone is the preferred treatment method because it is less complex and does not generate liquid waste. However, if any of the following conditions exist, then Sulf-IX followed by NF is the preferred option:

1. NH_4 removal greater than 1 ppm is required and cannot be achieved by another treatment process
2. The upstream metals removal plant is insufficient to reach discharge targets, requiring NF as a final metals removal stage
3. Removal of sulphate balanced by calcium achieved by Sulf-IX alone is insufficient
4. If the pre-treatment objective is to reduce sulphate levels in the TSF supernatant to allow direct discharge into Davidson Creek

Based on the water modelling conducted by ERM, items 1, 2 and 4 all apply. Therefore, Sulf-IX + NF is the active treatment method currently selected for application at Blackwater.

6. Treatment System Description

The proposed water treatment system for the Blackwater project is composed of four main circuits:

- Sulf-IX cation circuit for removal of Ca
- Sulf-IX anion circuit for removal of SO_4
- NF circuit for removal of Na, K, and SO_4
- Reagent circuit supplying reagents to all of the other circuits

A schematic of the Sulf-IX™ process is shown in Figure 6.1.

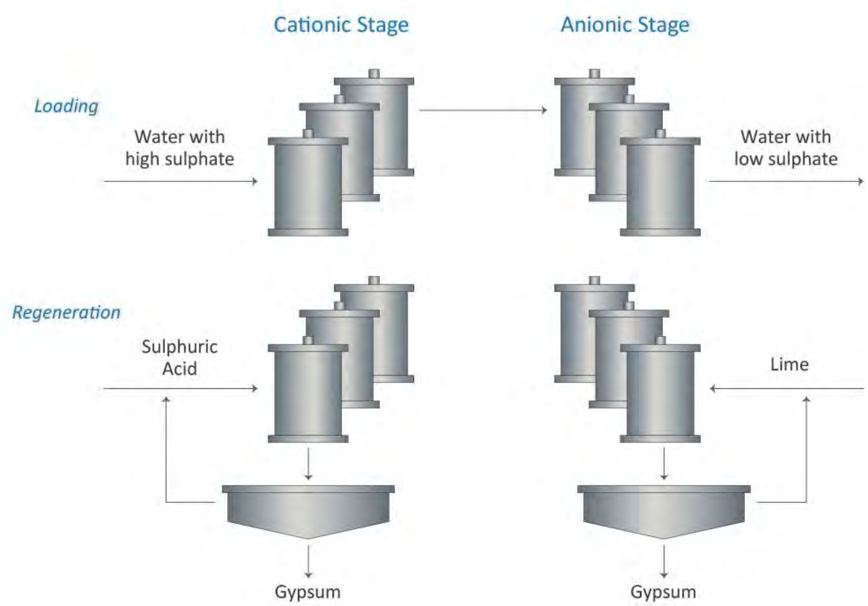


Figure 6.1 - Schematic of the Sulf-IX™ Process

The circuits are described in detail in the following sections. Process flow diagrams (PFDs) are included in Appendix B.

6.1 Plant Feed

The plant feed, along with a general overview of the process, is captured in 16044-PFD-000-01 in Appendix B.

6.2 Cationic IX Circuit

The cationic IX circuit is given in the process flow diagrams 16044-PFD-100-01, and 16044-PFD-300-01.

6.2.1 Cationic IX Resin Loading & Washing

The Cationic Feed Tank (TK-100) collects the plant feed water. From TK-100, the feed is pumped to the bottom of the Cationic IX Columns TK-105(01 to 08) that are in the loading stage. At any time during the operation four IX columns will be in the loading stage while four will be in the regeneration/washing stage.

During the loading stage, the effluent from the cationic IX columns is collected in the Anionic Feed Tank (TK-200). The majority of the effluent collected in TK-110 is pumped to the Anionic IX Columns TK-205, while a smaller portion of the treated effluent is recycled back to the IX columns during the wash stage to serve as wash water. The initial portion of spent wash water, containing residual regenerant, is recycled back to the Cationic Gypsum Reactor Tank #1 (TK-120). Once the conductivity is low, signifying a lack of residual regenerant, the spent wash is sent to the Anionic Feed Tank (TK-200)

6.2.2 Cationic Regeneration

During the regeneration stage, regenerant is pumped to the IX columns from the Cationic Regenerant Storage Tank (TK-110). The spent regenerant from the regeneration stage is super-saturated with gypsum and flows to Cationic Gypsum Reactor Tank #1 (TK-120) where gypsum precipitates out of solution. Gypsum seed added to the reactor via P-302 facilitates the formation of larger gypsum particles. In TK-120, concentrated sulphuric acid is added to make up for acid consumed during the regeneration, as well as for any acid lost during the IX wash stage. The sulphuric acid addition is controlled by the conductivity of the regenerant solution.

From the first Cationic Gypsum Reactor Tank No.1 (TK-120) the regenerant flows to the Cationic Gypsum Reactor Tank No.2 (TK-125) for additional retention time in order to ensure the relief of the super saturation. Following the reactors, the solution flows into the Cationic Gypsum Clarifier (TF-300). The majority of the gypsum slurry collected in the clarifier is returned as seed to the cationic regenerant storage tank (TK-110).

6.2.3 Gypsum Recovery & Dewatering

The gypsum slurry that is not required for seed in the gypsum reactor is pumped to the Cationic Gypsum Filter Press (EQ-305) for further dewatering. The gypsum filter press is a standard horizontal plate and frame press ubiquitous in the mining world for dewatering slurries. The cationic circuit contains the only filter press within the plant, as the cationic regenerant solution is more concentrated compared to the Anionic (which is limited by the solubility of lime), therefore there is much larger operating cost saving by further dewatering the cationic gypsum, and retrieving the sulphuric acid within. Filtrate from the press is sent back to the regenerant storage tank.

The press will be elevated over the Gypsum Slurry Tank (TK-315), which will accept the cationic gypsum filter cake, as well as the anionic gypsum slurry. The two products will be mixed into a neutral gypsum paste and pumped to the TSF via P-316.

6.3 Anionic IX Circuit

The Anionic IX circuit is captured in the process flow diagrams 16044-PFD-200-01, and 16044-PFD-300-01.

6.3.1 Anionic IX Resin Loading, Regeneration & Washing

As the ion exchange portion of the Anionic circuit is similar to the Cationic circuit, refer to sections 7.2.1 and 7.2.2 for details.

6.3.2 Gypsum Recovery & Dewatering

Unlike the cationic gypsum, which is dewatered to a cake in order to retrieve as much sulphuric acid as possible, the anionic circuit does not contain any additional gypsum dewatering. There are a few reasons for this, namely:

- The strength of the anionic regenerant is an order of magnitude less than that of the cationic. This is due to the solubility restriction the anionic regenerant encounters.
  - » The cationic circuit uses sulphuric acid as the resin regenerant. While not limited by solubility, the cationic regenerant is typically between 30 – 40 g/L.
  - » The anionic side uses lime, which, depending on temperature, solubilizes to approximately 1 – 2 g/L.
  - » Because the concentration of regenerant in the anionic side is much lower than the cationic side, there is a smaller potential operating cost saving from re-use of the anionic regenerant
- As the cationic regenerant is sulphuric acid, the cake produced will still contain some acid, and therefore be acidic. For producing a neutral gypsum product, the residual acid must by neutralized. This is accomplished by mixing the cationic cake with the anionic gypsum slurry, which will contain sufficient lime to produce a neutral, combined gypsum product.
- To allow for lower operating costs, quick lime is used in the process as opposed to hydrated lime. As quicklime needs to be slaked with water prior to use, it is dosed into the system as a lime slurry. This adds water to an otherwise closed circuit. By removing the anionic gypsum as a slurry, the overall anionic regenerant water balance can be held static.

6.4 Nanofiltration

Process flow diagram 16044-PFD-400-01 displays the NF circuit, which is only incorporated into the WTP for Scenarios 3 and 4.

The feed to the NF circuit is pumped from the NF feed tank (TK-400) to a series of cartridge filters (F-405) prior to reaching the NF unit (F-410x). Pre-treatment filtration removes suspended solids to lower the risk of scaling/fouling in the NF unit. The proposed NF system comprises two stages of NF treatment whereby the reject stream from the first stage enters the second stage and the clean permeate streams produced by the two stages are blended together for discharge. Typically, the NF system design and the water recovery achieved by industrial scale plants is limited by the concentration of scale forming constituents in the reject brine stream. In order to avoid membrane fouling, it is important that the reject stream is not super-saturated with respect to sparingly soluble solids such as calcium sulphate. Table 6.1 summarizes the concentrations of calcium sulphate and sodium sulphate in the NF brine stream during treatment scenarios 3 and 4.

Table 6.1 – Concentrations of Major Scale Forming Constituents in NF Brine

NF Brine Solution Stream	Units	Saturation	Scenario 3+4
CLOSURE			
Gypsum	mg/L	~2,000	452
Sodium Sulphate	mg/L	>50,000	774
POST CLOSURE			
Gypsum	mg/L	~2,000	452
Sodium Sulphate	mg/L	>50,000	2,400

As shown in Table 6.1, the brine stream produced by the NF operating downstream of Sulf-IX is well below gypsum saturation. Therefore, it may be possible to concentrate the brine further by installing additional stages of NF which would operate on the reject stream from the second stage of NF. This would result in a higher water recovery, lower sulphate concentrations in the plant effluent, and reduced volume of brine requiring disposal. However, care must be taken to check for the presence of scale forming constituents other than calcium and sulphate that may start to limit water recovery and/or cause membrane fouling if additional NF stages are installed.

6.5 Reagent Circuit

The reagent circuit is described in the flow diagram 16044-PFD-500-01. Each of the reagent systems are briefly described below.

6.5.1 Flocculant

Flocculant make-up is operated automatically on demand as a two tank batch system (EQ-510). The top mixing tank will always contain a maturing batch of floc. When the dosing/storage tank empties, the matured batch will drain by gravity to the dosing tank, and a new batch will be made up and matured. This system allows for relatively small equipment, while also ensuring that fresh flocculant is always being used in the system.

6.5.2 Sulphuric Acid

Sulphuric acid is delivered to the plant by tanker trucks as 90 to 96% solution and transferred to the sulphuric acid storage tank (TK-500). From the storage tank, acid is pumped to the cationic gypsum reactor by metering pump P-501, which is controlled by conductivity in the Cationic Gypsum Reactor Tank #1 TK-120.

6.5.3 Nanofiltration Clean-in Place System (CIP)

Cleaning-in-place using hydrochloric acid and/or bleach can be done in the event of major fouling/scaling on the membrane. The solution is delivered to the plant in bulk and is transferred to the CIP solution tank (TK-415). From the tank, CIP solution is pumped through a series of cartridge filters before entering the NF unit. The spent CIP solution returns to the CIP solution tank and is recycled for additional cleaning cycles. The CIP solution needs to be replaced once it is found to not effectively clean the membranes. Cleaning is completed as required, depending on the level of membrane fouling/scaling.

6.5.4 Slaked Lime

Lime slurry will be supplied by existing equipment that was used for lime makeup in the mill during operations. The lime slurry will be transferred to the agitated Lime Slurry Storage Tank (TK-510), where it will be stored prior to addition to the process. The slurry, continuously circulated through a pressurized loop by the lime loop pump (P-511), is directed from the loop to the process addition points via automated pinch valves installed on branches of the loop.

6.5.5 Fresh Water

The uses of fresh water at the water treatment plant include:

- Reagent make-up
- General purpose utility water

Plant discharge will be used as the source of fresh water and distributed throughout the plant via a fresh water loop.

7. Treatment Implementation Details

7.1 TSF Supernatant Pre-treatment during Closure

Treatment Scenarios # 2 and #4 presented in Section 5 involve pre-treatment of the TSF supernatant during closure. As shown in Section 5, the supernatant pre-treatment offers significant reduction in sulphate and ammonia concentrations, and furthermore, the combination of Sulf-IX+NF achieves water quality suitable for direct discharge into the environment. According to Figure 3.5, the volume of TSF supernatant contained in the TSF at the end of closure is estimated to be approximately 8 Mm^3. Given the hydraulic capacity of the water treatment plant of 149 L/s, approximately 4.7 Mm^3 of water will be processed through the plant operating in a closed loop during closure. This means that the entire TSF supernatant inventory will be processed in less than two years. The risk of short-circuiting between the treatment plant discharge point and feed intake point, respectively, can be largely eliminated by increasing the distance between the discharge and intake points and by promoting plug flow in between these points (i.e. planned installation of TSF splitter dyke in later years of operations). Furthermore, a till cover installed in the TSF is expected to dramatically reduce the risk of sulphate release from consolidated tailings to the overlying water.

Consequently, BioteQ recommends that the pre-treatment period be limited to three to five years allowing sufficient time for the ramp-up in the water treatment plant capacity and overall availability.

7.2 WTP Tie-Ins Requirements

In order for the sulphate removal water treatment plant to operate, a number of plant tie-ins will need to be completed. Tables 7.1 and 7.2 present the tie-ins required for water treatment plant consisting of Sulf-IX alone, and Sulf-IX combined with NF, respectively.

Table 7.1: List of Tie-ins for Sulf-IX

Tie-in	Tie-in Description
Power	200 kW running/ 400 kW installed, 3 x 575V, 60 Hz
Gypsum disposal	Slurry pipeline to a segregated area of the TSF
Access road for construction equipment and reagents delivery	Bulk delivery by semi-trailer and tank truck

Table 7.2: List of Tie-ins for Sulf-IX Combined with NF

Tie-in	Tie-in Description
Power	610 kW running/ 1220 kW installed, 3 x 575V, 60 Hz
Gypsum disposal	Slurry pipeline to a segregated area of the TSF
NF reject disposal	Reject pumping and pipeline to open pit

Access road for construction equipment and reagents delivery	Bulk delivery by semi-trailer and tank truck

As noted in Sections 5, the advantage of Sulf-IX operating upstream of NF is that the brine produced by NF is not supersaturated with Ca and SO_4 which are the key constituents causing scaling in pipelines. Therefore, the pumping of NF reject from the water treatment plant to the open pit will be similar to conventional water transport and not require any additional maintenance or special design features.

7.3 Engineering and Fabrication

The activities involved in treatment system implementation will be the same regardless of whether Treatment Method 1 or 2 is selected. However, activity timing will change depending on whether treatment during closure or post-closure treatment is selected. The following are the major activities involved in implementation:

- Confirmation of required plant hydraulic capacity and feed concentrations based on water balance measurements during mine operation
- Detailed design of treatment system
- Procurement of WTP components (process equipment/instrumentation etc)
- Off-site fabrication of WTP modules
- On-site installation of WTP modules
- Commissioning
- Operation

Both Sulf-IX and NF are designed as highly modular systems, and can be fabricated off-site in controlled environments to reduce project cost and delivery times. Modularization of the process equipment involves fabrication of structural steel frames (also known as skids), upon which pumps, small tanks, process piping, instrumentation and electrical components are mounted and tested in a fabrication facility – likely located in the lower mainland of BC – before being shipped to site for installation and commissioning. Modules are designed to be as large as possible, while fitting within the shipping limits of the road to site and to minimize the amount of on-site fabrication required. However, some components are too large to ship pre-fabricated, such as the Sulf-IX anionic and cationic clarifiers. For those components, field-erection will be required.

7.4 Plant Operation

Although the water treatment plant is expected to be fully automated, the plant will require on-site operating labour mainly for the following daily tasks:

- Operation of cationic filterpress in Sulf-IX plant
- Operation of lime slaker
- Gypsum by-product management/disposal most probably by transport to the pit or other dedicated area

The site is relatively remote and it may be difficult to respond to the control system call-outs when the plant is running unattended. Therefore, the operating crew may need to include a sufficient number of operators to work on rotations (on site/off site). Table 7.3 provides an estimate of plant staffing during active plant operation.

Table 7.3: Estimate of Staffing Requirements During Active Plant Operation

Position	# day shift	# night shift	# off-site
Operators	2	1	3
Shift Total	**3**	**1**	**3**
Total Head Count	**6**		
Note: 1 operator will be designated as the plant superintendent/manager			

There may be opportunities to reduce the annual labour cost associated with the overall water treatment at site through the following:

- Combining the operations of the sulphate and metal removal plants under one operating crew. Although this would increase the staffing numbers presented in Table 7.3, it would most likely reduce the overall number of staff required for the operation of both plants.
- Operate the WTP on a seasonal/campaign basis depending on the overall site water management plan.

These options should be investigated later during more detailed costing.

7.4.1 Maintenance and Replacement Considerations

The following maintenance and replacement considerations are to be considered as part of the operations phase:

- Critical spare parts stocked based on individual equipment vendor recommendations
- Rotating equipment to be:
  - » Inspected daily on plant walkthroughs for noise-vibration-heat
  - » Lubricated quarterly
- Filter cloth to be inspected monthly
- pH and conductivity probes to be cleaned and calibrated daily
- Scaling of piping mitigated with the use of scale coupons in strategic locations
- NF membranes will be replaced when in-situ membrane cleaning no longer improves performance. The frequency is dependent on many factors and can only be determined during operation.
- Replacement membranes to be warehoused.
- Cationic resin is expected to have a useful life of ~10 years, after which it will be replaced
- Anionic resin is expected to have a useful life of ~5 years, after which it will be replaced

7.5 Implementation Schedule

Table 7.4 provides estimates for durations of pre-operation implementation activities based on previous similar projects. The duration of operation will depend on whether treatment during closure is selected or not.

Table 7.4: Pre-operation Implementation Schedule

Implementation Activity	Estimated Duration (months)
Detailed design of treatment system	6
Procurement of WTP components (process equipment/instrumentation etc)	2
Off-site fabrication of WTP modules	4
On-site installation of WTP modules	2
Commissioning	3
Total	**17**

7.6 Main Tank Capacities and Retention Times

Table 7.5 supplies information on the process' major tanks.

Table 7.5: Major Tank Capacities, Retention Times, Materials and Estimated Shipping Weights

EQP Tag	Description	Capacity (m^3)	HRT (min)	Material	Weight (tonnes)
TK-100	Cationic Feed Tank	100	10	FRP	2.2
TK-110	Cationic Regenerant Storage	100	10	FRP	2.2
TK-120/125	Cationic Gypsum Reactors	225	22.5/ea	FRP	3.7/ea
TK-200	Anionic Feed Tank	200	20	FRP	3.6
TK-400	Effluent/NF Feed Tank	100	10	FRP	2.2
TK-220/225	Anionic Gypsum Reactors	225	22.5/ea	CS	3.7/ea
TK-500	H_2SO_4 Storage Tank	23	5760	CS	1.9
EQP Tag	Description	Height (m)	Diameter (m)	Material	Weight (tonnes)
TK-105 (1-8)	Cationic Sulf-IX Columns	5	2.8	PVC & FRP	2.0
TK-205 (1-8)	Anionic IX Columns	5	2.8	PVC & FRP	2.0
EQP Tag	Description	Height (m)	Diameter (m)	Material	Weight (tonnes)
TK-300	Cationic Clarifier	3	17	SS	22
TK-320	Anionic Clarifier	3	17	CS	22
Notes: CS=carbon steel; SS=stainless steel; FRP=fiber-reinforced plastic; PVC = polyvinyl chloride					

7.7 Consumables, Reagents and Products

Tale 7.6 supplies information on the consumables, and reagents. Due to the relatively accessible site location, a minimum of 4-days storage was used in order to guarantee uninterrupted operation of the WTP.

Table 7.6: WTP Consumables, Reagents and Products

Reagent	Purity/ Type	Delivery Method/ Container	Storage Volumes	Storage Duration
IX Resin	100%	Truck/200 L drum	1600 L (8 barrels)	30 weeks
Sulphuric Acid	96%	Truck Load	23 m^3	4 days
Quick Lime	92%	Truck load	130 m^3	9 weeks
Flocculant	-	Truck/25 kg bags	1 pallet / 40 bags	20 days
Membrane clean-in-place (CIP) Solution	31%	Truck/200 L drum	200 L (1 barrel)	40 weeks

8. Risks and Risk Mitigation

All treatment systems (passive or active) are subject to risks, and the proposed Blackwater sulphate removal WTP will be no different.

The selection of the treatment method described in detail in Sections 4 and 5 eliminated several risks including:

- Treatment failure due to inadequate design that has not been proven on industrial scale and mine water of similar composition to the Blackwater TSF supernatant and seepage
- Risk of acute fish toxicity in effluent caused by treatment (BOD/COD)
- Risk of calcite formation in the receiving environment caused by extremely high levels of bicarbonate in the treated effluent
- Risk of potential impact of increase in TDS resulting from sulphate removal by certain treatment methods
- Risk of plant upsets caused by changes in microbial population
- Sensitivity to temperature

The remaining primary risks fall into one of the following categories:

- Environmental conditions, such as geohazards, snow, rainfall, etc
- Process or mechanical system failure not caused by design
- Chemical handling activities

Table 8.1 provides details on potential hazards, their associated risks and mitigation measures to control the risks.

Table 8.1: Risks and Mitigation for New Gold Blackwater Sulf-IX WTP

Risk/Hazard	Impact	Mitigation
Other geohazards (earthquake, landslide, etc)	Plant rendered inoperable or inaccessible by geohazards other than an avalanche.	In general, site has low level of geohazards. Locate WTP outside of areas with known or suspected geohazards.
Absence of snow removal	Plant rendered inoperable or inaccessible by failure or inability to remove snowfall, negatively affecting deliveries (operators, reagents, etc).	As site is in area of potentially high snow load, operations room will be equipped with overnight capabilities, and stocked with emergency food and water. Sufficient consumables to be stored on-site.
Freezing conditions	Solutions freezing in pipes, potentially cracking pipes, and causing spill.	Contain WTP in climate-controlled building. All external process lines will be buried, insulated, heat traced, and/or be completely self-draining.
Heavy rainfall	Increased contact water flow and reduced storage capacity.	Significant storage available in TSF. WTP will be capable of bypassing excess flow and blending with WTP effluent, as during times of excess rainfall the feed waters will have a corresponding lower SO_4 content. Effluent can be recycled back to TSF as required.
Power outage	Plant rendered inoperable	Diesel backup generators will be available.
Gypsum Scaling in Sulf-IX	Reduced capacity	Routine maintenance Plant design based on actual operating experience from existing lime treatment plant and TSF supernatant and seepage quality and flows.
Fluctuations in feed flow	Insufficient flow to fluidize Sulf-IX bed.	The number of columns in operation can be reduced during periods of low flow to ensure sufficient velocity to fluidize IX resin bed
Membrane fouling	Reduced capacity, increased opex	Sulf-IX operating upstream of NF membrane provides a degree of mitigation. Detailed design of membrane system based on actual water quality in TSF during closure. Periodic membrane cleaning.
Freezing under zero flow	Plant rendered inoperable, resin and membrane damage	Avoid zero flow situation by design and place critical pieces of equipment inside heated building
Chemical exposure by worker	Contact of sulphuric acid and/or hydrated lime through a worker's skin or eyes.	Standard PPE will be worn by all employees at all times. All staff handling chemicals will be properly trained on the applicable SOPs. Emergency eyewash stations and showers will be located in the plant, specifically within the reagent makeup areas.
	Chemical dust and/or mist contact through inhalation.	Dust extraction systems will be installed on any powder reagent makeup systems (specifically lime and flocculant), and sufficient air turn overs per hour will be used to mitigate any potential inhalation of chemical mist (specifically sulphuric acid).

Risk/Hazard	Impact	Mitigation
Chemical spill outside secondary containment	Spill during transfer from delivery vehicle.	All reagent transfer areas will be within the secondary containment of the plant.

9. By-product Generation and Management

Table 9.1 presents estimates of annual by-products generation rate by the WTP for the average concentrations.

Table 9.1 – Estimate of Annual By-product Generation Rate for Average Concentrations

	Units	Sulf-IX	Sulf-IX + NF
CLOSURE			
Gypsum	dmt/year	2,200	2,200
Brine	m^3/year	0	1,175,000
POST CLOSURE			
Gypsum	dmt/year	6,500	6,500
Brine	m^3/year	0	1,175,000

Gypsum slurry generated by the Sulf-IX process will be thickened and pumped into the TSF. Alternatively, it can be dewatered and the resulting cake disposed of in a landfill. With its high purity, gypsum produced by Sulf-IX can be used in reclamation as part of soil covers installed over waste rock piles or spent heaps, or as a soil amendment prior to re-vegetation.

Table 9.2 summarizes the post closure concentrations of the Sulf-IX feed stream, as supplied by ERM. These concentrations were used to estimate the NF brine composition during post-closure (Table 9.3).

Table 9.2 – WTP Influent Composition Estimate during Post-Closure

Element	95th Percentile Elemental Concentrations in the WTP Feed during Post Closure (mg/L)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cl	14.1	14.2	14.4	14.3	13.9	13.7	13.6	13.6	13.6	13.7	13.9	14.0
F	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03
SO_4	1232	1237	1243	1262	1270	1209	1199	1205	1208	1215	1221	1226
NH_4-N	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Al	0.03	0.03	0.03	0.06	0.17	0.10	0.08	0.06	0.04	0.04	0.04	0.04
Sb	0.05	0.05	0.05	0.07	0.14	0.06	0.06	0.06	0.05	0.06	0.05	0.05
As	0.02	0.02	0.02	0.03	0.07	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Ba	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Be[1]	0.05	0.05	0.05	0.08	0.14	0.07	0.06	0.06	0.06	0.06	0.06	0.06
B	0.02	0.02	0.02	0.03	0.05	0.03	0.03	0.03	0.02	0.03	0.02	0.02
Cd[1]	0.45	0.42	0.39	0.80	1.90	0.69	0.58	0.56	0.54	0.56	0.53	0.49
Ca	247	248	249	257	265	242	240	242	244	245	246	247
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Co	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cu[1]	0.25	0.23	0.24	0.45	1.00	0.46	0.41	0.37	0.31	0.27	0.27	0.33
Fe	0.06	0.06	0.05	0.07	0.12	0.09	0.09	0.09	0.07	0.08	0.07	0.06
Pb[1]	0.47	0.44	0.41	0.82	1.90	0.71	0.60	0.58	0.59	0.58	0.59	0.51
Li	0.05	0.05	0.05	0.06	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Mg	12.0	12.0	12.0	12.8	14.3	11.8	11.8	11.9	12.0	12.0	12.0	12.0
Mn	3.24	3.22	3.20	3.53	4.44	3.45	3.36	3.33	3.32	3.33	3.31	3.28
Hg[1]	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mo	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Ni	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
P	0.05	0.05	0.05	0.09	0.23	0.08	0.07	0.07	0.06	0.07	0.06	0.06
K	140	141	142	150	169	140	138	137	138	138	139	140
Se[1]	0.63	0.62	0.61	0.76	1.17	0.68	0.65	0.65	0.65	0.66	0.65	0.64
Si	7.48	7.39	7.33	7.75	8.67	7.25	7.29	7.45	7.45	7.44	7.44	7.42
Ag[1]	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Na	213	214	214	215	215	207	208	209	210	211	212	212
Sr	1.40	1.41	1.42	1.50	1.69	1.39	1.37	1.37	1.37	1.38	1.39	1.40
Tl[1]	0.22	0.22	0.21	0.33	0.62	0.28	0.25	0.24	0.24	0.25	0.24	0.23
Sn[1]	0.95	0.97	0.99	1.00	0.99	0.92	0.90	0.90	0.91	0.91	0.91	0.93
Ti	0.05	0.05	0.05	0.07	0.11	0.06	0.06	0.06	0.06	0.06	0.06	0.06
U[1]	2.98	2.98	2.98	3.17	3.55	3.00	2.95	2.97	2.98	2.99	2.99	2.98
V	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.29	0.29	0.28	0.35	0.53	0.33	0.31	0.31	0.30	0.31	0.30	0.30
Note 1: Units expressed as µg/L for these constituents.												

The brine solution generated by the NF process will be pumped into the decommissioned open pit and discharged at depth below the chemocline. Table 9.3 presents the estimated brine composition during post closure. The concentrations were calculated using an ion rejection rate of 99% across the NF unit(s), which is the same rejection rate applied for calcium, magnesium, potassium, sodium and sulphate. It should be noted that an assumption is made that all arsenic and antimony are present as pentavalent species.

Table 9.3 – Brine Composition Estimate during Post-Closure

Elements	95th Percentile Elemental Concentrations in the NF Brine during Post Closure (mg/L)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cl	53.5	54.1	54.5	54.3	52.8	51.9	51.9	51.7	51.8	52.2	52.7	53.1
F	0.13	0.13	0.13	0.13	0.13	0.10	0.12	0.08	0.12	0.12	0.12	0.13
SO4	2744	2760	2776	2773	2731	2710	2686	2688	2686	2702	2717	2730
NH_4-N	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9
Al	0.12	0.10	0.10	0.21	0.64	0.39	0.31	0.23	0.16	0.17	0.16	0.14
Sb	0.19	0.18	0.18	0.28	0.55	0.24	0.21	0.21	0.21	0.21	0.21	0.20
As	0.07	0.06	0.06	0.12	0.28	0.10	0.09	0.08	0.08	0.08	0.08	0.07
Ba	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Be[1]	0.21	0.20	0.19	0.29	0.54	0.26	0.24	0.23	0.23	0.23	0.22	0.21
B	0.09	0.09	0.09	0.11	0.18	0.10	0.10	0.10	0.09	0.10	0.09	0.09
Cd[1]	1.71	1.59	1.50	3.03	7.24	2.64	2.22	2.12	2.07	2.11	2.01	1.87
Ca	133	133	133	133	133	133	133	133	133	133	133	133
Cr	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.00	0.01	0.00	0.00
Co	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cu[1]	0.93	0.88	0.89	1.70	3.80	1.75	1.55	1.41	1.18	1.03	1.04	1.25
Fe	0.22	0.22	0.21	0.28	0.46	0.36	0.33	0.33	0.27	0.30	0.27	0.23
Pb[1]	1.79	1.67	1.57	3.10	7.23	2.71	2.30	2.20	2.25	2.19	2.26	1.95
Li	0.18	0.18	0.18	0.23	0.36	0.20	0.19	0.19	0.19	0.19	0.19	0.19
Mg	45.7	45.6	45.6	48.6	54.3	44.7	44.7	45.1	45.5	45.6	45.7	45.6
Mn	12.33	12.23	12.15	13.41	16.88	13.10	12.76	12.67	12.62	12.66	12.58	12.46
Hg[1]	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Mo	0.07	0.07	0.07	0.08	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Ni	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02
P	0.20	0.20	0.17	0.36	0.86	0.31	0.28	0.27	0.24	0.25	0.23	0.22
K	533	537	540	570	644	534	523	522	523	526	528	531
Se[1]	2.38	2.35	2.32	2.91	4.43	2.57	2.47	2.47	2.46	2.49	2.47	2.43
Si	28.41	28.09	27.84	29.44	32.95	27.55	27.71	28.31	28.31	28.28	28.25	28.21
Ag[1]	0.15	0.15	0.15	0.16	0.18	0.14	0.14	0.14	0.14	0.15	0.15	0.15
Na	809	812	814	816	815	788	792	796	799	801	804	806
Sr	5.33	5.37	5.41	5.69	6.42	5.30	5.20	5.20	5.22	5.24	5.27	5.30
Tl[1]	0.85	0.83	0.80	1.24	2.35	1.05	0.94	0.93	0.92	0.94	0.92	0.89
Sn[1]	3.60	3.67	3.75	3.79	3.76	3.50	3.41	3.42	3.44	3.45	3.47	3.53
Ti	0.21	0.20	0.20	0.26	0.42	0.23	0.22	0.21	0.21	0.22	0.21	0.21
U[1]	11.34	11.32	11.33	12.03	13.50	11.39	11.22	11.27	11.31	11.36	11.35	11.34
V	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Zn	1.10	1.09	1.07	1.31	2.00	1.26	1.18	1.17	1.16	1.17	1.15	1.13
Note 1: Units expressed as μg/L for these constituents.												

10. Conclusions

Conclusions related to the proposed design and implementation of an active sulphate removal water treatment plant at Blackwater during closure and post-closure, are summarized below.

- The sulphate removal plant capacity has been set at 149 L/s based on watershed modelling by KP

- Five different active treatment technologies were considered and the pros and cons of each were evaluated vis-à-vis project requirements.

- Sulf-IX ion exchange process and the combination of Sulf-IX with nanofiltration (NF) were selected as the two best options for the Blackwater project for the following reasons:
  - Proven on industrial scale on water with similar water quality to Blackwater TSF supernatant and seepage
  - Production of stable residue that can be easily managed
  - Avoiding exposure of the project to exotic and/or very expensive reagents that would be used in large quantities including barium and aluminum based chemicals used for sulphate removal
  - No risk of acute fish toxicity caused by the process
  - No risk of calcite formation in the receiving environment
  - Net reduction in effluent salinity/total dissolved solids (TDS) levels minimizing potential impacts on the aquatic life in the creek caused by the dissolved solids from TSF
  - Ability to achieve significant reduction in NH_4 level reporting to Davidson Creek

- Active treatment by Sulf-IX alone is expected to reduce the concentration of sulphate in the plant effluent by up to 40% compared to no treatment.

- Active treatment by Sulf-IX followed by NF is expected to reduce the concentration of sulphate in the plant effluent by up to 96% compared to no treatment.

- Gypsum produced by Sulf-IX will be thickened and pumped into a separate area within the TSF catchment. Alternatively, it can be dewatered and the resulting cake disposed of in a landfill. Due to its high purity, gypsum produced by Sulf-IX can be used in reclamation as part of soil covers installed over waste rock piles, or as a soil amendment prior to re-vegetation. It also has potential as feedstock for off-site manufacturing wallboard, bricks, and other construction materials. Gypsum production post closure is expected to be approximately 6,500 dmt/year.

- Brine solution generated by NF will be pumped into the decommissioned open pit and discharged at depth below the chemocline for storage. The volume of brine generated during the treatment post closure is expected to be approximately 1,175,000 m^3/year. The design of the NF can be optimized and additional stages of NF added to reduce the volume of brine.

- Understanding that water management plan is going to evolve over time and actual water quality may differ from predictions, a definitive recommendation regarding the water treatment process should not be made at this time. Instead, the following methodology is provided to inform active water treatment method selection:

  » Sulf-IX alone is the preferred active water treatment method because it is less complex and does not generate liquid waste. However, if any of the following conditions exist, then Sulf-IX followed by NF is the preferred option:

    1. NH_4 removal greater than 1 ppm is required and cannot be achieved by another treatment process
    2. The upstream metals removal plant is insufficient to reach discharge targets, requiring NF as a final metals removal stage
    3. Removal of sulphate balanced by calcium achieved by Sulf-IX alone is insufficient
    4. If the pre-treatment objective is to reduce sulphate levels in the TSF supernatant to allow direct discharge into Davidson Creek

Based on the water modelling conducted by ERM, items 1, 2 and 4 all apply. Therefore, Sulf-IX + NF is the active treatment method currently selected for application at Blackwater.

Appendix A – Industrial Scale Experience

One of the main requirements for the Blackwater WTP design is that it be based on industrially proven technology. This section provides details about Sulf-IX's industrial experience.

Background

In 2011, BioteQ and Freeport-McMoRan Copper and Gold initiated the commissioning of an industrial scale Sulf-IX demonstration plant located at an active copper mine in Arizona. The plant, shown in Figure A.1, operated for a total of four years treating gypsum saturated mine impacted water.

Figure A.1: Industrial Scale Sulf-IX Demonstration Plant

During the initial two years, the plant was treated as a pilot plant, where it underwent substantial process optimizations and improvements. For the final operating year, the plant operated as an industrial demonstration plant with the main goals of uninterrupted fully automated operation and maintenance carried out according to preventative maintenance schedule established from previous years of operation.

Typical feed water for the demonstration plant during its four years of operation is provided in Table A.1.

Table A.1: Feed Water to Sulf-IX Plant, 2011-2015

Constituent	Unit	Minimum	Maximum	Average
Flowrate	m^3/hr	17	22.5	28
Ca	mg/L	400	450	450
SO^4	mg/L	923	2400	1500
Mg	mg/L	50	150	100
Na	mg/L	100	280	150
Cl	mg/L	100	160	120
Alkalinity	mg/L	90	130	120

From the above table, it is evident that throughout the years of operation, the feed water quality fluctuated substantially. Despite these fluctuations, the Sulf-IX process maintained effluent quality, and the site's mineral processing plant re-used all of the Sulf-IX plant effluent.

Results

The main benefits of Sulf-IX is the removal of Ca and SO_4, which leads to a reduction in TDS. Figures A.2 and A.3 below display the operating results from the industrial scale demonstration plant spanning two years of operation from November 2013 to November 2015.

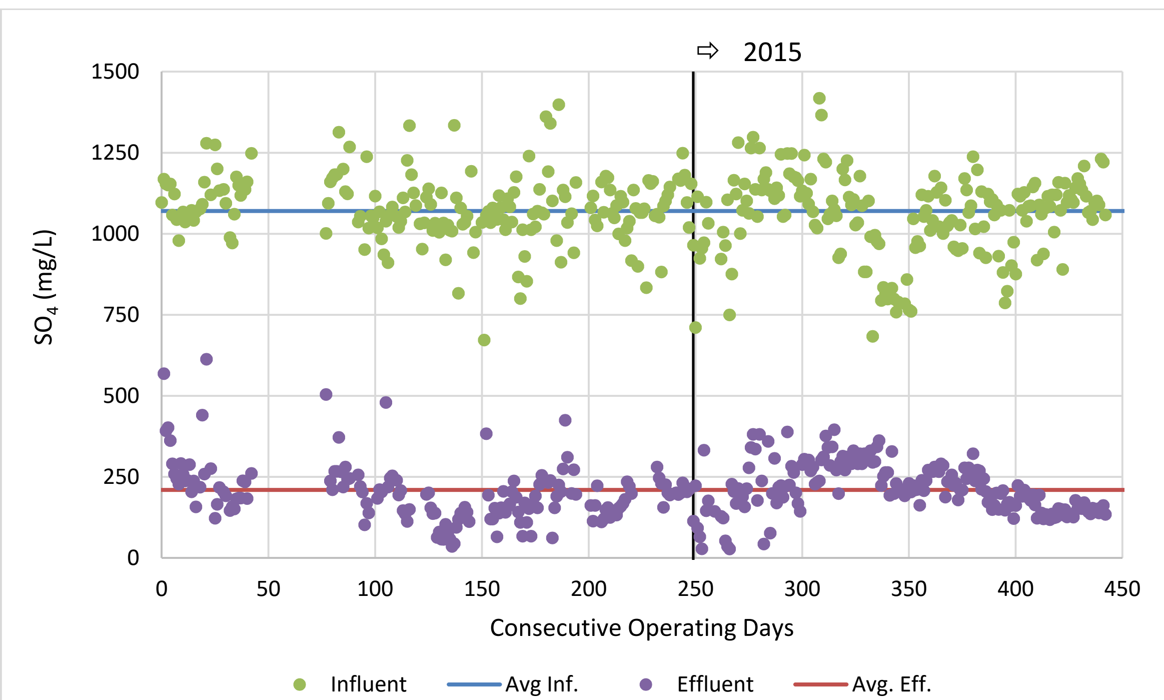


Figure A.2: Sulf-IX Demonstration Plant Ca Associated SO_4 Removal

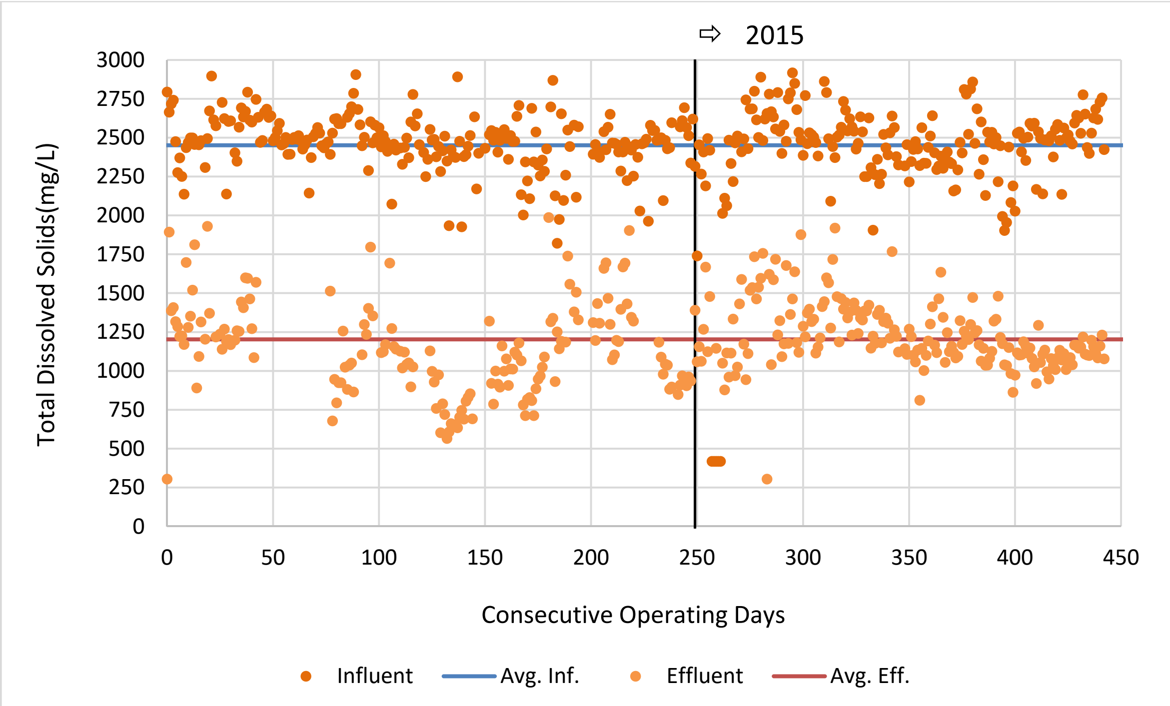


Figure A.3: Sulf-IX Demonstration Plant TDS Reduction

The above graphs demonstrate the robustness and consistency of the Sulf-IX process capacity to achieve a significant net reduction in TDS by selective and simultaneous removal of Ca and SO_4.

Sulf-IX generates a high percentage of water recovery. Figure A.4 provides an overview of the water recovery achieved by the Sulf-IX demonstration plant for a portion of the demonstration phase.

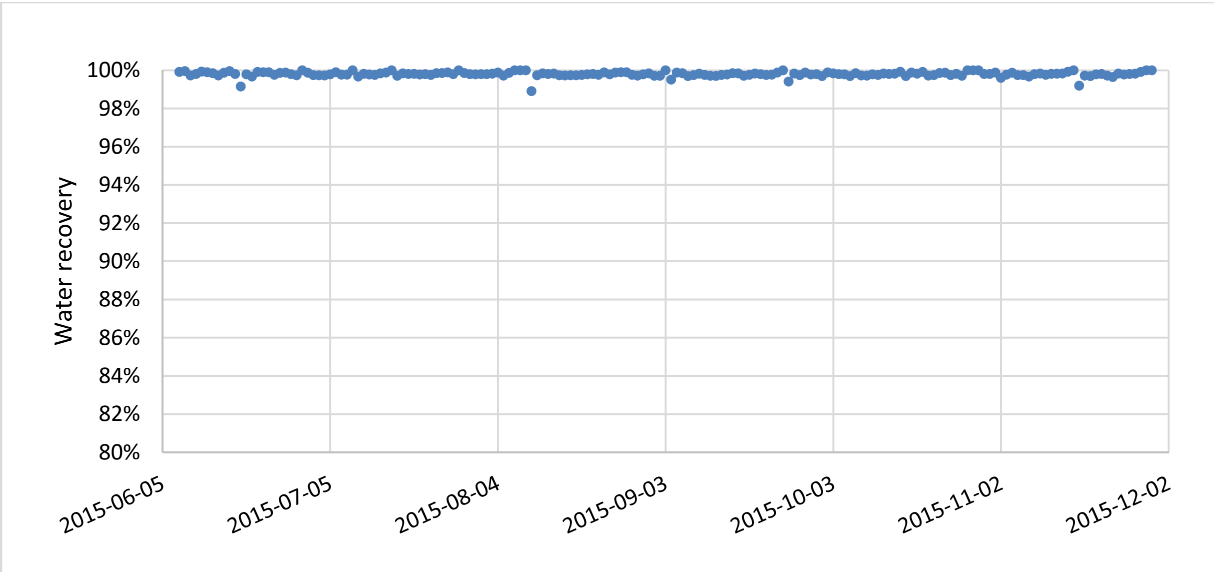


Figure A.4: Sulf-IX Demo plant Water Recovery

From Figure A.4, we can see that water recovery with Sulf-IX is close to 100%, with the only loss of water through the gypsum hydration and pore water of the gypsum product. This is in contrast to membrane based systems which achieve only 50% to 80% recovery depending on water quality and membrane system design.

Solid Product

One of the key differentiators between Sulf-IX and other sulphate removal processes is the elimination of liquid waste streams, and the production of high purity gypsum solid by-product. Gypsum produced by Sulf-IX is not only stable across a wide range of pH conditions, allowing for co-disposal with tailings, but is also of very high purity (> 99.5% gypsum), enabling potential re-use in soil covers over waste rock piles, soil amendment, and/or feedstock for manufacturing wallboard, bricks, and other construction materials. A photo of the gypsum from the demonstration plant is provided in Figure A.5.

Figure A.5: Sulf-IX solid gypsum by-product

Automated Process Control

The Sulf-IX plant shown in Figure A.1 was equipped with a PLC that controlled the treatment process. One of the main benefits of Sulf-IX is that the entire process can be controlled and final effluent quality monitored using on-line conductivity and pH measurements. Similar to conventional ion exchange processes, Sulf-IX operates on the concept of cycles whereby ion exchange resin placed in columns undergoes loading, regeneration, and wash. The robustness and repeatability of the process is best illustrated by the trends in key process control parameters including pH and conductivity. Figures A.6 and A.7 below display the pH and conductivity trends for the Cationic and Anionic columns, respectively.

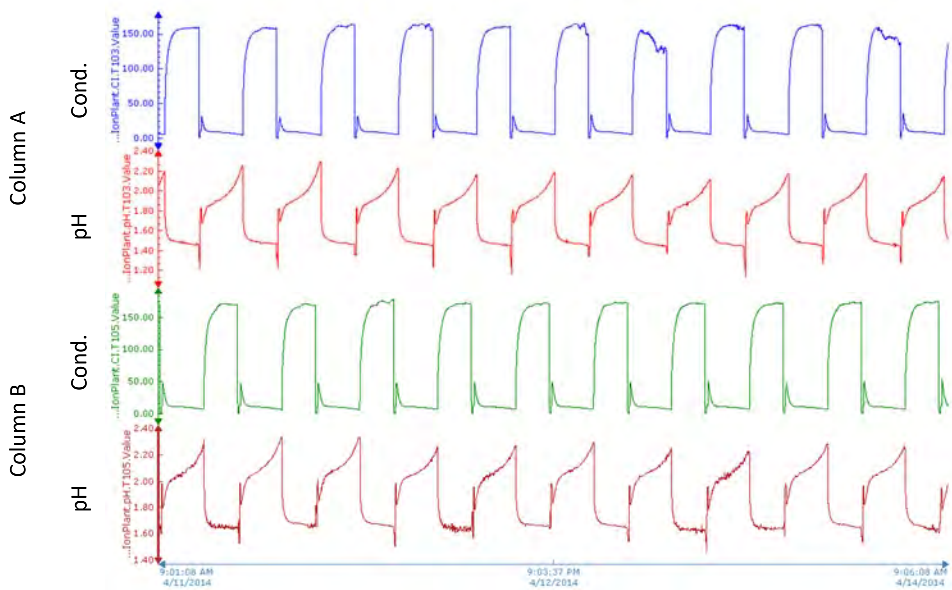


Figure A.6: Cation Columns Process Trends

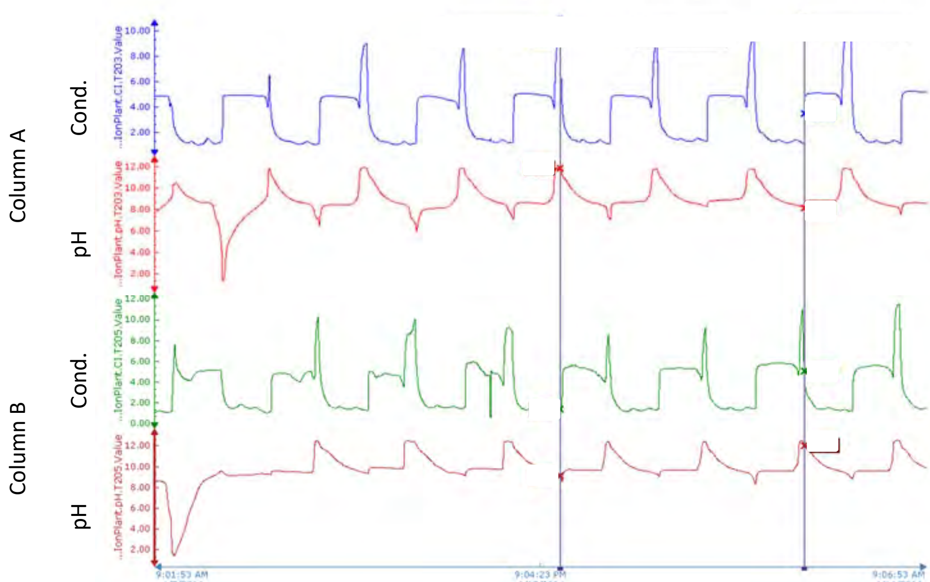


Figure A.7: Anionic Column Process Trends

Evident from the above trends is the repeatability of the process, as the pH and conductivity trends remain unchanged over many consecutive IX process cycles.

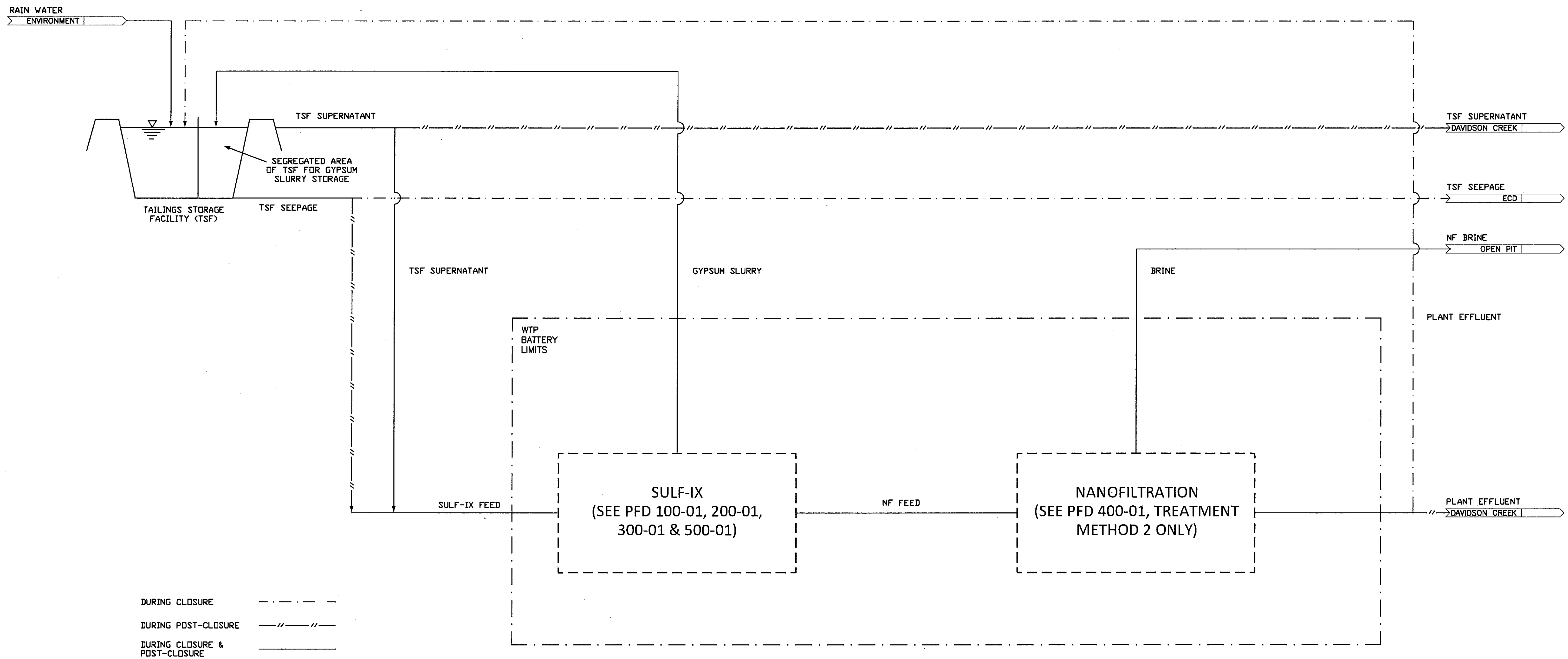
Through the online measurements of pH and conductivity, the process can adapt automatically to changes in feed composition while maximizing resin capacity and SO_4 removal.

Summary of Industrial Scale Sulf-IX Demonstration

The Sulf-IX industrial scale demonstration plant confirmed the following:

- Selective simultaneous removal of Ca and SO_4
- Net TDS reduction across the process resulting in low scaling potential of effluent, suitable for process reuse or further treatment for example by a membrane system that would otherwise be susceptible to fouling
- High water recovery (>99%)
- Highly automated process ensuring consistent operations with high mechanical and process availability, despite wide fluctuations in feed water quality
- Stable gypsum solids that are easy to manage and/or re-use

Appendix B – Process Flow Diagrams (PFDs)



NOTES

REV.	REVISION ISSUED FOR:	DATE	DRAWN	DESIGNED	REVIEWED	APPROVED
D	RE-ISSUED FOR PERMITTING	2017 FEB 14	B.BAKER			
C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

BIOTEQ ENVIRONMENTAL TECHNOLOGIES INC.

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: WATER TREATMENT PLANT OVERVIEW

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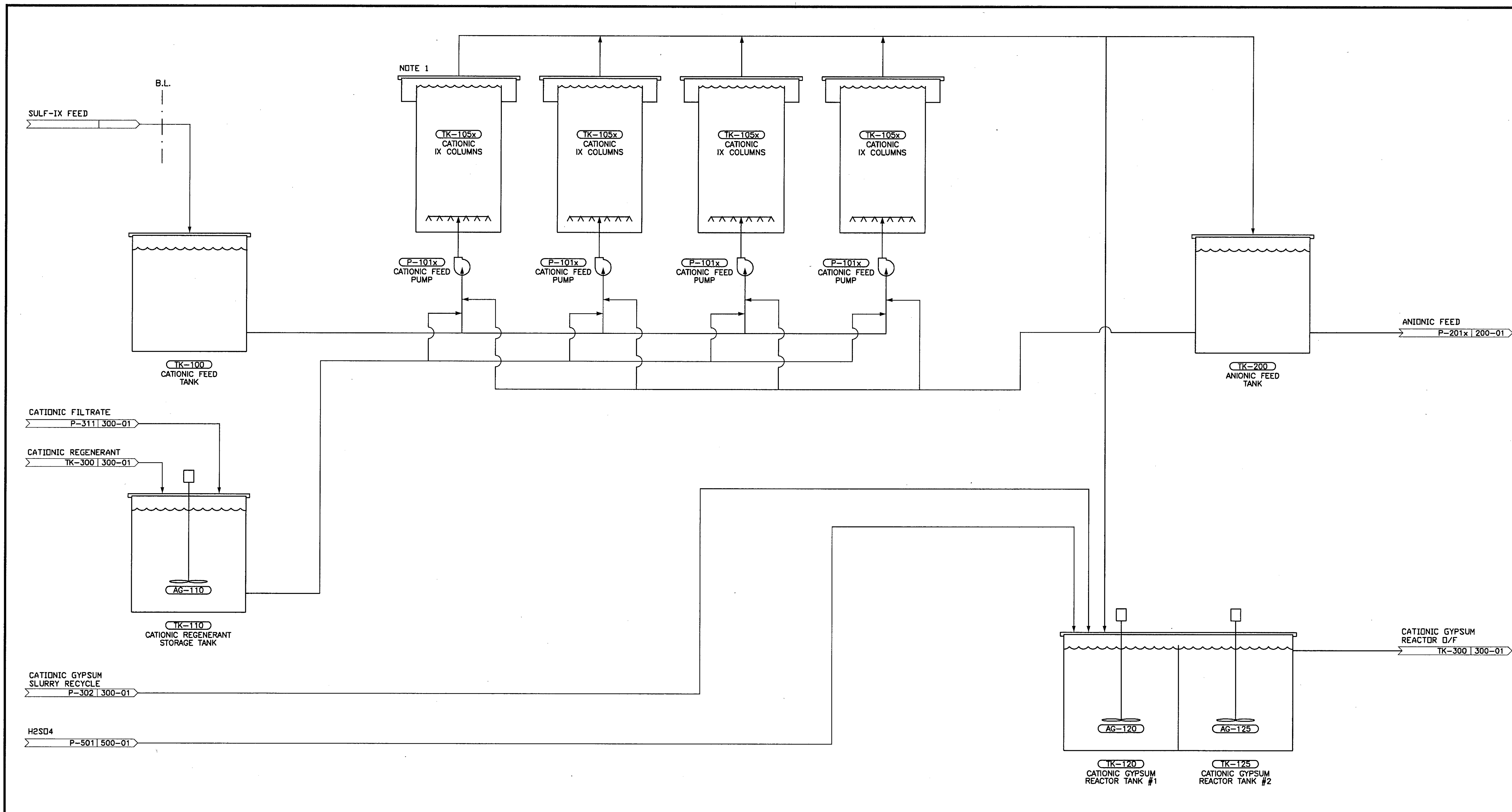
SCALE:	DATE OF LAST ISSUE:	SHEET NO:	REV:
NTS	2017 FEB 14	1/6	D



BIOTEQ
ENVIRONMENTAL TECHNOLOGIES INC.

NOTES
NOTE 1: CATIONIC CIRCUIT REQUIRES 8 IX COLUMNS BASED ON A FEED RATE OF 112 L/s.

REV.	REVISION ISSUED FOR:	DATE	DRAWN	DESIGNED	REVIEWED	APPROVED
D	RE-ISSUED FOR PERMITTING	2017 FEB 14	B.BAKER	V SUNDAR	J.REYNOLDS	J.REYNOLDS
C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: SULF-IX CATIONIC CIRCUIT

DIM	SIZE	DWG No.	
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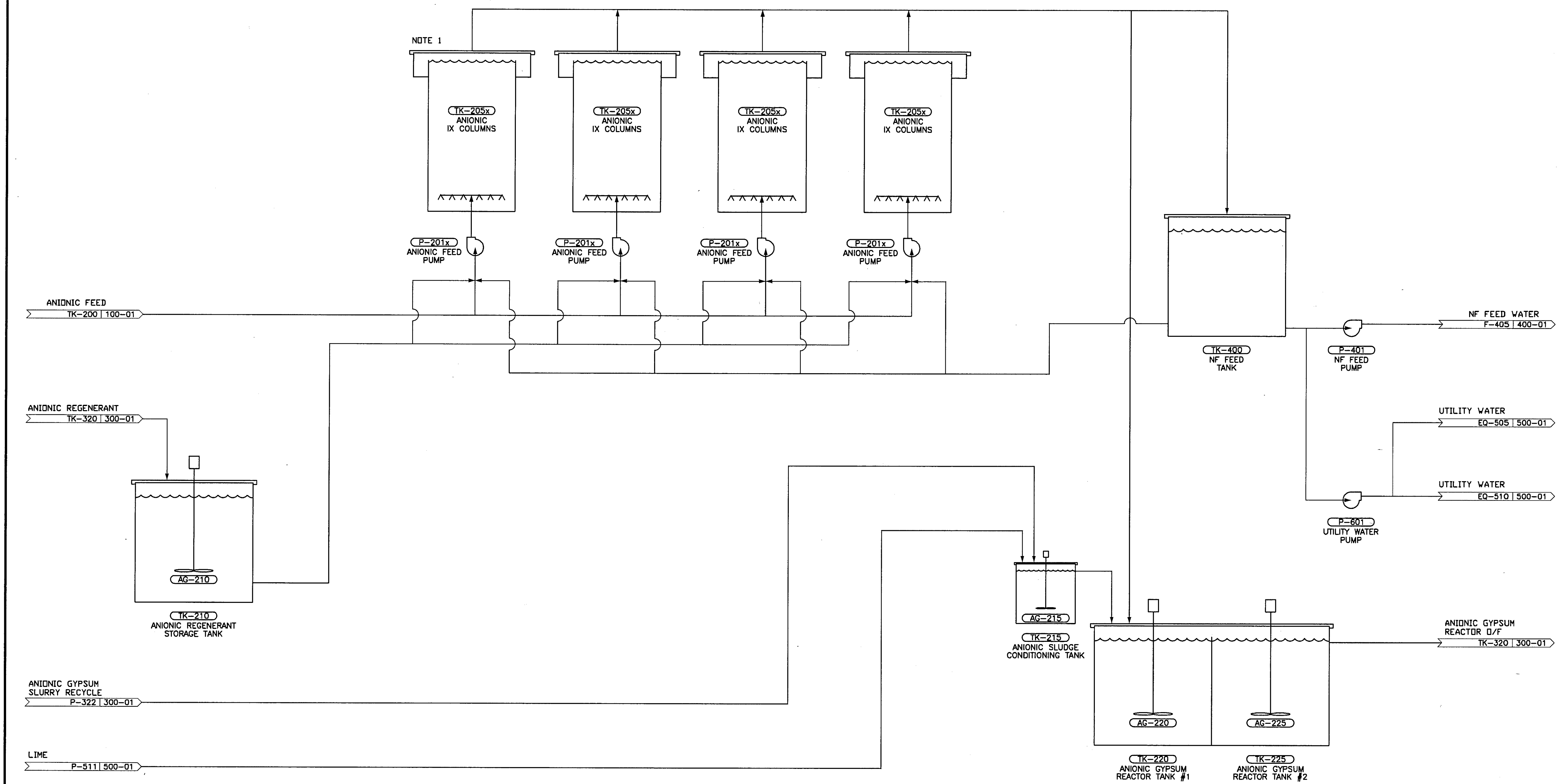
SCALE	DATE OF LAST ISSUE	SHEET No	REV.
NTS	2017 FEB 14	2/6	D



NOTES
NOTE 1: ANIONIC CIRCUIT REQUIRES 8 IX COLUMNS BASED ON A FEED RATE OF 112 L/s.

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C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

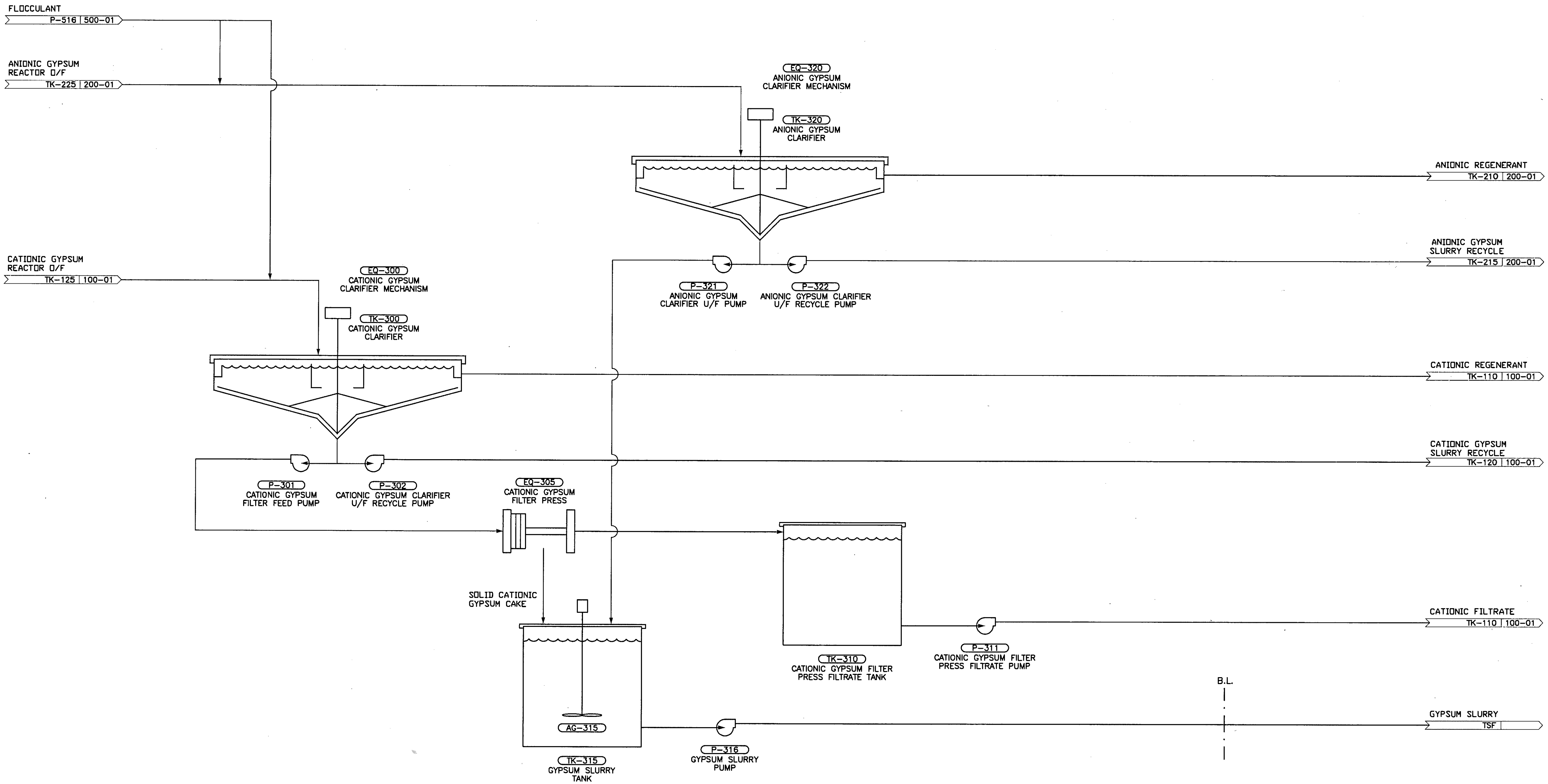
BIOTEQ
ENVIRONMENTAL TECHNOLOGIES INC.

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: SULF-IX ANIONIC CIRCUIT

UNITS	SIZE	DWG. No.
METRIC	11x17	16044-PFD-200-01

SCALE	DATE OF LAST ISSUE	SHEET NO	REV
NTS	2017 FEB 14	3/6	D



NOTES

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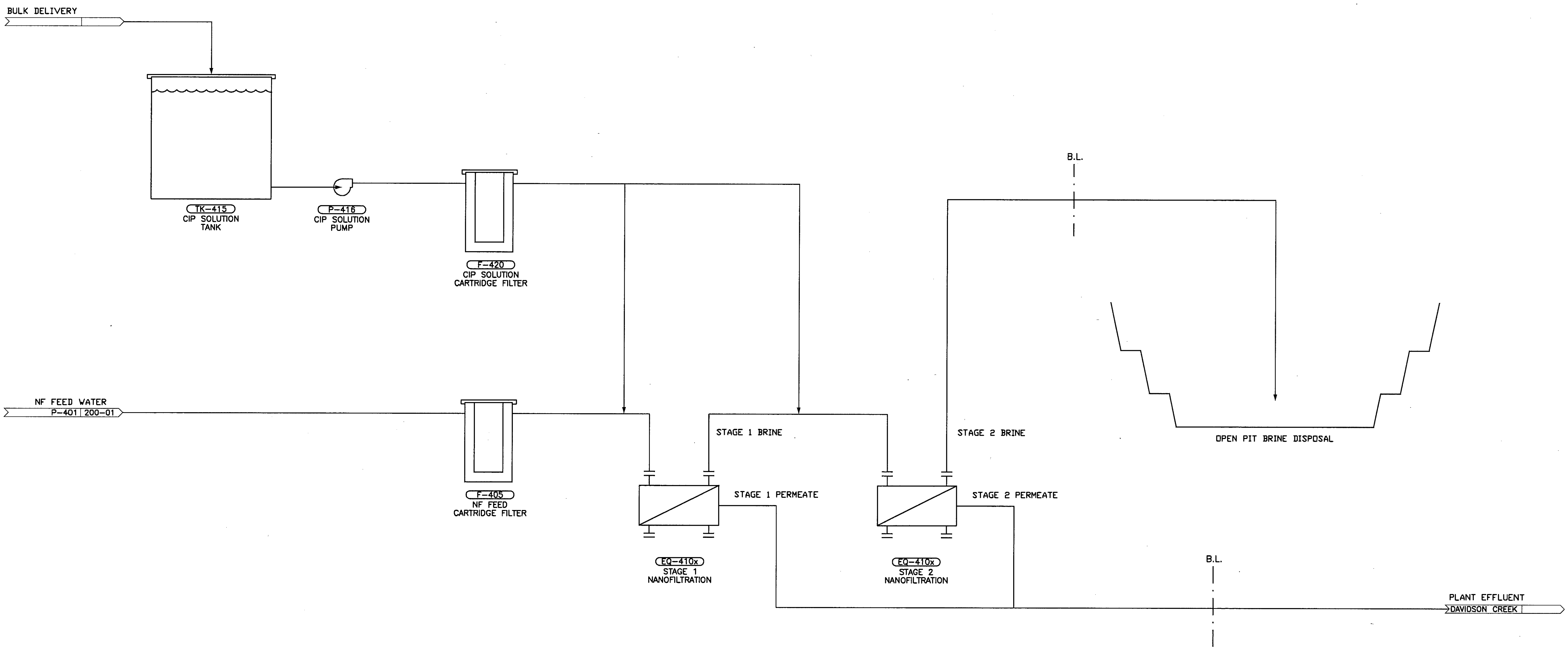
C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

BIOTEQ
ENVIRONMENTAL TECHNOLOGIES INC.

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: SULF-IX DEWATERING CIRCUIT

SYS: METRIC	SIZE: 11x17	DWG. No. 16044-PFD-300-01	
SCALE: NTS	DATE OF LAST ISSUE: 2017 FEB 14	SHEET NO. 4/6	REV: D



NOTES

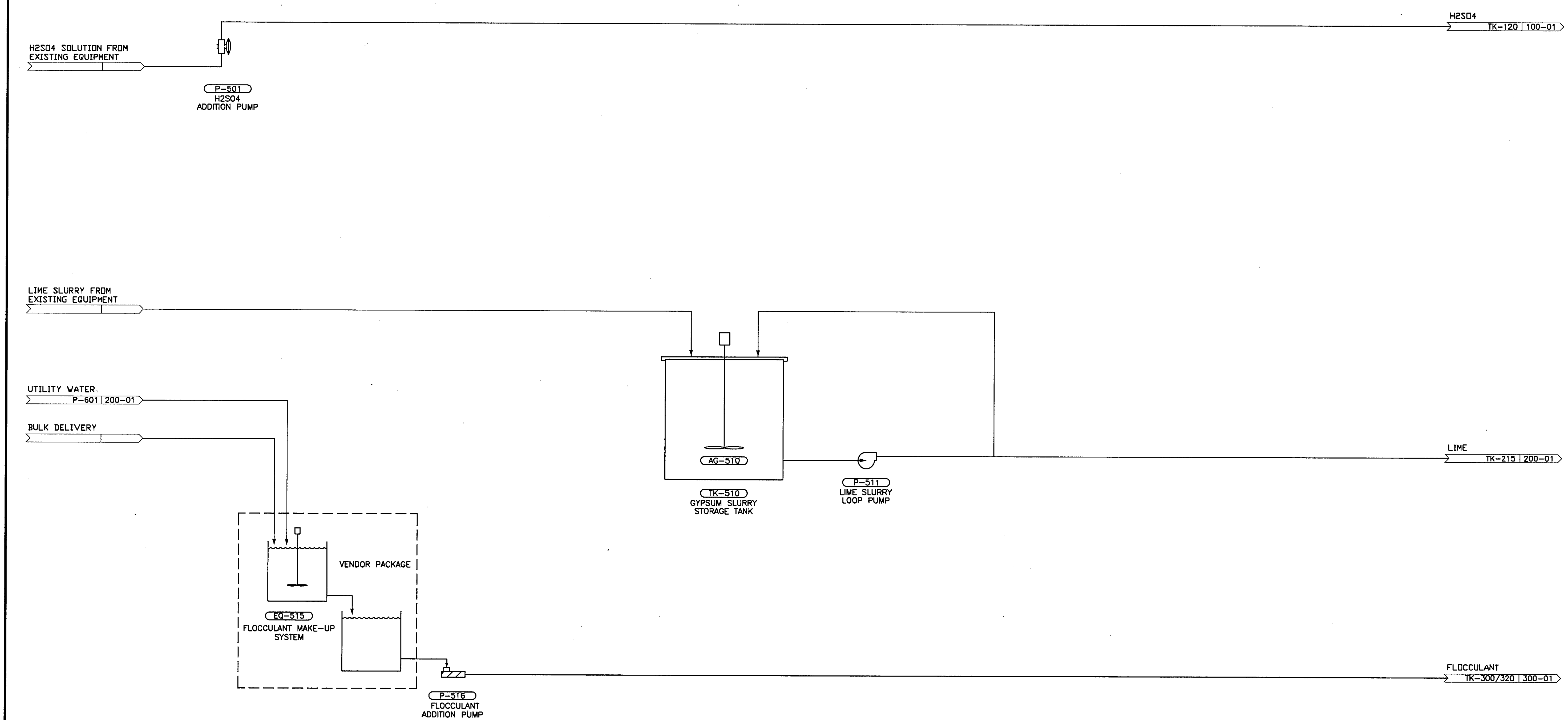
REV.	REVISION ISSUED FOR:	DATE	DRAWN	DESIGNED	REVIEWED	APPROVED
D	RE-ISSUED FOR PERMITTING	2017 FEB 14	B.BAKER	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

BIOTEQ
ENVIRONMENTAL TECHNOLOGIES INC.

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: NANOFILTRATION CIRCUIT

SYS	SIZE	DWG No.	
METRIC	11x17	16044-PFD-400-01	
SCALE	DATE OF LAST ISSUE	SHEET NO	REV.
NTS	2017 FEB 14	5/6	D



NOTES

REV.	REVISION ISSUED FOR	DATE	DRAWN	DESIGNED	REVIEWED	APPROVED
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C	RE-ISSUED FOR PERMITTING	2017 JAN 27	V. SUNDAR	V.SUNDAR	J.REYNOLDS	J.REYNOLDS
B	RE-ISSUED FOR PERMITTING	2017 JAN 10	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS
A	ISSUED FOR PERMITTING	2016 DEC 08	V. SUNDAR	V.SUNDAR	B.BAKER	J.REYNOLDS

BIOTEQ
ENVIRONMENTAL TECHNOLOGIES INC.

PROJECT TITLE: NEW GOLD BLACKWATER

DRAWING TITLE: SULF-IX REAGENT CIRCUIT

SI/IMP: METRIC	SIZE: 11x17	DWG. No.: 16044-PFD-500-01	
SCALE: NTS	DATE OF LAST ISSUE: 2017 FEB 14	SHEET NO: 6/6	REV: D

— Appendix D —

Blackwater Gold Project – Updated Watershed Modelling in Support of Water Quality Assessment (KP 2017)

MEMORANDUM

To:	Mr. Ryan Todd	Date:	February 14, 2017
Copy To:	Sachi DeSouza, Nicole Bishop	File No.:	VA101-00457/22-A.01
From:	Kevin Davenport	Cont. No.:	VA17-00219
Re:	Blackwater Gold Project - Updated Watershed Modelling in Support of Water Quality Assessment		

1 – INTRODUCTION

This memorandum presents the results of updated Life of Mine (LOM) watershed modelling completed by Knight Piésold Ltd. (KP) for the Blackwater Gold Project (the Project) to support ongoing water quality modelling by Environmental Resource Management (ERM). Watershed modelling and water quality modelling support the Project Environmental Assessment (EA) Application (the Application). The updated modelling is being conducted in order to predict water quality Davidson Creek during Post-Closure with revised water management practices.

The initial version of the watershed model is documented in the *Watershed Modelling Report* (KP, 2014; Appendix 5.1.2.1B of the Application). Revisions to the watershed model to reflect changes to the project design, address reviewer comments to the Application, and support updates to the Water Quality Model are documented in the *Life of Mine Watershed Model Report* (KP, 2016b).

2 – SUMMARY OF REVISIONS TO THE LOM WATERSHED MODEL

Revisions implemented in the updated LOM Watershed Model include the following:

- Water management changes:
  - Operation of the Northern and Southern Diversions in Post-Closure to direct non-contact water around TSF Site D.
  - The Environmental Control Dam (ECD) remains operational in Post-Closure. Non-contact surface water is diverted downstream of the ECD to Davidson Creek to the extent possible.
  - Implementation of anion exchange and Nanofiltration (Sulf-IX-NF) Water Treatment Plant to treat TSF Site D supernatant pond water during Late Closure (Years 38 through 42) and seepage and non-contact groundwater captured in the Environmental Control Dam (ECD) in Post-Closure.
  - Decreased pumping rates from TSF Site D to TSF Site C and from TSF Site C to the Open Pit during Closure in order to account for Sulf-IX-NF brine pumped to the Open Pit and to maintain consistent supernatant pond water volumes with previous model results.
- The LOM Watershed Model was extended by 250 years to allow water quality in the Pit Lake to reach steady state conditions in Post-Closure. The last year the watershed model simulates is Mine Year 332.

The revised water management plan includes a metals water treatment plant in Late Closure and Post-Closure. The metals water treatment plant will treat water from the TSF Site D supernatant pond during Years 31 to 37. The plant will also treat spillway discharge from the Pit Lake prior to discharging to TSF Site D and Sulf-IX-NF brine prior to discharge to the Pit Lake. No revisions to the LOM Watershed Model were required to simulate flow to the metals water treatment plant since modelled flow rates remain unchanged by the treatment process.

Revised water management plans for Late Closure and Post-Closure are illustrated in Appendix A and flow diagrams are presented in Appendix B.

3 – REVISIONS TO MODEL

Implementation of the modified water management strategies in the LOM Watershed Model are discussed below.

Operation of Northern and Southern Diversions in Post-Closure:

The LOM Watershed Model presented in KP (2016b) had active diversions only during the Operations phase. The Northern Diversion was active from Year 11 through 16 and the Southern Diversion was active from Year 4 through 16.

The LOM Watershed Model was revised to reactivate the Northern and Southern Diversions during Post-Closure (Year 42+). The Northern and Southern Diversions divert non-contact water around TSF Site D and convey it downstream to Davidson Creek. The diversions reduce the influx of non-contact water into TSF Site D, which decreases the spillway flows and increases the non-contact water flows to Davidson Creek. The diverted areas are shown on Figure A2.

Implementation of Sulf-IX and Nanofiltration Water Treatment Plant:

The updated LOM Watershed Model includes a Sulf-IX-NF WTP during Late Closure (Years 38 through 42) and Post-Closure (Years 43+) with the following details:

- In Late Closure, the Sulf-IX-NF WTP actively treats TSF Site D supernatant pond water at a constant inflow rate of 149 liters per second (L/s). The effluent from the plant discharges back to TSF Site D at a rate of 112 L/s. Concentrated Sulf-IX-NF brine is generated during the treatment process at a rate of 37 L/s (25% of the influent flow rate) and is discharged to the Pit Lake.
- In Post-Closure, the Sulf-IX-NF WTP switches inflow sources to treat seepage and non-contact groundwater captured in the ECD. Seepage contributing to the ECD include TSF Site D seepage and minor seepage from the Pit Lake). WTP inflow and outflow rates are maintained at 149 L/s and 112 L/s, respectively. Make-up water is pumped from the TSF Site D pond to maintain a constant WTP inflow rate during months when flow from the ECD is less than 149 L/s. WTP effluent is discharged to the Plunge Pool in Davidson Creek. Sulf-IX-NF brine discharges to the Pit Lake.

Active Water Management Pumping Rates:

A total of 5.8 million cubic meters of TSF Site D pond water is discharged to the Pit Lake as brine with the Sulf-IX-NF treatment plant in operation. The pumping rates from TSF Site D to TSF Site C and from TSF Site C to the Pit Lake during Late Closure were reduced by the brine production in order to maintain TSF pond volumes and spillway timing consistent with previous model results. The pumping rates in the updated LOM model were modified from those presented in KP (2016b) as follows:

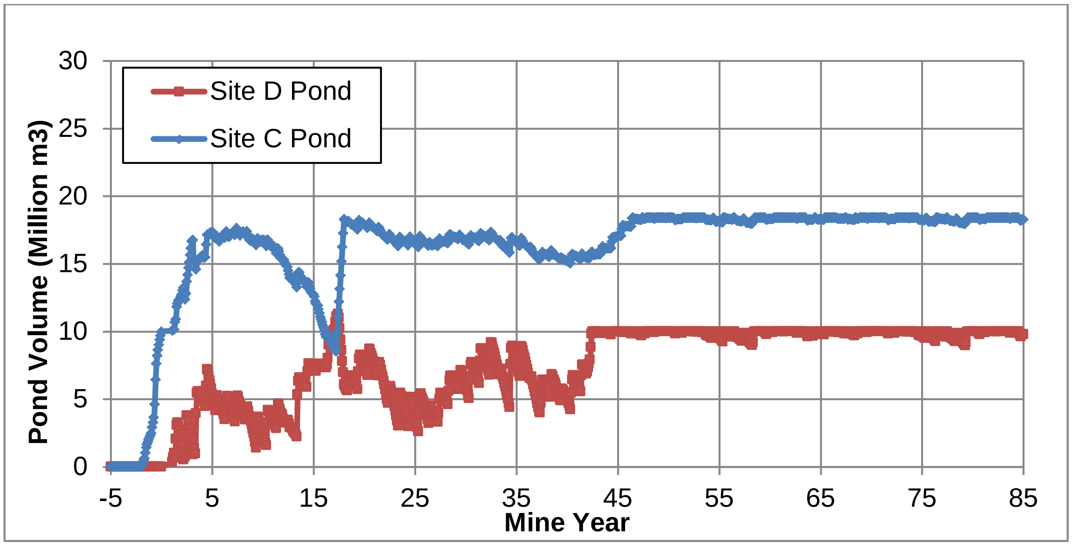
- Pumping rate from TSF Site D to TSF Site C specified at a rate of 374 m^3/hr starting in Year 38 (reduced from 500 m^3/hr previously).
- Pumping rate from TSF Site C to the Pit Lake specified at a rate of 449 m^3/hr starting in Year 38 (reduced from 575 m^3/hr previously).

4 – RESULTS OF UPDATED WATERSHED MODEL

Monthly streamflow at the 12 key model nodes are presented in Table C2 in Appendix C. Flow predictions at all model nodes during Construction, Operations, and Closure are the same as previous flow predictions presented in KP (2016b). No changes to water management were made for surface and groundwater discharges to Creek 661 and streamflow predicted at nodes on Creek 661 in Post-Closure remain unchanged from the results presented in KP (2016b) as expected.

Mean monthly streamflow at model nodes in Post-Closure are presented in Table C2. Mean monthly Post-Closure flows were calculated by averaging the monthly streamflows over one 21-year climate cycle. The footprint and water management of the mine in Post-Closure is static and averaging streamflows over any 21-year period in Post-Closure except for the initial stabilization period yields the same results. Mean monthly streamflows in Post-Closure were calculated over the period of Years 55 to 75. Mean monthly streamflows in Post-Closure are unchanged at model nodes 11-DC and nodes on Creek 661 from results presented in KP (2016b). Surface flows passing node H2 in Post-Closure in the updated model are zero since the node is located at the ECD, which is active in Post-Closure in the revised model and prevents surface water from flowing downstream at this location.

Time-series plots of TSF Site D and Site C supernatant pond volume and Pit Lake volume are presented on Figures 1 and 2, respectively. Pond volumes remain essentially unchanged from previous results presented in KP (2016b). The timing of when TSF Site D overflows to Davidson Creek and the Pit Lake starts to spill are also consistent with previous results (KP 2016b). Water is predicted to discharge from TSF Site D via the spillway to the plunge pool and hence Davidson Creek beginning in Year 42. The Pit Lake is estimated to fill in Year 41.



NOTES:

1. THE TSF SITE D SPILLWAY IS CONSTRUCTED IN YEAR 10. THE TSF SITE D POND VOLUME IS LIMITED TO APPROXIMATELY 10 Mm^3 IN POST-CLOSURE BY THE INVERT ELEVATION OF THE SPILLWAY.
2. THE TSF SITE C POND VOLUME IS LIMITED TO APPROXIMATELY 18 Mm^3 IN POST-CLOSURE BY THE INVERT ELEVATION OF THE SPILLWAY. DISCHARGE FROM THE TSF SITE C SPILLWAY FLOWS INTO THE TSF SITE D POND.

Figure 1 Simulated TSF Site D and Site C Pond Volume

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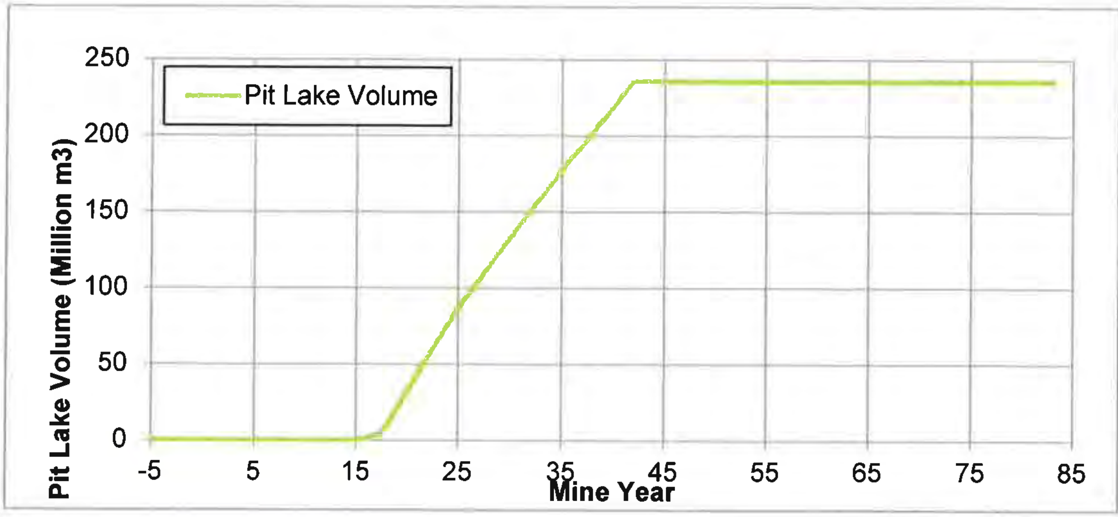
CONSULTING



NOTES:

1. THE PIT LAKE FILLS TO A MAXIMUM SPILLWAY CONTROLLED STORAGE VOLUME OF 236 Mm^3 IN YEAR 41.

Figure 2 Simulated Pit Lake Storage Volume

5 – SEEPAGE FROM STRATIFIED LAYERS OF THE PIT LAKE

The Pit Lake is conceptualized as a two-layer stratified lake with a lower layer comprised of a single water quality and an upper layer with a mixed water type (ERM, 2016). Rates of seepage leaving a Pit Lake with a 40 m upper mixed layer were previously assessed by KP and reported in the memo *Blackwater Gold Project – Pit Lake Seepage Assessment to Support Water Quality Modelling* and Mitigation (KP, 2016a). The analysis used the MODFLOW groundwater flow model developed for the Project and estimated that 55% of the total 1.3 L/s Pit Lake seepage discharges from the upper 40 m.

Current updates predict a Pit Lake with an upper mixed layer that is 3 m deep. KP was requested to estimate the proportion of the total 1.3 L/s Pit Lake seepage that would originate from this 3 m layer of the Pit Lake to support the water quality modelling updates. The proportion of the 1.3 L/s seepage that would originate from an upper mixed layer 3 m deep is considered too small to reliably assess with the MODFLOW model, particularly since this layer is much smaller than the 30 m thickness of the MODFLOW grid cells. As a result, all seepage leaving a Pit Lake with an upper mixed zone 3 m deep is conservatively estimated to consist entirely of water originating from the lower stratified layer where the water quality is expected to be poorer (ERM, 2016).

6 – CLOSURE

We trust that this memo meets the current needs of the Project team. Please contact the undersigned with any questions or comments.

PROFESSIONAL PROVINCE OF BRITISH COLUMBIA ENGINEER
Dr. C. A. STARZYK
39753
Feb 14/17

Prepared: Kevin Davenport, EIT
Intermediate Engineer

Reviewed: Cindy Starzyk, Ph.D., P.Eng.
Senior Engineer

Approval that this document adheres to Knight Piésold Quality Systems: DDF

Attachments:

Appendix A Water Management Plans
Appendix B Flow Diagrams
Appendix C Streamflow Summary Tables

References:

ERM. 2016. Blackwater Gold Project: Updated Surface Water Quality Model Report. Prepared for New Gold Inc. by ERM Consultants Canada Ltd.: Vancouver, British Columbia. August 2016.

Knight Piésold Ltd. (KP), 2014. Watershed Modelling Report. KP Ref No. VA101-457/6-6, Rev 1. Prepared for New Gold Inc. dated January 17, 2014.

Knight Piésold Ltd. (KP), 2016a. Blackwater Gold Project – Pit Lake Seepage Assessment to Support Water Quality Modelling and Mitigation. Memorandum prepared for New Gold Inc. dated August 11, 2016.

Knight Piésold Ltd. (KP), 2016b. Life of Mine Watershed Model Report. KP Ref No. VA101-457/19-12, Rev 0. Prepared for New Gold Inc. dated August 12, 2016.

/ktd

Knight Piésold
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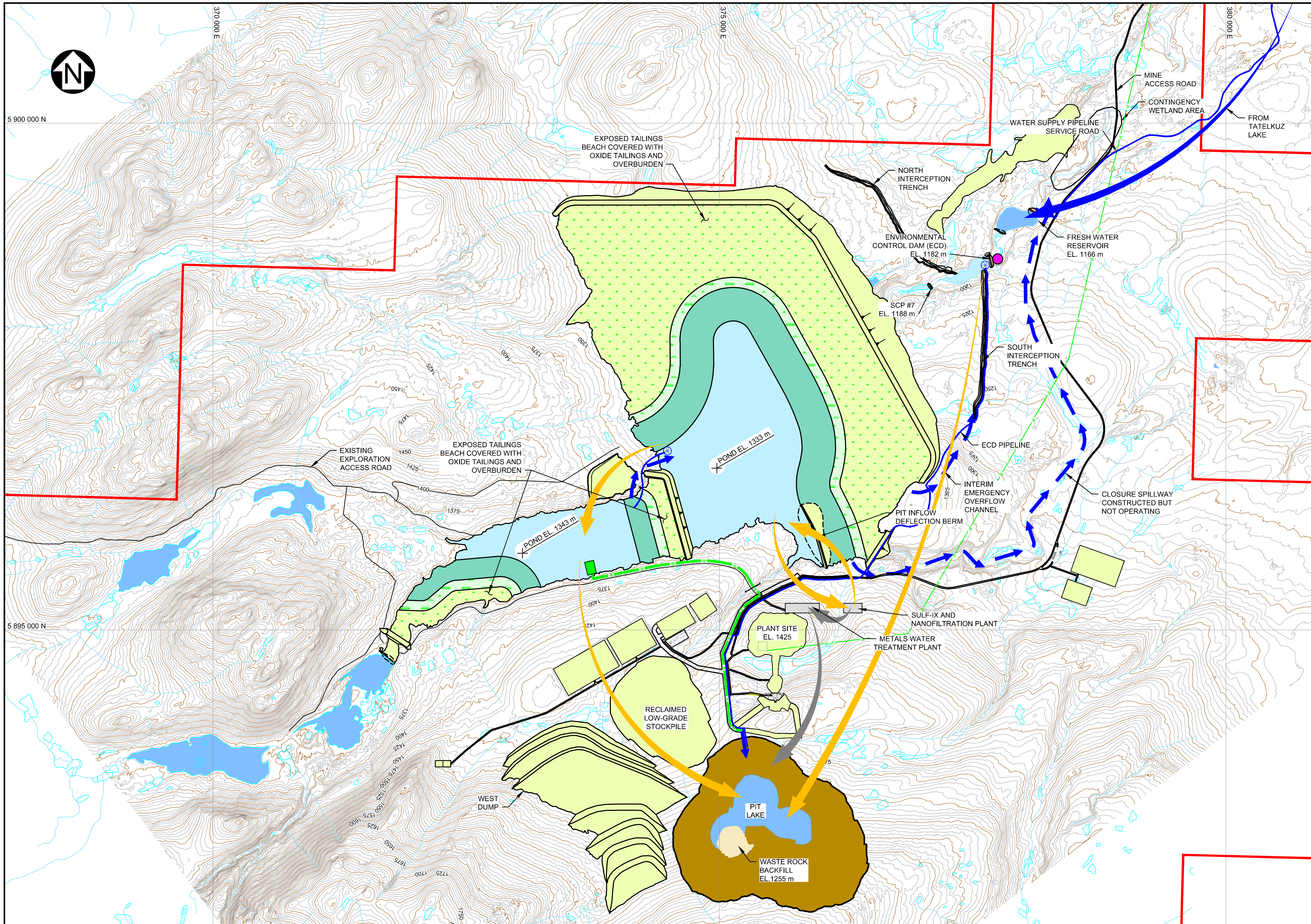
APPENDIX A

WATER MANAGEMENT PLANS

(Figures A1 to A2)



LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- MINE WATER
- FRESH WATER
- PAG WASTE ROCK
- ROCK SLOPES
- RECLAIM SYSTEM
- PUMPSTATION
- SEEPAGE SUMP AND PUMPBACK SYSTEM
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- DIVERSION CHANNEL
- EXISTING ACCESS TRAILS
- WATER RECLAIM PIPELINE
- TRANSMISSION LINE
- NEW GOLD PROPERTY BOUNDARY
- SPILLWAY
- FRESH WATER
- SITE WATER
- BRINE

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. SCP STANDS FOR SEDIMENT CONTROL POND.
4. LOCATIONS OF WATER TREATMENT PLANTS ARE APPROXIMATE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PROPOSED WATER MANAGEMENT PLAN
LATE CLOSURE (YEAR 38)

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/22	VA17-00219

FIGURE A1 REV 0

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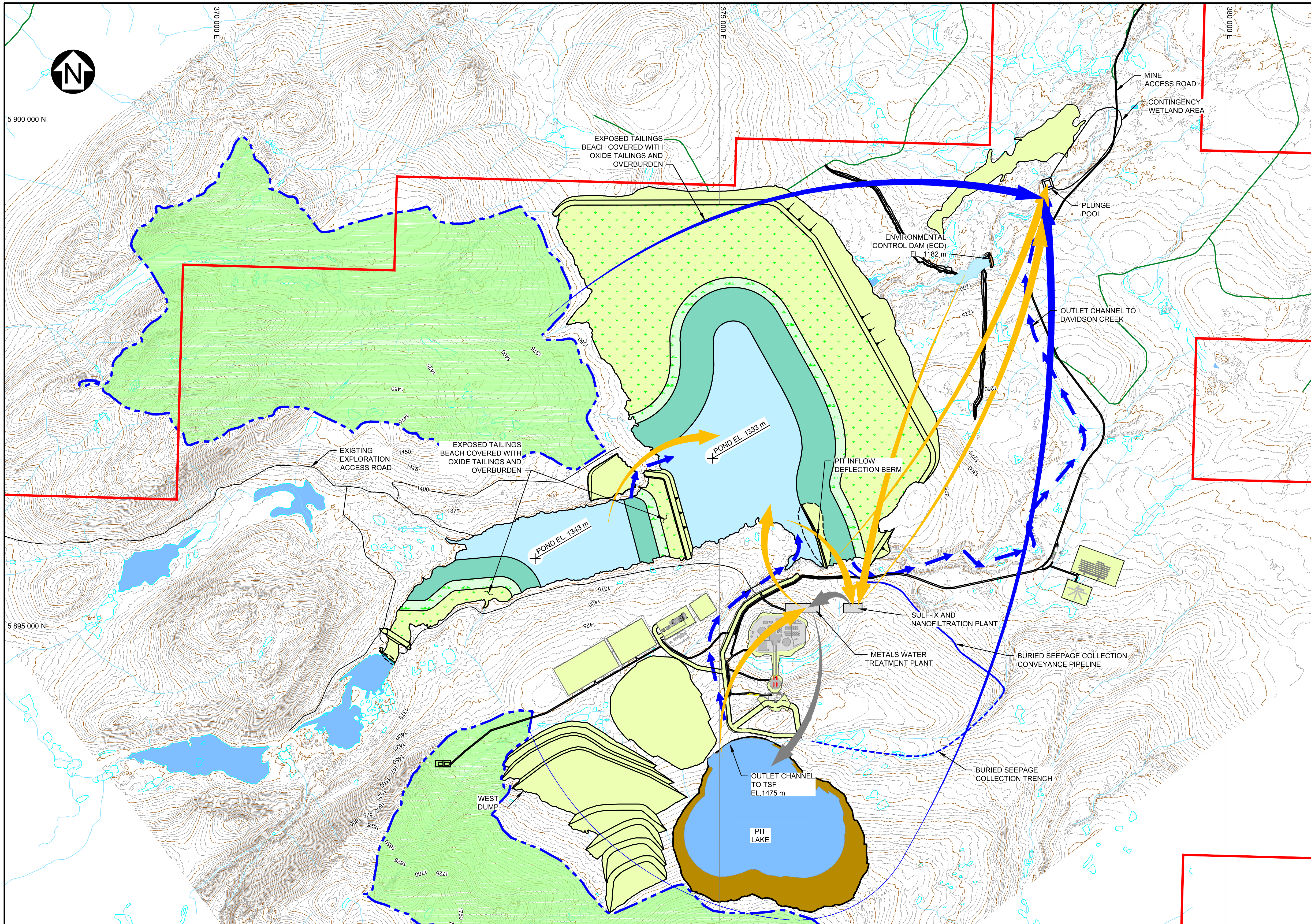

LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- MINE WATER
- FRESH WATER
- ROCK SLOPES
- MINE ACCESS ROAD
- DIVERSION CHANNEL
- EXISTING ACCESS TRAILS
- NEW GOLD PROPERTY BOUNDARY
- SPILLWAY
- SITE WATER
- FRESH WATER
- BRINE

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. SCP STANDS FOR SEDIMENT CONTROL POND.
4. LOCATIONS OF WATER TREATMENT PLANTS ARE APPROXIMATE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PROPOSED WATER MANAGEMENT PLAN POST CLOSURE

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/22	VA17-00219

FIGURE A2 — REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
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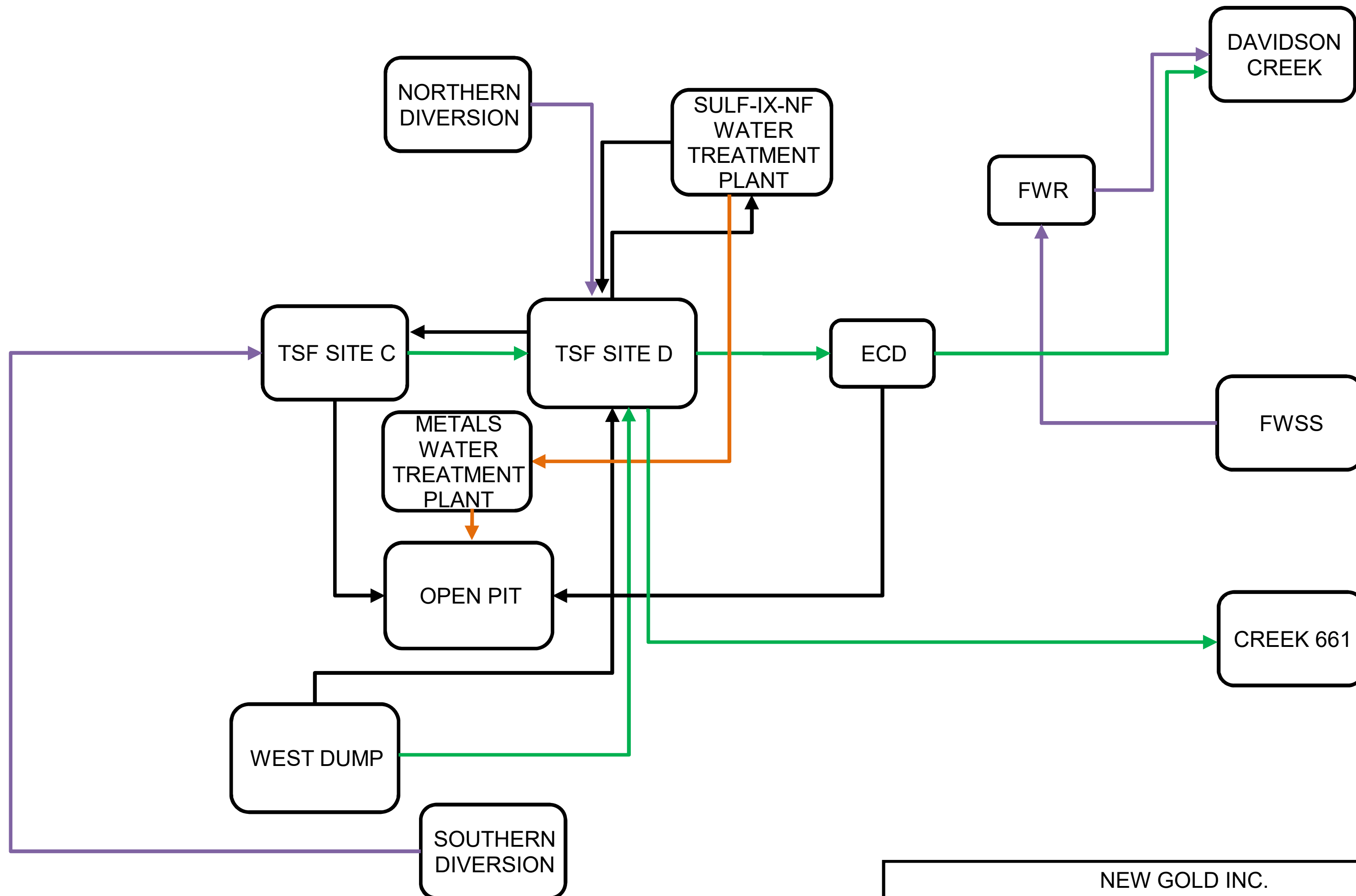
APPENDIX B

FLOW DIAGRAMS

(Figures B1 to B2)



NOTES:
1. NON-CONTACT FLOW: →
2. WATER MANAGEMENT FLOW: →
3. SPILLWAY FLOW: →
4. SEEPAGE FLOW: →
5. BRINE FLOW: →
6. ACRONYMS: ECD (ENVIRONMENTAL CONTROL DAM), FWR (FRESH WATER RESERVOIR), FWSS (FRESH WATER SUPPLY SYSTEM), TSF (TAILINGS STORAGE FACILITY)

0	14FEB'17	ISSUED WITH MEMO	KTD	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

LATE CLOSURE FLOW PATHS
(YEAR 38)

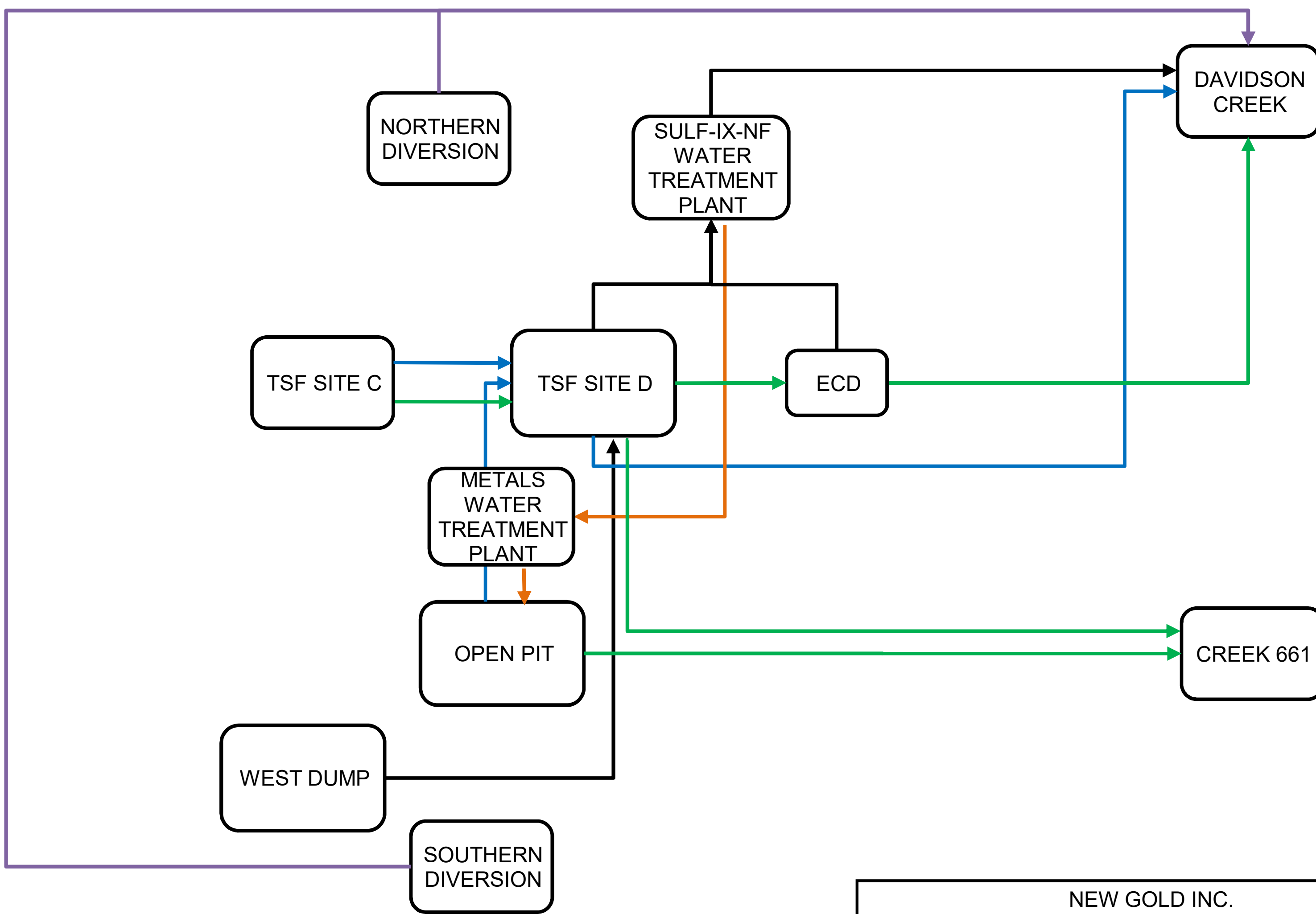
Knight Piésold CONSULTING

P/A NO. VA101-457/22

REF. NO. VA17-00219

FIGURE B1

REV 0



NOTES:
1. NON-CONTACT FLOW: →
2. WATER MANAGEMENT FLOW: →
3. SPILLWAY FLOW: →
4. SEEPAGE FLOW: →
5. BRINE FLOW: →
6. ACRONYMS: ECD (ENVIRONMENTAL CONTROL DAM), FWR (FRESH WATER RESERVOIR), FWSS (FRESH WATER SUPPLY SYSTEM), TSF (TAILINGS STORAGE FACILITY)

0	14FEB'17	ISSUED WITH MEMO	KTD	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

POST CLOSURE FLOW PATHS

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA101-457/22	VA17-00219

FIGURE B2 REV 0

APPENDIX C

STREAMFLOW SUMMARY TABLES

(Pages C-1 to C-49)

TABLE C1

NEW GOLD INC.
BLACKWATER GOLD PROJECT

UPDATED LIFE OF MINE WATERSHED MODEL
ESTIMATED MONTHLY STREAMFLOWS

Print Feb/14/17 14:22:02

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
-5	Jan	0	143	150	-	176	178	207	6	18	107	902	1,356
-5	Feb	0	134	140	-	162	163	190	5	16	97	831	1,249
-5	Mar	0	130	136	-	172	207	237	5	18	122	1,119	1,681
-5	Apr	29	539	563	-	641	726	762	72	191	717	1,934	2,907
-5	May	42	862	890	-	977	1,040	1,077	104	275	892	3,434	5,161
-5	Jun	17	492	505	-	569	586	622	48	121	361	1,704	2,561
-5	Jul	4	241	250	-	302	309	344	27	48	199	1,426	2,143
-5	Aug	1	176	183	-	225	230	263	17	30	149	740	1,112
-5	Sep	0	158	166	-	200	204	236	13	25	132	651	978
-5	Oct	0	151	158	-	188	191	222	10	24	123	822	1,235
-5	Nov	0	142	148	-	174	177	206	6	21	111	1,021	1,535
-5	Dec	0	132	138	-	159	161	190	4	19	101	989	1,486
-4	Jan	0	124	129	-	146	147	175	4	17	91	887	1,333
-4	Feb	0	116	121	-	135	135	162	3	15	83	915	1,376
-4	Mar	0	109	114	-	126	126	152	2	13	76	1,012	1,520
-4	Apr	5	157	169	-	296	398	459	5	82	373	1,249	1,877
-4	May	27	507	523	-	682	806	876	51	211	695	4,167	6,262
-4	Jun	26	533	543	-	603	629	668	62	170	480	1,911	2,871
-4	Jul	6	237	246	-	281	288	320	24	53	202	1,201	1,805
-4	Aug	4	193	201	-	232	235	265	21	54	196	955	1,435
-4	Sep	4	186	194	-	223	226	255	20	54	195	797	1,198
-4	Oct	2	181	189	-	223	237	267	18	47	198	817	1,227
-4	Nov	1	179	187	-	226	243	273	17	46	200	986	1,481
-4	Dec	0	166	174	-	205	211	240	12	29	148	987	1,483
-3	Jan	0	155	162	-	187	191	219	8	23	125	1,332	2,002
-3	Feb	0	145	151	-	172	174	201	5	20	111	1,196	1,798
-3	Mar	0	135	141	-	158	160	186	4	18	101	1,248	1,876
-3	Apr	0	130	137	-	284	400	469	4	36	251	3,518	5,287
-3	May	45	803	830	-	1,017	1,157	1,238	116	285	1,007	3,832	5,758
-3	Jun	59	1,111	1,142	-	1,216	1,248	1,290	151	337	1,055	6,019	9,045
-3	Jul	16	507	520	-	566	576	609	49	124	375	2,335	3,509
-3	Aug	3	230	239	-	273	277	308	22	45	185	1,187	1,783
-3	Sep	6	210	218	-	255	268	298	21	73	261	1,352	2,031
-3	Oct	8	215	225	-	270	287	319	23	80	289	934	1,403
-3	Nov	1	182	191	-	234	243	275	18	38	179	1,298	1,951
-3	Dec	0	166	174	-	209	216	247	13	28	143	990	1,488
-2	Jan	0	136	143	-	172	177	207	8	16	117	928	1,371
-2	Feb	0	127	134	-	158	162	190	5	14	104	1,025	1,518
-2	Mar	0	118	125	-	146	150	177	4	12	95	1,154	1,712
-2	Apr	0	123	133	-	285	403	474	4	50	315	1,712	2,549
-2	May	0	688	711	-	899	1,041	1,123	102	284	935	5,895	8,698
-2	Jun	0	737	759	-	830	863	905	127	278	840	4,301	6,270
-2	Jul	0	263	275	-	317	327	361	37	68	273	1,438	2,098
-2	Aug	0	155	164	-	195	200	230	15	24	144	826	1,205
-2	Sep	0	133	141	-	166	170	199	9	16	116	656	956
-2	Oct	0	132	141	-	171	180	210	10	25	137	1,022	1,504
-2	Nov	0	130	138	-	176	188	219	9	27	146	1,094	1,611
-2	Dec	0	121	129	-	165	174	204	6	18	123	949	1,396
-1	Jan	0	22	125	-	155	161	191	5	14	110	796	1,220
-1	Feb	0	20	125	-	152	157	186	4	13	101	779	1,206
-1	Mar	0	19	125	-	154	160	189	4	12	98	949	1,470
-1	Apr	0	61	125	-	226	305	351	47	162	617	1,065	1,416
-1	May	0	70	570	-	693	786	838	74	228	785	2,672	4,073
-1	Jun	0	30	560	-	621	646	683	40	95	314	1,009	1,868
-1	Jul	0	20	240	-	282	293	326	19	33	166	1,178	1,886
-1	Aug	0	17	150	-	183	190	221	11	18	122	547	865
-1	Sep	0	15	115	-	141	147	177	6	14	103	496	757
-1	Oct	0	13	115	-	136	141	169	4	12	95	805	1,231
-1	Nov	0	12	115	-	133	137	165	4	11	89	980	1,502
-1	Dec	0	11	125	-	141	144	171	3	10	82	890	1,391
1	Jan	0	0	125	-	138	140	166	2	8	74	859	1,359
1	Feb	0	0	125	-	136	137	162	2	7	66	877	1,394
1	Mar	0	0	125	-	135	136	161	1	5	61	952	1,512
1	Apr	0	0	125	-	194	258	295	2	61	280	1,345	2,062
1	May	0	0	570	-	665	744	786	77	234	813	2,185	3,481
1	Jun	0	0	560	-	615	636	670	102	231	751	2,838	4,262
1	Jul	0	0	240	-	282	291	322	39	73	274	1,265	1,856
1	Aug	0	0	150	-	183	188	218	20	25	145	1,001	1,519
1	Sep	0	0	115	-	142	146	174	12	14	109	867	1,313
1	Oct	0	0	115	-	137	140	167	7	11	93	894	1,371
1	Nov	0	0	115	-	133	136	162	3	9	81	1,048	1,614
1	Dec	0	0	125	-	140	142	168	2	7	74	966	1,513

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
2	Jan	0	0	125	-	137	138	163	1	6	67	817	1,297
2	Feb	0	0	125	-	134	135	159	1	5	60	812	1,296
2	Mar	0	0	125	-	133	134	157	0	3	55	787	1,264
2	Apr	0	0	125	-	177	230	260	0	9	105	1,150	1,814
2	May	0	0	570	-	651	724	760	120	254	877	1,106	1,866
2	Jun	0	0	560	-	628	668	702	161	327	1,106	1,864	2,566
2	Jul	0	0	240	-	304	329	364	52	116	431	1,206	1,727
2	Aug	0	0	150	-	205	217	250	24	37	198	648	971
2	Sep	0	0	115	-	163	171	204	17	23	150	614	911
2	Oct	0	0	115	-	167	194	228	16	36	198	688	1,027
2	Nov	0	0	115	-	179	214	250	15	40	216	1,003	1,501
2	Dec	0	0	125	-	184	204	239	10	22	151	803	1,228
3	Jan	0	0	125	-	173	185	219	6	16	124	752	1,163
3	Feb	0	0	125	-	164	173	206	2	13	109	724	1,131
3	Mar	0	0	125	-	161	170	201	2	12	103	732	1,150
3	Apr	0	0	125	-	231	314	364	1	19	171	944	1,477
3	May	0	0	570	-	698	796	852	121	254	897	1,145	1,997
3	Jun	0	0	560	-	627	655	695	156	284	989	1,835	2,530
3	Jul	0	0	240	-	288	301	336	45	74	321	1,068	1,554
3	Aug	0	0	150	-	187	196	229	17	27	164	693	1,054
3	Sep	0	0	115	-	144	151	183	8	16	122	515	780
3	Oct	0	0	115	-	141	148	180	4	14	109	517	798
3	Nov	0	0	115	-	140	147	178	2	12	103	764	1,178
3	Dec	0	0	125	-	145	152	182	1	11	94	755	1,188
4	Jan	0	0	125	-	141	146	174	1	9	84	729	1,158
4	Feb	0	0	125	-	137	141	169	0	7	76	753	1,201
4	Mar	0	0	125	-	133	137	163	0	6	69	712	1,146
4	Apr	0	0	125	-	140	153	181	0	5	70	927	1,473
4	May	0	0	570	-	681	779	832	138	316	1,095	1,820	2,651
4	Jun	0	0	560	-	698	806	865	176	321	1,265	3,416	4,674
4	Jul	0	0	240	-	301	329	368	46	75	347	1,167	1,617
4	Aug	0	0	150	-	188	198	232	13	22	141	598	910
4	Sep	0	0	115	-	143	149	180	4	11	92	578	889
4	Oct	0	0	115	-	138	143	173	2	8	80	575	902
4	Nov	0	0	115	-	138	144	174	1	7	78	740	1,157
4	Dec	0	0	125	-	147	152	182	0	6	72	720	1,150
5	Jan	0	0	125	-	141	146	174	0	4	65	701	1,129
5	Feb	0	0	125	-	137	141	168	0	3	59	674	1,095
5	Mar	0	0	125	-	133	136	162	0	2	53	775	1,231
5	Apr	0	0	182	-	280	368	420	0	20	184	981	1,617
5	May	0	0	788	-	914	1,020	1,080	75	173	666	1,369	2,466
5	Jun	0	0	671	-	720	745	781	96	189	654	1,690	2,689
5	Jul	0	0	305	-	334	342	373	23	45	206	878	1,470
5	Aug	0	0	220	-	241	244	273	6	14	104	504	896
5	Sep	0	0	173	-	191	194	223	3	24	107	513	850
5	Oct	0	0	115	-	175	228	261	28	114	429	742	1,003
5	Nov	0	0	115	-	191	256	292	35	119	486	958	1,276
5	Dec	0	0	125	-	170	187	221	16	33	190	822	1,225
6	Jan	0	0	125	-	157	164	195	8	14	116	730	1,122
6	Feb	0	0	125	-	150	153	184	4	9	93	706	1,102
6	Mar	0	0	125	-	160	190	222	3	10	102	843	1,295
6	Apr	0	0	181	-	256	335	372	76	191	729	1,250	1,622
6	May	0	0	855	-	943	1,007	1,047	123	254	919	1,306	2,353
6	Jun	0	0	660	-	725	745	783	67	90	361	812	1,595
6	Jul	0	0	307	-	358	368	404	28	31	187	935	1,562
6	Aug	0	0	220	-	262	269	304	17	19	144	888	1,436
6	Sep	0	0	173	-	220	243	278	24	67	293	1,669	2,488
6	Oct	0	0	115	-	179	225	263	31	98	399	1,171	1,652
6	Nov	0	0	115	-	187	224	264	26	55	279	2,994	4,444
6	Dec	0	0	125	-	190	208	247	19	27	184	1,705	2,548
7	Jan	0	0	125	-	177	190	227	14	19	149	1,280	1,925
7	Feb	0	0	125	-	168	178	214	9	16	130	1,238	1,875
7	Mar	0	0	125	-	165	175	210	7	15	124	1,711	2,570
7	Apr	0	0	188	-	285	358	405	105	238	898	3,287	4,441
7	May	0	0	832	-	947	1,032	1,083	134	272	1,052	5,424	8,215
7	Jun	0	0	670	-	732	758	799	46	70	332	2,960	4,872
7	Jul	0	0	357	-	406	420	458	29	46	211	1,423	2,331
7	Aug	0	0	219	-	262	274	311	24	41	185	976	1,528
7	Sep	0	0	173	-	206	216	251	18	23	147	931	1,426
7	Oct	0	0	115	-	157	188	225	19	59	267	1,558	2,302
7	Nov	0	0	115	-	168	207	245	20	68	299	1,427	2,099
7	Dec	0	0	125	-	173	191	228	15	28	172	1,112	1,660
8	Jan	0	0	125	-	164	176	211	10	18	131	921	1,388
8	Feb	0	0	125	-	156	166	200	6	14	113	798	1,215
8	Mar	0	0	125	-	151	160	193	2	12	100	833	1,257
8	Apr	0	0	181	-	286	372	426	36	133	550	1,148	1,575
8	May	0	0	855	-	984	1,086	1,146	87	212	795	2,078	3,439
8	Jun	0	0	637	-	696	723	764	70	109	410	1,744	2,928
8	Jul	0	0	313	-	352	364	400	28	35	190	919	1,532
8	Aug	0	0	207	-	236	243	277	15	18	132	580	950
8	Sep	0	0	173	-	195	201	233	9	13	109	494	794
8	Oct	0	0	115	-	133	139	170	4	11	97	592	898
8	Nov	0	0	115	-	130	135	165	2	9	87	963	1,467
8	Dec	0	0	125	-	136	140	169	1	7	79	884	1,373
9	Jan	0	0	125	-	133	136	164	1	6	71	883	1,379

Knight Piésold
CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
9	Feb	0	0	125	-	130	132	159	0	4	64	873	1,372
9	Mar	0	0	125	-	129	130	157	0	3	59	1,038	1,605
9	Apr	0	0	179	-	265	347	395	0	12	141	1,895	2,977
9	May	0	0	855	-	971	1,070	1,126	112	220	820	5,127	7,948
9	Jun	0	0	768	-	829	864	902	158	305	1,054	10,066	14,989
9	Jul	0	0	308	-	359	382	417	57	122	464	2,717	4,008
9	Aug	0	0	220	-	259	269	302	21	34	187	1,638	2,518
9	Sep	0	0	173	-	205	212	244	13	17	131	1,244	1,914
9	Oct	0	0	115	-	154	173	206	14	37	191	2,064	3,090
9	Nov	0	0	115	-	160	182	216	13	42	207	1,970	2,948
9	Dec	0	0	125	-	163	175	207	9	19	138	1,383	2,093
10	Jan	0	0	124	125	155	163	194	5	13	112	1,142	1,744
10	Feb	0	0	125	125	149	155	185	2	11	98	1,108	1,704
10	Mar	0	0	125	125	147	153	183	1	9	91	1,128	1,722
10	Apr	0	0	179	179	200	206	235	1	9	87	1,173	1,871
10	May	0	0	809	855	923	984	1,021	128	145	792	6,568	9,975
10	Jun	0	0	592	647	733	807	847	161	174	953	2,609	3,712
10	Jul	0	0	295	306	353	374	408	39	44	280	994	1,558
10	Aug	0	0	217	220	254	263	296	12	17	136	890	1,433
10	Sep	0	0	172	173	200	206	238	6	12	105	811	1,285
10	Oct	0	0	113	115	142	149	180	4	15	107	813	1,238
10	Nov	0	0	113	115	154	177	210	5	18	122	1,133	1,717
10	Dec	0	0	124	125	168	194	227	3	15	117	1,020	1,571
11	Jan	0	0	125	125	159	170	202	2	13	106	942	1,451
11	Feb	0	0	125	125	152	159	190	1	11	96	930	1,443
11	Mar	0	0	125	125	146	152	181	1	9	87	989	1,517
11	Apr	0	0	179	180	279	365	417	0	18	168	1,698	2,667
11	May	0	0	778	833	960	1,062	1,120	125	147	809	3,424	5,233
11	Jun	0	0	641	697	754	781	819	158	166	877	3,701	5,319
11	Jul	0	0	300	312	349	359	393	38	44	274	1,633	2,498
11	Aug	0	0	203	206	233	239	271	10	18	136	696	1,125
11	Sep	0	0	172	173	193	198	228	4	11	101	610	988
11	Oct	0	0	115	115	131	134	163	2	9	87	662	1,026
11	Nov	0	0	115	115	127	129	157	1	7	78	1,137	1,750
11	Dec	0	0	125	125	133	135	162	0	5	70	921	1,449
12	Jan	0	0	125	125	130	131	157	0	4	62	890	1,409
12	Feb	0	0	125	125	128	128	153	0	2	56	894	1,421
12	Mar	0	0	125	125	186	251	289	0	6	106	916	1,442
12	Apr	0	0	168	178	262	342	385	0	28	186	1,566	2,460
12	May	0	0	834	855	894	912	945	24	60	258	2,568	4,591
12	Jun	0	0	639	653	678	683	712	33	49	228	2,129	3,678
12	Jul	0	0	295	299	317	318	346	10	18	129	959	1,643
12	Aug	0	0	204	205	218	219	246	2	11	98	568	976
12	Sep	0	0	172	173	182	182	208	1	8	86	3,999	6,100
12	Oct	0	0	115	115	122	122	147	0	7	82	2,416	3,669
12	Nov	0	0	115	115	120	120	144	0	7	78	1,469	2,249
12	Dec	0	0	125	125	127	127	151	0	5	71	1,054	1,648
13	Jan	0	0	125	125	126	126	148	0	4	64	527	863
13	Feb	0	0	125	125	126	126	147	0	3	57	565	929
13	Mar	0	0	125	125	126	126	147	0	1	52	1,127	1,759
13	Apr	0	0	177	177	187	208	230	0	2	56	7,999	12,161
13	May	0	0	751	855	1,019	1,162	1,232	259	289	1,515	14,626	21,205
13	Jun	0	0	596	663	865	1,015	1,097	224	220	1,333	9,920	14,319
13	Jul	0	0	337	357	438	473	516	55	67	403	5,389	8,114
13	Aug	0	0	199	208	262	273	307	20	35	211	2,376	3,614
13	Sep	0	0	170	173	212	218	249	9	14	122	970	1,512
13	Oct	0	0	114	115	146	150	179	4	9	95	768	1,172
13	Nov	0	0	115	115	139	142	170	2	7	83	940	1,443
13	Dec	0	0	125	125	143	145	173	1	5	74	524	842
14	Jan	0	0	125	125	138	140	166	0	4	67	527	855
14	Feb	0	0	125	125	134	135	161	0	2	60	565	920
14	Mar	0	0	125	125	131	131	156	0	1	54	1,127	1,749
14	Apr	0	0	187	188	287	375	428	0	14	158	2,202	3,453
14	May	0	0	802	847	976	1,083	1,143	111	132	734	5,357	8,232
14	Jun	0	0	656	710	760	783	819	142	147	774	4,740	6,991
14	Jul	0	0	289	300	331	337	367	35	38	240	2,156	3,296
14	Aug	0	0	218	220	241	243	272	8	14	117	1,339	2,118
14	Sep	0	0	169	170	186	187	214	3	8	87	908	1,445
14	Oct	0	0	115	115	127	127	153	1	5	74	688	1,074
14	Nov	0	0	115	115	123	123	148	1	4	66	938	1,460
14	Dec	0	0	125	125	130	130	154	0	3	59	608	987
15	Jan	0	0	125	125	127	127	151	0	1	53	952	1,510
15	Feb	0	0	125	125	126	126	148	0	0	48	957	1,523
15	Mar	0	0	125	125	139	161	186	0	1	53	1,603	2,499
15	Apr	0	0	110	125	155	184	211	3	35	192	1,890	2,855
15	May	0	0	547	570	598	606	633	16	61	272	1,948	3,419
15	Jun	0	0	549	560	582	585	611	19	37	173	1,592	2,883
15	Jul	0	0	238	240	257	258	283	8	14	110	1,078	1,788
15	Aug	0	0	149	150	163	163	187	2	8	88	578	945
15	Sep	0	0	115	115	124	124	147	1	5	77	562	885
15	Oct	0	0	115	115	121	121	143	0	4	69	722	1,133
15	Nov	0	0	115	115	118	118	140	0	3	63	968	1,511
15	Dec	0	0	125	125	126	126	147	0	1	57	767	1,230
16	Jan	0	0	125	125	126	126	146	0	0	51	670	1,092
16	Feb	0	0	125	125	126	126	145	0	0	46	731	1,190

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
16	Mar	0	0	125	125	126	126	145	0	0	42	866	1,399
16	Apr	0	0	108	125	178	237	268	11	53	323	1,010	1,483
16	May	0	0	533	570	646	717	753	64	115	589	3,523	5,413
16	Jun	0	0	508	560	674	764	812	133	169	875	1,824	2,636
16	Jul	0	0	204	243	372	468	521	105	132	754	1,464	1,985
16	Aug	0	0	142	150	209	229	264	35	33	240	970	1,374
16	Sep	0	0	113	115	154	159	189	18	14	132	679	989
16	Oct	0	0	111	115	149	151	181	16	17	126	643	951
16	Nov	0	0	111	115	148	151	180	14	19	128	1,063	1,585
16	Dec	0	0	124	125	152	155	183	10	12	110	805	1,224
17	Jan	0	0	125	125	146	148	175	5	9	96	775	1,204
17	Feb	0	0	125	125	141	142	169	3	8	85	701	1,104
17	Mar	0	0	125	125	156	190	219	2	11	111	986	1,536
17	Apr	0	0	88	125	198	283	317	69	109	630	1,793	2,342
17	May	0	0	526	570	653	715	752	100	135	748	2,798	4,216
17	Jun	0	0	551	560	619	636	671	47	49	287	1,089	1,997
17	Jul	0	0	238	240	287	295	329	26	25	174	1,174	1,879
17	Aug	0	0	149	150	188	192	224	17	18	136	587	922
17	Sep	0	0	115	115	145	149	180	12	16	121	534	807
17	Oct	0	0	115	115	140	143	173	9	15	113	705	1,071
17	Nov	0	0	115	115	136	138	167	5	13	102	904	1,380
17	Dec	0	0	125	125	141	143	170	2	11	90	859	1,337
18	Jan	0	0	125	125	136	137	164	1	10	82	757	1,192
18	Feb	0	0	125	125	133	133	159	0	8	74	785	1,243
18	Mar	0	0	125	125	131	131	156	0	7	67	881	1,394
18	Apr	0	0	114	125	244	346	406	1	55	342	1,117	1,700
18	May	0	0	542	570	723	845	915	47	111	590	3,543	5,687
18	Jun	0	0	538	560	614	640	679	59	77	382	1,292	2,266
18	Jul	0	0	235	240	270	277	308	23	27	174	945	1,538
18	Aug	0	0	143	150	176	179	208	20	31	171	794	1,217
18	Sep	0	0	108	115	139	142	171	19	32	172	674	989
18	Oct	0	0	111	115	144	158	187	17	30	180	696	1,027
18	Nov	0	0	111	115	149	165	196	16	30	184	866	1,284
18	Dec	0	0	124	125	152	158	187	11	19	138	858	1,300
19	Jan	0	0	125	125	146	149	177	7	15	116	1,204	1,830
19	Feb	0	0	125	125	141	143	170	3	13	102	1,066	1,634
19	Mar	0	0	125	125	137	138	164	1	11	92	1,117	1,721
19	Apr	0	0	125	125	269	386	455	1	30	244	3,382	5,131
19	May	0	0	516	570	753	895	976	112	154	875	3,207	4,881
19	Jun	0	0	504	560	629	661	703	147	165	882	5,378	7,828
19	Jul	0	0	228	240	282	292	325	48	52	303	2,040	2,924
19	Aug	0	0	147	150	180	184	215	21	24	164	1,024	1,524
19	Sep	0	0	106	115	148	160	191	19	42	230	1,222	1,790
19	Oct	0	0	105	115	157	173	205	22	48	255	804	1,156
19	Nov	0	0	113	115	155	164	196	17	25	166	1,178	1,748
19	Dec	0	0	124	125	157	163	194	12	18	134	861	1,303
20	Jan	0	0	125	125	150	155	185	8	15	115	802	1,227
20	Feb	0	0	125	125	145	149	178	4	13	102	899	1,382
20	Mar	0	0	125	125	142	145	173	1	11	92	1,026	1,583
20	Apr	0	0	122	125	273	391	461	2	44	307	1,584	2,415
20	May	0	0	532	570	754	896	977	102	144	795	5,246	7,926
20	Jun	0	0	517	560	627	659	701	126	134	696	3,663	5,453
20	Jul	0	0	231	240	278	289	322	37	39	244	1,183	1,811
20	Aug	0	0	148	150	177	182	213	14	18	137	672	1,038
20	Sep	0	0	114	115	137	140	170	8	14	114	540	813
20	Oct	0	0	113	115	142	150	180	9	20	132	905	1,360
20	Nov	0	0	113	115	150	162	193	8	22	140	976	1,469
20	Dec	0	0	124	125	158	166	197	4	16	121	822	1,264
21	Jan	0	0	125	125	151	157	187	2	14	106	763	1,186
21	Feb	0	0	125	125	147	153	182	1	12	98	750	1,175
21	Mar	0	0	125	125	149	156	185	1	11	95	922	1,440
21	Apr	0	0	96	125	222	300	347	44	95	549	965	1,312
21	May	0	0	535	570	688	781	833	73	124	681	2,533	3,949
21	Jun	0	0	553	560	616	641	678	39	48	268	933	1,794
21	Jul	0	0	238	240	278	289	322	18	23	155	1,142	1,849
21	Aug	0	0	149	150	178	185	216	10	16	119	522	838
21	Sep	0	0	115	115	137	142	172	5	13	102	474	733
21	Oct	0	0	115	115	132	136	165	2	12	92	783	1,207
21	Nov	0	0	115	115	128	132	160	1	11	87	959	1,478
21	Dec	0	0	125	125	135	138	165	1	9	79	872	1,369
22	Jan	0	0	125	125	132	134	160	0	7	71	853	1,348
22	Feb	0	0	125	125	129	131	156	0	6	65	873	1,384
22	Mar	0	0	125	125	128	130	154	0	5	60	949	1,504
22	Apr	0	0	115	125	186	249	286	0	42	258	1,334	2,051
22	May	0	0	525	570	657	735	777	75	135	709	2,138	3,451
22	Jun	0	0	518	560	609	629	663	100	125	641	2,781	4,222
22	Jul	0	0	231	240	276	285	316	37	42	241	1,241	1,833
22	Aug	0	0	148	150	177	182	212	18	19	138	994	1,509
22	Sep	0	0	114	115	136	140	168	11	13	107	865	1,307
22	Oct	0	0	115	115	131	134	161	6	11	92	894	1,366
22	Nov	0	0	115	115	128	130	156	2	9	80	1,048	1,609
22	Dec	0	0	125	125	135	136	162	1	7	73	965	1,508
23	Jan	0	0	125	125	131	132	157	0	6	66	817	1,292
23	Feb	0	0	125	125	129	129	153	0	4	60	812	1,292
23	Mar	0	0	125	125	128	128	152	0	3	55	787	1,260

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
23	Apr	0	0	125	125	173	227	257	0	9	107	1,150	1,810
23	May	0	0	518	570	647	722	757	120	140	766	1,055	1,812
23	Jun	0	0	498	560	624	664	698	161	187	969	1,800	2,498
23	Jul	0	0	221	240	299	325	359	51	72	388	1,185	1,706
23	Aug	0	0	145	150	201	212	246	24	28	188	644	964
23	Sep	0	0	113	115	159	167	200	17	19	147	613	908
23	Oct	0	0	111	115	163	190	224	15	30	191	685	1,023
23	Nov	0	0	111	115	175	211	246	15	33	208	1,001	1,497
23	Dec	0	0	124	125	181	200	236	10	21	150	803	1,226
24	Jan	0	0	125	125	170	182	215	6	16	124	752	1,161
24	Feb	0	0	125	125	161	170	203	2	14	109	724	1,130
24	Mar	0	0	125	125	158	167	199	2	12	103	732	1,149
24	Apr	0	0	125	125	229	311	361	1	19	171	945	1,476
24	May	0	0	517	570	696	793	849	121	143	786	1,100	1,949
24	Jun	0	0	504	560	625	652	692	156	164	868	1,784	2,477
24	Jul	0	0	228	240	285	299	334	45	48	295	1,057	1,546
24	Aug	0	0	147	150	185	194	227	16	22	159	691	1,052
24	Sep	0	0	114	115	142	149	182	8	16	121	515	780
24	Oct	0	0	115	115	139	146	178	4	14	109	518	798
24	Nov	0	0	115	115	138	145	176	2	13	103	765	1,178
24	Dec	0	0	125	125	144	150	180	1	11	94	756	1,188
25	Jan	0	0	125	125	139	144	173	1	9	84	729	1,157
25	Feb	0	0	125	125	135	140	167	0	7	76	753	1,201
25	Mar	0	0	125	125	132	135	162	0	6	69	713	1,146
25	Apr	0	0	125	125	139	152	180	0	6	70	927	1,473
25	May	0	0	500	570	680	778	830	138	175	953	1,727	2,558
25	Jun	0	0	500	560	697	805	864	176	198	1,143	3,270	4,541
25	Jul	0	0	227	240	300	328	367	46	50	322	1,086	1,539
25	Aug	0	0	147	150	187	197	231	13	18	136	580	892
25	Sep	0	0	114	115	142	148	179	4	10	91	573	884
25	Oct	0	0	115	115	137	142	172	2	8	80	573	899
25	Nov	0	0	115	115	138	143	173	1	7	78	738	1,156
25	Dec	0	0	125	125	146	151	181	0	6	73	719	1,150
26	Jan	0	0	125	125	141	145	173	0	5	65	701	1,130
26	Feb	0	0	125	125	136	140	167	0	3	59	674	1,095
26	Mar	0	0	125	125	133	135	162	0	2	53	733	1,189
26	Apr	0	0	125	125	221	308	360	0	20	183	981	1,560
26	May	0	0	538	570	694	800	859	74	108	596	1,284	2,171
26	Jun	0	0	521	560	609	633	669	93	111	569	1,583	2,481
26	Jul	0	0	232	240	269	277	308	21	29	187	853	1,382
26	Aug	0	0	148	150	170	174	203	6	11	100	497	820
26	Sep	0	0	111	115	133	136	165	3	17	99	503	783
26	Oct	0	0	94	115	174	228	261	26	73	385	715	976
26	Nov	0	0	94	115	191	256	292	33	77	441	934	1,256
26	Dec	0	0	120	125	170	187	220	14	25	178	813	1,216
27	Jan	0	0	124	125	157	163	195	6	12	112	724	1,117
27	Feb	0	0	125	125	150	153	184	3	9	92	703	1,100
27	Mar	0	0	125	125	160	190	222	3	10	102	799	1,251
27	Apr	0	0	85	125	202	281	318	74	113	651	1,217	1,536
27	May	0	0	520	570	660	725	764	122	157	823	1,162	1,926
27	Jun	0	0	547	560	625	645	683	65	66	336	707	1,391
27	Jul	0	0	237	240	291	301	337	26	26	180	908	1,469
27	Aug	0	0	149	150	192	199	234	15	18	142	879	1,356
27	Sep	0	0	105	115	162	185	221	22	48	271	1,647	2,409
27	Oct	0	0	99	115	179	225	263	29	68	367	1,145	1,626
27	Nov	0	0	108	115	187	224	264	24	43	265	2,980	4,430
27	Dec	0	0	123	125	190	208	247	17	25	179	1,698	2,540
28	Jan	0	0	124	125	177	190	227	12	19	146	1,274	1,919
28	Feb	0	0	125	125	167	178	214	7	16	128	1,234	1,870
28	Mar	0	0	125	125	165	175	210	5	16	122	1,665	2,525
28	Apr	0	0	75	125	223	295	343	103	141	798	3,247	4,343
28	May	0	0	516	570	684	769	821	132	167	945	5,307	7,840
28	Jun	0	0	549	560	622	648	689	45	49	309	2,868	4,671
28	Jul	0	0	234	240	289	303	342	27	35	198	1,391	2,183
28	Aug	0	0	145	150	193	204	241	22	32	175	957	1,440
28	Sep	0	0	114	115	149	159	194	16	21	143	920	1,358
28	Oct	0	0	107	115	157	188	225	17	44	249	1,544	2,288
28	Nov	0	0	105	115	168	207	245	19	49	279	1,412	2,085
28	Dec	0	0	123	125	173	191	228	13	25	166	1,103	1,652
29	Jan	0	0	124	125	164	176	211	8	18	129	915	1,382
29	Feb	0	0	125	125	156	166	200	4	15	111	793	1,210
29	Mar	0	0	125	125	151	160	193	2	13	100	788	1,213
29	Apr	0	0	101	125	230	317	371	35	86	502	1,127	1,500
29	May	0	0	531	570	699	801	861	86	137	719	1,945	3,022
29	Jun	0	0	542	560	618	646	687	68	75	374	1,640	2,748
29	Jul	0	0	236	240	278	290	326	26	28	181	893	1,433
29	Aug	0	0	149	150	179	186	220	13	16	129	571	885
29	Sep	0	0	115	115	137	143	175	7	13	107	489	732
29	Oct	0	0	115	115	133	139	170	3	11	95	589	895
29	Nov	0	0	115	115	130	135	165	2	9	87	962	1,467
29	Dec	0	0	125	125	136	140	169	1	8	79	884	1,373
30	Jan	0	0	125	125	133	136	164	1	6	71	883	1,380
30	Feb	0	0	125	125	130	132	159	0	4	63	873	1,372
30	Mar	0	0	125	125	129	130	157	0	3	58	996	1,564
30	Apr	0	0	125	125	211	293	341	0	12	140	1,895	2,923

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
30	May	0	0	524	570	686	785	841	111	131	728	5,019	7,559
30	Jun	0	0	496	560	621	656	694	155	182	924	9,915	14,636
30	Jul	0	0	217	240	291	314	349	55	78	416	2,649	3,873
30	Aug	0	0	145	150	189	198	231	19	25	175	1,620	2,431
30	Sep	0	0	114	115	148	155	186	11	15	127	1,236	1,849
30	Oct	0	0	110	115	154	173	205	12	28	180	2,055	3,080
30	Nov	0	0	109	115	160	182	216	12	31	194	1,961	2,939
30	Dec	0	0	124	125	163	174	207	7	18	133	1,377	2,088
31	Jan	0	0	124	125	155	163	194	3	13	109	1,138	1,740
31	Feb	0	0	125	125	149	155	185	2	11	98	1,107	1,702
31	Mar	0	0	125	125	147	153	183	1	9	91	1,085	1,679
31	Apr	0	0	125	125	146	152	181	1	9	87	1,172	1,816
31	May	0	0	523	570	639	701	738	127	145	793	6,460	9,578
31	Jun	0	0	505	560	648	723	764	160	175	955	2,516	3,531
31	Jul	0	0	228	240	287	308	343	38	44	279	971	1,468
31	Aug	0	0	147	150	184	193	226	10	17	134	881	1,354
31	Sep	0	0	114	115	143	149	180	5	12	103	806	1,222
31	Oct	0	0	113	115	142	149	180	3	15	106	809	1,234
31	Nov	0	0	113	115	154	177	210	3	18	120	1,129	1,713
31	Dec	0	0	124	125	168	194	228	3	15	117	1,019	1,569
32	Jan	0	0	125	125	159	170	202	2	13	105	918	1,427
32	Feb	0	0	125	125	152	159	190	1	11	95	908	1,420
32	Mar	0	0	125	125	146	152	182	1	9	86	925	1,453
32	Apr	0	0	125	125	225	310	362	0	18	167	1,678	2,592
32	May	0	0	515	570	696	799	857	125	147	808	3,188	4,735
32	Jun	0	0	504	560	617	643	682	156	166	874	3,428	4,910
32	Jul	0	0	228	240	277	287	321	36	44	271	1,549	2,343
32	Aug	0	0	147	150	177	184	215	9	18	135	657	1,030
32	Sep	0	0	114	115	136	141	171	4	11	100	582	903
32	Oct	0	0	115	115	131	134	163	2	9	86	638	1,002
32	Nov	0	0	115	115	127	129	157	1	7	76	1,115	1,729
32	Dec	0	0	125	125	133	135	162	0	5	68	901	1,429
33	Jan	0	0	125	125	130	131	157	0	4	61	871	1,390
33	Feb	0	0	125	125	128	128	153	0	2	55	877	1,404
33	Mar	0	0	125	125	186	251	289	0	6	105	858	1,383
33	Apr	0	0	115	125	210	289	332	0	28	185	1,548	2,390
33	May	0	0	549	570	609	627	660	23	60	256	2,434	4,171
33	Jun	0	0	547	560	585	590	619	31	49	225	1,968	3,424
33	Jul	0	0	237	240	258	260	288	8	18	126	903	1,528
33	Aug	0	0	149	150	163	164	191	2	11	97	538	891
33	Sep	0	0	115	115	124	124	150	1	8	85	3,975	6,019
33	Oct	0	0	115	115	122	122	147	0	7	81	2,393	3,646
33	Nov	0	0	115	115	120	120	144	0	7	77	1,447	2,228
33	Dec	0	0	125	125	127	127	151	0	5	69	1,034	1,628
34	Jan	0	0	125	125	126	126	148	0	4	62	508	844
34	Feb	0	0	125	125	126	126	147	0	2	56	547	911
34	Mar	0	0	125	125	126	126	147	0	1	50	1,068	1,701
34	Apr	0	0	125	125	135	155	178	0	2	54	7,983	12,094
34	May	0	0	467	570	733	875	944	258	288	1,506	14,320	20,621
34	Jun	0	0	493	560	761	910	991	222	220	1,328	9,618	13,918
34	Jul	0	0	221	240	321	356	399	53	66	400	5,290	7,899
34	Aug	0	0	141	150	204	215	249	18	35	208	2,324	3,505
34	Sep	0	0	113	115	155	160	192	7	14	119	934	1,419
34	Oct	0	0	114	115	146	150	179	3	9	93	738	1,143
34	Nov	0	0	115	115	139	142	170	2	7	82	914	1,417
34	Dec	0	0	125	125	143	145	173	1	5	73	500	819
35	Jan	0	0	125	125	138	140	166	0	4	66	506	834
35	Feb	0	0	125	125	134	135	161	0	2	59	546	901
35	Mar	0	0	125	125	131	131	156	0	1	53	1,066	1,688
35	Apr	0	0	125	125	226	315	367	0	14	158	2,184	3,373
35	May	0	0	525	570	701	808	869	113	132	738	5,126	7,722
35	Jun	0	0	506	560	611	634	670	141	148	776	4,475	6,574
35	Jul	0	0	228	240	271	277	307	34	38	240	2,072	3,150
35	Aug	0	0	147	150	172	174	202	10	14	117	1,301	2,010
35	Sep	0	0	114	115	131	132	159	5	8	87	882	1,364
35	Oct	0	0	115	115	127	127	153	3	5	75	665	1,051
35	Nov	0	0	115	115	123	123	148	2	4	67	918	1,440
35	Dec	0	0	125	125	130	130	154	2	3	60	590	969
36	Jan	0	0	125	125	127	127	151	1	1	53	935	1,493
36	Feb	0	0	125	125	126	126	148	1	0	47	941	1,507
36	Mar	0	0	125	125	139	161	186	1	1	52	1,588	2,484
36	Apr	0	0	110	125	155	184	211	6	33	194	1,874	2,839
36	May	0	0	547	570	598	606	633	18	60	271	1,854	3,325
36	Jun	0	0	549	560	582	585	611	20	37	172	1,478	2,768
36	Jul	0	0	238	240	257	258	283	8	14	110	1,031	1,742
36	Aug	0	0	149	150	163	163	187	4	8	89	550	917
36	Sep	0	0	115	115	124	124	147	3	5	78	540	862
36	Oct	0	0	115	115	121	121	143	2	4	71	702	1,114
36	Nov	0	0	115	115	118	118	140	2	3	64	950	1,492
36	Dec	0	0	125	125	126	126	147	1	1	57	750	1,212
37	Jan	0	0	125	125	126	126	146	1	0	51	653	1,075
37	Feb	0	0	125	125	126	126	145	0	0	46	715	1,174
37	Mar	0	0	125	125	126	126	145	0	0	42	851	1,384
37	Apr	0	0	108	125	178	237	268	15	51	324	988	1,461
37	May	0	0	533	570	646	717	753	67	112	589	3,310	5,200

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
37	Jun	0	0	508	560	674	764	812	138	165	876	1,529	2,342
37	Jul	0	0	201	240	370	465	518	109	129	754	1,280	1,798
37	Aug	0	0	142	150	209	229	264	36	33	241	906	1,310
37	Sep	0	0	113	115	154	159	189	19	14	133	641	950
37	Oct	0	0	111	115	149	151	181	17	17	126	609	917
37	Nov	0	0	111	115	148	151	180	15	18	128	1,030	1,552
37	Dec	0	0	124	125	152	155	183	10	12	110	775	1,195
38	Jan	0	0	125	125	146	148	175	6	9	96	775	1,205
38	Feb	0	0	125	125	141	142	169	5	8	88	704	1,106
38	Mar	0	0	125	125	155	190	219	5	11	113	988	1,538
38	Apr	0	0	88	125	197	281	315	72	106	629	1,793	2,343
38	May	0	0	526	570	651	713	749	103	132	746	2,798	4,218
38	Jun	0	0	551	560	619	636	670	48	49	287	1,089	1,999
38	Jul	0	0	238	240	287	295	328	27	25	174	1,174	1,880
38	Aug	0	0	149	150	187	192	224	17	18	136	587	923
38	Sep	0	0	115	115	145	149	179	13	16	121	534	808
38	Oct	0	0	115	115	140	143	173	10	15	113	706	1,072
38	Nov	0	0	115	115	136	138	167	6	13	102	905	1,380
38	Dec	0	0	125	125	141	142	170	4	11	92	861	1,340
39	Jan	0	0	125	125	136	137	164	4	10	84	759	1,195
39	Feb	0	0	125	125	133	133	159	3	8	76	787	1,245
39	Mar	0	0	125	125	131	131	156	2	7	69	883	1,396
39	Apr	0	0	114	125	245	347	408	5	54	345	1,119	1,702
39	May	0	0	542	570	724	847	917	50	110	594	3,543	5,682
39	Jun	0	0	538	560	614	641	679	62	76	385	1,292	2,262
39	Jul	0	0	235	240	271	277	308	24	27	175	945	1,537
39	Aug	0	0	143	150	176	179	208	21	30	172	794	1,217
39	Sep	0	0	108	115	139	142	171	20	31	172	674	989
39	Oct	0	0	111	115	144	158	187	18	30	181	697	1,027
39	Nov	0	0	111	115	149	165	196	17	30	184	867	1,284
39	Dec	0	0	124	125	152	158	187	12	19	138	859	1,300
40	Jan	0	0	125	125	146	149	177	8	15	117	1,204	1,830
40	Feb	0	0	125	125	141	143	170	5	13	104	1,068	1,636
40	Mar	0	0	125	125	137	138	164	4	11	95	1,119	1,723
40	Apr	0	0	125	125	269	386	455	4	30	246	3,384	5,133
40	May	0	0	516	570	753	895	976	117	150	875	3,207	4,882
40	Jun	0	0	504	560	629	661	703	151	161	882	5,378	7,828
40	Jul	0	0	228	240	282	292	325	49	51	303	2,040	2,925
40	Aug	0	0	147	150	180	184	215	22	24	164	1,024	1,524
40	Sep	0	0	106	115	148	160	191	21	42	230	1,223	1,791
40	Oct	0	0	105	115	157	173	205	23	47	256	804	1,157
40	Nov	0	0	113	115	155	164	196	18	25	166	1,179	1,749
40	Dec	0	0	124	125	157	163	194	13	18	134	862	1,303
41	Jan	0	0	125	125	150	155	185	8	15	116	803	1,227
41	Feb	0	0	125	125	145	149	178	5	13	103	900	1,383
41	Mar	0	0	125	125	142	145	173	4	11	94	1,028	1,586
41	Apr	0	0	122	125	273	391	461	5	43	309	1,587	2,418
41	May	0	0	532	570	754	896	977	105	141	796	5,247	7,927
41	Jun	0	0	517	560	627	659	701	130	131	696	3,664	5,453
41	Jul	0	0	231	240	278	289	322	38	39	244	1,183	1,812
41	Aug	0	0	148	150	177	182	213	15	18	137	673	1,038
41	Sep	0	0	114	115	137	140	170	9	14	115	540	813
41	Oct	0	0	113	115	142	151	180	10	20	132	905	1,360
41	Nov	0	0	113	115	150	162	193	9	22	141	977	1,470
41	Dec	0	0	124	125	158	166	197	6	15	120	822	1,263
42	Jan	0	0	124	125	151	157	187	5	12	108	792	1,215
42	Feb	0	0	124	125	147	153	182	4	11	99	776	1,201
42	Mar	0	0	124	125	149	156	185	4	10	96	946	1,464
42	Apr	0	0	96	125	221	298	344	49	91	548	1,020	1,365
42	May	0	0	535	570	687	779	830	76	119	676	2,733	4,150
42	Jun	0	0	459	560	616	641	678	40	45	264	1,223	2,085
42	Jul	0	0	180	240	278	288	321	19	21	153	1,277	1,984
42	Aug	0	0	111	150	178	185	216	11	14	117	606	922
42	Sep	0	0	52	115	137	142	172	6	12	101	583	841
42	Oct	0	0	27	183	200	204	232	4	11	93	924	1,416
42	Nov	0	0	25	115	128	132	160	4	10	88	1,098	1,618
42	Dec	0	0	39	125	135	138	165	3	9	81	1,004	1,502
43	Jan	0	0	133	134	141	144	169	3	8	73	979	1,484
43	Feb	0	0	132	133	137	139	164	2	6	66	999	1,518
43	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
43	Apr	0	1	136	147	209	273	310	4	42	261	1,448	2,187
43	May	0	41	306	681	770	848	891	80	131	711	2,662	4,084
43	Jun	0	28	382	620	669	690	723	105	120	642	3,297	4,794
43	Jul	0	6	256	265	302	310	341	38	39	239	1,466	2,083
43	Aug	0	1	167	170	197	202	232	19	17	136	1,140	1,675
43	Sep	0	0	147	149	170	174	202	11	12	106	978	1,454
43	Oct	0	0	141	142	158	161	188	7	10	91	1,008	1,508
43	Nov	0	0	138	139	151	154	180	5	9	82	1,165	1,750
43	Dec	0	0	136	137	147	148	174	4	8	75	1,092	1,647
44	Jan	0	0	134	135	141	143	167	3	6	68	944	1,429
44	Feb	0	0	133	134	137	138	162	3	5	61	939	1,427
44	Mar	0	0	131	132	135	136	159	2	3	56	913	1,393
44	Apr	0	0	130	131	179	233	264	2	9	108	1,276	1,942
44	May	0	75	433	993	1,070	1,145	1,181	127	135	767	1,566	2,747
44	Jun	0	54	492	825	889	929	963	167	180	966	2,281	3,245

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
44	Jul	0	11	258	322	381	407	442	53	69	385	1,410	2,013
44	Aug	0	2	170	206	256	268	301	25	25	185	793	1,169
44	Sep	0	0	153	156	199	208	240	18	17	144	724	1,059
44	Oct	0	0	149	199	247	274	308	16	26	189	805	1,227
44	Nov	0	0	147	175	235	270	306	16	29	205	1,114	1,670
44	Dec	0	0	144	162	218	237	273	11	18	147	928	1,389
45	Jan	0	0	141	152	197	209	243	7	14	122	878	1,314
45	Feb	0	0	138	144	180	190	222	5	12	110	851	1,276
45	Mar	0	0	136	137	170	179	211	4	11	104	858	1,287
45	Apr	0	0	135	136	239	322	372	4	18	171	1,070	1,612
45	May	0	73	409	1,031	1,156	1,254	1,310	126	136	784	1,609	2,919
45	Jun	0	51	468	767	831	859	899	160	156	865	2,274	3,174
45	Jul	0	11	246	272	317	331	366	46	45	292	1,281	1,802
45	Aug	0	2	167	170	205	214	248	17	20	157	836	1,217
45	Sep	0	0	149	151	178	185	217	8	14	120	628	928
45	Oct	0	0	144	148	172	179	210	5	12	109	633	946
45	Nov	0	0	141	146	170	177	208	5	11	104	882	1,327
45	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
46	Jan	0	0	136	137	151	156	185	3	9	86	856	1,295
46	Feb	0	0	133	134	145	149	176	3	7	78	880	1,337
46	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
46	Apr	0	0	131	132	146	159	186	2	6	71	1,053	1,605
46	May	0	105	432	1,116	1,225	1,323	1,374	145	168	950	2,207	3,581
46	Jun	0	80	516	907	1,042	1,149	1,208	180	192	1,136	3,743	5,364
46	Jul	0	17	282	295	355	383	421	46	48	319	1,304	1,815
46	Aug	0	3	172	175	212	222	255	14	17	135	725	1,062
46	Sep	0	1	148	149	176	182	213	6	9	92	687	1,033
46	Oct	0	0	141	143	165	170	200	4	8	81	689	1,043
46	Nov	0	0	138	139	162	167	197	4	7	79	855	1,297
46	Dec	0	0	136	137	158	163	193	3	6	74	846	1,288
47	Jan	0	0	133	134	150	154	183	2	5	67	828	1,266
47	Feb	0	0	132	133	144	148	175	2	3	60	800	1,229
47	Mar	0	0	130	131	139	142	168	1	2	54	859	1,321
47	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
47	May	0	0	333	642	768	874	933	80	106	602	1,831	2,787
47	Jun	0	0	361	499	548	572	609	99	107	574	2,109	2,941
47	Jul	0	0	186	195	224	232	263	24	28	189	1,084	1,567
47	Aug	0	0	146	149	169	173	202	9	11	102	647	969
47	Sep	0	0	145	150	169	172	200	6	16	101	616	931
47	Oct	0	0	185	347	406	460	493	30	69	385	823	1,316
47	Nov	0	0	186	288	364	429	466	37	74	442	1,040	1,536
47	Dec	0	0	154	189	233	251	284	16	23	179	940	1,407
48	Jan	0	0	145	161	193	199	231	9	12	114	852	1,281
48	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
48	Mar	0	0	138	147	182	212	244	5	9	104	928	1,402
48	Apr	0	0	268	808	884	964	1,001	80	108	652	1,301	2,302
48	May	0	0	438	938	1,028	1,093	1,132	129	150	822	1,674	2,806
48	Jun	0	0	342	417	482	502	540	68	62	335	1,265	1,805
48	Jul	0	0	190	193	245	254	291	29	24	180	1,145	1,659
48	Aug	0	0	157	167	209	216	251	18	16	142	1,030	1,525
48	Sep	0	0	171	266	313	336	372	26	44	271	1,773	2,685
48	Oct	0	0	177	297	360	407	445	33	63	366	1,264	1,927
48	Nov	0	0	160	222	293	331	371	27	39	264	3,101	4,658
48	Dec	0	0	154	196	261	279	318	20	22	179	1,830	2,744
49	Jan	0	0	149	181	233	246	283	15	17	147	1,407	2,108
49	Feb	0	0	146	170	212	223	259	10	14	129	1,365	2,047
49	Mar	0	0	144	167	207	217	252	7	14	123	1,796	2,698
49	Apr	0	0	321	1,056	1,154	1,227	1,274	110	135	798	3,313	5,339
49	May	0	0	424	797	912	997	1,048	138	159	944	5,807	8,568
49	Jun	0	0	298	388	451	476	517	47	46	308	3,431	5,063
49	Jul	0	0	193	268	317	331	370	30	32	197	1,641	2,461
49	Aug	0	0	170	176	218	230	267	25	29	174	1,102	1,610
49	Sep	0	0	160	174	208	217	253	19	19	143	1,037	1,534
49	Oct	0	0	159	258	300	332	368	21	40	249	1,673	2,561
49	Nov	0	0	158	218	271	309	348	22	45	279	1,529	2,305
49	Dec	0	0	154	192	240	258	295	16	22	166	1,235	1,851
50	Jan	0	0	151	177	216	228	264	11	16	130	1,046	1,566
50	Feb	0	0	147	166	197	207	241	7	13	112	924	1,383
50	Mar	0	0	144	157	183	191	224	4	12	101	918	1,374
50	Apr	0	0	208	449	553	638	692	39	83	501	1,237	1,934
50	May	0	0	386	817	945	1,046	1,106	90	131	714	2,479	3,807
50	Jun	0	0	338	392	449	477	518	71	71	370	2,189	3,133
50	Jul	0	0	191	196	234	246	282	28	26	181	1,129	1,626
50	Aug	0	0	157	159	187	195	229	15	15	130	721	1,044
50	Sep	0	0	148	149	171	177	209	9	12	109	606	883
50	Oct	0	0	144	145	163	168	199	6	10	97	706	1,042
50	Nov	0	0	140	141	157	161	192	5	9	90	1,080	1,611
50	Dec	0	0	138	139	150	154	183	4	8	81	1,012	1,516
51	Jan	0	0	136	137	145	148	175	3	6	73	1,010	1,520
51	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
51	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
51	Apr	0	0	131	132	218	300	349	2	12	142	2,022	3,057
51	May	0	0	418	1,118	1,235	1,334	1,389	118	127	733	5,542	8,627
51	Jun	0	0	484	968	1,029	1,064	1,102	163	175	929	10,401	15,525
51	Jul	0	0	268	307	358	381	416	59	75	417	2,866	4,156

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
51	Aug	0	0	169	205	244	254	287	22	23	176	1,774	2,639
51	Sep	0	0	150	175	208	214	246	13	14	128	1,357	2,029
51	Oct	0	0	149	215	255	273	306	15	26	180	2,181	3,307
51	Nov	0	0	147	187	232	254	288	15	29	194	2,079	3,130
51	Dec	0	0	144	169	207	218	251	10	16	134	1,507	2,262
52	Jan	0	0	141	157	188	195	226	6	12	111	1,268	1,902
52	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
52	Mar	0	0	136	137	159	165	195	4	9	93	1,213	1,818
52	Apr	0	0	134	135	156	163	192	4	9	89	1,299	1,953
52	May	0	0	485	1,332	1,402	1,464	1,501	133	141	795	6,977	10,857
52	Jun	0	0	485	792	880	955	995	167	169	957	3,008	4,255
52	Jul	0	0	214	226	273	294	329	41	43	281	1,196	1,679
52	Aug	0	0	156	188	222	231	264	13	17	136	1,037	1,548
52	Sep	0	0	144	146	173	180	211	7	11	105	922	1,369
52	Oct	0	0	141	164	192	198	229	6	14	107	929	1,403
52	Nov	0	0	140	165	204	227	259	6	16	121	1,248	1,881
52	Dec	0	0	138	151	193	220	253	5	13	118	1,147	1,723
53	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
53	Feb	0	0	134	135	161	169	200	4	10	97	1,035	1,556
53	Mar	0	0	132	133	154	160	190	3	9	88	1,053	1,589
53	Apr	0	0	131	132	232	317	369	3	17	169	1,805	2,726
53	May	0	0	440	1,279	1,405	1,508	1,566	132	141	809	3,697	5,953
53	Jun	0	0	457	753	811	837	875	163	159	874	3,921	5,596
53	Jul	0	0	208	221	258	268	302	39	42	272	1,774	2,548
53	Aug	0	0	152	156	183	189	221	12	17	136	805	1,184
53	Sep	0	0	139	141	162	166	197	6	11	102	698	1,045
53	Oct	0	0	135	136	152	155	184	5	8	89	755	1,140
53	Nov	0	0	132	133	145	148	175	4	7	79	1,233	1,865
53	Dec	0	0	130	131	140	141	168	3	5	71	1,029	1,563
54	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
54	Feb	0	0	128	129	131	132	157	2	2	57	1,004	1,535
54	Mar	0	0	127	128	188	252	290	2	6	105	985	1,513
54	Apr	0	0	130	141	224	303	346	4	27	186	1,665	2,523
54	May	0	0	244	309	348	366	398	27	56	254	2,995	4,476
54	Jun	0	0	270	292	317	322	351	34	46	222	2,519	3,711
54	Jul	0	0	165	169	187	188	216	10	17	126	1,141	1,696
54	Aug	0	0	141	142	155	156	183	5	10	99	689	1,035
54	Sep	0	0	134	136	145	145	171	3	7	87	4,092	6,157
54	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
54	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
54	Dec	0	0	131	132	134	134	158	2	5	71	1,161	1,762
55	Jan	0	0	129	130	131	131	154	2	4	64	635	977
55	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
55	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
55	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
55	May	0	0	618	1,890	2,054	2,198	2,267	270	281	1,516	14,745	22,360
55	Jun	0	0	563	1,033	1,235	1,385	1,467	230	214	1,332	10,074	14,845
55	Jul	0	0	240	390	472	507	549	57	64	402	5,523	8,281
55	Aug	0	0	167	177	231	242	276	22	33	209	2,465	3,672
55	Sep	0	0	146	149	189	194	226	10	13	121	1,049	1,567
55	Oct	0	0	140	141	172	176	206	6	8	96	855	1,286
55	Nov	0	0	137	138	161	164	193	4	6	85	1,032	1,558
55	Dec	0	0	134	135	153	155	183	4	5	76	628	957
56	Jan	0	0	132	133	146	147	174	3	4	69	633	970
56	Feb	0	0	130	131	141	141	167	2	3	62	673	1,034
56	Mar	0	0	129	130	136	136	161	2	1	55	1,194	1,820
56	Apr	0	0	128	129	230	319	371	2	14	160	2,311	3,504
56	May	0	0	423	988	1,119	1,227	1,287	118	128	739	5,650	8,664
56	Jun	0	0	440	772	822	845	881	147	142	776	4,973	7,283
56	Jul	0	0	208	220	250	257	287	36	36	240	2,296	3,355
56	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
56	Sep	0	0	139	141	157	157	184	6	7	88	997	1,504
56	Oct	0	0	135	136	148	148	174	4	6	76	781	1,188
56	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
56	Dec	0	0	130	131	136	136	160	3	3	61	716	1,101
57	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
57	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,636
57	Mar	0	0	126	127	141	164	188	1	1	53	1,714	2,612
57	Apr	0	0	135	151	180	210	237	7	33	194	1,985	2,976
57	May	0	0	211	235	263	271	298	19	59	271	2,399	3,535
57	Jun	0	0	227	238	260	263	289	20	35	171	2,027	2,995
57	Jul	0	0	158	161	178	179	204	9	13	109	1,268	1,900
57	Aug	0	0	141	142	155	155	179	4	7	88	699	1,058
57	Sep	0	0	136	137	146	146	169	3	5	79	655	999
57	Oct	0	0	133	134	140	140	162	3	4	71	817	1,248
57	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
57	Dec	0	0	130	131	132	132	153	2	1	57	875	1,344
58	Jan	0	0	129	130	130	130	151	1	0	51	778	1,204
58	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
58	Mar	0	0	126	127	128	128	147	0	0	42	976	1,511
58	Apr	0	0	156	174	226	285	315	15	51	323	1,089	1,612
58	May	0	0	353	390	464	535	570	66	111	585	3,835	5,549
58	Jun	0	0	471	951	1,065	1,155	1,203	137	162	870	2,032	3,235
58	Jul	0	0	350	534	664	759	812	108	127	751	1,478	2,290
58	Aug	0	0	186	200	259	280	314	36	32	239	1,046	1,500

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
58	Sep	0	0	152	171	209	215	245	19	13	131	756	1,122
58	Oct	0	0	146	207	240	243	272	17	15	124	733	1,133
58	Nov	0	0	145	177	210	213	242	15	17	127	1,147	1,731
58	Dec	0	0	142	161	189	191	220	10	11	109	903	1,359
59	Jan	0	0	139	151	172	174	201	6	9	96	902	1,357
59	Feb	0	0	136	142	158	159	186	5	8	88	830	1,249
59	Mar	0	0	135	143	173	208	236	5	10	112	1,114	1,682
59	Apr	0	0	255	739	813	897	932	72	104	629	1,879	3,043
59	May	0	0	396	772	855	918	954	104	129	745	3,316	4,936
59	Jun	0	0	305	416	475	492	527	48	45	284	1,655	2,420
59	Jul	0	0	184	187	235	242	276	27	22	171	1,408	2,060
59	Aug	0	0	155	156	194	198	231	17	16	133	734	1,076
59	Sep	0	0	148	149	179	183	214	13	14	119	647	954
59	Oct	0	0	146	147	172	175	205	10	13	112	819	1,217
59	Nov	0	0	143	144	165	167	196	6	12	101	1,018	1,523
59	Dec	0	0	140	141	157	159	187	4	11	92	985	1,480
60	Jan	0	0	137	138	150	151	178	4	9	83	884	1,333
60	Feb	0	0	135	136	144	144	171	3	8	76	912	1,381
60	Mar	0	0	134	135	140	140	166	2	7	69	1,008	1,530
60	Apr	0	0	148	173	293	396	456	5	54	345	1,231	1,861
60	May	0	0	301	587	741	864	934	50	108	593	4,093	6,249
60	Jun	0	0	309	383	437	464	502	62	74	384	1,840	2,633
60	Jul	0	0	180	215	246	252	283	24	25	173	1,185	1,752
60	Aug	0	0	158	213	239	242	272	21	28	169	947	1,433
60	Sep	0	0	154	165	189	192	221	20	29	170	781	1,146
60	Oct	0	0	152	218	247	261	290	18	27	178	820	1,253
60	Nov	0	0	150	189	223	240	270	17	27	181	983	1,475
60	Dec	0	0	147	173	200	206	235	12	17	136	987	1,476
61	Jan	0	0	144	161	182	185	213	8	14	115	1,331	1,994
61	Feb	0	0	141	152	168	170	197	5	12	103	1,194	1,788
61	Mar	0	0	138	143	155	156	182	4	11	94	1,245	1,866
61	Apr	0	0	136	137	281	398	467	4	29	246	3,508	5,269
61	May	0	0	358	1,140	1,323	1,464	1,545	117	148	873	3,714	5,958
61	Jun	0	0	466	910	979	1,011	1,053	151	158	879	5,867	8,667
61	Jul	0	0	303	358	400	409	443	49	48	300	2,270	3,273
61	Aug	0	0	180	190	220	224	254	22	22	161	1,170	1,709
61	Sep	0	0	169	266	299	311	342	21	39	228	1,348	2,067
61	Oct	0	0	169	228	270	287	319	23	44	253	919	1,384
61	Nov	0	0	155	191	231	241	272	18	22	163	1,297	1,944
61	Dec	0	0	150	175	207	214	244	13	16	132	990	1,481
62	Jan	0	0	146	163	188	194	223	8	14	114	930	1,393
62	Feb	0	0	143	153	173	178	206	5	12	102	1,026	1,538
62	Mar	0	0	140	145	161	165	192	4	11	94	1,154	1,731
62	Apr	0	0	143	167	313	431	501	5	42	307	1,711	2,584
62	May	0	0	420	1,051	1,234	1,375	1,455	105	138	789	5,779	8,945
62	Jun	0	0	416	661	727	760	801	129	128	690	4,180	6,074
62	Jul	0	0	203	218	256	267	300	37	37	241	1,411	2,019
62	Aug	0	0	155	158	185	190	220	14	17	136	819	1,193
62	Sep	0	0	146	160	182	186	215	9	13	113	657	975
62	Oct	0	0	146	179	206	215	245	10	18	130	1,024	1,544
62	Nov	0	0	144	168	202	214	245	9	20	138	1,092	1,638
62	Dec	0	0	141	158	190	199	229	6	15	120	950	1,424
63	Jan	0	0	138	147	173	180	209	5	12	108	891	1,337
63	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
63	Mar	0	0	134	135	159	166	195	4	11	96	1,048	1,576
63	Apr	0	0	222	539	636	714	761	49	92	549	1,066	1,826
63	May	0	0	364	668	786	879	931	77	119	679	3,066	4,579
63	Jun	0	0	297	356	412	437	474	40	45	265	1,493	2,149
63	Jul	0	0	178	181	219	229	262	19	21	153	1,378	2,026
63	Aug	0	0	150	151	180	187	218	11	14	118	670	987
63	Sep	0	0	142	143	165	171	200	6	12	101	588	875
63	Oct	0	0	139	140	157	161	190	4	11	93	899	1,348
63	Nov	0	0	137	138	151	155	182	4	10	88	1,076	1,618
63	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
64	Jan	0	0	133	134	141	144	170	3	8	73	979	1,484
64	Feb	0	0	132	133	137	139	164	2	6	66	999	1,518
64	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
64	Apr	0	0	136	147	209	273	310	4	42	261	1,448	2,187
64	May	0	0	306	694	783	861	904	79	131	712	2,661	4,096
64	Jun	0	0	382	688	737	757	791	104	120	642	3,297	4,861
64	Jul	0	0	256	265	302	310	341	38	39	239	1,466	2,083
64	Aug	0	0	167	170	197	202	232	19	17	136	1,140	1,675
64	Sep	0	0	147	149	170	174	202	11	12	106	978	1,454
64	Oct	0	0	141	142	158	161	189	7	10	91	1,008	1,507
64	Nov	0	0	138	139	151	154	180	5	9	82	1,165	1,750
64	Dec	0	0	136	137	147	148	174	4	8	75	1,092	1,647
65	Jan	0	0	134	135	142	143	167	3	6	68	944	1,429
65	Feb	0	0	133	134	137	138	162	3	5	61	939	1,427
65	Mar	0	0	131	132	135	136	159	2	3	56	913	1,393
65	Apr	0	0	130	131	179	233	264	2	9	108	1,276	1,942
65	May	0	0	433	1,128	1,205	1,280	1,316	127	135	767	1,566	2,882
65	Jun	0	0	492	943	1,006	1,046	1,081	167	180	966	2,281	3,362
65	Jul	0	0	258	328	387	413	447	53	69	385	1,411	2,020
65	Aug	0	0	170	208	259	271	304	25	25	185	793	1,172
65	Sep	0	0	153	156	199	208	240	18	17	144	724	1,059

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
65	Oct	0	0	149	211	259	286	320	16	26	188	808	1,242
65	Nov	0	0	147	182	242	277	313	16	29	205	1,116	1,679
65	Dec	0	0	144	167	223	242	277	11	18	147	930	1,395
66	Jan	0	0	141	155	200	212	246	6	14	122	879	1,318
66	Feb	0	0	138	146	182	191	224	5	12	109	852	1,278
66	Mar	0	0	136	137	170	178	210	4	11	103	858	1,287
66	Apr	0	0	135	136	238	320	369	4	18	170	1,070	1,612
66	May	0	0	408	1,213	1,337	1,434	1,489	125	135	779	1,610	3,099
66	Jun	0	0	467	868	933	960	1,000	159	155	861	2,275	3,275
66	Jul	0	0	246	271	316	329	365	45	45	290	1,281	1,803
66	Aug	0	0	167	170	205	214	247	17	20	156	836	1,218
66	Sep	0	0	149	151	178	185	217	8	14	119	628	929
66	Oct	0	0	144	147	171	178	210	5	12	109	633	945
66	Nov	0	0	141	146	169	176	207	5	11	104	882	1,327
66	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
67	Jan	0	0	136	136	151	156	184	3	9	86	856	1,296
67	Feb	0	0	133	134	145	149	176	3	7	78	880	1,337
67	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
67	Apr	0	0	131	132	146	159	186	2	6	71	1,053	1,605
67	May	0	0	433	1,315	1,425	1,524	1,576	146	169	954	2,206	3,782
67	Jun	0	0	517	933	1,070	1,178	1,237	181	192	1,140	3,743	5,387
67	Jul	0	0	283	296	356	384	423	46	48	319	1,304	1,814
67	Aug	0	0	172	175	212	223	256	14	17	135	725	1,062
67	Sep	0	0	148	149	176	182	214	6	9	92	687	1,033
67	Oct	0	0	142	143	165	170	200	4	8	81	689	1,043
67	Nov	0	0	138	139	162	167	197	4	7	79	855	1,296
67	Dec	0	0	136	137	158	163	193	3	6	74	846	1,288
68	Jan	0	0	133	134	150	154	183	2	5	67	828	1,266
68	Feb	0	0	132	133	144	148	175	2	3	60	800	1,229
68	Mar	0	0	131	131	139	142	168	1	2	54	859	1,321
68	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
68	May	0	0	333	643	769	875	935	80	106	602	1,831	2,788
68	Jun	0	0	361	499	548	572	609	99	107	574	2,109	2,941
68	Jul	0	0	186	195	224	232	263	24	28	189	1,084	1,567
68	Aug	0	0	146	149	169	173	202	9	11	102	647	969
68	Sep	0	0	145	150	169	172	200	6	16	101	616	931
68	Oct	0	0	185	347	406	460	493	30	69	385	823	1,316
68	Nov	0	0	186	288	364	429	466	37	74	441	1,040	1,536
68	Dec	0	0	154	189	233	251	284	16	23	179	940	1,407
69	Jan	0	0	145	161	193	199	231	9	12	114	852	1,281
69	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
69	Mar	0	0	138	147	183	212	244	5	9	104	928	1,402
69	Apr	0	0	268	808	885	964	1,001	80	108	652	1,301	2,302
69	May	0	0	438	938	1,028	1,093	1,132	129	150	822	1,674	2,806
69	Jun	0	0	342	417	482	502	540	68	62	335	1,265	1,805
69	Jul	0	0	190	193	245	254	291	29	24	180	1,145	1,659
69	Aug	0	0	157	167	209	216	251	18	16	142	1,030	1,525
69	Sep	0	0	171	266	313	336	372	26	44	271	1,773	2,685
69	Oct	0	0	177	297	360	407	445	33	63	366	1,264	1,927
69	Nov	0	0	160	222	293	331	371	27	39	263	3,101	4,658
69	Dec	0	0	154	196	261	279	318	20	22	179	1,830	2,744
70	Jan	0	0	149	181	233	246	283	15	17	146	1,407	2,108
70	Feb	0	0	146	170	212	222	258	10	14	128	1,365	2,046
70	Mar	0	0	143	167	206	216	252	7	14	122	1,796	2,698
70	Apr	0	0	320	1,052	1,148	1,220	1,267	109	134	795	3,313	5,338
70	May	0	0	422	794	907	991	1,042	138	159	940	5,808	8,569
70	Jun	0	0	297	387	449	475	516	47	45	307	3,431	5,063
70	Jul	0	0	192	268	317	331	369	30	32	197	1,641	2,461
70	Aug	0	0	170	176	218	230	267	25	29	174	1,102	1,610
70	Sep	0	0	160	173	207	217	252	18	19	143	1,037	1,534
70	Oct	0	0	159	258	300	331	368	20	40	249	1,673	2,561
70	Nov	0	0	158	218	271	309	347	22	45	278	1,529	2,305
70	Dec	0	0	154	192	240	258	295	16	22	166	1,235	1,851
71	Jan	0	0	151	177	216	228	263	11	16	129	1,046	1,566
71	Feb	0	0	147	166	197	207	241	7	13	112	924	1,383
71	Mar	0	0	144	157	183	192	225	5	12	102	918	1,374
71	Apr	0	0	208	449	554	641	695	39	83	503	1,237	1,934
71	May	0	0	387	822	951	1,053	1,113	91	132	719	2,478	3,807
71	Jun	0	0	339	394	452	480	521	71	72	374	2,189	3,131
71	Jul	0	0	191	196	234	246	282	28	26	182	1,129	1,626
71	Aug	0	0	157	159	187	195	229	15	15	130	721	1,044
71	Sep	0	0	148	149	171	177	209	9	12	109	606	883
71	Oct	0	0	144	145	163	168	199	6	10	97	706	1,042
71	Nov	0	0	140	141	157	162	192	5	9	90	1,080	1,611
71	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
72	Jan	0	0	136	137	145	148	176	3	6	73	1,010	1,519
72	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
72	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
72	Apr	0	0	131	132	218	300	349	2	12	142	2,022	3,057
72	May	0	0	418	1,120	1,236	1,335	1,391	118	127	733	5,542	8,629
72	Jun	0	0	484	968	1,029	1,064	1,102	163	176	929	10,401	15,525
72	Jul	0	0	268	307	358	381	416	59	75	417	2,866	4,156
72	Aug	0	0	169	205	244	254	287	21	23	176	1,774	2,639
72	Sep	0	0	150	175	208	214	246	13	14	128	1,357	2,029
72	Oct	0	0	149	215	255	273	306	15	26	180	2,181	3,307

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
72	Nov	0	0	147	187	232	255	288	14	29	194	2,079	3,130
72	Dec	0	0	144	169	207	218	251	10	16	134	1,507	2,262
73	Jan	0	0	141	157	188	195	227	6	12	111	1,268	1,902
73	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
73	Mar	0	0	136	137	159	165	195	4	9	93	1,213	1,818
73	Apr	0	0	134	135	156	163	192	4	9	89	1,299	1,953
73	May	0	0	485	1,332	1,402	1,464	1,501	133	141	795	6,977	10,857
73	Jun	0	0	485	792	880	955	995	167	169	956	3,008	4,255
73	Jul	0	0	214	226	273	294	329	41	43	281	1,196	1,678
73	Aug	0	0	156	188	222	231	264	13	17	136	1,037	1,548
73	Sep	0	0	144	146	173	180	211	7	11	105	922	1,369
73	Oct	0	0	141	164	192	198	229	6	14	107	929	1,403
73	Nov	0	0	140	165	204	227	260	6	16	121	1,248	1,881
73	Dec	0	0	138	151	193	220	253	5	13	118	1,147	1,723
74	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
74	Feb	0	0	134	135	161	169	200	4	10	97	1,035	1,556
74	Mar	0	0	132	133	154	160	189	3	9	88	1,053	1,589
74	Apr	0	0	131	132	231	316	367	3	17	168	1,805	2,726
74	May	0	0	439	1,273	1,398	1,500	1,558	131	140	805	3,698	5,951
74	Jun	0	0	456	751	808	834	872	162	158	870	3,921	5,597
74	Jul	0	0	208	220	257	268	301	39	42	271	1,774	2,549
74	Aug	0	0	152	155	183	189	220	12	17	136	805	1,184
74	Sep	0	0	139	141	162	166	196	6	11	102	698	1,045
74	Oct	0	0	135	136	152	155	184	5	8	88	755	1,141
74	Nov	0	0	132	133	145	147	175	4	7	79	1,233	1,865
74	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
75	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
75	Feb	0	0	128	129	131	132	157	2	2	57	1,004	1,535
75	Mar	0	0	127	128	189	254	292	2	6	106	985	1,513
75	Apr	0	0	130	141	225	305	348	4	27	187	1,665	2,523
75	May	0	0	245	311	350	368	401	27	57	257	2,995	4,474
75	Jun	0	0	270	294	319	324	353	35	46	225	2,518	3,709
75	Jul	0	0	165	169	187	189	217	11	17	127	1,141	1,696
75	Aug	0	0	141	142	155	156	183	5	10	99	689	1,035
75	Sep	0	0	135	136	145	145	171	4	7	87	4,092	6,157
75	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
75	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
75	Dec	0	0	131	132	134	134	158	2	5	71	1,161	1,762
76	Jan	0	0	129	130	131	131	154	2	4	64	635	977
76	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
76	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
76	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
76	May	0	0	618	1,894	2,057	2,201	2,270	270	281	1,516	14,745	22,363
76	Jun	0	0	563	1,033	1,235	1,385	1,467	230	214	1,332	10,074	14,845
76	Jul	0	0	240	390	472	507	550	57	64	402	5,523	8,281
76	Aug	0	0	167	177	231	242	276	22	33	209	2,465	3,672
76	Sep	0	0	146	149	189	194	226	10	13	121	1,049	1,567
76	Oct	0	0	140	141	172	176	206	6	8	96	855	1,286
76	Nov	0	0	137	138	162	164	193	4	6	85	1,032	1,558
76	Dec	0	0	134	135	153	155	183	4	5	76	628	957
77	Jan	0	0	132	133	146	147	174	3	4	69	633	970
77	Feb	0	0	130	131	141	141	167	2	3	62	673	1,034
77	Mar	0	0	129	130	136	136	161	2	1	55	1,193	1,820
77	Apr	0	0	128	129	230	319	371	2	14	160	2,311	3,504
77	May	0	0	423	989	1,119	1,227	1,288	118	128	739	5,650	8,664
77	Jun	0	0	440	772	822	845	881	147	142	776	4,973	7,283
77	Jul	0	0	208	220	250	257	287	36	36	240	2,296	3,355
77	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
77	Sep	0	0	139	141	157	157	184	6	7	88	997	1,504
77	Oct	0	0	135	136	148	148	174	4	6	76	781	1,188
77	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
77	Dec	0	0	130	131	136	136	160	3	3	61	716	1,101
78	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
78	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,636
78	Mar	0	0	126	127	141	164	188	1	1	53	1,714	2,612
78	Apr	0	0	135	151	180	210	237	7	33	194	1,985	2,976
78	May	0	0	211	234	262	270	297	18	58	268	2,400	3,536
78	Jun	0	0	226	237	259	262	288	20	35	168	2,027	2,996
78	Jul	0	0	158	161	178	179	204	8	13	108	1,268	1,901
78	Aug	0	0	141	142	155	155	179	4	7	88	699	1,059
78	Sep	0	0	136	137	145	145	169	3	5	79	655	1,000
78	Oct	0	0	133	134	140	140	162	3	4	71	817	1,248
78	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
78	Dec	0	0	130	131	132	132	153	1	1	57	875	1,344
79	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
79	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
79	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
79	Apr	0	0	156	174	227	287	317	15	51	324	1,089	1,612
79	May	0	0	354	392	467	539	574	67	112	589	3,835	5,546
79	Jun	0	0	472	952	1,065	1,156	1,204	138	163	874	2,031	3,235
79	Jul	0	0	350	535	664	760	813	108	127	752	1,478	2,290
79	Aug	0	0	186	201	259	280	315	36	32	239	1,046	1,500
79	Sep	0	0	152	171	210	215	245	19	13	131	756	1,122
79	Oct	0	0	146	207	240	243	272	17	15	124	733	1,133
79	Nov	0	0	145	177	210	213	242	15	17	127	1,147	1,731

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
79	Dec	0	0	142	161	189	191	220	10	11	109	903	1,359
80	Jan	0	0	139	151	172	174	201	6	9	96	902	1,357
80	Feb	0	0	136	142	158	159	186	5	8	88	830	1,249
80	Mar	0	0	135	143	173	208	237	5	10	112	1,114	1,682
80	Apr	0	0	255	739	813	897	932	72	104	629	1,879	3,043
80	May	0	0	396	772	855	918	954	104	129	745	3,316	4,936
80	Jun	0	0	305	416	475	492	527	48	45	284	1,655	2,420
80	Jul	0	0	184	187	235	242	276	27	22	171	1,408	2,060
80	Aug	0	0	155	156	194	199	231	17	16	133	734	1,076
80	Sep	0	0	148	149	179	183	214	13	14	119	647	954
80	Oct	0	0	146	147	172	175	205	10	13	111	819	1,217
80	Nov	0	0	143	144	165	167	196	6	12	101	1,018	1,523
80	Dec	0	0	140	141	157	159	187	4	11	92	985	1,480
81	Jan	0	0	137	138	150	151	178	4	9	83	884	1,333
81	Feb	0	0	135	136	144	144	171	3	8	76	912	1,381
81	Mar	0	0	134	135	140	140	166	2	7	69	1,008	1,530
81	Apr	0	0	148	173	294	396	456	5	54	345	1,231	1,861
81	May	0	0	301	587	741	864	934	50	108	592	4,093	6,249
81	Jun	0	0	309	383	437	464	502	62	74	383	1,840	2,633
81	Jul	0	0	180	215	246	252	283	24	25	173	1,185	1,752
81	Aug	0	0	158	213	239	242	272	21	28	169	947	1,433
81	Sep	0	0	154	165	189	192	221	20	29	169	781	1,146
81	Oct	0	0	152	218	247	261	290	18	27	178	820	1,253
81	Nov	0	0	150	189	223	240	270	17	27	181	983	1,475
81	Dec	0	0	147	173	200	206	235	12	17	136	987	1,476
82	Jan	0	0	144	161	182	185	213	7	14	115	1,331	1,994
82	Feb	0	0	141	152	168	170	197	5	12	103	1,194	1,788
82	Mar	0	0	138	143	155	156	182	4	11	94	1,245	1,866
82	Apr	0	0	136	137	280	396	465	4	29	244	3,508	5,269
82	May	0	0	357	1,134	1,316	1,456	1,537	116	147	868	3,715	5,956
82	Jun	0	0	464	906	975	1,007	1,049	151	157	875	5,867	8,668
82	Jul	0	0	303	357	398	408	442	48	48	299	2,270	3,274
82	Aug	0	0	180	189	219	224	254	22	22	161	1,170	1,709
82	Sep	0	0	169	266	298	311	341	21	39	227	1,348	2,067
82	Oct	0	0	169	228	270	286	318	23	44	252	919	1,384
82	Nov	0	0	155	191	231	240	272	18	22	163	1,297	1,944
82	Dec	0	0	150	175	207	213	244	13	16	131	990	1,481
83	Jan	0	0	146	163	188	193	223	8	14	114	930	1,393
83	Feb	0	0	143	153	173	178	206	5	12	102	1,026	1,538
83	Mar	0	0	140	145	161	165	192	4	11	94	1,154	1,731
83	Apr	0	0	143	167	314	433	503	5	43	308	1,711	2,584
83	May	0	0	421	1,057	1,241	1,383	1,464	105	139	793	5,778	8,946
83	Jun	0	0	417	664	731	763	805	130	128	693	4,179	6,073
83	Jul	0	0	203	219	257	268	301	37	37	242	1,411	2,019
83	Aug	0	0	155	158	185	190	221	14	17	136	819	1,193
83	Sep	0	0	146	161	182	186	215	9	13	113	657	975
83	Oct	0	0	146	180	206	215	245	10	18	130	1,024	1,544
83	Nov	0	0	144	168	203	215	246	9	20	138	1,092	1,639
83	Dec	0	0	141	158	191	199	229	6	15	120	950	1,424
84	Jan	0	0	138	148	173	180	209	5	12	108	891	1,337
84	Feb	0	0	136	139	162	167	196	4	11	99	877	1,316
84	Mar	0	0	134	135	159	166	195	4	11	96	1,048	1,576
84	Apr	0	0	222	539	636	714	761	49	92	549	1,066	1,826
84	May	0	0	364	668	786	879	931	77	119	678	3,066	4,579
84	Jun	0	0	297	356	412	437	474	40	45	265	1,493	2,149
84	Jul	0	0	178	181	219	229	262	19	21	153	1,378	2,026
84	Aug	0	0	150	152	180	187	218	11	14	117	670	987
84	Sep	0	0	142	143	165	171	200	6	12	101	588	875
84	Oct	0	0	139	140	157	161	190	4	11	93	899	1,348
84	Nov	0	0	137	138	151	155	182	4	10	88	1,076	1,618
84	Dec	0	0	135	136	146	150	176	3	9	81	999	1,507
85	Jan	0	0	133	134	141	144	170	3	8	73	979	1,484
85	Feb	0	0	132	133	137	139	164	2	6	66	999	1,518
85	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
85	Apr	0	0	136	147	209	273	310	4	42	261	1,448	2,187
85	May	0	0	306	695	783	862	904	79	131	712	2,661	4,096
85	Jun	0	0	382	688	737	758	791	104	120	642	3,297	4,861
85	Jul	0	0	256	265	302	310	341	38	39	239	1,466	2,083
85	Aug	0	0	167	170	197	203	232	19	17	136	1,140	1,675
85	Sep	0	0	147	149	170	174	202	11	12	106	978	1,453
85	Oct	0	0	141	142	158	161	189	7	10	91	1,008	1,507
85	Nov	0	0	138	139	151	154	180	5	9	82	1,165	1,750
85	Dec	0	0	136	137	147	148	174	4	8	75	1,092	1,647
86	Jan	0	0	134	135	142	143	167	3	6	68	944	1,429
86	Feb	0	0	133	134	137	138	162	3	5	61	939	1,427
86	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
86	Apr	0	0	130	131	178	231	261	2	9	106	1,276	1,942
86	May	0	0	432	1,122	1,198	1,271	1,307	127	135	762	1,567	2,874
86	Jun	0	0	491	939	1,003	1,042	1,077	166	180	962	2,282	3,358
86	Jul	0	0	257	326	385	411	445	53	68	384	1,411	2,020
86	Aug	0	0	170	208	258	270	303	25	25	185	793	1,172
86	Sep	0	0	153	155	199	208	240	18	17	144	724	1,059
86	Oct	0	0	149	211	259	286	319	16	26	188	808	1,242
86	Nov	0	0	147	181	241	277	313	16	29	205	1,116	1,679

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
86	Dec	0	0	144	166	223	242	277	11	18	147	930	1,395
87	Jan	0	0	141	155	200	212	246	6	14	122	879	1,318
87	Feb	0	0	138	146	182	191	224	5	12	109	852	1,278
87	Mar	0	0	136	137	170	179	211	4	11	103	858	1,287
87	Apr	0	0	135	136	239	322	372	4	18	171	1,070	1,612
87	May	0	0	409	1,219	1,344	1,442	1,498	126	136	783	1,609	3,106
87	Jun	0	0	468	871	936	964	1,004	160	156	865	2,274	3,278
87	Jul	0	0	246	272	317	330	366	46	45	291	1,281	1,802
87	Aug	0	0	167	170	205	214	248	17	20	156	836	1,217
87	Sep	0	0	149	151	178	185	217	8	14	119	628	928
87	Oct	0	0	144	148	172	179	210	5	12	109	633	946
87	Nov	0	0	141	146	170	177	208	5	11	104	882	1,327
87	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
88	Jan	0	0	136	137	151	156	185	3	9	86	856	1,296
88	Feb	0	0	133	134	145	149	177	3	7	78	880	1,337
88	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
88	Apr	0	0	131	132	146	159	186	2	6	71	1,053	1,605
88	May	0	0	433	1,316	1,426	1,525	1,577	146	169	954	2,206	3,783
88	Jun	0	0	517	933	1,070	1,178	1,237	181	192	1,140	3,743	5,387
88	Jul	0	0	283	296	356	384	423	46	48	319	1,304	1,814
88	Aug	0	0	172	175	212	223	256	14	17	135	725	1,062
88	Sep	0	0	148	149	176	182	214	6	9	92	687	1,033
88	Oct	0	0	142	143	165	170	200	4	8	82	689	1,043
88	Nov	0	0	138	139	162	167	197	4	7	79	855	1,296
88	Dec	0	0	136	137	158	163	193	3	6	74	846	1,288
89	Jan	0	0	133	134	150	154	183	2	5	67	828	1,265
89	Feb	0	0	132	133	144	148	175	2	3	60	800	1,229
89	Mar	0	0	131	131	139	142	168	1	2	54	859	1,321
89	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
89	May	0	0	333	644	770	876	935	80	106	602	1,831	2,789
89	Jun	0	0	361	499	548	572	609	99	107	573	2,109	2,941
89	Jul	0	0	186	195	224	232	263	24	28	189	1,084	1,567
89	Aug	0	0	146	149	169	173	202	9	11	102	647	969
89	Sep	0	0	146	150	169	172	200	6	16	101	616	931
89	Oct	0	0	185	347	407	460	494	30	69	385	823	1,316
89	Nov	0	0	186	288	364	429	466	37	74	441	1,040	1,536
89	Dec	0	0	154	189	233	251	284	16	23	179	940	1,407
90	Jan	0	0	145	161	193	199	231	9	12	114	852	1,281
90	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
90	Mar	0	0	138	147	182	212	244	5	9	104	928	1,402
90	Apr	0	0	267	805	880	959	996	80	108	648	1,301	2,297
90	May	0	0	437	933	1,022	1,086	1,125	128	149	817	1,674	2,799
90	Jun	0	0	341	416	481	500	538	68	62	333	1,265	1,803
90	Jul	0	0	190	193	244	254	290	28	24	179	1,145	1,659
90	Aug	0	0	157	167	208	215	250	18	16	141	1,030	1,525
90	Sep	0	0	171	265	312	335	371	26	44	270	1,772	2,685
90	Oct	0	0	177	297	360	406	445	33	63	366	1,264	1,927
90	Nov	0	0	160	222	293	331	371	27	39	263	3,101	4,658
90	Dec	0	0	154	196	260	279	318	20	22	178	1,830	2,744
91	Jan	0	0	149	181	233	246	283	14	17	146	1,407	2,108
91	Feb	0	0	146	170	212	222	258	10	14	128	1,365	2,047
91	Mar	0	0	144	167	206	217	252	7	14	122	1,796	2,698
91	Apr	0	0	321	1,056	1,154	1,227	1,274	110	135	798	3,313	5,339
91	May	0	0	423	797	912	997	1,048	138	159	944	5,807	8,568
91	Jun	0	0	298	388	450	476	517	47	46	308	3,431	5,063
91	Jul	0	0	192	268	317	331	370	30	32	197	1,641	2,461
91	Aug	0	0	170	176	218	230	267	25	29	174	1,102	1,610
91	Sep	0	0	160	173	207	217	252	18	19	143	1,037	1,534
91	Oct	0	0	159	258	300	332	368	20	40	249	1,673	2,561
91	Nov	0	0	158	218	271	309	347	22	45	278	1,529	2,305
91	Dec	0	0	154	192	240	258	295	16	22	166	1,235	1,851
92	Jan	0	0	151	177	216	228	263	11	16	129	1,046	1,566
92	Feb	0	0	147	167	198	207	241	7	13	112	924	1,383
92	Mar	0	0	144	157	183	192	225	5	12	102	918	1,374
92	Apr	0	0	208	449	554	641	695	39	83	503	1,237	1,934
92	May	0	0	387	822	951	1,053	1,113	91	132	719	2,478	3,807
92	Jun	0	0	339	394	452	480	521	71	72	374	2,189	3,131
92	Jul	0	0	191	196	234	246	282	28	26	182	1,129	1,626
92	Aug	0	0	157	159	187	195	229	15	15	130	721	1,044
92	Sep	0	0	148	149	171	177	209	9	12	109	606	883
92	Oct	0	0	144	145	163	168	200	6	10	98	706	1,042
92	Nov	0	0	140	141	157	162	192	5	9	90	1,080	1,611
92	Dec	0	0	138	140	152	155	184	4	8	81	1,012	1,517
93	Jan	0	0	136	137	145	148	176	3	6	73	1,010	1,519
93	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
93	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
93	Apr	0	0	131	132	218	300	349	2	12	142	2,022	3,057
93	May	0	0	418	1,120	1,236	1,335	1,391	118	127	733	5,542	8,629
93	Jun	0	0	484	968	1,029	1,064	1,102	163	176	929	10,401	15,525
93	Jul	0	0	268	307	358	381	416	59	75	417	2,866	4,156
93	Aug	0	0	169	205	244	254	287	21	23	176	1,774	2,639
93	Sep	0	0	150	175	208	214	246	13	14	128	1,357	2,029
93	Oct	0	0	149	215	255	273	306	14	26	180	2,181	3,307
93	Nov	0	0	147	187	232	255	288	14	29	194	2,079	3,130
93	Dec	0	0	144	169	207	218	251	9	16	134	1,507	2,262

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
94	Jan	0	0	141	157	188	195	226	6	12	111	1,268	1,902
94	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
94	Mar	0	0	136	137	159	165	194	4	9	93	1,213	1,818
94	Apr	0	0	134	135	156	162	191	4	8	89	1,299	1,953
94	May	0	0	483	1,325	1,393	1,454	1,490	133	140	791	6,978	10,856
94	Jun	0	0	484	789	876	950	990	166	168	951	3,008	4,256
94	Jul	0	0	213	226	273	293	328	40	43	279	1,196	1,679
94	Aug	0	0	156	187	221	231	263	13	16	135	1,036	1,547
94	Sep	0	0	144	146	173	180	211	7	11	105	922	1,369
94	Oct	0	0	141	164	191	198	229	6	14	107	929	1,403
94	Nov	0	0	140	164	204	227	259	6	16	121	1,248	1,881
94	Dec	0	0	138	150	193	220	253	5	13	117	1,147	1,723
95	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
95	Feb	0	0	134	135	161	169	200	4	10	97	1,035	1,556
95	Mar	0	0	132	133	154	160	189	3	9	88	1,053	1,589
95	Apr	0	0	131	132	231	317	369	3	17	169	1,805	2,726
95	May	0	0	440	1,279	1,405	1,507	1,566	132	141	809	3,697	5,953
95	Jun	0	0	457	753	810	837	875	163	159	874	3,921	5,596
95	Jul	0	0	208	221	258	268	302	39	42	271	1,774	2,548
95	Aug	0	0	152	156	183	189	221	12	17	136	805	1,184
95	Sep	0	0	139	141	162	166	196	6	11	102	698	1,045
95	Oct	0	0	135	136	152	155	184	5	8	88	755	1,141
95	Nov	0	0	132	133	145	148	175	4	7	79	1,233	1,865
95	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
96	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
96	Feb	0	0	128	129	131	132	157	2	2	57	1,004	1,535
96	Mar	0	0	127	128	189	254	292	2	6	106	985	1,513
96	Apr	0	0	130	141	225	305	348	4	27	187	1,665	2,523
96	May	0	0	245	312	351	369	402	27	57	257	2,995	4,476
96	Jun	0	0	270	294	319	324	354	35	46	225	2,518	3,709
96	Jul	0	0	165	169	187	189	217	10	17	127	1,141	1,695
96	Aug	0	0	141	142	155	156	183	5	10	99	689	1,035
96	Sep	0	0	135	136	145	145	171	4	8	87	4,092	6,157
96	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
96	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
96	Dec	0	0	131	132	134	134	158	2	5	71	1,161	1,762
97	Jan	0	0	129	130	131	131	154	2	4	64	635	977
97	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
97	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
97	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
97	May	0	0	618	1,895	2,058	2,202	2,271	270	281	1,516	14,745	22,364
97	Jun	0	0	563	1,033	1,236	1,385	1,467	229	214	1,332	10,074	14,845
97	Jul	0	0	240	390	472	507	550	57	64	402	5,523	8,281
97	Aug	0	0	167	177	231	242	276	21	33	209	2,465	3,672
97	Sep	0	0	146	149	189	194	226	9	13	121	1,049	1,567
97	Oct	0	0	140	141	172	176	206	6	8	96	855	1,286
97	Nov	0	0	137	138	161	164	193	4	6	85	1,032	1,557
97	Dec	0	0	134	135	153	155	183	4	5	76	628	957
98	Jan	0	0	132	133	146	147	174	3	4	68	633	970
98	Feb	0	0	130	131	141	141	167	2	3	62	673	1,034
98	Mar	0	0	129	130	136	136	161	2	1	55	1,193	1,821
98	Apr	0	0	128	129	228	317	369	2	14	159	2,311	3,504
98	May	0	0	422	982	1,112	1,219	1,279	118	127	735	5,651	8,662
98	Jun	0	0	438	769	819	842	878	146	141	772	4,974	7,284
98	Jul	0	0	207	219	250	256	286	36	36	239	2,297	3,356
98	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
98	Sep	0	0	139	141	156	157	184	6	7	88	997	1,505
98	Oct	0	0	135	136	147	147	173	4	5	76	781	1,189
98	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
98	Dec	0	0	130	131	136	136	160	3	3	60	716	1,101
99	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
99	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,636
99	Mar	0	0	126	127	141	164	188	1	1	53	1,714	2,612
99	Apr	0	0	135	151	180	210	237	7	33	194	1,985	2,976
99	May	0	0	211	235	263	271	298	18	59	270	2,399	3,535
99	Jun	0	0	227	238	260	263	289	20	35	171	2,027	2,995
99	Jul	0	0	158	161	178	179	204	8	13	109	1,268	1,900
99	Aug	0	0	141	142	155	155	179	4	7	88	699	1,058
99	Sep	0	0	136	137	145	145	169	3	5	79	655	999
99	Oct	0	0	133	134	140	140	162	3	4	71	817	1,248
99	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
99	Dec	0	0	130	131	132	132	153	1	1	57	875	1,344
100	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
100	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
100	Mar	0	0	126	127	128	128	147	0	0	42	976	1,511
100	Apr	0	0	156	174	227	287	317	15	51	324	1,089	1,612
100	May	0	0	354	392	468	539	574	67	112	589	3,835	5,546
100	Jun	0	0	472	957	1,070	1,161	1,209	138	163	874	2,031	3,240
100	Jul	0	0	350	535	665	760	813	108	127	752	1,478	2,291
100	Aug	0	0	186	201	259	280	315	36	32	239	1,046	1,500
100	Sep	0	0	152	171	210	215	245	19	13	131	756	1,122
100	Oct	0	0	147	207	240	243	272	16	15	124	734	1,133
100	Nov	0	0	145	177	210	213	242	15	17	126	1,147	1,731
100	Dec	0	0	142	161	189	191	220	10	11	109	903	1,359
101	Jan	0	0	139	151	172	174	201	6	9	96	902	1,357

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
101	Feb	0	0	136	142	158	159	186	5	8	88	830	1,249
101	Mar	0	0	135	143	173	208	237	5	10	112	1,114	1,682
101	Apr	0	0	255	739	813	897	932	72	104	628	1,879	3,043
101	May	0	0	396	772	855	918	954	104	129	745	3,316	4,936
101	Jun	0	0	305	416	475	492	527	48	45	284	1,655	2,420
101	Jul	0	0	184	187	234	242	276	27	22	171	1,408	2,060
101	Aug	0	0	155	156	194	198	231	17	16	133	734	1,076
101	Sep	0	0	148	149	179	183	214	13	14	119	647	954
101	Oct	0	0	146	147	172	175	205	10	13	111	819	1,217
101	Nov	0	0	143	144	165	167	196	6	12	101	1,018	1,523
101	Dec	0	0	140	141	157	159	187	4	11	92	986	1,480
102	Jan	0	0	137	138	150	151	178	4	9	83	884	1,333
102	Feb	0	0	135	136	144	144	170	3	8	76	912	1,381
102	Mar	0	0	133	134	140	140	165	2	7	69	1,008	1,530
102	Apr	0	0	148	173	292	393	453	5	54	343	1,231	1,861
102	May	0	0	299	582	734	857	926	50	108	588	4,094	6,249
102	Jun	0	0	307	380	434	460	499	61	74	380	1,840	2,634
102	Jul	0	0	180	214	245	251	282	24	25	172	1,185	1,752
102	Aug	0	0	158	213	238	242	271	21	28	168	947	1,433
102	Sep	0	0	154	165	189	191	220	20	29	169	781	1,146
102	Oct	0	0	152	218	247	260	290	18	27	177	820	1,253
102	Nov	0	0	150	189	223	239	269	17	27	181	983	1,475
102	Dec	0	0	147	173	199	205	234	12	17	135	987	1,476
103	Jan	0	0	144	161	182	185	213	7	14	115	1,331	1,994
103	Feb	0	0	141	152	167	170	197	5	12	103	1,194	1,788
103	Mar	0	0	138	143	155	156	182	4	11	94	1,245	1,866
103	Apr	0	0	136	137	281	398	467	4	29	245	3,508	5,269
103	May	0	0	358	1,139	1,323	1,464	1,545	117	148	872	3,714	5,958
103	Jun	0	0	466	910	979	1,011	1,053	151	158	879	5,867	8,667
103	Jul	0	0	303	358	399	409	443	48	48	300	2,270	3,273
103	Aug	0	0	180	189	219	224	254	22	22	161	1,170	1,709
103	Sep	0	0	169	266	299	311	342	21	39	227	1,348	2,067
103	Oct	0	0	169	228	270	286	318	23	44	252	919	1,384
103	Nov	0	0	155	191	231	240	272	18	22	163	1,297	1,943
103	Dec	0	0	150	175	207	213	244	13	16	131	990	1,481
104	Jan	0	0	146	163	188	193	223	8	14	114	930	1,393
104	Feb	0	0	143	154	173	178	206	5	12	102	1,026	1,538
104	Mar	0	0	140	145	161	165	193	4	11	94	1,154	1,731
104	Apr	0	0	143	167	315	433	503	5	43	308	1,711	2,584
104	May	0	0	421	1,057	1,241	1,383	1,464	105	139	793	5,778	8,946
104	Jun	0	0	417	664	731	763	805	130	128	693	4,179	6,073
104	Jul	0	0	203	219	257	268	301	37	37	242	1,411	2,019
104	Aug	0	0	155	158	185	190	221	14	17	136	819	1,192
104	Sep	0	0	146	161	182	186	215	9	13	113	657	975
104	Oct	0	0	146	180	206	215	245	10	18	130	1,024	1,544
104	Nov	0	0	144	168	203	215	246	9	20	138	1,092	1,639
104	Dec	0	0	141	158	190	199	229	6	15	120	950	1,424
105	Jan	0	0	139	148	173	180	209	5	12	108	891	1,337
105	Feb	0	0	136	139	162	167	196	4	11	99	877	1,316
105	Mar	0	0	134	135	159	166	195	4	11	96	1,048	1,576
105	Apr	0	0	222	539	636	714	761	49	92	549	1,066	1,826
105	May	0	0	364	668	786	879	931	76	119	678	3,066	4,579
105	Jun	0	0	297	356	412	437	474	40	45	264	1,493	2,149
105	Jul	0	0	178	181	219	229	262	19	21	153	1,378	2,026
105	Aug	0	0	150	152	180	187	218	11	14	117	670	987
105	Sep	0	0	142	143	165	171	200	6	12	101	588	875
105	Oct	0	0	139	140	157	161	190	4	11	93	899	1,348
105	Nov	0	0	137	138	151	155	182	4	10	88	1,076	1,618
105	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
106	Jan	0	0	133	134	141	144	170	3	8	73	979	1,484
106	Feb	0	0	132	133	137	139	164	2	6	66	999	1,518
106	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
106	Apr	0	0	136	147	208	271	308	4	41	260	1,448	2,187
106	May	0	0	305	689	776	854	895	79	130	707	2,662	4,094
106	Jun	0	0	380	684	733	753	787	104	120	638	3,298	4,863
106	Jul	0	0	255	265	301	309	340	38	39	238	1,467	2,084
106	Aug	0	0	167	170	197	202	232	19	17	136	1,140	1,675
106	Sep	0	0	147	149	170	173	202	11	12	106	978	1,454
106	Oct	0	0	141	142	158	161	188	6	10	91	1,008	1,508
106	Nov	0	0	138	139	151	154	180	5	9	82	1,165	1,750
106	Dec	0	0	136	137	146	148	174	4	8	75	1,092	1,647
107	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
107	Feb	0	0	133	134	137	138	162	3	5	61	939	1,427
107	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
107	Apr	0	0	130	131	179	233	263	2	9	108	1,276	1,942
107	May	0	0	433	1,126	1,203	1,278	1,314	127	135	767	1,566	2,880
107	Jun	0	0	492	943	1,006	1,046	1,081	166	180	966	2,281	3,362
107	Jul	0	0	258	327	386	412	447	53	69	385	1,411	2,020
107	Aug	0	0	170	208	259	270	304	25	25	185	793	1,172
107	Sep	0	0	153	155	199	208	240	18	17	144	724	1,059
107	Oct	0	0	149	211	259	286	320	16	26	188	808	1,242
107	Nov	0	0	147	181	241	277	313	15	29	205	1,116	1,679
107	Dec	0	0	144	167	223	242	277	11	18	147	930	1,395
108	Jan	0	0	141	155	200	212	246	6	14	122	879	1,318
108	Feb	0	0	138	146	182	191	224	5	12	109	852	1,278

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
108	Mar	0	0	136	137	170	179	211	4	11	103	858	1,287
108	Apr	0	0	135	136	239	322	372	4	18	171	1,070	1,612
108	May	0	0	409	1,219	1,344	1,442	1,498	125	136	783	1,609	3,107
108	Jun	0	0	468	871	936	964	1,004	160	156	865	2,274	3,278
108	Jul	0	0	246	272	317	330	366	45	45	291	1,281	1,802
108	Aug	0	0	167	170	205	214	248	17	20	156	836	1,217
108	Sep	0	0	149	151	178	185	217	8	14	119	628	928
108	Oct	0	0	144	148	172	179	210	5	12	109	633	946
108	Nov	0	0	141	146	170	177	207	5	11	104	882	1,327
108	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
109	Jan	0	0	136	137	151	156	184	3	9	86	856	1,295
109	Feb	0	0	133	134	145	149	176	3	7	78	880	1,337
109	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
109	Apr	0	0	131	132	146	159	186	2	6	71	1,053	1,605
109	May	0	0	433	1,316	1,427	1,525	1,577	146	169	954	2,206	3,783
109	Jun	0	0	517	933	1,070	1,178	1,237	181	192	1,140	3,743	5,387
109	Jul	0	0	283	296	356	384	423	46	48	319	1,304	1,814
109	Aug	0	0	172	175	212	223	256	14	17	135	725	1,062
109	Sep	0	0	148	149	176	182	214	6	9	92	687	1,033
109	Oct	0	0	142	143	165	170	200	4	8	81	689	1,043
109	Nov	0	0	139	139	162	167	197	4	7	79	855	1,296
109	Dec	0	0	136	137	158	163	193	3	6	74	846	1,288
110	Jan	0	0	133	134	150	154	183	2	5	67	828	1,265
110	Feb	0	0	132	133	144	148	175	2	3	60	800	1,229
110	Mar	0	0	131	131	139	142	168	1	2	54	859	1,321
110	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
110	May	0	0	333	644	770	876	935	80	106	602	1,831	2,789
110	Jun	0	0	361	499	548	572	609	99	107	573	2,109	2,941
110	Jul	0	0	186	195	224	232	263	24	28	189	1,084	1,567
110	Aug	0	0	146	149	169	173	202	9	11	102	647	969
110	Sep	0	0	146	150	169	171	200	6	16	101	616	931
110	Oct	0	0	185	347	407	460	493	30	69	385	823	1,316
110	Nov	0	0	186	288	364	429	466	37	74	441	1,040	1,536
110	Dec	0	0	154	189	233	251	284	16	23	179	940	1,407
111	Jan	0	0	145	161	193	199	231	9	12	114	852	1,281
111	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
111	Mar	0	0	138	148	182	212	244	5	9	104	928	1,402
111	Apr	0	0	268	808	884	964	1,001	80	108	651	1,301	2,302
111	May	0	0	438	938	1,028	1,093	1,132	128	150	822	1,674	2,806
111	Jun	0	0	342	417	482	502	540	68	62	335	1,265	1,805
111	Jul	0	0	190	193	244	254	291	28	24	180	1,145	1,659
111	Aug	0	0	157	167	209	216	251	18	16	141	1,030	1,525
111	Sep	0	0	171	266	313	336	372	26	44	271	1,773	2,685
111	Oct	0	0	177	297	360	406	445	33	63	366	1,264	1,927
111	Nov	0	0	160	222	293	331	371	27	39	263	3,101	4,658
111	Dec	0	0	154	196	261	279	318	20	22	178	1,830	2,744
112	Jan	0	0	149	181	233	246	283	14	17	146	1,407	2,108
112	Feb	0	0	146	170	212	222	258	10	14	128	1,365	2,047
112	Mar	0	0	144	167	206	217	252	7	14	122	1,796	2,698
112	Apr	0	0	321	1,056	1,154	1,227	1,274	109	135	798	3,313	5,339
112	May	0	0	424	797	912	997	1,048	138	159	944	5,807	8,568
112	Jun	0	0	298	388	450	476	517	47	46	308	3,431	5,063
112	Jul	0	0	193	268	317	331	370	30	32	197	1,641	2,461
112	Aug	0	0	170	176	218	230	267	25	29	174	1,102	1,610
112	Sep	0	0	160	174	208	217	253	18	19	143	1,037	1,534
112	Oct	0	0	159	258	300	332	368	20	40	249	1,673	2,561
112	Nov	0	0	158	218	271	309	347	22	45	278	1,529	2,305
112	Dec	0	0	154	192	240	258	295	16	22	166	1,235	1,851
113	Jan	0	0	151	178	216	228	263	11	16	129	1,046	1,566
113	Feb	0	0	147	167	198	207	241	7	13	112	924	1,383
113	Mar	0	0	144	157	183	192	225	5	12	102	918	1,374
113	Apr	0	0	208	449	554	641	695	39	83	503	1,237	1,934
113	May	0	0	387	822	951	1,053	1,113	91	132	719	2,478	3,807
113	Jun	0	0	339	394	452	480	521	71	72	374	2,189	3,131
113	Jul	0	0	191	196	234	246	282	28	26	182	1,129	1,626
113	Aug	0	0	157	159	187	195	229	15	15	130	721	1,044
113	Sep	0	0	148	149	171	177	209	9	12	109	606	883
113	Oct	0	0	144	145	163	168	199	6	10	98	706	1,042
113	Nov	0	0	141	141	157	162	192	5	9	90	1,080	1,611
113	Dec	0	0	138	141	152	156	185	4	8	81	1,012	1,517
114	Jan	0	0	136	137	145	148	175	3	6	73	1,010	1,519
114	Feb	0	0	134	135	140	142	169	3	5	66	1,000	1,510
114	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
114	Apr	0	0	131	132	218	300	348	2	12	142	2,022	3,057
114	May	0	0	417	1,114	1,230	1,329	1,385	118	127	730	5,543	8,627
114	Jun	0	0	484	964	1,025	1,060	1,099	162	175	925	10,401	15,527
114	Jul	0	0	267	306	357	380	415	58	75	416	2,866	4,157
114	Aug	0	0	169	205	244	253	286	21	23	176	1,774	2,639
114	Sep	0	0	150	174	207	214	246	13	14	127	1,357	2,029
114	Oct	0	0	149	215	254	273	305	14	26	180	2,181	3,307
114	Nov	0	0	147	187	232	254	288	14	29	194	2,079	3,130
114	Dec	0	0	144	169	207	218	251	9	16	134	1,507	2,262
115	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
115	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
115	Mar	0	0	136	137	159	165	195	4	9	93	1,213	1,818

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
115	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
115	May	0	0	485	1,332	1,401	1,463	1,500	133	141	795	6,977	10,857
115	Jun	0	0	485	792	880	954	995	167	169	956	3,008	4,255
115	Jul	0	0	214	226	273	294	329	40	43	280	1,196	1,679
115	Aug	0	0	156	188	222	231	264	13	17	135	1,037	1,548
115	Sep	0	0	144	146	173	180	211	7	11	105	922	1,369
115	Oct	0	0	141	164	192	198	229	6	14	107	929	1,403
115	Nov	0	0	140	165	204	227	259	6	16	121	1,248	1,881
115	Dec	0	0	138	151	193	220	253	5	13	117	1,147	1,723
116	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
116	Feb	0	0	134	135	161	169	200	4	10	97	1,035	1,556
116	Mar	0	0	132	133	154	160	189	3	9	88	1,053	1,589
116	Apr	0	0	131	132	231	317	369	3	17	169	1,805	2,726
116	May	0	0	440	1,279	1,405	1,507	1,566	132	141	809	3,697	5,953
116	Jun	0	0	457	753	810	837	875	163	159	873	3,921	5,596
116	Jul	0	0	208	221	258	268	302	39	42	271	1,774	2,548
116	Aug	0	0	152	156	183	189	221	12	17	136	805	1,184
116	Sep	0	0	139	141	162	166	196	6	11	102	698	1,045
116	Oct	0	0	135	136	152	155	184	5	8	88	755	1,140
116	Nov	0	0	132	133	145	147	175	4	7	79	1,233	1,865
116	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
117	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
117	Feb	0	0	128	129	131	132	157	2	3	57	1,004	1,535
117	Mar	0	0	127	128	189	254	291	2	6	106	985	1,513
117	Apr	0	0	130	141	225	305	348	4	27	187	1,665	2,523
117	May	0	0	245	313	351	370	402	27	57	257	2,996	4,476
117	Jun	0	0	270	294	319	324	353	34	46	225	2,518	3,709
117	Jul	0	0	165	169	187	189	217	10	17	127	1,141	1,695
117	Aug	0	0	141	142	155	156	183	5	10	99	689	1,035
117	Sep	0	0	135	136	145	145	171	3	8	87	4,092	6,157
117	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
117	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
117	Dec	0	0	131	132	134	134	158	2	5	71	1,161	1,762
118	Jan	0	0	129	130	131	131	154	2	4	64	635	977
118	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
118	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
118	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
118	May	0	0	617	1,886	2,049	2,192	2,261	269	280	1,508	14,746	22,363
118	Jun	0	0	563	1,031	1,232	1,381	1,462	229	214	1,330	10,074	14,845
118	Jul	0	0	240	390	471	506	548	56	64	401	5,523	8,281
118	Aug	0	0	167	176	230	242	276	21	33	209	2,465	3,672
118	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
118	Oct	0	0	140	141	172	176	205	6	8	96	855	1,286
118	Nov	0	0	137	138	161	164	193	4	6	84	1,032	1,558
118	Dec	0	0	134	135	153	155	182	4	5	76	628	957
119	Jan	0	0	132	133	146	147	174	3	4	68	633	970
119	Feb	0	0	130	131	140	141	167	2	3	61	673	1,034
119	Mar	0	0	129	130	136	136	161	2	1	55	1,194	1,820
119	Apr	0	0	128	129	229	319	371	2	14	160	2,311	3,504
119	May	0	0	422	988	1,118	1,226	1,287	118	128	739	5,650	8,663
119	Jun	0	0	439	771	822	845	881	147	142	775	4,973	7,283
119	Jul	0	0	208	220	250	257	287	36	36	239	2,296	3,355
119	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
119	Sep	0	0	139	141	157	157	184	6	7	88	997	1,504
119	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
119	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
119	Dec	0	0	130	131	136	136	160	3	3	60	716	1,101
120	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
120	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,636
120	Mar	0	0	126	127	141	164	188	1	1	53	1,714	2,612
120	Apr	0	0	135	151	180	210	237	7	33	194	1,985	2,976
120	May	0	0	211	235	263	271	298	18	59	270	2,399	3,535
120	Jun	0	0	227	238	260	263	289	20	35	171	2,027	2,995
120	Jul	0	0	158	161	178	179	204	8	13	109	1,268	1,900
120	Aug	0	0	141	142	155	155	179	4	7	88	699	1,058
120	Sep	0	0	136	137	145	145	169	3	5	79	655	999
120	Oct	0	0	133	134	139	139	162	3	4	71	817	1,248
120	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
120	Dec	0	0	130	131	132	132	153	1	1	57	875	1,344
121	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
121	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
121	Mar	0	0	126	127	128	128	147	0	0	42	976	1,511
121	Apr	0	0	156	174	227	287	317	15	51	324	1,089	1,612
121	May	0	0	354	392	467	539	574	67	112	588	3,835	5,546
121	Jun	0	0	472	959	1,073	1,163	1,211	138	163	873	2,031	3,243
121	Jul	0	0	350	535	665	760	813	108	127	752	1,478	2,290
121	Aug	0	0	186	201	259	280	315	36	32	239	1,046	1,500
121	Sep	0	0	152	171	210	215	245	19	13	131	756	1,122
121	Oct	0	0	147	207	240	243	272	16	15	124	734	1,133
121	Nov	0	0	145	177	210	213	242	15	17	126	1,147	1,731
121	Dec	0	0	142	161	189	191	220	10	11	109	903	1,359
122	Jan	0	0	139	151	172	174	201	6	9	96	902	1,357
122	Feb	0	0	136	142	158	159	185	5	8	87	830	1,249
122	Mar	0	0	135	142	173	207	236	5	10	112	1,114	1,682
122	Apr	0	0	254	739	811	895	929	72	104	627	1,879	3,043

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
122	May	0	0	395	769	851	912	949	103	129	743	3,316	4,935
122	Jun	0	0	305	415	474	490	525	48	45	282	1,655	2,420
122	Jul	0	0	184	187	234	241	275	26	22	171	1,408	2,060
122	Aug	0	0	155	156	194	198	230	17	16	133	734	1,076
122	Sep	0	0	148	149	179	183	213	12	14	119	647	955
122	Oct	0	0	146	147	172	175	205	10	13	111	819	1,217
122	Nov	0	0	143	144	164	167	196	6	12	101	1,018	1,523
122	Dec	0	0	140	141	157	158	186	4	11	91	985	1,480
123	Jan	0	0	137	138	149	151	177	4	9	83	884	1,333
123	Feb	0	0	135	136	144	144	170	3	8	76	912	1,381
123	Mar	0	0	134	134	140	140	165	2	7	69	1,008	1,530
123	Apr	0	0	148	172	293	395	455	5	54	345	1,231	1,861
123	May	0	0	301	586	740	863	933	50	108	592	4,093	6,249
123	Jun	0	0	309	383	437	463	502	61	74	383	1,840	2,633
123	Jul	0	0	180	215	245	252	283	24	25	173	1,185	1,752
123	Aug	0	0	158	213	239	242	271	21	28	169	947	1,433
123	Sep	0	0	154	165	189	192	220	20	29	169	781	1,146
123	Oct	0	0	152	218	247	260	290	18	27	177	820	1,253
123	Nov	0	0	150	189	223	239	269	17	27	181	983	1,475
123	Dec	0	0	147	173	199	206	235	12	17	135	987	1,476
124	Jan	0	0	144	161	182	185	213	7	14	115	1,331	1,994
124	Feb	0	0	141	152	167	170	197	5	12	103	1,194	1,788
124	Mar	0	0	138	143	155	156	182	4	11	94	1,245	1,866
124	Apr	0	0	136	137	281	398	467	4	29	246	3,508	5,269
124	May	0	0	358	1,140	1,323	1,464	1,545	117	148	872	3,714	5,958
124	Jun	0	0	466	910	979	1,011	1,053	151	158	878	5,867	8,667
124	Jul	0	0	303	358	399	409	443	48	48	300	2,270	3,273
124	Aug	0	0	180	190	219	224	254	22	22	161	1,170	1,709
124	Sep	0	0	169	266	299	311	342	20	39	227	1,348	2,067
124	Oct	0	0	169	228	270	286	318	23	44	252	919	1,384
124	Nov	0	0	155	191	231	240	272	18	22	163	1,297	1,944
124	Dec	0	0	150	175	207	213	244	13	16	131	990	1,481
125	Jan	0	0	146	163	188	193	223	8	14	114	930	1,393
125	Feb	0	0	143	154	173	178	206	5	12	102	1,026	1,538
125	Mar	0	0	140	145	161	165	193	4	11	94	1,154	1,731
125	Apr	0	0	143	167	314	433	503	5	43	308	1,711	2,584
125	May	0	0	421	1,057	1,241	1,383	1,464	105	139	793	5,778	8,946
125	Jun	0	0	417	664	731	763	805	130	128	693	4,179	6,073
125	Jul	0	0	203	219	257	267	301	37	37	242	1,411	2,019
125	Aug	0	0	155	158	185	190	221	14	17	136	819	1,192
125	Sep	0	0	146	161	182	186	215	9	13	113	657	975
125	Oct	0	0	146	180	206	215	245	10	18	130	1,024	1,544
125	Nov	0	0	144	168	203	215	246	9	20	138	1,092	1,639
125	Dec	0	0	141	158	190	199	229	6	15	120	950	1,424
126	Jan	0	0	139	148	173	180	209	5	12	108	891	1,337
126	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
126	Mar	0	0	134	135	159	166	194	4	10	96	1,048	1,576
126	Apr	0	0	221	538	634	711	758	49	91	548	1,066	1,823
126	May	0	0	363	665	782	874	925	76	119	676	3,066	4,578
126	Jun	0	0	297	355	411	435	472	39	45	263	1,493	2,149
126	Jul	0	0	178	181	218	229	262	19	21	152	1,378	2,026
126	Aug	0	0	150	151	180	186	218	10	14	117	670	988
126	Sep	0	0	142	143	165	170	200	5	12	100	588	876
126	Oct	0	0	139	140	156	161	189	4	11	93	899	1,348
126	Nov	0	0	137	138	151	154	182	4	10	88	1,076	1,618
126	Dec	0	0	135	136	146	149	176	3	9	81	999	1,508
127	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
127	Feb	0	0	132	133	137	138	164	2	6	66	999	1,518
127	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
127	Apr	0	0	136	147	209	273	310	4	42	260	1,448	2,187
127	May	0	0	306	692	781	859	901	79	131	711	2,662	4,095
127	Jun	0	0	382	688	737	757	791	104	120	642	3,297	4,861
127	Jul	0	0	256	265	301	310	341	38	39	238	1,466	2,083
127	Aug	0	0	167	170	197	202	232	19	17	136	1,140	1,675
127	Sep	0	0	147	149	170	173	202	11	12	106	978	1,454
127	Oct	0	0	141	142	158	161	188	6	10	91	1,008	1,508
127	Nov	0	0	138	139	151	154	180	5	9	82	1,165	1,750
127	Dec	0	0	136	137	146	148	174	4	8	75	1,092	1,647
128	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
128	Feb	0	0	133	134	137	138	162	3	5	61	939	1,427
128	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
128	Apr	0	0	130	131	179	233	263	2	9	108	1,276	1,942
128	May	0	0	433	1,127	1,204	1,279	1,315	127	135	766	1,566	2,881
128	Jun	0	0	492	943	1,006	1,046	1,080	166	180	966	2,281	3,362
128	Jul	0	0	258	327	386	412	447	53	69	385	1,411	2,020
128	Aug	0	0	170	208	259	270	304	24	25	185	793	1,172
128	Sep	0	0	153	156	199	208	240	17	17	144	724	1,059
128	Oct	0	0	149	211	259	286	320	16	26	188	808	1,242
128	Nov	0	0	147	181	241	277	313	15	29	205	1,116	1,679
128	Dec	0	0	144	167	222	242	277	11	18	147	930	1,395
129	Jan	0	0	141	155	200	212	246	6	14	122	879	1,318
129	Feb	0	0	138	146	182	191	224	5	12	109	852	1,278
129	Mar	0	0	136	137	170	179	210	4	11	103	858	1,287
129	Apr	0	0	135	136	239	321	372	4	18	171	1,070	1,612
129	May	0	0	409	1,219	1,344	1,442	1,498	125	136	783	1,609	3,107

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
129	Jun	0	0	468	871	936	964	1,004	160	156	864	2,274	3,278
129	Jul	0	0	246	272	317	330	366	45	45	291	1,281	1,802
129	Aug	0	0	167	170	205	214	248	17	20	156	836	1,217
129	Sep	0	0	149	151	178	185	217	8	14	119	628	928
129	Oct	0	0	144	148	172	179	210	5	12	109	633	946
129	Nov	0	0	141	146	169	177	207	5	11	104	882	1,327
129	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
130	Jan	0	0	136	137	150	156	184	3	9	86	856	1,295
130	Feb	0	0	133	134	144	149	176	3	7	78	880	1,337
130	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
130	Apr	0	0	131	132	145	159	186	2	6	70	1,053	1,605
130	May	0	0	432	1,310	1,419	1,516	1,568	145	168	950	2,207	3,775
130	Jun	0	0	516	930	1,065	1,172	1,231	180	192	1,136	3,743	5,387
130	Jul	0	0	282	295	355	383	421	46	48	318	1,304	1,815
130	Aug	0	0	172	175	212	222	255	14	17	134	725	1,062
130	Sep	0	0	148	149	176	182	213	6	9	91	687	1,033
130	Oct	0	0	141	143	165	169	200	4	8	81	689	1,043
130	Nov	0	0	138	139	162	167	197	4	7	79	855	1,297
130	Dec	0	0	136	137	158	163	192	3	6	74	846	1,288
131	Jan	0	0	133	134	150	154	182	2	5	66	828	1,266
131	Feb	0	0	132	133	144	148	175	2	3	60	800	1,229
131	Mar	0	0	130	131	139	142	168	1	2	53	859	1,321
131	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
131	May	0	0	333	642	767	873	933	80	106	602	1,831	2,787
131	Jun	0	0	361	499	547	572	608	99	107	573	2,109	2,941
131	Jul	0	0	186	195	224	232	263	24	28	189	1,084	1,567
131	Aug	0	0	146	149	169	173	202	9	11	102	647	969
131	Sep	0	0	145	150	168	171	200	6	16	100	616	931
131	Oct	0	0	185	347	406	460	493	30	69	384	823	1,316
131	Nov	0	0	186	288	364	429	465	37	74	441	1,040	1,536
131	Dec	0	0	154	189	233	250	284	16	23	179	940	1,407
132	Jan	0	0	145	161	192	199	231	8	12	113	852	1,281
132	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
132	Mar	0	0	138	147	182	212	244	5	9	104	928	1,402
132	Apr	0	0	268	808	884	964	1,001	80	108	651	1,301	2,302
132	May	0	0	438	938	1,027	1,092	1,132	128	150	821	1,674	2,806
132	Jun	0	0	342	417	482	502	540	68	62	335	1,265	1,805
132	Jul	0	0	190	193	244	254	291	28	24	180	1,145	1,659
132	Aug	0	0	157	167	209	216	251	18	16	141	1,030	1,525
132	Sep	0	0	171	266	312	336	371	26	44	270	1,773	2,685
132	Oct	0	0	177	297	360	406	445	33	63	366	1,264	1,927
132	Nov	0	0	160	222	293	331	371	27	39	263	3,101	4,658
132	Dec	0	0	154	196	260	279	318	20	22	178	1,830	2,744
133	Jan	0	0	149	181	233	246	283	14	17	146	1,407	2,108
133	Feb	0	0	146	170	212	222	258	10	14	128	1,365	2,047
133	Mar	0	0	144	167	206	217	252	7	14	122	1,796	2,698
133	Apr	0	0	321	1,056	1,154	1,227	1,274	109	135	798	3,313	5,339
133	May	0	0	424	797	912	997	1,048	138	159	943	5,807	8,568
133	Jun	0	0	298	388	450	476	517	47	46	308	3,431	5,063
133	Jul	0	0	193	268	317	331	370	30	32	197	1,641	2,461
133	Aug	0	0	170	176	218	230	267	25	29	174	1,102	1,610
133	Sep	0	0	160	174	207	217	252	18	19	143	1,037	1,534
133	Oct	0	0	159	258	300	331	368	20	40	249	1,673	2,561
133	Nov	0	0	158	218	271	309	347	21	45	278	1,529	2,305
133	Dec	0	0	154	192	240	258	295	16	22	166	1,235	1,851
134	Jan	0	0	151	177	216	228	263	11	16	129	1,046	1,566
134	Feb	0	0	147	166	197	207	241	6	13	112	924	1,383
134	Mar	0	0	144	157	182	191	224	4	12	101	918	1,374
134	Apr	0	0	208	449	552	638	692	39	83	501	1,237	1,934
134	May	0	0	386	817	944	1,046	1,105	90	131	714	2,479	3,807
134	Jun	0	0	338	392	449	477	518	70	71	370	2,189	3,133
134	Jul	0	0	191	196	233	245	281	28	26	181	1,129	1,626
134	Aug	0	0	157	159	187	195	228	15	15	129	721	1,044
134	Sep	0	0	148	149	171	177	209	9	12	109	606	883
134	Oct	0	0	144	145	163	168	199	6	10	97	706	1,042
134	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
134	Dec	0	0	138	139	150	154	183	4	8	81	1,012	1,516
135	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,520
135	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
135	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
135	Apr	0	0	131	132	218	300	348	2	12	142	2,022	3,057
135	May	0	0	418	1,118	1,234	1,333	1,389	118	127	733	5,542	8,627
135	Jun	0	0	484	968	1,028	1,064	1,102	163	175	928	10,401	15,525
135	Jul	0	0	268	307	358	381	416	59	75	417	2,866	4,156
135	Aug	0	0	169	205	244	254	286	21	23	176	1,774	2,639
135	Sep	0	0	150	175	207	214	246	13	14	127	1,357	2,029
135	Oct	0	0	149	215	254	273	306	14	26	180	2,181	3,307
135	Nov	0	0	147	187	232	254	288	14	29	194	2,079	3,130
135	Dec	0	0	144	169	207	218	251	9	16	134	1,507	2,262
136	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
136	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
136	Mar	0	0	136	137	159	165	195	4	9	93	1,213	1,818
136	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
136	May	0	0	485	1,332	1,401	1,463	1,500	133	141	795	6,977	10,857
136	Jun	0	0	485	792	880	954	995	167	169	956	3,008	4,255

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
136	Jul	0	0	214	226	273	294	329	40	43	280	1,196	1,679
136	Aug	0	0	156	188	222	231	263	13	17	135	1,037	1,548
136	Sep	0	0	144	146	173	180	211	7	11	105	922	1,369
136	Oct	0	0	141	164	192	198	229	6	14	107	929	1,403
136	Nov	0	0	140	165	204	227	259	6	16	121	1,248	1,881
136	Dec	0	0	138	151	193	220	253	5	13	117	1,147	1,723
137	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
137	Feb	0	0	134	135	161	169	200	4	10	97	1,035	1,556
137	Mar	0	0	132	133	154	160	189	3	9	88	1,053	1,589
137	Apr	0	0	131	132	231	317	369	3	17	169	1,805	2,726
137	May	0	0	440	1,279	1,405	1,507	1,566	132	141	809	3,697	5,953
137	Jun	0	0	457	753	810	837	875	163	159	873	3,921	5,596
137	Jul	0	0	208	221	258	268	302	39	42	271	1,774	2,548
137	Aug	0	0	152	156	183	189	221	12	17	136	805	1,184
137	Sep	0	0	139	141	162	166	196	6	11	102	698	1,045
137	Oct	0	0	135	136	152	155	184	5	8	88	755	1,140
137	Nov	0	0	132	133	145	147	175	4	7	79	1,233	1,865
137	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
138	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
138	Feb	0	0	128	129	131	132	157	2	2	56	1,004	1,535
138	Mar	0	0	127	128	188	252	290	2	6	105	985	1,513
138	Apr	0	0	130	141	224	303	345	3	27	186	1,665	2,523
138	May	0	0	244	309	347	366	398	26	56	254	2,995	4,476
138	Jun	0	0	270	292	317	322	351	34	46	222	2,519	3,711
138	Jul	0	0	165	169	186	188	216	10	17	125	1,141	1,696
138	Aug	0	0	141	142	155	155	182	5	10	98	689	1,035
138	Sep	0	0	134	136	145	145	171	3	7	87	4,092	6,157
138	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
138	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
138	Dec	0	0	131	132	134	134	157	2	5	71	1,161	1,762
139	Jan	0	0	129	130	131	131	154	2	4	64	635	977
139	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
139	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
139	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
139	May	0	0	618	1,890	2,054	2,197	2,267	270	281	1,516	14,745	22,360
139	Jun	0	0	563	1,033	1,235	1,385	1,466	229	214	1,332	10,074	14,845
139	Jul	0	0	240	390	471	507	549	56	64	401	5,523	8,281
139	Aug	0	0	167	177	230	242	276	21	33	209	2,465	3,672
139	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
139	Oct	0	0	140	141	172	176	205	6	8	96	855	1,286
139	Nov	0	0	137	138	161	164	193	4	6	84	1,032	1,558
139	Dec	0	0	134	135	153	155	182	4	5	76	628	957
140	Jan	0	0	132	133	146	147	173	3	4	68	633	970
140	Feb	0	0	130	131	140	141	167	2	3	61	673	1,034
140	Mar	0	0	129	130	136	136	161	2	1	55	1,194	1,820
140	Apr	0	0	128	129	229	319	371	2	14	160	2,311	3,504
140	May	0	0	423	988	1,119	1,226	1,287	118	128	739	5,650	8,664
140	Jun	0	0	440	772	822	845	881	146	142	775	4,973	7,283
140	Jul	0	0	208	220	250	256	287	36	36	239	2,296	3,355
140	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
140	Sep	0	0	139	141	156	157	184	6	7	88	997	1,504
140	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
140	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
140	Dec	0	0	130	131	136	136	160	3	3	60	716	1,101
141	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
141	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,636
141	Mar	0	0	126	127	141	163	188	1	1	53	1,714	2,612
141	Apr	0	0	135	151	180	210	237	7	33	194	1,985	2,976
141	May	0	0	211	235	263	271	298	18	59	270	2,399	3,535
141	Jun	0	0	227	238	260	263	289	20	35	170	2,027	2,995
141	Jul	0	0	158	161	178	179	204	8	13	109	1,268	1,900
141	Aug	0	0	141	142	155	155	179	4	7	88	699	1,058
141	Sep	0	0	136	137	145	145	169	3	5	79	655	999
141	Oct	0	0	133	134	139	139	162	3	4	71	817	1,248
141	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
141	Dec	0	0	130	131	132	132	153	1	1	57	875	1,344
142	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
142	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
142	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
142	Apr	0	0	156	174	226	284	315	15	51	323	1,089	1,612
142	May	0	0	353	390	464	534	569	66	111	584	3,835	5,549
142	Jun	0	0	471	951	1,065	1,155	1,203	137	162	870	2,032	3,235
142	Jul	0	0	350	534	663	759	812	108	127	751	1,478	2,289
142	Aug	0	0	186	200	259	279	314	36	32	238	1,046	1,500
142	Sep	0	0	152	171	209	214	245	18	13	131	756	1,122
142	Oct	0	0	146	207	240	243	272	16	15	124	733	1,133
142	Nov	0	0	145	177	209	212	241	15	17	126	1,147	1,731
142	Dec	0	0	142	161	189	191	219	10	11	108	903	1,359
143	Jan	0	0	139	151	172	173	201	6	9	96	902	1,357
143	Feb	0	0	136	142	158	159	185	5	8	87	830	1,249
143	Mar	0	0	135	143	173	208	236	5	10	112	1,114	1,682
143	Apr	0	0	255	739	812	897	931	72	104	628	1,879	3,043
143	May	0	0	396	772	855	917	954	103	129	745	3,316	4,936
143	Jun	0	0	305	416	475	492	526	48	45	283	1,655	2,420
143	Jul	0	0	184	187	234	242	275	26	22	171	1,408	2,060

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
143	Aug	0	0	155	156	194	198	230	17	16	133	734	1,076
143	Sep	0	0	148	149	179	183	214	12	14	119	647	954
143	Oct	0	0	146	147	172	175	205	9	13	111	819	1,217
143	Nov	0	0	143	144	164	167	196	6	12	101	1,018	1,523
143	Dec	0	0	140	141	157	158	186	4	11	92	985	1,480
144	Jan	0	0	137	138	149	151	177	4	9	83	884	1,333
144	Feb	0	0	135	136	144	144	170	3	8	76	912	1,381
144	Mar	0	0	134	135	140	140	165	2	7	69	1,008	1,530
144	Apr	0	0	148	173	293	395	456	5	54	345	1,231	1,861
144	May	0	0	301	587	740	863	934	50	108	592	4,093	6,249
144	Jun	0	0	309	383	437	463	502	61	74	383	1,840	2,633
144	Jul	0	0	180	215	245	252	283	24	25	173	1,185	1,752
144	Aug	0	0	158	213	239	242	271	21	28	168	947	1,433
144	Sep	0	0	154	165	189	192	220	20	29	169	781	1,146
144	Oct	0	0	152	218	247	260	290	18	27	177	820	1,253
144	Nov	0	0	150	189	223	239	269	17	27	181	983	1,475
144	Dec	0	0	147	173	199	206	235	12	17	135	987	1,476
145	Jan	0	0	144	161	182	185	213	7	14	115	1,331	1,994
145	Feb	0	0	141	152	167	170	197	5	12	103	1,194	1,788
145	Mar	0	0	138	143	155	156	182	4	11	94	1,245	1,866
145	Apr	0	0	136	137	281	398	467	4	29	246	3,508	5,269
145	May	0	0	358	1,140	1,323	1,464	1,545	116	148	872	3,714	5,958
145	Jun	0	0	466	910	979	1,011	1,053	151	158	878	5,867	8,667
145	Jul	0	0	303	358	399	409	443	48	48	299	2,270	3,273
145	Aug	0	0	180	190	219	224	254	22	22	161	1,170	1,709
145	Sep	0	0	169	266	298	311	342	20	39	227	1,348	2,067
145	Oct	0	0	169	228	270	286	318	23	44	252	919	1,384
145	Nov	0	0	155	191	231	240	272	18	22	163	1,297	1,944
145	Dec	0	0	150	175	207	213	244	12	16	131	990	1,481
146	Jan	0	0	146	163	188	193	223	8	14	114	930	1,393
146	Feb	0	0	143	153	173	178	206	5	12	102	1,026	1,538
146	Mar	0	0	140	145	161	165	192	4	11	93	1,154	1,731
146	Apr	0	0	143	167	313	431	500	5	42	307	1,711	2,584
146	May	0	0	420	1,051	1,233	1,374	1,455	104	138	788	5,779	8,945
146	Jun	0	0	416	661	727	759	801	129	128	689	4,180	6,074
146	Jul	0	0	203	218	256	266	300	37	37	241	1,411	2,019
146	Aug	0	0	155	158	185	190	220	14	17	135	819	1,193
146	Sep	0	0	146	160	182	185	215	9	13	113	657	975
146	Oct	0	0	146	179	206	215	244	10	18	130	1,024	1,544
146	Nov	0	0	144	168	202	214	245	9	20	138	1,092	1,638
146	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
147	Jan	0	0	138	147	173	179	209	5	12	107	891	1,337
147	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
147	Mar	0	0	134	135	159	166	195	4	11	96	1,048	1,576
147	Apr	0	0	222	539	635	714	760	49	92	549	1,066	1,826
147	May	0	0	364	668	786	878	930	76	119	678	3,066	4,579
147	Jun	0	0	297	356	412	437	474	39	45	264	1,493	2,149
147	Jul	0	0	178	181	218	229	262	19	21	152	1,378	2,026
147	Aug	0	0	150	151	180	186	218	10	14	117	670	987
147	Sep	0	0	142	143	165	170	200	5	12	100	588	875
147	Oct	0	0	139	140	156	161	189	4	11	93	899	1,348
147	Nov	0	0	137	138	151	154	182	4	10	88	1,076	1,618
147	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
148	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
148	Feb	0	0	132	133	137	138	164	2	6	66	999	1,518
148	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
148	Apr	0	0	136	147	209	273	310	4	42	261	1,448	2,187
148	May	0	0	306	694	783	861	903	79	131	711	2,661	4,096
148	Jun	0	0	382	688	737	757	791	104	120	642	3,297	4,861
148	Jul	0	0	256	265	301	310	341	38	39	238	1,466	2,083
148	Aug	0	0	167	170	197	202	232	19	17	136	1,140	1,675
148	Sep	0	0	147	149	170	173	202	11	12	106	978	1,454
148	Oct	0	0	141	142	158	161	188	6	10	91	1,008	1,507
148	Nov	0	0	138	139	151	153	180	5	9	82	1,165	1,750
148	Dec	0	0	136	137	146	148	174	4	8	75	1,092	1,647
149	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
149	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
149	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
149	Apr	0	0	130	131	179	233	263	2	9	108	1,276	1,942
149	May	0	0	433	1,128	1,205	1,280	1,315	127	135	766	1,566	2,882
149	Jun	0	0	492	943	1,006	1,046	1,080	166	180	965	2,281	3,362
149	Jul	0	0	258	328	386	412	447	53	69	385	1,411	2,020
149	Aug	0	0	170	208	258	270	304	24	25	185	793	1,172
149	Sep	0	0	153	156	199	208	240	17	17	144	724	1,059
149	Oct	0	0	149	211	259	286	320	16	26	188	808	1,242
149	Nov	0	0	147	182	241	277	313	15	29	204	1,116	1,679
149	Dec	0	0	144	167	222	242	277	10	18	147	930	1,395
150	Jan	0	0	141	155	200	212	246	6	14	122	879	1,318
150	Feb	0	0	138	146	182	191	223	5	12	109	852	1,278
150	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
150	Apr	0	0	135	136	238	319	369	4	18	170	1,070	1,612
150	May	0	0	408	1,213	1,337	1,433	1,489	125	135	778	1,610	3,099
150	Jun	0	0	467	868	932	960	1,000	159	155	861	2,275	3,274
150	Jul	0	0	246	271	316	329	365	45	45	290	1,281	1,803
150	Aug	0	0	167	170	204	213	247	17	20	156	836	1,218

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
150	Sep	0	0	149	151	177	185	217	8	14	119	628	929
150	Oct	0	0	144	147	171	178	209	5	12	108	633	945
150	Nov	0	0	141	146	169	176	207	5	11	103	882	1,327
150	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
151	Jan	0	0	136	136	150	155	184	3	9	86	856	1,296
151	Feb	0	0	133	134	144	149	176	3	7	78	880	1,337
151	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
151	Apr	0	0	131	132	145	159	186	2	6	70	1,053	1,605
151	May	0	0	433	1,315	1,425	1,523	1,575	146	169	954	2,206	3,782
151	Jun	0	0	517	933	1,070	1,178	1,237	180	192	1,140	3,743	5,387
151	Jul	0	0	283	296	356	384	422	46	48	319	1,304	1,814
151	Aug	0	0	172	175	212	222	256	14	17	134	725	1,062
151	Sep	0	0	148	149	176	182	213	6	9	92	687	1,033
151	Oct	0	0	142	143	165	169	200	4	8	81	689	1,043
151	Nov	0	0	138	139	162	167	197	4	7	79	855	1,296
151	Dec	0	0	136	137	157	163	192	3	6	74	846	1,288
152	Jan	0	0	133	134	150	154	182	2	5	66	828	1,266
152	Feb	0	0	132	133	144	147	175	2	3	60	800	1,229
152	Mar	0	0	131	131	139	142	168	1	2	53	859	1,321
152	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
152	May	0	0	333	643	769	875	934	80	106	602	1,831	2,788
152	Jun	0	0	361	499	547	572	608	99	107	573	2,109	2,941
152	Jul	0	0	186	195	224	231	263	24	28	189	1,084	1,567
152	Aug	0	0	146	149	169	173	202	9	11	102	647	969
152	Sep	0	0	145	150	168	171	200	6	16	100	616	931
152	Oct	0	0	185	347	406	460	493	30	69	384	823	1,316
152	Nov	0	0	186	288	364	429	465	37	74	441	1,040	1,536
152	Dec	0	0	154	189	233	250	284	16	23	179	940	1,407
153	Jan	0	0	145	161	192	199	231	8	12	113	852	1,281
153	Feb	0	0	141	148	173	176	207	6	9	94	831	1,251
153	Mar	0	0	138	147	182	212	244	5	9	104	928	1,402
153	Apr	0	0	268	808	884	964	1,001	80	108	651	1,301	2,302
153	May	0	0	438	938	1,027	1,092	1,132	128	150	821	1,674	2,806
153	Jun	0	0	342	417	482	502	540	68	62	334	1,265	1,805
153	Jul	0	0	190	193	244	254	290	28	24	180	1,145	1,659
153	Aug	0	0	157	167	209	216	251	18	16	141	1,030	1,525
153	Sep	0	0	171	266	312	335	371	25	44	270	1,773	2,685
153	Oct	0	0	177	297	360	406	445	33	63	365	1,264	1,927
153	Nov	0	0	160	222	293	331	371	27	39	263	3,101	4,658
153	Dec	0	0	154	196	260	279	318	20	22	178	1,830	2,744
154	Jan	0	0	149	181	233	245	283	14	17	146	1,407	2,108
154	Feb	0	0	146	170	212	222	258	10	14	128	1,365	2,046
154	Mar	0	0	143	167	206	216	251	7	14	122	1,796	2,698
154	Apr	0	0	320	1,052	1,148	1,220	1,267	109	134	794	3,313	5,338
154	May	0	0	422	794	907	991	1,041	137	159	939	5,808	8,569
154	Jun	0	0	297	387	449	474	515	47	45	306	3,431	5,063
154	Jul	0	0	192	268	316	330	369	29	32	196	1,641	2,461
154	Aug	0	0	170	176	218	229	266	25	29	173	1,102	1,610
154	Sep	0	0	160	173	207	216	252	18	19	143	1,037	1,534
154	Oct	0	0	159	258	299	331	367	20	40	249	1,673	2,561
154	Nov	0	0	158	218	271	309	347	21	45	278	1,529	2,305
154	Dec	0	0	154	192	240	257	294	15	22	165	1,235	1,851
155	Jan	0	0	151	177	216	227	263	10	16	129	1,046	1,566
155	Feb	0	0	147	166	197	207	241	6	13	112	924	1,383
155	Mar	0	0	144	157	183	191	224	5	12	102	918	1,374
155	Apr	0	0	208	449	554	640	694	39	83	502	1,237	1,934
155	May	0	0	387	822	950	1,053	1,113	91	132	718	2,478	3,807
155	Jun	0	0	339	394	452	479	520	71	72	373	2,189	3,131
155	Jul	0	0	191	196	234	246	282	28	26	182	1,129	1,626
155	Aug	0	0	157	159	187	195	229	15	15	129	721	1,044
155	Sep	0	0	148	149	171	177	209	9	12	109	606	883
155	Oct	0	0	144	145	163	168	199	6	10	97	706	1,042
155	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
155	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
156	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
156	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
156	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
156	Apr	0	0	131	132	218	300	348	2	12	142	2,022	3,057
156	May	0	0	418	1,120	1,236	1,335	1,391	118	127	733	5,542	8,629
156	Jun	0	0	484	968	1,028	1,064	1,102	163	176	928	10,401	15,525
156	Jul	0	0	268	307	358	381	416	59	75	417	2,866	4,156
156	Aug	0	0	169	205	244	254	287	21	23	176	1,774	2,639
156	Sep	0	0	150	175	207	214	246	13	14	127	1,357	2,029
156	Oct	0	0	149	215	254	273	306	14	26	180	2,181	3,307
156	Nov	0	0	147	187	232	254	288	14	29	194	2,079	3,130
156	Dec	0	0	144	169	207	218	251	9	16	134	1,507	2,262
157	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
157	Feb	0	0	138	148	172	178	208	5	10	100	1,235	1,854
157	Mar	0	0	136	137	159	165	194	4	9	93	1,213	1,818
157	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
157	May	0	0	485	1,332	1,401	1,464	1,500	133	141	795	6,977	10,857
157	Jun	0	0	485	792	880	954	995	166	169	956	3,008	4,255
157	Jul	0	0	214	226	273	294	329	40	43	280	1,196	1,678
157	Aug	0	0	156	188	222	231	263	13	17	135	1,037	1,548
157	Sep	0	0	144	146	173	179	211	7	11	105	922	1,369

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
157	Oct	0	0	141	164	192	198	229	6	14	107	929	1,403
157	Nov	0	0	140	165	203	227	259	6	16	121	1,248	1,881
157	Dec	0	0	138	151	193	220	253	5	13	117	1,147	1,723
158	Jan	0	0	135	141	175	186	218	5	11	106	1,045	1,570
158	Feb	0	0	134	135	161	169	199	4	10	97	1,035	1,556
158	Mar	0	0	132	133	153	159	189	3	9	88	1,053	1,589
158	Apr	0	0	131	132	230	315	367	3	17	168	1,805	2,726
158	May	0	0	439	1,273	1,398	1,500	1,558	131	140	805	3,698	5,951
158	Jun	0	0	456	751	807	833	872	162	158	870	3,921	5,597
158	Jul	0	0	208	220	257	267	301	39	42	270	1,774	2,549
158	Aug	0	0	152	155	182	189	220	12	17	135	805	1,184
158	Sep	0	0	139	141	161	166	196	6	11	102	698	1,045
158	Oct	0	0	135	136	151	155	184	5	8	88	755	1,141
158	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
158	Dec	0	0	130	131	139	141	168	3	5	70	1,029	1,563
159	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
159	Feb	0	0	128	129	131	132	157	2	2	56	1,004	1,535
159	Mar	0	0	127	128	189	253	291	2	6	106	985	1,513
159	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
159	May	0	0	245	311	350	368	401	27	57	256	2,995	4,474
159	Jun	0	0	270	294	319	324	353	34	46	225	2,518	3,709
159	Jul	0	0	165	169	187	188	216	10	17	126	1,141	1,696
159	Aug	0	0	141	142	155	156	182	5	10	99	689	1,035
159	Sep	0	0	135	136	145	145	171	3	7	87	4,092	6,157
159	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
159	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
159	Dec	0	0	131	132	134	134	157	2	5	71	1,161	1,762
160	Jan	0	0	129	130	131	131	154	2	4	64	635	977
160	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
160	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
160	Apr	0	0	126	127	137	157	180	0	2	55	8,109	12,222
160	May	0	0	618	1,894	2,057	2,200	2,270	270	281	1,516	14,745	22,363
160	Jun	0	0	563	1,033	1,235	1,385	1,467	229	214	1,331	10,074	14,845
160	Jul	0	0	240	390	471	507	549	56	64	401	5,523	8,281
160	Aug	0	0	167	177	230	242	276	21	33	209	2,465	3,672
160	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
160	Oct	0	0	140	141	172	176	205	6	8	96	855	1,286
160	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,558
160	Dec	0	0	134	135	153	155	182	4	5	76	628	957
161	Jan	0	0	132	133	146	147	173	3	4	68	633	970
161	Feb	0	0	130	131	140	141	167	2	3	61	673	1,034
161	Mar	0	0	129	130	136	136	161	2	1	55	1,193	1,820
161	Apr	0	0	128	129	229	318	371	2	14	160	2,311	3,504
161	May	0	0	423	989	1,119	1,227	1,287	118	128	739	5,650	8,664
161	Jun	0	0	440	772	822	845	881	146	142	775	4,973	7,283
161	Jul	0	0	208	220	250	256	287	35	36	239	2,296	3,355
161	Aug	0	0	152	155	177	179	207	11	13	118	1,449	2,163
161	Sep	0	0	139	141	156	157	184	6	7	88	997	1,504
161	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
161	Nov	0	0	132	133	141	141	166	3	4	68	1,034	1,574
161	Dec	0	0	130	131	136	136	160	3	3	60	716	1,101
162	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
162	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
162	Mar	0	0	126	127	140	163	188	1	1	53	1,714	2,612
162	Apr	0	0	135	151	180	209	236	7	33	194	1,985	2,976
162	May	0	0	211	234	262	270	297	18	58	267	2,400	3,536
162	Jun	0	0	226	237	259	262	288	19	35	167	2,027	2,996
162	Jul	0	0	158	161	178	179	204	8	13	108	1,268	1,901
162	Aug	0	0	141	142	154	155	179	4	7	88	699	1,059
162	Sep	0	0	136	137	145	145	168	3	5	78	655	1,000
162	Oct	0	0	133	134	139	139	162	2	4	71	817	1,248
162	Nov	0	0	131	132	135	135	157	2	3	63	1,065	1,625
162	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
163	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
163	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
163	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
163	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
163	May	0	0	354	392	467	538	574	66	112	588	3,835	5,546
163	Jun	0	0	472	952	1,065	1,155	1,204	137	163	873	2,031	3,235
163	Jul	0	0	350	535	664	760	812	108	127	752	1,478	2,290
163	Aug	0	0	186	201	259	279	314	36	32	239	1,046	1,500
163	Sep	0	0	152	171	209	214	245	18	13	131	756	1,122
163	Oct	0	0	146	207	240	243	272	16	15	124	733	1,133
163	Nov	0	0	145	177	209	212	241	15	17	126	1,147	1,731
163	Dec	0	0	142	161	188	191	219	10	11	108	903	1,359
164	Jan	0	0	139	151	172	173	201	6	9	96	902	1,357
164	Feb	0	0	136	142	158	159	185	5	8	88	830	1,249
164	Mar	0	0	135	143	173	208	236	5	10	112	1,114	1,682
164	Apr	0	0	255	739	812	897	931	72	104	628	1,879	3,043
164	May	0	0	396	772	855	917	953	103	129	745	3,316	4,936
164	Jun	0	0	305	416	475	492	526	48	45	283	1,655	2,420
164	Jul	0	0	184	187	234	242	275	26	22	171	1,408	2,060
164	Aug	0	0	155	156	194	198	230	17	16	133	734	1,076
164	Sep	0	0	148	149	179	183	213	12	14	119	647	954
164	Oct	0	0	146	147	172	175	205	9	13	111	819	1,217

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
164	Nov	0	0	143	144	164	167	196	6	12	101	1,018	1,523
164	Dec	0	0	140	141	157	158	186	4	11	92	985	1,480
165	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
165	Feb	0	0	135	136	144	144	170	3	8	76	912	1,381
165	Mar	0	0	134	135	140	140	165	2	7	69	1,008	1,530
165	Apr	0	0	148	173	293	395	456	5	54	345	1,231	1,861
165	May	0	0	301	587	740	863	934	50	108	592	4,093	6,249
165	Jun	0	0	309	383	437	463	502	61	74	383	1,840	2,633
165	Jul	0	0	180	215	245	252	283	24	25	172	1,185	1,752
165	Aug	0	0	158	213	239	242	271	21	28	168	947	1,433
165	Sep	0	0	154	165	189	191	220	19	29	169	781	1,146
165	Oct	0	0	152	218	247	260	290	18	27	177	820	1,253
165	Nov	0	0	150	189	223	239	269	17	27	180	983	1,475
165	Dec	0	0	147	173	199	205	234	12	17	135	987	1,476
166	Jan	0	0	144	161	182	185	213	7	14	115	1,331	1,994
166	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
166	Mar	0	0	138	143	154	156	182	4	11	94	1,245	1,866
166	Apr	0	0	136	137	280	396	465	4	29	244	3,508	5,269
166	May	0	0	357	1,134	1,316	1,456	1,536	116	147	868	3,715	5,956
166	Jun	0	0	464	906	975	1,007	1,048	150	157	875	5,867	8,669
166	Jul	0	0	303	357	398	408	441	48	48	298	2,270	3,274
166	Aug	0	0	180	189	219	223	254	21	22	160	1,170	1,709
166	Sep	0	0	169	266	298	310	341	20	39	227	1,348	2,067
166	Oct	0	0	169	228	270	286	318	23	44	252	919	1,384
166	Nov	0	0	155	191	231	240	272	17	22	162	1,297	1,944
166	Dec	0	0	150	175	206	213	243	12	16	131	990	1,481
167	Jan	0	0	146	163	188	193	222	8	14	113	930	1,393
167	Feb	0	0	143	153	173	178	206	5	12	102	1,026	1,538
167	Mar	0	0	140	145	161	165	192	4	11	94	1,154	1,731
167	Apr	0	0	143	167	314	433	503	5	43	308	1,711	2,584
167	May	0	0	421	1,057	1,241	1,383	1,464	105	139	793	5,778	8,946
167	Jun	0	0	417	664	730	763	805	130	128	693	4,179	6,073
167	Jul	0	0	203	219	257	267	301	37	37	242	1,411	2,019
167	Aug	0	0	155	158	185	190	220	14	17	135	819	1,193
167	Sep	0	0	146	161	182	186	215	8	13	113	657	975
167	Oct	0	0	146	180	206	215	244	9	18	130	1,024	1,544
167	Nov	0	0	144	168	202	214	245	9	20	138	1,092	1,639
167	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
168	Jan	0	0	138	148	173	179	209	5	12	108	891	1,337
168	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
168	Mar	0	0	134	135	159	166	195	4	11	96	1,048	1,576
168	Apr	0	0	222	539	635	714	760	49	92	549	1,066	1,826
168	May	0	0	364	668	786	878	931	76	119	678	3,066	4,579
168	Jun	0	0	297	356	412	437	474	39	45	264	1,493	2,149
168	Jul	0	0	178	181	218	229	262	19	21	152	1,378	2,026
168	Aug	0	0	150	152	180	186	218	10	14	117	670	987
168	Sep	0	0	142	143	165	170	200	5	12	100	588	875
168	Oct	0	0	139	140	156	161	189	4	11	93	899	1,348
168	Nov	0	0	137	138	151	154	182	4	10	88	1,076	1,618
168	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
169	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
169	Feb	0	0	132	133	137	138	164	2	6	66	999	1,518
169	Mar	0	0	131	132	135	136	161	2	5	61	1,075	1,637
169	Apr	0	0	136	147	209	273	310	4	42	261	1,448	2,187
169	May	0	0	306	695	783	861	904	79	131	711	2,661	4,096
169	Jun	0	0	382	688	737	757	791	104	120	642	3,297	4,861
169	Jul	0	0	256	265	301	310	341	38	39	238	1,466	2,083
169	Aug	0	0	167	170	197	202	232	18	17	136	1,140	1,675
169	Sep	0	0	147	149	169	173	202	11	12	106	978	1,453
169	Oct	0	0	141	142	158	161	188	6	10	91	1,008	1,507
169	Nov	0	0	138	139	151	153	180	5	9	82	1,165	1,750
169	Dec	0	0	136	137	146	148	174	4	8	75	1,092	1,647
170	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
170	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
170	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
170	Apr	0	0	130	131	178	231	261	2	9	106	1,276	1,942
170	May	0	0	432	1,122	1,197	1,271	1,306	127	135	762	1,567	2,874
170	Jun	0	0	491	939	1,002	1,042	1,077	165	180	962	2,282	3,358
170	Jul	0	0	257	326	385	411	445	52	68	383	1,411	2,020
170	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
170	Sep	0	0	153	155	199	207	240	17	17	143	724	1,059
170	Oct	0	0	149	211	259	286	319	16	26	188	808	1,242
170	Nov	0	0	147	181	241	277	312	15	29	204	1,116	1,679
170	Dec	0	0	144	166	222	241	277	10	18	146	930	1,395
171	Jan	0	0	141	155	200	211	245	6	14	122	879	1,318
171	Feb	0	0	138	146	182	191	223	5	12	109	852	1,278
171	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
171	Apr	0	0	135	136	239	321	372	4	18	171	1,070	1,612
171	May	0	0	409	1,219	1,344	1,441	1,497	125	136	783	1,609	3,106
171	Jun	0	0	468	871	935	963	1,003	160	156	864	2,274	3,278
171	Jul	0	0	246	272	317	330	366	45	45	291	1,281	1,802
171	Aug	0	0	167	170	205	214	247	17	20	156	836	1,217
171	Sep	0	0	149	151	178	185	217	8	14	119	628	928
171	Oct	0	0	144	148	172	179	210	5	12	109	633	946
171	Nov	0	0	141	146	169	176	207	5	11	104	882	1,327

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
171	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
172	Jan	0	0	136	137	150	156	184	3	9	86	856	1,296
172	Feb	0	0	133	134	144	149	176	3	7	78	880	1,337
172	Mar	0	0	132	133	140	143	170	2	6	70	839	1,280
172	Apr	0	0	131	132	145	159	186	2	6	70	1,053	1,605
172	May	0	0	433	1,316	1,426	1,524	1,576	146	169	954	2,206	3,783
172	Jun	0	0	517	933	1,070	1,178	1,237	180	192	1,140	3,743	5,387
172	Jul	0	0	283	296	356	384	422	46	48	319	1,304	1,814
172	Aug	0	0	172	175	212	222	256	14	17	134	725	1,062
172	Sep	0	0	148	149	176	182	213	6	9	92	687	1,033
172	Oct	0	0	142	143	165	169	200	4	8	81	689	1,043
172	Nov	0	0	138	139	162	167	197	4	7	79	855	1,296
172	Dec	0	0	136	137	157	163	192	3	6	74	846	1,288
173	Jan	0	0	133	134	150	154	182	2	5	66	828	1,265
173	Feb	0	0	132	133	144	147	175	2	3	60	800	1,229
173	Mar	0	0	131	131	139	142	168	1	2	53	859	1,321
173	Apr	0	0	130	131	228	316	368	2	20	185	1,107	1,692
173	May	0	0	333	644	769	875	935	80	106	602	1,831	2,789
173	Jun	0	0	361	499	547	572	608	99	107	573	2,109	2,941
173	Jul	0	0	186	195	224	231	263	24	28	189	1,084	1,567
173	Aug	0	0	146	149	169	173	202	9	11	102	647	969
173	Sep	0	0	146	150	168	171	200	6	16	100	616	931
173	Oct	0	0	185	347	406	460	493	30	69	384	823	1,316
173	Nov	0	0	186	288	364	429	465	36	74	441	1,040	1,536
173	Dec	0	0	154	189	233	250	284	16	23	178	940	1,407
174	Jan	0	0	145	161	192	199	230	8	12	113	852	1,281
174	Feb	0	0	141	148	172	176	206	6	9	93	831	1,251
174	Mar	0	0	138	147	182	211	243	5	9	103	928	1,402
174	Apr	0	0	267	805	880	958	995	79	108	648	1,301	2,297
174	May	0	0	437	933	1,021	1,085	1,125	127	149	817	1,674	2,799
174	Jun	0	0	341	416	480	500	538	67	62	333	1,265	1,803
174	Jul	0	0	190	193	244	253	290	28	24	179	1,145	1,659
174	Aug	0	0	157	167	208	215	250	17	16	141	1,030	1,525
174	Sep	0	0	171	265	312	335	371	25	44	270	1,772	2,685
174	Oct	0	0	177	297	360	406	444	33	63	365	1,264	1,927
174	Nov	0	0	160	222	293	330	370	26	39	263	3,101	4,658
174	Dec	0	0	154	196	260	278	318	20	22	178	1,830	2,744
175	Jan	0	0	149	181	233	245	283	14	17	146	1,407	2,108
175	Feb	0	0	146	170	212	222	258	9	14	128	1,365	2,047
175	Mar	0	0	144	167	206	216	252	7	14	122	1,796	2,698
175	Apr	0	0	321	1,056	1,154	1,226	1,273	109	135	798	3,313	5,339
175	May	0	0	423	797	911	996	1,047	138	159	943	5,807	8,568
175	Jun	0	0	298	388	450	476	517	47	46	307	3,431	5,063
175	Jul	0	0	192	268	317	331	369	29	32	197	1,641	2,461
175	Aug	0	0	170	176	218	229	266	25	29	174	1,102	1,610
175	Sep	0	0	160	173	207	217	252	18	19	143	1,037	1,534
175	Oct	0	0	159	258	299	331	367	20	40	249	1,673	2,561
175	Nov	0	0	158	218	271	309	347	21	45	278	1,529	2,305
175	Dec	0	0	154	192	240	257	294	15	22	166	1,235	1,851
176	Jan	0	0	151	177	216	228	263	10	16	129	1,046	1,566
176	Feb	0	0	147	167	197	207	241	6	13	112	924	1,383
176	Mar	0	0	144	157	183	191	224	5	12	102	918	1,374
176	Apr	0	0	208	449	554	640	694	39	83	502	1,237	1,934
176	May	0	0	387	822	950	1,053	1,113	91	132	718	2,478	3,807
176	Jun	0	0	339	394	452	479	520	71	72	373	2,189	3,131
176	Jul	0	0	191	196	234	246	282	28	26	182	1,129	1,626
176	Aug	0	0	157	159	187	195	229	15	15	129	721	1,044
176	Sep	0	0	148	149	171	177	209	9	12	109	606	883
176	Oct	0	0	144	145	163	168	199	6	10	97	706	1,042
176	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
176	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
177	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
177	Feb	0	0	134	135	140	142	169	3	5	66	1,001	1,510
177	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
177	Apr	0	0	131	132	218	300	348	2	12	142	2,022	3,057
177	May	0	0	418	1,120	1,236	1,335	1,391	118	127	733	5,542	8,629
177	Jun	0	0	484	968	1,028	1,064	1,102	163	176	928	10,401	15,525
177	Jul	0	0	268	307	358	381	416	58	75	417	2,866	4,156
177	Aug	0	0	169	205	244	254	286	21	23	176	1,774	2,639
177	Sep	0	0	150	175	207	214	246	13	14	127	1,357	2,029
177	Oct	0	0	149	215	254	273	306	14	26	180	2,181	3,307
177	Nov	0	0	147	187	232	254	288	14	29	194	2,079	3,130
177	Dec	0	0	144	169	207	218	251	9	16	133	1,507	2,262
178	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
178	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
178	Mar	0	0	136	137	159	165	194	4	9	92	1,213	1,818
178	Apr	0	0	134	135	156	162	191	4	8	89	1,299	1,953
178	May	0	0	483	1,325	1,392	1,454	1,490	133	140	791	6,978	10,856
178	Jun	0	0	484	789	876	949	990	165	168	951	3,008	4,256
178	Jul	0	0	213	226	272	293	327	40	43	279	1,196	1,679
178	Aug	0	0	156	187	221	230	263	13	16	135	1,036	1,547
178	Sep	0	0	144	146	173	179	210	7	11	105	922	1,369
178	Oct	0	0	141	164	191	197	228	6	14	107	929	1,403
178	Nov	0	0	140	164	203	226	259	6	16	120	1,248	1,881
178	Dec	0	0	138	150	193	219	253	5	13	117	1,147	1,723

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
179	Jan	0	0	135	141	174	186	218	5	11	106	1,045	1,570
179	Feb	0	0	134	135	161	169	199	4	10	96	1,035	1,556
179	Mar	0	0	132	133	153	160	189	3	9	88	1,053	1,589
179	Apr	0	0	131	132	231	317	368	3	17	169	1,805	2,726
179	May	0	0	440	1,279	1,405	1,507	1,565	132	141	808	3,697	5,953
179	Jun	0	0	457	753	810	836	875	163	159	873	3,921	5,596
179	Jul	0	0	208	221	257	268	301	39	42	271	1,774	2,548
179	Aug	0	0	152	156	183	189	220	12	17	136	805	1,184
179	Sep	0	0	139	141	161	166	196	6	11	102	698	1,045
179	Oct	0	0	135	136	151	155	184	5	8	88	755	1,141
179	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
179	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
180	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
180	Feb	0	0	128	129	131	132	157	2	2	56	1,004	1,535
180	Mar	0	0	127	128	189	253	291	2	6	106	985	1,513
180	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
180	May	0	0	245	312	351	369	402	27	57	256	2,995	4,476
180	Jun	0	0	270	294	319	324	353	34	46	225	2,518	3,709
180	Jul	0	0	165	169	187	188	216	10	17	126	1,141	1,695
180	Aug	0	0	141	142	155	155	182	5	10	99	689	1,035
180	Sep	0	0	135	136	145	145	171	3	8	87	4,092	6,157
180	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
180	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
180	Dec	0	0	131	132	134	134	157	2	5	71	1,161	1,762
181	Jan	0	0	129	130	131	131	154	2	4	64	635	977
181	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
181	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
181	Apr	0	0	126	127	136	157	180	0	2	55	8,109	12,222
181	May	0	0	618	1,895	2,058	2,201	2,271	270	281	1,516	14,745	22,364
181	Jun	0	0	563	1,033	1,235	1,385	1,467	229	214	1,331	10,074	14,845
181	Jul	0	0	240	390	471	507	549	56	64	401	5,523	8,281
181	Aug	0	0	167	177	230	242	276	21	33	208	2,465	3,672
181	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
181	Oct	0	0	140	141	172	176	205	6	8	96	855	1,286
181	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,557
181	Dec	0	0	134	135	153	155	182	4	5	76	628	957
182	Jan	0	0	132	133	146	147	173	3	4	68	633	970
182	Feb	0	0	130	131	140	141	166	2	3	61	673	1,034
182	Mar	0	0	129	130	136	136	160	2	1	55	1,193	1,821
182	Apr	0	0	128	129	228	316	369	2	14	159	2,311	3,504
182	May	0	0	422	982	1,111	1,218	1,278	118	127	735	5,651	8,662
182	Jun	0	0	438	769	818	841	877	146	141	771	4,974	7,284
182	Jul	0	0	207	219	249	255	286	35	36	238	2,297	3,356
182	Aug	0	0	152	155	176	178	206	11	13	117	1,449	2,163
182	Sep	0	0	139	141	156	157	184	6	7	88	997	1,505
182	Oct	0	0	135	136	147	147	173	4	5	76	781	1,189
182	Nov	0	0	132	133	141	141	166	3	4	67	1,034	1,574
182	Dec	0	0	130	131	135	135	160	3	3	60	716	1,101
183	Jan	0	0	129	130	132	132	155	2	1	54	1,061	1,623
183	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
183	Mar	0	0	126	127	140	163	188	1	1	53	1,714	2,612
183	Apr	0	0	135	151	180	209	236	7	33	194	1,985	2,976
183	May	0	0	211	235	263	271	298	18	59	270	2,399	3,535
183	Jun	0	0	227	238	260	262	288	20	35	170	2,027	2,995
183	Jul	0	0	158	161	178	179	204	8	13	108	1,268	1,900
183	Aug	0	0	141	142	154	155	179	4	7	88	699	1,058
183	Sep	0	0	136	137	145	145	168	3	5	78	655	999
183	Oct	0	0	133	134	139	139	162	3	4	71	817	1,248
183	Nov	0	0	131	132	135	135	157	2	3	64	1,065	1,625
183	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
184	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
184	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
184	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
184	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
184	May	0	0	354	392	467	538	574	66	112	588	3,835	5,546
184	Jun	0	0	472	957	1,070	1,161	1,209	137	163	873	2,031	3,240
184	Jul	0	0	350	535	664	760	813	108	127	751	1,478	2,290
184	Aug	0	0	186	201	259	279	314	36	32	239	1,046	1,500
184	Sep	0	0	152	171	209	214	245	18	13	131	756	1,122
184	Oct	0	0	147	207	240	243	272	16	15	124	734	1,133
184	Nov	0	0	145	177	209	212	242	15	17	126	1,147	1,731
184	Dec	0	0	142	161	188	191	219	10	11	108	903	1,359
185	Jan	0	0	139	151	172	173	201	6	9	96	902	1,357
185	Feb	0	0	136	142	158	159	185	5	8	87	830	1,249
185	Mar	0	0	135	143	173	208	236	5	10	112	1,114	1,682
185	Apr	0	0	255	739	812	897	931	72	104	628	1,879	3,043
185	May	0	0	396	772	855	917	953	103	129	745	3,316	4,936
185	Jun	0	0	305	416	475	492	526	48	45	283	1,655	2,420
185	Jul	0	0	184	187	234	242	275	26	22	171	1,408	2,060
185	Aug	0	0	155	156	193	198	230	17	16	133	734	1,076
185	Sep	0	0	148	149	179	182	213	12	14	118	647	954
185	Oct	0	0	146	147	172	175	205	9	13	111	819	1,217
185	Nov	0	0	143	144	164	167	196	6	12	100	1,018	1,523
185	Dec	0	0	140	141	157	159	187	4	11	91	986	1,480
186	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
186	Feb	0	0	135	136	144	144	170	3	8	76	912	1,381
186	Mar	0	0	133	134	140	140	165	2	7	69	1,008	1,530
186	Apr	0	0	148	173	291	393	453	5	54	343	1,231	1,861
186	May	0	0	299	582	734	856	926	49	108	587	4,094	6,249
186	Jun	0	0	307	380	434	460	498	60	74	379	1,840	2,634
186	Jul	0	0	180	214	244	251	282	24	25	171	1,185	1,752
186	Aug	0	0	158	213	238	241	271	20	28	168	947	1,433
186	Sep	0	0	154	165	188	191	220	19	29	169	781	1,146
186	Oct	0	0	152	218	246	260	289	18	27	177	820	1,253
186	Nov	0	0	150	189	222	239	269	17	27	180	983	1,475
186	Dec	0	0	147	173	199	205	234	11	17	135	987	1,476
187	Jan	0	0	144	161	181	185	213	7	14	115	1,331	1,994
187	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
187	Mar	0	0	138	143	154	156	182	4	11	94	1,245	1,866
187	Apr	0	0	136	137	281	398	467	4	29	245	3,508	5,269
187	May	0	0	358	1,139	1,322	1,464	1,544	116	148	872	3,714	5,958
187	Jun	0	0	466	910	979	1,011	1,053	151	158	878	5,867	8,667
187	Jul	0	0	303	358	399	409	442	48	48	299	2,270	3,273
187	Aug	0	0	180	189	219	223	254	21	22	161	1,170	1,709
187	Sep	0	0	169	266	298	311	341	20	39	227	1,348	2,067
187	Oct	0	0	169	228	270	286	318	22	44	252	919	1,384
187	Nov	0	0	155	191	231	240	272	17	22	162	1,297	1,943
187	Dec	0	0	150	175	206	213	243	12	16	131	990	1,481
188	Jan	0	0	146	163	188	193	222	8	14	113	930	1,393
188	Feb	0	0	143	154	173	178	206	5	12	102	1,026	1,538
188	Mar	0	0	140	145	161	165	192	4	11	94	1,154	1,731
188	Apr	0	0	143	167	314	433	503	5	43	308	1,711	2,584
188	May	0	0	421	1,057	1,241	1,383	1,464	105	139	793	5,778	8,946
188	Jun	0	0	417	664	730	763	805	130	128	693	4,179	6,073
188	Jul	0	0	203	219	257	267	301	37	37	242	1,411	2,019
188	Aug	0	0	155	158	185	190	220	14	17	135	819	1,192
188	Sep	0	0	146	161	182	186	215	8	13	113	657	975
188	Oct	0	0	146	180	206	215	244	9	18	130	1,024	1,544
188	Nov	0	0	144	168	202	214	245	9	20	137	1,092	1,639
188	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
189	Jan	0	0	139	148	173	179	209	5	12	108	891	1,337
189	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
189	Mar	0	0	134	135	159	166	194	4	11	96	1,048	1,576
189	Apr	0	0	222	539	635	714	760	49	92	549	1,066	1,826
189	May	0	0	364	668	786	878	930	76	119	678	3,066	4,579
189	Jun	0	0	297	356	412	437	474	39	45	264	1,493	2,149
189	Jul	0	0	178	181	218	229	262	18	21	152	1,378	2,026
189	Aug	0	0	150	152	179	186	218	10	14	117	670	987
189	Sep	0	0	142	143	165	170	200	5	12	100	588	875
189	Oct	0	0	139	140	156	161	189	4	11	93	899	1,348
189	Nov	0	0	137	138	151	154	182	4	10	88	1,076	1,618
189	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
190	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
190	Feb	0	0	132	133	137	138	163	2	6	66	999	1,518
190	Mar	0	0	131	132	135	136	160	2	5	60	1,075	1,637
190	Apr	0	0	136	147	207	271	307	4	41	259	1,448	2,187
190	May	0	0	305	689	776	853	895	78	130	707	2,662	4,094
190	Jun	0	0	380	684	733	753	786	103	120	638	3,298	4,863
190	Jul	0	0	255	265	300	309	340	37	39	237	1,467	2,084
190	Aug	0	0	167	170	197	202	231	18	17	135	1,140	1,675
190	Sep	0	0	147	149	169	173	201	11	12	105	978	1,454
190	Oct	0	0	141	142	158	161	188	6	10	90	1,008	1,508
190	Nov	0	0	138	139	151	153	180	5	9	82	1,165	1,750
190	Dec	0	0	136	137	146	148	173	4	8	75	1,092	1,647
191	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
191	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
191	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
191	Apr	0	0	130	131	179	232	263	2	9	107	1,276	1,942
191	May	0	0	433	1,126	1,203	1,277	1,313	127	135	766	1,566	2,880
191	Jun	0	0	492	943	1,006	1,046	1,080	166	180	965	2,281	3,362
191	Jul	0	0	258	327	386	412	446	52	69	384	1,411	2,020
191	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
191	Sep	0	0	153	155	199	207	240	17	17	143	724	1,059
191	Oct	0	0	149	211	259	286	319	16	26	188	808	1,242
191	Nov	0	0	147	181	241	277	312	15	29	204	1,116	1,679
191	Dec	0	0	144	167	222	241	277	10	18	146	930	1,395
192	Jan	0	0	141	155	200	212	245	6	14	121	879	1,318
192	Feb	0	0	138	146	182	191	223	5	12	109	852	1,278
192	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
192	Apr	0	0	135	136	239	321	372	4	18	171	1,070	1,612
192	May	0	0	409	1,219	1,344	1,441	1,497	125	136	783	1,609	3,106
192	Jun	0	0	468	871	935	963	1,003	160	156	864	2,274	3,278
192	Jul	0	0	246	272	317	330	366	45	45	291	1,281	1,802
192	Aug	0	0	167	170	205	214	247	17	20	156	836	1,217
192	Sep	0	0	149	151	177	185	217	8	14	119	628	928
192	Oct	0	0	144	148	172	179	210	5	12	109	633	946
192	Nov	0	0	141	146	169	176	207	5	11	104	882	1,327
192	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
193	Jan	0	0	136	137	150	155	184	3	9	86	856	1,295
193	Feb	0	0	133	134	144	148	176	3	7	78	880	1,337

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
193	Mar	0	0	132	133	139	143	170	2	6	70	839	1,280
193	Apr	0	0	131	132	145	159	186	2	6	70	1,053	1,605
193	May	0	0	433	1,316	1,426	1,524	1,576	146	169	954	2,206	3,783
193	Jun	0	0	517	933	1,070	1,178	1,237	180	192	1,140	3,743	5,387
193	Jul	0	0	283	296	355	384	422	46	48	319	1,304	1,814
193	Aug	0	0	172	175	212	222	255	14	17	134	725	1,062
193	Sep	0	0	148	149	176	182	213	6	9	92	687	1,033
193	Oct	0	0	142	143	164	169	199	4	8	81	689	1,043
193	Nov	0	0	139	139	162	167	197	4	7	79	855	1,296
193	Dec	0	0	136	137	157	163	192	3	6	74	846	1,288
194	Jan	0	0	133	134	150	154	182	2	5	66	828	1,265
194	Feb	0	0	132	133	144	147	175	2	3	59	800	1,229
194	Mar	0	0	130	131	139	141	168	1	2	53	859	1,321
194	Apr	0	0	130	131	226	314	366	2	20	183	1,107	1,692
194	May	0	0	332	638	762	867	926	79	105	598	1,831	2,786
194	Jun	0	0	360	496	544	568	605	98	106	569	2,109	2,943
194	Jul	0	0	186	195	223	231	262	24	28	188	1,084	1,568
194	Aug	0	0	146	149	169	172	201	9	11	102	647	969
194	Sep	0	0	145	150	168	171	199	6	16	100	616	931
194	Oct	0	0	185	346	405	458	492	29	69	384	823	1,315
194	Nov	0	0	186	288	363	429	465	36	74	440	1,040	1,536
194	Dec	0	0	154	189	233	250	283	16	23	178	940	1,407
195	Jan	0	0	145	160	192	198	230	8	12	113	852	1,281
195	Feb	0	0	141	148	172	176	206	6	9	94	831	1,251
195	Mar	0	0	138	147	182	212	244	5	9	103	928	1,402
195	Apr	0	0	268	808	884	963	1,000	80	108	651	1,301	2,301
195	May	0	0	438	938	1,027	1,092	1,131	128	150	821	1,674	2,805
195	Jun	0	0	342	417	482	501	540	68	62	334	1,265	1,805
195	Jul	0	0	190	193	244	254	290	28	24	179	1,145	1,659
195	Aug	0	0	157	167	208	215	250	17	16	141	1,030	1,525
195	Sep	0	0	171	265	312	335	371	25	44	270	1,773	2,685
195	Oct	0	0	177	297	360	406	445	33	63	365	1,264	1,927
195	Nov	0	0	160	222	293	330	371	26	39	263	3,101	4,658
195	Dec	0	0	154	196	260	278	318	19	22	178	1,830	2,744
196	Jan	0	0	149	181	233	245	283	14	17	146	1,407	2,108
196	Feb	0	0	146	170	212	222	258	9	14	128	1,365	2,047
196	Mar	0	0	144	167	206	216	252	7	14	122	1,796	2,698
196	Apr	0	0	321	1,056	1,154	1,226	1,273	109	135	798	3,313	5,339
196	May	0	0	424	797	911	996	1,047	138	159	943	5,807	8,568
196	Jun	0	0	298	388	450	476	517	47	46	307	3,431	5,063
196	Jul	0	0	193	268	317	331	369	29	32	197	1,641	2,461
196	Aug	0	0	170	176	218	229	266	25	29	174	1,102	1,610
196	Sep	0	0	160	174	207	217	252	18	19	143	1,037	1,534
196	Oct	0	0	159	258	299	331	367	20	40	249	1,673	2,561
196	Nov	0	0	158	218	271	309	347	21	45	278	1,529	2,305
196	Dec	0	0	154	192	240	257	295	15	22	165	1,235	1,851
197	Jan	0	0	151	177	216	227	263	10	16	129	1,046	1,566
197	Feb	0	0	147	167	197	207	241	6	13	112	924	1,383
197	Mar	0	0	144	157	183	191	224	5	12	102	918	1,374
197	Apr	0	0	208	449	554	640	694	38	83	502	1,237	1,934
197	May	0	0	387	822	950	1,053	1,113	90	132	718	2,478	3,807
197	Jun	0	0	339	394	452	479	520	71	72	373	2,189	3,131
197	Jul	0	0	191	196	234	246	282	28	26	181	1,129	1,626
197	Aug	0	0	157	159	187	195	228	15	15	129	721	1,044
197	Sep	0	0	148	149	171	177	209	9	12	109	606	883
197	Oct	0	0	144	145	162	168	199	6	10	97	706	1,042
197	Nov	0	0	141	141	156	161	191	5	9	90	1,080	1,611
197	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
198	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
198	Feb	0	0	134	135	140	142	169	3	5	66	1,000	1,510
198	Mar	0	0	133	134	137	139	165	2	3	60	1,123	1,699
198	Apr	0	0	131	132	218	299	348	2	12	142	2,022	3,057
198	May	0	0	417	1,114	1,230	1,329	1,385	118	127	729	5,543	8,627
198	Jun	0	0	484	964	1,025	1,060	1,098	162	175	924	10,401	15,527
198	Jul	0	0	267	306	356	379	414	58	75	416	2,866	4,157
198	Aug	0	0	169	205	243	253	286	21	23	175	1,774	2,639
198	Sep	0	0	150	174	207	213	245	13	14	127	1,357	2,029
198	Oct	0	0	149	215	254	272	305	14	26	179	2,181	3,307
198	Nov	0	0	147	187	232	254	287	14	29	193	2,079	3,130
198	Dec	0	0	144	169	207	218	250	9	16	133	1,507	2,262
199	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
199	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
199	Mar	0	0	136	137	159	165	194	4	9	93	1,213	1,818
199	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
199	May	0	0	485	1,332	1,401	1,463	1,500	133	141	795	6,977	10,857
199	Jun	0	0	485	792	879	954	995	166	169	955	3,008	4,255
199	Jul	0	0	214	226	273	294	328	40	43	280	1,196	1,679
199	Aug	0	0	156	188	222	231	263	13	17	135	1,037	1,548
199	Sep	0	0	144	146	173	179	210	7	11	105	922	1,369
199	Oct	0	0	141	164	191	198	229	6	14	107	929	1,403
199	Nov	0	0	140	165	203	226	259	6	16	120	1,248	1,881
199	Dec	0	0	138	151	193	219	253	5	13	117	1,147	1,723
200	Jan	0	0	135	141	174	186	218	5	11	106	1,045	1,570
200	Feb	0	0	134	135	161	169	199	4	10	97	1,035	1,556
200	Mar	0	0	132	133	153	160	189	3	9	88	1,053	1,589

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
200	Apr	0	0	131	132	231	317	368	3	17	169	1,805	2,726
200	May	0	0	440	1,279	1,405	1,507	1,566	132	141	808	3,697	5,953
200	Jun	0	0	457	753	810	836	875	162	159	873	3,921	5,596
200	Jul	0	0	208	221	257	268	301	39	42	271	1,774	2,548
200	Aug	0	0	152	156	183	189	220	12	17	136	805	1,184
200	Sep	0	0	139	141	161	166	196	6	11	102	698	1,045
200	Oct	0	0	135	136	151	155	184	5	8	88	755	1,140
200	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
200	Dec	0	0	130	131	139	141	168	3	5	71	1,029	1,563
201	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
201	Feb	0	0	128	129	131	132	157	2	3	56	1,004	1,535
201	Mar	0	0	127	128	189	253	291	2	6	106	985	1,513
201	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
201	May	0	0	245	313	351	369	402	27	57	256	2,996	4,476
201	Jun	0	0	270	294	319	324	353	34	46	224	2,518	3,709
201	Jul	0	0	165	169	186	188	216	10	17	126	1,141	1,695
201	Aug	0	0	141	142	155	155	182	5	10	99	689	1,035
201	Sep	0	0	135	136	145	145	171	3	8	87	4,092	6,157
201	Oct	0	0	133	134	141	141	166	3	7	83	2,510	3,783
201	Nov	0	0	132	133	138	138	162	3	6	79	1,564	2,363
201	Dec	0	0	131	132	134	134	157	2	5	71	1,161	1,762
202	Jan	0	0	129	130	131	131	154	2	4	64	635	977
202	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
202	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,830
202	Apr	0	0	126	127	136	157	180	0	2	55	8,109	12,222
202	May	0	0	617	1,886	2,049	2,191	2,260	269	280	1,508	14,746	22,363
202	Jun	0	0	563	1,031	1,231	1,380	1,461	228	214	1,329	10,074	14,845
202	Jul	0	0	240	390	470	505	548	56	64	400	5,523	8,281
202	Aug	0	0	167	176	230	241	275	21	33	208	2,465	3,672
202	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
202	Oct	0	0	140	141	171	175	205	6	8	95	855	1,286
202	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,558
202	Dec	0	0	134	135	153	155	182	4	5	76	628	957
203	Jan	0	0	132	133	145	147	173	3	4	68	633	970
203	Feb	0	0	130	131	140	141	166	2	3	61	673	1,034
203	Mar	0	0	129	130	136	136	160	2	1	55	1,194	1,820
203	Apr	0	0	128	129	229	318	371	2	14	160	2,311	3,504
203	May	0	0	422	988	1,118	1,226	1,286	118	128	739	5,650	8,663
203	Jun	0	0	439	771	821	845	881	146	142	775	4,973	7,283
203	Jul	0	0	208	220	250	256	286	35	36	239	2,296	3,355
203	Aug	0	0	152	155	176	178	207	11	13	118	1,449	2,163
203	Sep	0	0	139	141	156	157	184	6	7	88	997	1,504
203	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
203	Nov	0	0	132	133	141	141	166	3	4	67	1,034	1,574
203	Dec	0	0	130	131	135	135	160	3	3	60	716	1,101
204	Jan	0	0	129	130	131	131	155	2	1	54	1,061	1,623
204	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
204	Mar	0	0	126	127	140	163	188	1	1	53	1,714	2,612
204	Apr	0	0	135	151	180	209	236	7	33	194	1,985	2,976
204	May	0	0	211	235	263	271	298	18	59	270	2,399	3,535
204	Jun	0	0	227	238	260	262	288	20	35	170	2,027	2,995
204	Jul	0	0	158	161	178	179	204	8	13	108	1,268	1,900
204	Aug	0	0	141	142	154	155	179	4	7	88	699	1,058
204	Sep	0	0	136	137	145	145	168	3	5	78	655	999
204	Oct	0	0	133	134	139	139	162	3	4	71	817	1,248
204	Nov	0	0	131	132	135	135	157	2	3	63	1,065	1,625
204	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
205	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
205	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
205	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
205	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
205	May	0	0	354	392	467	538	574	66	112	588	3,835	5,546
205	Jun	0	0	472	959	1,072	1,163	1,211	137	163	873	2,031	3,242
205	Jul	0	0	350	535	664	760	813	108	127	751	1,478	2,290
205	Aug	0	0	186	201	259	279	314	35	32	238	1,046	1,500
205	Sep	0	0	152	171	209	214	245	18	13	131	756	1,122
205	Oct	0	0	147	207	240	243	272	16	15	124	734	1,133
205	Nov	0	0	145	177	209	212	241	15	17	126	1,147	1,731
205	Dec	0	0	142	161	188	191	219	10	11	108	903	1,359
206	Jan	0	0	139	151	171	173	201	6	9	96	902	1,357
206	Feb	0	0	136	142	157	159	185	5	8	87	830	1,249
206	Mar	0	0	135	142	172	207	236	5	10	112	1,114	1,682
206	Apr	0	0	254	739	811	895	929	72	104	626	1,879	3,043
206	May	0	0	395	769	850	912	948	103	129	742	3,316	4,935
206	Jun	0	0	305	415	473	490	525	47	45	282	1,655	2,420
206	Jul	0	0	184	187	234	241	275	26	22	170	1,408	2,060
206	Aug	0	0	155	156	193	198	230	16	16	132	734	1,076
206	Sep	0	0	148	149	179	182	213	12	14	118	647	955
206	Oct	0	0	146	147	171	175	204	9	13	110	819	1,217
206	Nov	0	0	143	144	164	167	196	5	12	100	1,018	1,523
206	Dec	0	0	140	141	156	158	186	4	11	91	985	1,480
207	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
207	Feb	0	0	135	136	143	144	170	3	8	76	912	1,381
207	Mar	0	0	134	134	140	140	165	2	7	69	1,008	1,530
207	Apr	0	0	148	172	292	394	455	5	54	345	1,231	1,861

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
207	May	0	0	301	586	740	863	933	50	108	591	4,093	6,249
207	Jun	0	0	309	383	437	463	501	61	74	383	1,840	2,633
207	Jul	0	0	180	215	245	252	283	24	25	172	1,185	1,752
207	Aug	0	0	158	213	238	241	271	20	28	168	947	1,433
207	Sep	0	0	154	165	189	191	220	19	29	169	781	1,146
207	Oct	0	0	152	218	246	260	290	18	27	177	820	1,253
207	Nov	0	0	150	189	222	239	269	17	27	180	983	1,475
207	Dec	0	0	147	173	199	205	234	11	17	135	987	1,476
208	Jan	0	0	144	161	181	185	213	7	14	115	1,331	1,994
208	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
208	Mar	0	0	138	143	154	156	182	4	11	94	1,245	1,866
208	Apr	0	0	136	137	281	398	467	4	29	245	3,508	5,269
208	May	0	0	358	1,140	1,322	1,464	1,545	116	148	872	3,714	5,958
208	Jun	0	0	466	910	979	1,011	1,053	151	158	878	5,867	8,667
208	Jul	0	0	303	358	399	409	442	48	48	299	2,270	3,273
208	Aug	0	0	180	190	219	223	254	21	22	160	1,170	1,709
208	Sep	0	0	169	266	298	311	341	20	39	227	1,348	2,067
208	Oct	0	0	169	228	270	286	318	22	44	252	919	1,384
208	Nov	0	0	155	191	231	240	272	17	22	162	1,297	1,944
208	Dec	0	0	150	175	206	213	243	12	16	131	990	1,481
209	Jan	0	0	146	163	188	193	222	8	14	113	930	1,393
209	Feb	0	0	143	154	173	178	206	5	12	102	1,026	1,538
209	Mar	0	0	140	145	161	165	192	4	11	94	1,154	1,731
209	Apr	0	0	143	167	314	433	503	5	43	308	1,711	2,584
209	May	0	0	421	1,057	1,241	1,383	1,464	105	139	792	5,778	8,946
209	Jun	0	0	417	664	730	763	805	130	128	692	4,179	6,073
209	Jul	0	0	203	219	257	267	300	37	37	241	1,411	2,019
209	Aug	0	0	155	158	185	190	220	14	17	135	819	1,192
209	Sep	0	0	146	161	182	185	215	8	13	112	657	975
209	Oct	0	0	146	180	206	215	244	9	18	130	1,024	1,544
209	Nov	0	0	144	168	202	214	245	8	20	137	1,092	1,639
209	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
210	Jan	0	0	139	148	173	179	209	5	12	107	891	1,337
210	Feb	0	0	136	139	161	167	196	4	11	99	877	1,316
210	Mar	0	0	134	135	159	166	194	4	11	96	1,048	1,576
210	Apr	0	0	222	539	635	714	760	49	92	549	1,066	1,826
210	May	0	0	364	668	785	878	930	76	119	678	3,066	4,579
210	Jun	0	0	297	356	411	436	474	39	45	264	1,493	2,149
210	Jul	0	0	178	181	218	229	262	18	21	152	1,378	2,026
210	Aug	0	0	150	152	179	186	217	10	14	117	670	987
210	Sep	0	0	142	143	165	170	200	5	12	100	588	875
210	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
210	Nov	0	0	137	138	151	154	182	4	10	88	1,076	1,618
210	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
211	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
211	Feb	0	0	132	133	137	138	163	2	6	66	999	1,518
211	Mar	0	0	131	132	135	136	160	2	5	61	1,075	1,637
211	Apr	0	0	136	147	209	272	310	4	42	261	1,448	2,187
211	May	0	0	306	695	783	861	904	79	131	711	2,661	4,097
211	Jun	0	0	382	688	736	757	791	104	120	641	3,297	4,861
211	Jul	0	0	256	265	301	310	341	38	39	238	1,466	2,083
211	Aug	0	0	167	170	197	202	231	18	17	135	1,140	1,675
211	Sep	0	0	147	149	169	173	201	11	12	105	978	1,453
211	Oct	0	0	141	142	158	161	188	6	10	90	1,008	1,507
211	Nov	0	0	138	139	151	153	180	5	9	82	1,165	1,750
211	Dec	0	0	136	137	146	148	173	4	8	75	1,092	1,647
212	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
212	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
212	Mar	0	0	131	132	135	135	159	2	3	56	913	1,393
212	Apr	0	0	130	131	178	232	263	2	9	107	1,276	1,942
212	May	0	0	433	1,129	1,205	1,280	1,316	127	135	766	1,566	2,882
212	Jun	0	0	492	943	1,006	1,046	1,080	166	180	965	2,281	3,362
212	Jul	0	0	258	328	386	412	446	52	69	384	1,411	2,020
212	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
212	Sep	0	0	153	156	199	207	240	17	17	143	724	1,059
212	Oct	0	0	149	211	259	286	319	16	26	188	808	1,242
212	Nov	0	0	147	182	241	277	312	15	29	204	1,116	1,679
212	Dec	0	0	144	167	222	241	277	10	18	146	930	1,395
213	Jan	0	0	141	155	200	212	245	6	14	121	879	1,318
213	Feb	0	0	138	146	182	191	223	5	12	109	852	1,278
213	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
213	Apr	0	0	135	136	239	321	371	4	18	171	1,070	1,612
213	May	0	0	409	1,219	1,344	1,441	1,498	125	136	782	1,609	3,106
213	Jun	0	0	468	871	935	963	1,003	160	156	864	2,274	3,278
213	Jul	0	0	246	272	317	330	366	45	45	291	1,281	1,802
213	Aug	0	0	167	170	205	214	247	16	20	156	836	1,217
213	Sep	0	0	149	151	177	185	217	8	14	119	628	928
213	Oct	0	0	144	148	172	179	210	5	12	109	633	946
213	Nov	0	0	141	146	169	176	207	5	11	104	882	1,327
213	Dec	0	0	138	139	158	164	194	4	10	95	882	1,329
214	Jan	0	0	136	137	150	155	184	3	9	86	856	1,295
214	Feb	0	0	133	134	144	148	176	3	7	77	880	1,337
214	Mar	0	0	132	133	139	143	169	2	6	70	839	1,280
214	Apr	0	0	131	132	145	158	186	2	6	70	1,053	1,605
214	May	0	0	432	1,310	1,418	1,516	1,568	145	168	949	2,207	3,774

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
214	Jun	0	0	516	930	1,065	1,172	1,231	179	192	1,135	3,743	5,387
214	Jul	0	0	282	295	354	382	421	46	48	317	1,304	1,814
214	Aug	0	0	172	175	211	222	255	13	17	134	725	1,062
214	Sep	0	0	148	149	176	182	213	6	9	91	687	1,033
214	Oct	0	0	141	143	164	169	199	4	8	81	689	1,043
214	Nov	0	0	138	139	161	167	197	4	7	79	855	1,297
214	Dec	0	0	136	137	157	163	192	3	6	74	846	1,288
215	Jan	0	0	133	134	149	154	182	2	5	66	828	1,266
215	Feb	0	0	132	133	144	147	174	2	3	59	800	1,229
215	Mar	0	0	130	131	139	141	168	1	2	53	859	1,321
215	Apr	0	0	130	131	227	316	368	2	20	185	1,107	1,692
215	May	0	0	333	642	767	873	933	80	106	602	1,831	2,787
215	Jun	0	0	361	499	547	571	608	99	107	572	2,109	2,941
215	Jul	0	0	186	195	223	231	262	24	28	189	1,084	1,567
215	Aug	0	0	146	149	169	172	201	9	11	102	647	969
215	Sep	0	0	145	150	168	171	199	6	16	100	616	931
215	Oct	0	0	185	347	406	459	493	29	69	384	823	1,316
215	Nov	0	0	186	288	364	429	465	36	74	440	1,040	1,536
215	Dec	0	0	154	189	233	250	283	16	23	178	940	1,407
216	Jan	0	0	145	161	192	198	230	8	12	113	852	1,281
216	Feb	0	0	141	148	172	176	206	6	9	94	831	1,251
216	Mar	0	0	138	147	182	212	244	5	9	103	928	1,402
216	Apr	0	0	268	808	884	963	1,000	79	108	651	1,301	2,302
216	May	0	0	438	938	1,027	1,092	1,132	128	150	821	1,674	2,805
216	Jun	0	0	342	417	482	501	540	68	62	334	1,265	1,805
216	Jul	0	0	190	193	244	254	290	28	24	179	1,145	1,659
216	Aug	0	0	157	167	208	215	250	17	16	141	1,030	1,525
216	Sep	0	0	171	266	312	335	371	25	44	270	1,773	2,685
216	Oct	0	0	177	297	360	406	445	32	63	365	1,264	1,927
216	Nov	0	0	160	222	293	330	371	26	39	263	3,101	4,658
216	Dec	0	0	154	196	260	278	318	19	22	178	1,830	2,744
217	Jan	0	0	149	181	233	245	283	14	17	146	1,407	2,108
217	Feb	0	0	146	170	212	222	258	9	14	128	1,365	2,047
217	Mar	0	0	144	167	206	216	252	7	14	122	1,796	2,698
217	Apr	0	0	321	1,056	1,154	1,226	1,273	109	135	798	3,313	5,339
217	May	0	0	424	797	911	996	1,047	137	159	943	5,807	8,568
217	Jun	0	0	298	388	450	476	517	47	46	307	3,431	5,063
217	Jul	0	0	193	268	317	331	369	29	32	197	1,641	2,461
217	Aug	0	0	170	176	218	229	266	25	29	173	1,102	1,610
217	Sep	0	0	160	174	207	217	252	18	19	143	1,037	1,534
217	Oct	0	0	159	258	299	331	367	20	40	249	1,673	2,561
217	Nov	0	0	158	218	271	309	347	21	45	278	1,529	2,305
217	Dec	0	0	154	192	240	257	294	15	22	165	1,235	1,851
218	Jan	0	0	151	177	216	227	263	10	16	129	1,046	1,566
218	Feb	0	0	147	166	197	206	240	6	13	111	924	1,383
218	Mar	0	0	144	157	182	191	224	4	12	101	918	1,374
218	Apr	0	0	208	449	552	638	691	38	83	500	1,237	1,934
218	May	0	0	386	817	944	1,046	1,105	90	131	714	2,479	3,807
218	Jun	0	0	338	392	449	476	517	70	71	369	2,189	3,133
218	Jul	0	0	191	196	233	245	281	27	26	180	1,129	1,626
218	Aug	0	0	157	159	187	194	228	15	15	129	721	1,044
218	Sep	0	0	148	149	170	176	209	9	12	108	606	883
218	Oct	0	0	144	145	162	168	199	6	10	97	706	1,042
218	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
218	Dec	0	0	138	139	150	153	182	4	8	81	1,012	1,516
219	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,520
219	Feb	0	0	134	135	139	142	169	3	5	66	1,001	1,510
219	Mar	0	0	133	134	137	138	165	2	3	60	1,123	1,699
219	Apr	0	0	131	132	218	299	348	2	12	142	2,022	3,057
219	May	0	0	418	1,118	1,234	1,333	1,389	118	127	732	5,542	8,627
219	Jun	0	0	484	968	1,028	1,063	1,102	162	175	928	10,401	15,525
219	Jul	0	0	268	307	357	381	416	58	75	416	2,866	4,156
219	Aug	0	0	169	205	244	253	286	21	23	175	1,774	2,639
219	Sep	0	0	150	175	207	214	245	12	14	127	1,357	2,029
219	Oct	0	0	149	215	254	273	305	14	26	179	2,181	3,307
219	Nov	0	0	147	187	232	254	287	14	29	193	2,079	3,130
219	Dec	0	0	144	169	207	218	250	9	16	133	1,507	2,262
220	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
220	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
220	Mar	0	0	136	137	159	165	194	4	9	93	1,213	1,818
220	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
220	May	0	0	485	1,332	1,401	1,463	1,500	133	141	795	6,977	10,857
220	Jun	0	0	485	792	879	954	995	166	169	955	3,008	4,255
220	Jul	0	0	214	226	273	294	328	40	43	280	1,196	1,679
220	Aug	0	0	156	188	221	231	263	13	17	135	1,037	1,548
220	Sep	0	0	144	146	173	179	210	7	11	105	922	1,369
220	Oct	0	0	141	164	191	198	229	6	14	107	929	1,403
220	Nov	0	0	140	165	203	226	259	6	16	120	1,248	1,881
220	Dec	0	0	138	151	193	219	253	5	13	117	1,147	1,723
221	Jan	0	0	135	141	174	186	218	5	11	106	1,045	1,570
221	Feb	0	0	134	135	161	168	199	4	10	96	1,035	1,556
221	Mar	0	0	132	133	153	159	189	3	9	88	1,053	1,589
221	Apr	0	0	131	132	231	317	368	3	17	169	1,805	2,726
221	May	0	0	440	1,279	1,405	1,507	1,566	132	141	808	3,697	5,953
221	Jun	0	0	457	753	810	836	875	162	159	873	3,921	5,596

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
221	Jul	0	0	208	221	257	268	301	39	42	271	1,774	2,548
221	Aug	0	0	152	156	182	189	220	12	17	135	805	1,184
221	Sep	0	0	139	141	161	166	196	6	11	102	698	1,045
221	Oct	0	0	135	136	151	155	184	5	8	88	755	1,140
221	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
221	Dec	0	0	130	131	139	141	168	3	5	70	1,029	1,563
222	Jan	0	0	129	130	135	136	162	2	4	63	999	1,523
222	Feb	0	0	128	129	131	131	156	2	2	56	1,004	1,535
222	Mar	0	0	127	128	188	252	289	1	6	105	985	1,513
222	Apr	0	0	130	141	224	303	345	3	27	186	1,665	2,523
222	May	0	0	244	309	347	365	398	26	56	253	2,995	4,476
222	Jun	0	0	270	292	316	321	351	33	46	221	2,519	3,711
222	Jul	0	0	165	169	186	188	216	10	17	125	1,141	1,696
222	Aug	0	0	141	142	155	155	182	5	10	98	689	1,035
222	Sep	0	0	134	136	144	144	170	3	7	87	4,092	6,157
222	Oct	0	0	133	134	140	140	166	3	7	82	2,510	3,783
222	Nov	0	0	132	133	137	137	162	3	6	78	1,564	2,363
222	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
223	Jan	0	0	129	130	131	131	154	1	4	63	635	977
223	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
223	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
223	Apr	0	0	126	127	136	157	180	0	2	55	8,109	12,222
223	May	0	0	618	1,890	2,054	2,197	2,266	270	281	1,516	14,745	22,360
223	Jun	0	0	563	1,033	1,235	1,384	1,466	229	214	1,331	10,074	14,845
223	Jul	0	0	240	390	471	506	549	56	64	401	5,523	8,281
223	Aug	0	0	167	177	230	241	276	21	33	208	2,465	3,672
223	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
223	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
223	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,558
223	Dec	0	0	134	135	153	155	182	4	5	76	628	957
224	Jan	0	0	132	133	145	147	173	3	4	68	633	970
224	Feb	0	0	130	131	140	141	166	2	3	61	673	1,034
224	Mar	0	0	129	130	136	136	160	2	1	55	1,194	1,820
224	Apr	0	0	128	129	229	318	371	2	14	160	2,311	3,504
224	May	0	0	423	988	1,118	1,226	1,287	118	128	739	5,650	8,664
224	Jun	0	0	440	772	821	845	881	146	142	775	4,973	7,283
224	Jul	0	0	208	220	250	256	286	35	36	239	2,296	3,355
224	Aug	0	0	152	155	176	178	207	11	13	118	1,449	2,163
224	Sep	0	0	139	141	156	157	184	6	7	88	997	1,504
224	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
224	Nov	0	0	132	133	141	141	166	3	4	67	1,034	1,574
224	Dec	0	0	130	131	135	135	160	3	3	60	716	1,101
225	Jan	0	0	129	130	131	131	155	2	1	54	1,061	1,623
225	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
225	Mar	0	0	126	127	140	163	187	1	1	53	1,714	2,612
225	Apr	0	0	135	151	180	209	236	7	33	194	1,985	2,976
225	May	0	0	211	235	262	271	297	18	59	269	2,399	3,535
225	Jun	0	0	227	238	260	262	288	20	35	170	2,027	2,995
225	Jul	0	0	158	161	178	179	204	8	13	108	1,268	1,900
225	Aug	0	0	141	142	154	155	179	4	7	88	699	1,058
225	Sep	0	0	136	137	145	145	168	3	5	78	655	999
225	Oct	0	0	133	134	139	139	162	2	4	71	817	1,248
225	Nov	0	0	131	132	135	135	157	2	3	63	1,065	1,625
225	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
226	Jan	0	0	129	130	130	130	151	1	0	51	778	1,205
226	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
226	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
226	Apr	0	0	156	174	226	284	314	15	51	323	1,089	1,612
226	May	0	0	353	390	464	534	569	66	111	583	3,835	5,549
226	Jun	0	0	471	951	1,064	1,155	1,203	136	162	869	2,032	3,234
226	Jul	0	0	350	534	663	758	811	107	127	750	1,478	2,289
226	Aug	0	0	186	200	259	279	314	35	32	238	1,046	1,500
226	Sep	0	0	152	171	209	214	244	18	13	130	756	1,122
226	Oct	0	0	146	207	240	242	272	16	15	123	733	1,133
226	Nov	0	0	145	177	209	212	241	15	17	126	1,147	1,731
226	Dec	0	0	142	161	188	191	219	10	11	108	903	1,359
227	Jan	0	0	139	151	171	173	200	6	9	96	902	1,357
227	Feb	0	0	136	142	157	158	185	5	8	87	830	1,249
227	Mar	0	0	135	143	172	207	236	5	10	112	1,114	1,682
227	Apr	0	0	255	739	812	897	931	72	104	628	1,879	3,043
227	May	0	0	396	772	854	917	953	103	129	744	3,316	4,936
227	Jun	0	0	305	416	474	491	526	48	45	283	1,655	2,420
227	Jul	0	0	184	187	234	241	275	26	22	170	1,408	2,060
227	Aug	0	0	155	156	193	198	230	16	16	132	734	1,076
227	Sep	0	0	148	149	179	182	213	12	14	118	647	954
227	Oct	0	0	146	147	171	175	205	9	13	111	819	1,217
227	Nov	0	0	143	144	164	167	196	5	12	100	1,018	1,523
227	Dec	0	0	140	141	156	158	186	4	11	91	985	1,480
228	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
228	Feb	0	0	135	136	143	144	170	3	8	76	912	1,381
228	Mar	0	0	134	135	140	140	165	2	7	69	1,008	1,530
228	Apr	0	0	148	173	293	395	456	5	54	345	1,231	1,861
228	May	0	0	301	587	740	863	933	50	108	591	4,093	6,249
228	Jun	0	0	309	383	437	463	502	61	74	382	1,840	2,633
228	Jul	0	0	180	215	245	252	283	24	25	172	1,185	1,752

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
228	Aug	0	0	158	213	238	241	271	20	28	168	947	1,433
228	Sep	0	0	154	165	188	191	220	19	29	169	781	1,146
228	Oct	0	0	152	218	246	260	290	18	27	177	820	1,253
228	Nov	0	0	150	189	222	239	269	16	27	180	983	1,475
228	Dec	0	0	147	173	199	205	234	11	17	135	987	1,476
229	Jan	0	0	144	161	181	185	213	7	14	114	1,331	1,994
229	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
229	Mar	0	0	138	143	154	156	182	4	11	94	1,245	1,866
229	Apr	0	0	136	137	281	397	467	4	29	245	3,508	5,269
229	May	0	0	358	1,140	1,322	1,464	1,545	116	148	872	3,714	5,958
229	Jun	0	0	466	910	979	1,011	1,053	151	158	878	5,867	8,667
229	Jul	0	0	303	358	399	409	442	48	48	299	2,270	3,273
229	Aug	0	0	180	190	219	223	254	21	22	160	1,170	1,709
229	Sep	0	0	169	266	298	311	341	20	39	227	1,348	2,067
229	Oct	0	0	169	228	270	286	318	22	44	252	919	1,384
229	Nov	0	0	155	191	231	240	272	17	22	162	1,297	1,944
229	Dec	0	0	150	175	206	213	243	12	16	131	990	1,481
230	Jan	0	0	146	163	188	193	222	7	14	113	930	1,393
230	Feb	0	0	143	153	173	177	205	5	12	101	1,026	1,538
230	Mar	0	0	140	145	160	164	192	4	11	93	1,154	1,731
230	Apr	0	0	143	167	312	430	500	5	42	306	1,711	2,584
230	May	0	0	420	1,051	1,233	1,374	1,455	104	138	788	5,779	8,945
230	Jun	0	0	416	661	726	759	801	129	128	689	4,180	6,074
230	Jul	0	0	203	218	256	266	299	36	37	240	1,411	2,019
230	Aug	0	0	155	158	184	189	220	14	17	135	819	1,193
230	Sep	0	0	146	160	181	185	214	8	13	112	657	975
230	Oct	0	0	146	179	205	214	244	9	18	129	1,024	1,544
230	Nov	0	0	144	168	202	214	245	8	20	137	1,092	1,638
230	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
231	Jan	0	0	138	147	173	179	208	5	12	107	891	1,337
231	Feb	0	0	136	139	161	167	195	4	11	99	877	1,316
231	Mar	0	0	134	135	159	165	194	4	11	96	1,048	1,576
231	Apr	0	0	222	539	635	713	760	49	92	549	1,066	1,825
231	May	0	0	364	668	785	878	930	76	119	677	3,066	4,579
231	Jun	0	0	297	356	411	436	473	39	45	264	1,493	2,149
231	Jul	0	0	178	181	218	229	262	18	21	152	1,378	2,026
231	Aug	0	0	150	151	179	186	217	10	14	117	670	987
231	Sep	0	0	142	143	165	170	200	5	12	100	588	875
231	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
231	Nov	0	0	137	138	150	154	182	4	10	88	1,076	1,618
231	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
232	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
232	Feb	0	0	132	133	137	138	163	2	6	66	999	1,518
232	Mar	0	0	131	132	134	136	160	2	5	60	1,075	1,637
232	Apr	0	0	136	147	208	272	309	4	42	261	1,448	2,187
232	May	0	0	306	694	782	861	903	79	131	711	2,661	4,096
232	Jun	0	0	382	688	736	757	790	104	120	641	3,297	4,861
232	Jul	0	0	256	265	301	310	341	37	39	238	1,466	2,083
232	Aug	0	0	167	170	197	202	231	18	17	135	1,140	1,675
232	Sep	0	0	147	149	169	173	201	11	12	105	978	1,454
232	Oct	0	0	141	142	158	161	188	6	10	90	1,008	1,507
232	Nov	0	0	138	139	151	153	180	5	9	82	1,165	1,750
232	Dec	0	0	136	137	146	148	173	4	8	75	1,092	1,647
233	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
233	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
233	Mar	0	0	131	132	135	135	158	2	3	56	913	1,393
233	Apr	0	0	130	131	178	232	263	2	9	107	1,276	1,942
233	May	0	0	433	1,128	1,205	1,279	1,315	127	135	766	1,566	2,881
233	Jun	0	0	492	943	1,006	1,046	1,080	166	180	965	2,281	3,362
233	Jul	0	0	258	328	386	412	446	52	69	384	1,411	2,020
233	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
233	Sep	0	0	153	156	198	207	240	17	17	143	724	1,059
233	Oct	0	0	149	211	259	286	319	16	26	187	808	1,242
233	Nov	0	0	147	182	241	277	312	15	29	204	1,116	1,679
233	Dec	0	0	144	167	222	241	277	10	18	146	930	1,395
234	Jan	0	0	141	155	200	211	245	6	14	121	879	1,318
234	Feb	0	0	138	146	181	191	223	5	12	109	852	1,278
234	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
234	Apr	0	0	135	136	237	319	369	4	18	169	1,070	1,612
234	May	0	0	408	1,213	1,337	1,433	1,489	124	135	778	1,610	3,098
234	Jun	0	0	467	868	932	959	999	159	155	860	2,275	3,274
234	Jul	0	0	246	271	316	329	364	45	45	289	1,281	1,803
234	Aug	0	0	167	170	204	213	247	16	20	155	836	1,218
234	Sep	0	0	149	151	177	184	216	7	14	118	628	929
234	Oct	0	0	144	147	171	178	209	5	12	108	633	945
234	Nov	0	0	141	146	169	176	207	5	11	103	882	1,327
234	Dec	0	0	138	139	157	164	193	4	10	94	882	1,329
235	Jan	0	0	136	136	150	155	184	3	9	85	856	1,296
235	Feb	0	0	133	134	144	148	176	3	7	77	880	1,337
235	Mar	0	0	132	133	139	143	169	2	6	70	839	1,280
235	Apr	0	0	131	132	145	158	186	2	6	70	1,053	1,605
235	May	0	0	433	1,315	1,425	1,523	1,575	146	169	954	2,206	3,781
235	Jun	0	0	517	933	1,069	1,177	1,236	180	192	1,139	3,743	5,387
235	Jul	0	0	283	296	355	383	422	46	48	318	1,304	1,814
235	Aug	0	0	172	175	212	222	255	13	17	134	725	1,062

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
235	Sep	0	0	148	149	176	182	213	6	9	91	687	1,033
235	Oct	0	0	142	143	164	169	199	4	8	81	689	1,043
235	Nov	0	0	138	139	161	167	197	4	7	79	855	1,296
235	Dec	0	0	136	137	157	163	192	3	6	74	846	1,288
236	Jan	0	0	133	134	149	154	182	2	5	66	828	1,266
236	Feb	0	0	132	133	144	147	174	2	3	59	800	1,229
236	Mar	0	0	131	131	139	141	168	1	2	53	859	1,321
236	Apr	0	0	130	131	227	316	368	2	20	185	1,107	1,692
236	May	0	0	333	643	768	874	934	80	106	602	1,831	2,788
236	Jun	0	0	361	499	547	571	608	99	107	572	2,109	2,941
236	Jul	0	0	186	195	223	231	262	24	28	189	1,084	1,567
236	Aug	0	0	146	149	169	172	201	9	11	102	647	969
236	Sep	0	0	145	150	168	171	199	6	16	100	616	931
236	Oct	0	0	185	347	406	459	493	29	69	384	823	1,316
236	Nov	0	0	186	288	364	429	465	36	74	440	1,040	1,536
236	Dec	0	0	154	189	233	250	283	16	23	178	940	1,407
237	Jan	0	0	145	161	192	198	230	8	12	113	852	1,281
237	Feb	0	0	141	148	172	176	206	6	9	94	831	1,251
237	Mar	0	0	138	147	182	212	244	5	9	103	928	1,402
237	Apr	0	0	268	808	884	963	1,000	79	108	650	1,301	2,301
237	May	0	0	438	938	1,027	1,092	1,131	128	150	821	1,674	2,805
237	Jun	0	0	342	417	482	501	540	68	62	334	1,265	1,805
237	Jul	0	0	190	193	244	254	290	28	24	179	1,145	1,659
237	Aug	0	0	157	167	208	215	250	17	16	141	1,030	1,525
237	Sep	0	0	171	266	312	335	371	25	44	270	1,773	2,685
237	Oct	0	0	177	297	360	406	444	32	63	365	1,264	1,927
237	Nov	0	0	160	222	293	330	370	26	39	262	3,101	4,658
237	Dec	0	0	154	196	260	278	318	19	22	178	1,830	2,744
238	Jan	0	0	149	181	233	245	283	14	17	146	1,407	2,108
238	Feb	0	0	146	170	211	222	257	9	14	127	1,365	2,046
238	Mar	0	0	143	167	205	216	251	6	14	121	1,796	2,698
238	Apr	0	0	320	1,052	1,148	1,220	1,266	108	134	794	3,313	5,338
238	May	0	0	422	794	906	990	1,041	137	159	939	5,808	8,569
238	Jun	0	0	297	387	448	474	515	46	45	306	3,431	5,063
238	Jul	0	0	192	268	316	330	368	29	32	196	1,641	2,461
238	Aug	0	0	170	176	217	229	266	24	29	173	1,102	1,610
238	Sep	0	0	160	173	206	216	251	18	19	142	1,037	1,534
238	Oct	0	0	159	258	299	331	367	20	40	248	1,673	2,561
238	Nov	0	0	158	218	270	308	346	21	45	277	1,529	2,305
238	Dec	0	0	154	192	239	257	294	15	22	165	1,235	1,851
239	Jan	0	0	151	177	215	227	263	10	16	129	1,046	1,566
239	Feb	0	0	147	166	197	206	240	6	13	111	924	1,383
239	Mar	0	0	144	157	182	191	224	5	12	102	918	1,374
239	Apr	0	0	208	449	553	640	694	38	83	502	1,237	1,934
239	May	0	0	387	822	950	1,052	1,112	90	132	718	2,478	3,807
239	Jun	0	0	339	394	451	479	520	71	72	373	2,189	3,131
239	Jul	0	0	191	196	233	246	282	28	26	181	1,129	1,626
239	Aug	0	0	157	159	187	194	228	15	15	129	721	1,044
239	Sep	0	0	148	149	170	176	209	9	12	108	606	883
239	Oct	0	0	144	145	162	168	199	6	10	97	706	1,042
239	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
239	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
240	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
240	Feb	0	0	134	135	139	142	169	3	5	66	1,001	1,510
240	Mar	0	0	133	134	137	138	165	2	3	60	1,123	1,699
240	Apr	0	0	131	132	218	299	348	2	12	142	2,022	3,057
240	May	0	0	418	1,120	1,236	1,335	1,390	118	127	732	5,542	8,629
240	Jun	0	0	484	968	1,028	1,063	1,102	162	176	928	10,401	15,525
240	Jul	0	0	268	307	357	381	416	58	75	416	2,866	4,156
240	Aug	0	0	169	205	244	253	286	21	23	175	1,774	2,639
240	Sep	0	0	150	175	207	214	245	12	14	127	1,357	2,029
240	Oct	0	0	149	215	254	273	305	14	26	179	2,181	3,307
240	Nov	0	0	147	187	232	254	287	14	29	193	2,079	3,130
240	Dec	0	0	144	169	207	218	250	9	16	133	1,507	2,262
241	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
241	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
241	Mar	0	0	136	137	159	165	194	4	9	93	1,213	1,818
241	Apr	0	0	134	135	156	162	191	4	9	89	1,299	1,953
241	May	0	0	485	1,332	1,401	1,463	1,500	133	141	795	6,977	10,857
241	Jun	0	0	485	792	879	954	995	166	169	955	3,008	4,255
241	Jul	0	0	214	226	273	294	328	40	43	280	1,196	1,678
241	Aug	0	0	156	188	221	231	263	13	17	135	1,037	1,548
241	Sep	0	0	144	146	173	179	210	7	11	105	922	1,369
241	Oct	0	0	141	164	191	198	229	6	14	107	929	1,403
241	Nov	0	0	140	165	203	226	259	6	16	120	1,248	1,881
241	Dec	0	0	138	151	193	219	253	5	13	117	1,147	1,723
242	Jan	0	0	135	141	174	186	218	5	11	106	1,045	1,570
242	Feb	0	0	134	135	161	168	199	4	10	96	1,035	1,556
242	Mar	0	0	132	133	153	159	189	3	9	87	1,053	1,589
242	Apr	0	0	131	132	230	315	366	3	17	168	1,805	2,726
242	May	0	0	439	1,273	1,398	1,499	1,557	131	140	804	3,698	5,951
242	Jun	0	0	456	751	807	833	872	162	158	869	3,921	5,597
242	Jul	0	0	208	220	257	267	301	38	42	269	1,774	2,549
242	Aug	0	0	152	155	182	188	220	12	17	135	805	1,184
242	Sep	0	0	139	141	161	165	196	6	11	101	698	1,045

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
242	Oct	0	0	135	136	151	155	183	5	8	88	755	1,141
242	Nov	0	0	132	133	144	147	175	4	7	78	1,233	1,865
242	Dec	0	0	130	131	139	141	167	3	5	70	1,029	1,563
243	Jan	0	0	129	130	134	136	161	2	4	63	999	1,523
243	Feb	0	0	128	129	131	131	156	2	2	56	1,004	1,535
243	Mar	0	0	127	128	188	253	291	1	6	106	985	1,513
243	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
243	May	0	0	245	311	349	368	400	27	57	256	2,995	4,474
243	Jun	0	0	270	294	318	323	353	34	46	224	2,518	3,709
243	Jul	0	0	165	169	186	188	216	10	17	126	1,141	1,696
243	Aug	0	0	141	142	155	155	182	5	10	98	689	1,035
243	Sep	0	0	135	136	144	144	170	3	7	87	4,092	6,157
243	Oct	0	0	133	134	140	140	166	3	7	83	2,510	3,783
243	Nov	0	0	132	133	137	137	162	3	6	78	1,564	2,363
243	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
244	Jan	0	0	129	130	131	131	154	2	4	63	635	977
244	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
244	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
244	Apr	0	0	126	127	136	157	180	0	2	55	8,109	12,222
244	May	0	0	618	1,894	2,057	2,200	2,270	270	281	1,516	14,745	22,363
244	Jun	0	0	563	1,033	1,235	1,384	1,466	229	214	1,331	10,074	14,845
244	Jul	0	0	240	390	471	506	549	56	64	401	5,523	8,281
244	Aug	0	0	167	177	230	241	276	21	33	208	2,465	3,672
244	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
244	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
244	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,558
244	Dec	0	0	134	135	152	155	182	4	5	76	628	957
245	Jan	0	0	132	133	145	147	173	3	4	68	633	970
245	Feb	0	0	130	131	140	141	166	2	3	61	673	1,034
245	Mar	0	0	129	130	135	135	160	2	1	55	1,193	1,820
245	Apr	0	0	128	129	229	318	371	2	14	160	2,311	3,504
245	May	0	0	423	989	1,119	1,226	1,287	118	128	739	5,650	8,664
245	Jun	0	0	440	772	821	845	881	146	142	775	4,973	7,283
245	Jul	0	0	208	220	250	256	286	35	36	238	2,296	3,355
245	Aug	0	0	152	155	176	178	207	11	13	118	1,449	2,163
245	Sep	0	0	139	141	156	157	184	6	7	88	997	1,504
245	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
245	Nov	0	0	132	133	140	140	166	3	4	67	1,034	1,574
245	Dec	0	0	130	131	135	135	160	3	3	60	716	1,101
246	Jan	0	0	129	130	131	131	155	2	1	54	1,061	1,623
246	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
246	Mar	0	0	126	127	140	163	187	1	1	52	1,714	2,612
246	Apr	0	0	135	151	179	209	236	7	33	193	1,985	2,976
246	May	0	0	211	234	262	270	296	17	58	266	2,400	3,536
246	Jun	0	0	226	237	259	261	287	19	35	166	2,027	2,996
246	Jul	0	0	158	161	177	178	203	8	13	107	1,268	1,901
246	Aug	0	0	141	142	154	154	178	4	7	88	699	1,059
246	Sep	0	0	136	137	145	145	168	3	5	78	655	1,000
246	Oct	0	0	133	134	139	139	161	2	4	70	817	1,248
246	Nov	0	0	131	132	135	135	157	2	3	63	1,065	1,625
246	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
247	Jan	0	0	129	130	130	130	151	1	0	50	778	1,206
247	Feb	0	0	127	128	129	129	149	1	0	46	840	1,304
247	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
247	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
247	May	0	0	354	392	467	538	573	66	112	587	3,835	5,546
247	Jun	0	0	472	952	1,065	1,155	1,203	137	163	872	2,031	3,235
247	Jul	0	0	350	535	664	759	812	108	127	751	1,478	2,290
247	Aug	0	0	186	201	259	279	314	35	32	238	1,046	1,500
247	Sep	0	0	152	171	209	214	244	18	13	130	756	1,122
247	Oct	0	0	146	207	240	242	272	16	15	123	733	1,133
247	Nov	0	0	145	177	209	212	241	14	17	125	1,147	1,731
247	Dec	0	0	142	161	188	191	219	9	11	108	903	1,359
248	Jan	0	0	139	151	171	173	200	6	9	96	902	1,357
248	Feb	0	0	136	142	157	158	185	5	8	87	830	1,249
248	Mar	0	0	135	143	172	207	236	5	10	112	1,114	1,682
248	Apr	0	0	255	739	812	897	931	71	104	627	1,879	3,043
248	May	0	0	396	772	854	917	953	103	129	744	3,316	4,936
248	Jun	0	0	305	416	474	491	526	47	45	283	1,655	2,420
248	Jul	0	0	184	187	234	241	275	26	22	170	1,408	2,060
248	Aug	0	0	155	156	193	198	230	16	16	132	734	1,076
248	Sep	0	0	148	149	179	182	213	12	14	118	647	954
248	Oct	0	0	146	147	171	174	204	9	13	110	819	1,217
248	Nov	0	0	143	144	164	167	196	5	12	100	1,018	1,523
248	Dec	0	0	140	141	156	158	186	4	11	91	985	1,480
249	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
249	Feb	0	0	135	136	143	144	170	3	8	76	912	1,381
249	Mar	0	0	134	135	140	140	165	2	7	69	1,008	1,530
249	Apr	0	0	148	173	293	395	456	5	54	345	1,231	1,861
249	May	0	0	301	587	740	863	933	50	108	591	4,093	6,249
249	Jun	0	0	309	383	437	463	501	61	74	382	1,840	2,633
249	Jul	0	0	180	215	245	251	283	23	25	172	1,185	1,752
249	Aug	0	0	158	213	238	241	271	20	28	168	947	1,433
249	Sep	0	0	154	165	188	191	220	19	29	168	781	1,146
249	Oct	0	0	152	218	246	260	290	17	27	177	820	1,253

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
249	Nov	0	0	150	189	222	239	269	16	27	180	983	1,475
249	Dec	0	0	147	173	199	205	234	11	17	135	987	1,476
250	Jan	0	0	144	161	181	185	213	7	14	114	1,331	1,994
250	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
250	Mar	0	0	138	143	154	155	181	4	11	94	1,245	1,866
250	Apr	0	0	136	137	279	395	464	4	29	244	3,508	5,269
250	May	0	0	357	1,134	1,315	1,456	1,536	115	147	867	3,715	5,956
250	Jun	0	0	464	906	974	1,006	1,048	150	157	874	5,867	8,669
250	Jul	0	0	303	357	398	408	441	48	48	298	2,270	3,274
250	Aug	0	0	180	189	218	223	253	21	22	160	1,170	1,709
250	Sep	0	0	169	266	297	310	341	20	39	226	1,348	2,067
250	Oct	0	0	169	228	269	286	318	22	44	251	919	1,384
250	Nov	0	0	155	191	230	239	271	17	22	162	1,297	1,944
250	Dec	0	0	150	175	206	212	243	12	16	131	990	1,481
251	Jan	0	0	146	163	187	193	222	7	14	113	930	1,393
251	Feb	0	0	143	153	173	177	205	5	12	101	1,026	1,538
251	Mar	0	0	140	145	160	164	192	4	11	93	1,154	1,731
251	Apr	0	0	143	167	314	432	503	5	43	308	1,711	2,584
251	May	0	0	421	1,057	1,240	1,382	1,464	104	139	792	5,778	8,946
251	Jun	0	0	417	664	730	762	805	129	128	692	4,179	6,073
251	Jul	0	0	203	219	256	267	300	37	37	241	1,411	2,019
251	Aug	0	0	155	158	185	189	220	14	17	135	819	1,193
251	Sep	0	0	146	161	182	185	214	8	13	112	657	975
251	Oct	0	0	146	180	205	214	244	9	18	129	1,024	1,544
251	Nov	0	0	144	168	202	214	245	8	20	137	1,092	1,639
251	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
252	Jan	0	0	138	148	173	179	208	5	12	107	891	1,337
252	Feb	0	0	136	139	161	167	195	4	11	99	877	1,316
252	Mar	0	0	134	135	159	165	194	4	11	96	1,048	1,576
252	Apr	0	0	222	539	635	713	760	49	92	549	1,066	1,826
252	May	0	0	364	668	785	878	930	76	119	677	3,066	4,579
252	Jun	0	0	297	356	411	436	473	39	45	263	1,493	2,149
252	Jul	0	0	178	181	218	229	262	18	21	152	1,378	2,026
252	Aug	0	0	150	152	179	186	217	10	14	116	670	987
252	Sep	0	0	142	143	165	170	200	5	12	100	588	875
252	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
252	Nov	0	0	137	138	150	154	182	4	10	88	1,076	1,618
252	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
253	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
253	Feb	0	0	132	133	136	138	163	2	6	66	999	1,518
253	Mar	0	0	131	132	134	136	160	2	5	60	1,075	1,637
253	Apr	0	0	136	147	208	272	309	4	42	261	1,448	2,187
253	May	0	0	306	695	783	861	903	79	131	711	2,661	4,096
253	Jun	0	0	382	688	736	757	790	104	120	641	3,297	4,861
253	Jul	0	0	256	265	301	310	341	37	39	238	1,466	2,083
253	Aug	0	0	167	170	197	202	231	18	17	135	1,140	1,675
253	Sep	0	0	147	149	169	173	201	11	12	105	978	1,453
253	Oct	0	0	141	142	158	161	188	6	10	90	1,008	1,507
253	Nov	0	0	138	139	151	153	179	5	9	82	1,165	1,750
253	Dec	0	0	136	137	146	148	173	4	8	75	1,092	1,647
254	Jan	0	0	134	135	141	142	167	3	6	68	944	1,429
254	Feb	0	0	133	134	137	137	161	3	5	61	939	1,427
254	Mar	0	0	131	132	134	135	158	2	3	56	913	1,393
254	Apr	0	0	130	131	177	230	260	2	9	106	1,276	1,942
254	May	0	0	432	1,122	1,197	1,271	1,306	127	135	762	1,567	2,874
254	Jun	0	0	491	939	1,002	1,042	1,076	165	180	961	2,282	3,358
254	Jul	0	0	257	326	384	410	445	52	68	383	1,411	2,020
254	Aug	0	0	170	208	258	269	303	24	25	184	793	1,172
254	Sep	0	0	153	155	198	207	239	17	17	143	724	1,059
254	Oct	0	0	149	211	258	285	319	15	26	187	808	1,242
254	Nov	0	0	147	181	240	276	312	15	29	204	1,116	1,679
254	Dec	0	0	144	166	222	241	276	10	18	146	930	1,395
255	Jan	0	0	141	155	199	211	245	6	14	121	879	1,318
255	Feb	0	0	138	146	181	191	223	5	12	109	852	1,278
255	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
255	Apr	0	0	135	136	238	321	371	4	18	171	1,070	1,612
255	May	0	0	409	1,219	1,343	1,441	1,497	125	136	782	1,609	3,106
255	Jun	0	0	468	871	935	963	1,003	159	156	864	2,274	3,277
255	Jul	0	0	246	272	317	330	365	45	45	290	1,281	1,802
255	Aug	0	0	167	170	204	213	247	16	20	155	836	1,217
255	Sep	0	0	149	151	177	184	217	7	14	118	628	928
255	Oct	0	0	144	148	171	178	210	5	12	108	633	946
255	Nov	0	0	141	146	169	176	207	5	11	103	882	1,327
255	Dec	0	0	138	139	157	164	193	4	10	95	882	1,329
256	Jan	0	0	136	137	150	155	184	3	9	86	856	1,296
256	Feb	0	0	133	134	144	148	176	3	7	77	880	1,337
256	Mar	0	0	132	133	139	143	169	2	6	70	839	1,280
256	Apr	0	0	131	132	145	158	186	2	6	70	1,053	1,605
256	May	0	0	433	1,316	1,426	1,524	1,576	146	169	954	2,206	3,782
256	Jun	0	0	517	933	1,069	1,177	1,236	180	192	1,139	3,743	5,387
256	Jul	0	0	283	296	355	383	422	46	48	318	1,304	1,814
256	Aug	0	0	172	175	211	222	255	13	17	134	725	1,062
256	Sep	0	0	148	149	176	182	213	6	9	91	687	1,033
256	Oct	0	0	142	143	164	169	199	4	8	81	689	1,043
256	Nov	0	0	138	139	161	167	197	4	7	79	855	1,296

Knight Piésold
CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
256	Dec	0	0	136	137	157	162	192	3	6	74	846	1,288
257	Jan	0	0	133	134	149	154	182	2	5	66	828	1,265
257	Feb	0	0	132	133	143	147	174	2	3	59	800	1,229
257	Mar	0	0	131	131	138	141	168	1	2	53	859	1,321
257	Apr	0	0	130	131	227	316	368	2	20	185	1,107	1,692
257	May	0	0	333	644	769	875	934	80	106	602	1,831	2,789
257	Jun	0	0	361	499	547	571	608	98	107	572	2,109	2,941
257	Jul	0	0	186	195	223	231	262	24	28	189	1,084	1,567
257	Aug	0	0	146	149	169	172	201	9	11	102	647	969
257	Sep	0	0	146	150	168	171	199	6	16	100	616	931
257	Oct	0	0	185	347	406	460	493	29	69	384	823	1,316
257	Nov	0	0	186	288	364	429	465	36	74	440	1,040	1,536
257	Dec	0	0	154	189	233	250	283	16	23	178	940	1,407
258	Jan	0	0	145	161	192	198	230	8	12	113	852	1,281
258	Feb	0	0	141	148	172	175	206	6	9	93	831	1,251
258	Mar	0	0	138	147	181	211	243	5	9	103	928	1,402
258	Apr	0	0	267	805	879	958	995	79	108	647	1,301	2,296
258	May	0	0	437	933	1,021	1,085	1,124	127	149	816	1,674	2,799
258	Jun	0	0	341	416	480	499	538	67	62	332	1,265	1,803
258	Jul	0	0	190	193	243	253	289	28	24	178	1,145	1,659
258	Aug	0	0	157	167	207	215	250	17	16	140	1,030	1,525
258	Sep	0	0	171	265	311	334	370	25	44	269	1,772	2,685
258	Oct	0	0	177	297	359	405	444	32	63	365	1,264	1,927
258	Nov	0	0	160	222	292	330	370	26	39	262	3,101	4,658
258	Dec	0	0	154	196	260	278	317	19	22	177	1,830	2,744
259	Jan	0	0	149	181	232	245	282	14	17	145	1,407	2,108
259	Feb	0	0	146	170	211	222	257	9	14	127	1,365	2,047
259	Mar	0	0	144	167	206	216	251	6	14	122	1,796	2,698
259	Apr	0	0	321	1,056	1,153	1,226	1,273	109	135	797	3,313	5,339
259	May	0	0	423	797	911	996	1,047	137	159	943	5,807	8,568
259	Jun	0	0	298	388	450	475	516	47	46	307	3,431	5,063
259	Jul	0	0	192	268	316	331	369	29	32	196	1,641	2,461
259	Aug	0	0	170	176	218	229	266	24	29	173	1,102	1,610
259	Sep	0	0	160	173	207	216	252	18	19	142	1,037	1,534
259	Oct	0	0	159	258	299	331	367	20	40	248	1,673	2,561
259	Nov	0	0	158	218	270	309	347	21	45	277	1,529	2,305
259	Dec	0	0	154	192	239	257	294	15	22	165	1,235	1,851
260	Jan	0	0	151	177	215	227	263	10	16	129	1,046	1,566
260	Feb	0	0	147	167	197	206	240	6	13	111	924	1,383
260	Mar	0	0	144	157	182	191	224	5	12	102	918	1,374
260	Apr	0	0	208	449	553	640	694	38	83	502	1,237	1,934
260	May	0	0	387	822	950	1,052	1,112	90	132	718	2,478	3,807
260	Jun	0	0	339	394	451	479	520	71	72	373	2,189	3,131
260	Jul	0	0	191	196	233	245	281	28	26	181	1,129	1,626
260	Aug	0	0	157	159	187	194	228	15	15	129	721	1,044
260	Sep	0	0	148	149	170	176	209	8	12	108	606	883
260	Oct	0	0	144	145	162	168	199	6	10	97	706	1,042
260	Nov	0	0	140	141	156	161	191	5	9	90	1,080	1,611
260	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
261	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
261	Feb	0	0	134	135	139	142	169	3	5	66	1,001	1,510
261	Mar	0	0	133	134	137	138	165	2	3	60	1,123	1,699
261	Apr	0	0	131	132	218	299	348	2	12	142	2,022	3,057
261	May	0	0	418	1,120	1,236	1,335	1,390	118	127	732	5,542	8,629
261	Jun	0	0	484	968	1,028	1,063	1,102	162	176	927	10,401	15,525
261	Jul	0	0	268	307	357	380	416	58	75	416	2,866	4,156
261	Aug	0	0	169	205	244	253	286	21	23	175	1,774	2,639
261	Sep	0	0	150	175	207	214	245	12	14	127	1,357	2,029
261	Oct	0	0	149	215	254	273	305	14	26	179	2,181	3,307
261	Nov	0	0	147	187	232	254	287	14	29	193	2,079	3,130
261	Dec	0	0	144	169	206	218	250	9	16	133	1,507	2,262
262	Jan	0	0	141	157	187	195	226	6	12	111	1,268	1,902
262	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
262	Mar	0	0	136	137	158	164	194	4	9	92	1,213	1,818
262	Apr	0	0	134	135	155	162	191	4	8	89	1,299	1,953
262	May	0	0	483	1,325	1,392	1,453	1,490	133	140	790	6,978	10,856
262	Jun	0	0	484	789	875	949	989	165	168	950	3,008	4,256
262	Jul	0	0	213	226	272	293	327	39	43	278	1,196	1,679
262	Aug	0	0	156	187	221	230	262	13	16	135	1,036	1,547
262	Sep	0	0	144	146	172	179	210	7	11	104	922	1,369
262	Oct	0	0	141	164	191	197	228	6	14	107	929	1,403
262	Nov	0	0	140	164	203	226	258	6	16	120	1,248	1,881
262	Dec	0	0	138	150	192	219	252	5	13	117	1,147	1,723
263	Jan	0	0	135	141	174	185	217	5	11	106	1,045	1,570
263	Feb	0	0	134	135	161	168	199	4	10	96	1,035	1,556
263	Mar	0	0	132	133	153	159	189	3	9	87	1,053	1,589
263	Apr	0	0	131	132	231	316	368	3	17	169	1,805	2,726
263	May	0	0	440	1,279	1,404	1,506	1,565	132	141	808	3,697	5,953
263	Jun	0	0	457	753	810	836	874	162	159	872	3,921	5,596
263	Jul	0	0	208	221	257	267	301	38	42	270	1,774	2,548
263	Aug	0	0	152	156	182	188	220	12	17	135	805	1,184
263	Sep	0	0	139	141	161	166	196	6	11	102	698	1,045
263	Oct	0	0	135	136	151	155	184	5	8	88	755	1,141
263	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
263	Dec	0	0	130	131	139	141	167	3	5	70	1,029	1,563

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
264	Jan	0	0	129	130	134	136	161	2	4	63	999	1,523
264	Feb	0	0	128	129	131	131	156	2	2	56	1,004	1,535
264	Mar	0	0	127	128	188	253	291	1	6	106	985	1,513
264	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
264	May	0	0	245	312	350	369	401	27	57	256	2,995	4,476
264	Jun	0	0	270	294	318	323	353	34	46	224	2,518	3,709
264	Jul	0	0	165	169	186	188	216	10	17	126	1,141	1,695
264	Aug	0	0	141	142	155	155	182	5	10	98	689	1,035
264	Sep	0	0	135	136	144	144	170	3	8	87	4,092	6,157
264	Oct	0	0	133	134	140	140	165	3	7	82	2,510	3,783
264	Nov	0	0	132	133	137	137	162	3	6	78	1,564	2,363
264	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
265	Jan	0	0	129	130	131	131	154	2	4	63	635	977
265	Feb	0	0	128	129	130	130	152	1	3	57	674	1,042
265	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
265	Apr	0	0	126	127	136	157	179	0	2	55	8,109	12,222
265	May	0	0	618	1,895	2,058	2,201	2,270	270	281	1,515	14,745	22,364
265	Jun	0	0	563	1,033	1,235	1,384	1,466	229	214	1,331	10,074	14,845
265	Jul	0	0	240	390	471	506	549	56	64	400	5,523	8,281
265	Aug	0	0	167	177	230	241	275	21	33	208	2,465	3,672
265	Sep	0	0	146	149	188	194	225	9	13	120	1,049	1,567
265	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
265	Nov	0	0	137	138	161	164	192	4	6	84	1,032	1,557
265	Dec	0	0	134	135	152	154	182	4	5	76	628	957
266	Jan	0	0	132	133	145	147	173	3	4	68	633	970
266	Feb	0	0	130	131	140	140	166	2	3	61	673	1,034
266	Mar	0	0	129	130	135	135	160	2	1	55	1,193	1,821
266	Apr	0	0	128	129	228	316	368	2	14	158	2,311	3,504
266	May	0	0	422	982	1,111	1,218	1,278	117	127	734	5,651	8,662
266	Jun	0	0	438	769	818	841	877	145	141	771	4,974	7,284
266	Jul	0	0	207	219	249	255	285	35	36	237	2,297	3,356
266	Aug	0	0	152	155	176	178	206	11	13	117	1,449	2,163
266	Sep	0	0	139	141	156	156	183	6	7	87	997	1,505
266	Oct	0	0	135	136	147	147	173	4	5	76	781	1,189
266	Nov	0	0	132	133	140	140	165	3	4	67	1,034	1,574
266	Dec	0	0	130	131	135	135	159	3	3	60	716	1,101
267	Jan	0	0	129	130	131	131	154	2	1	53	1,061	1,623
267	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
267	Mar	0	0	126	127	140	163	187	1	1	52	1,714	2,612
267	Apr	0	0	135	151	179	209	236	7	33	194	1,985	2,976
267	May	0	0	211	235	262	270	297	18	59	269	2,399	3,535
267	Jun	0	0	227	238	259	262	288	19	35	169	2,027	2,995
267	Jul	0	0	158	161	177	179	204	8	13	108	1,268	1,900
267	Aug	0	0	141	142	154	154	179	4	7	88	699	1,058
267	Sep	0	0	136	137	145	145	168	3	5	78	655	999
267	Oct	0	0	133	134	139	139	161	2	4	70	817	1,248
267	Nov	0	0	131	132	135	135	157	2	3	63	1,065	1,625
267	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
268	Jan	0	0	129	130	130	130	151	1	0	50	778	1,205
268	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
268	Mar	0	0	126	127	128	128	147	0	0	42	976	1,512
268	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
268	May	0	0	354	392	467	538	573	66	112	587	3,835	5,546
268	Jun	0	0	472	957	1,070	1,160	1,208	137	163	872	2,031	3,240
268	Jul	0	0	350	535	664	759	812	107	127	751	1,478	2,290
268	Aug	0	0	186	201	259	279	314	35	32	238	1,046	1,500
268	Sep	0	0	152	171	209	214	244	18	13	130	756	1,122
268	Oct	0	0	147	207	240	242	272	16	15	123	734	1,133
268	Nov	0	0	145	177	209	212	241	14	17	125	1,147	1,731
268	Dec	0	0	142	161	188	191	219	9	11	108	903	1,359
269	Jan	0	0	139	151	171	173	200	6	9	96	902	1,357
269	Feb	0	0	136	142	157	158	185	5	8	87	830	1,249
269	Mar	0	0	135	143	172	207	236	5	10	112	1,114	1,682
269	Apr	0	0	255	739	812	897	931	71	104	627	1,879	3,043
269	May	0	0	396	772	854	917	953	103	129	744	3,316	4,936
269	Jun	0	0	305	416	474	491	526	47	45	283	1,655	2,420
269	Jul	0	0	184	187	234	241	275	26	22	170	1,408	2,060
269	Aug	0	0	155	156	193	198	230	16	16	132	734	1,076
269	Sep	0	0	148	149	179	182	213	12	14	118	647	954
269	Oct	0	0	146	147	171	174	204	9	13	110	819	1,217
269	Nov	0	0	143	144	164	166	195	5	12	100	1,018	1,523
269	Dec	0	0	140	141	156	158	186	4	11	91	986	1,480
270	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
270	Feb	0	0	135	136	143	144	170	3	8	76	912	1,381
270	Mar	0	0	133	134	139	139	165	2	7	69	1,008	1,530
270	Apr	0	0	148	173	291	392	453	5	54	343	1,231	1,861
270	May	0	0	299	582	733	856	925	49	108	587	4,094	6,249
270	Jun	0	0	307	380	433	460	498	60	74	379	1,840	2,634
270	Jul	0	0	180	214	244	250	282	23	25	171	1,185	1,752
270	Aug	0	0	158	213	238	241	270	20	28	167	947	1,433
270	Sep	0	0	154	165	188	191	220	19	29	168	781	1,146
270	Oct	0	0	152	218	246	260	289	17	27	176	820	1,253
270	Nov	0	0	150	189	222	238	269	16	27	180	983	1,475
270	Dec	0	0	147	173	198	205	234	11	17	134	987	1,476
271	Jan	0	0	144	161	181	184	212	7	14	114	1,331	1,994

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
271	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
271	Mar	0	0	138	143	154	155	181	4	11	94	1,245	1,866
271	Apr	0	0	136	137	280	397	467	4	29	245	3,508	5,269
271	May	0	0	358	1,139	1,322	1,463	1,544	116	148	871	3,714	5,958
271	Jun	0	0	466	910	978	1,010	1,052	150	158	877	5,867	8,667
271	Jul	0	0	303	358	399	409	442	48	48	299	2,270	3,273
271	Aug	0	0	180	189	219	223	254	21	22	160	1,170	1,709
271	Sep	0	0	169	266	298	310	341	20	39	226	1,348	2,067
271	Oct	0	0	169	228	269	286	318	22	44	251	919	1,384
271	Nov	0	0	155	191	230	240	271	17	22	162	1,297	1,943
271	Dec	0	0	150	175	206	213	243	12	16	131	990	1,481
272	Jan	0	0	146	163	187	193	222	7	14	113	930	1,393
272	Feb	0	0	143	154	173	177	205	5	12	102	1,026	1,538
272	Mar	0	0	140	145	160	164	192	4	11	94	1,154	1,731
272	Apr	0	0	143	167	314	432	503	5	43	308	1,711	2,584
272	May	0	0	421	1,057	1,240	1,382	1,464	104	139	792	5,778	8,946
272	Jun	0	0	417	664	730	762	805	129	128	692	4,179	6,073
272	Jul	0	0	203	219	256	267	300	36	37	241	1,411	2,019
272	Aug	0	0	155	158	184	189	220	13	17	135	819	1,192
272	Sep	0	0	146	161	182	185	214	8	13	112	657	975
272	Oct	0	0	146	180	205	214	244	9	18	129	1,024	1,544
272	Nov	0	0	144	168	202	214	245	8	20	137	1,092	1,639
272	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
273	Jan	0	0	139	148	173	179	208	5	12	107	891	1,337
273	Feb	0	0	136	139	161	167	195	4	11	99	877	1,316
273	Mar	0	0	134	135	159	165	194	4	11	96	1,048	1,576
273	Apr	0	0	222	539	635	713	760	49	92	549	1,066	1,826
273	May	0	0	364	668	785	878	930	76	119	677	3,066	4,579
273	Jun	0	0	297	356	411	436	473	39	45	263	1,493	2,149
273	Jul	0	0	178	181	218	229	262	18	21	152	1,378	2,026
273	Aug	0	0	150	152	179	186	217	10	14	116	670	987
273	Sep	0	0	142	143	164	170	200	5	12	100	588	875
273	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
273	Nov	0	0	137	138	150	154	182	4	10	88	1,076	1,618
273	Dec	0	0	135	136	146	149	176	3	9	81	999	1,507
274	Jan	0	0	133	134	141	143	169	3	8	73	979	1,484
274	Feb	0	0	132	133	136	138	163	2	6	65	999	1,518
274	Mar	0	0	131	132	134	135	160	2	5	60	1,075	1,637
274	Apr	0	0	136	147	207	270	307	4	41	259	1,448	2,187
274	May	0	0	305	689	775	853	895	78	130	706	2,662	4,094
274	Jun	0	0	380	684	732	753	786	103	120	637	3,298	4,863
274	Jul	0	0	255	265	300	308	339	37	39	237	1,467	2,084
274	Aug	0	0	167	170	196	201	231	18	17	134	1,140	1,675
274	Sep	0	0	147	149	169	173	201	10	12	105	978	1,454
274	Oct	0	0	141	142	157	160	188	6	10	90	1,008	1,508
274	Nov	0	0	138	139	151	153	179	5	9	82	1,165	1,750
274	Dec	0	0	136	137	146	147	173	4	8	75	1,092	1,647
275	Jan	0	0	134	135	141	142	166	3	6	67	944	1,429
275	Feb	0	0	133	134	136	137	161	3	5	61	939	1,427
275	Mar	0	0	131	132	134	135	158	2	3	56	913	1,393
275	Apr	0	0	130	131	178	232	263	2	9	107	1,276	1,942
275	May	0	0	433	1,126	1,202	1,277	1,313	127	135	766	1,566	2,879
275	Jun	0	0	492	943	1,005	1,045	1,080	166	180	964	2,281	3,361
275	Jul	0	0	258	327	386	412	446	52	69	384	1,411	2,020
275	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
275	Sep	0	0	153	155	198	207	239	17	17	143	724	1,059
275	Oct	0	0	149	211	258	285	319	15	26	187	808	1,242
275	Nov	0	0	147	181	241	276	312	15	29	204	1,116	1,679
275	Dec	0	0	144	167	222	241	276	10	18	146	930	1,395
276	Jan	0	0	141	155	199	211	245	6	14	121	879	1,318
276	Feb	0	0	138	146	181	191	223	5	12	109	852	1,278
276	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
276	Apr	0	0	135	136	238	321	371	4	18	171	1,070	1,612
276	May	0	0	409	1,219	1,344	1,441	1,497	125	136	782	1,609	3,106
276	Jun	0	0	468	871	935	963	1,003	159	156	864	2,274	3,277
276	Jul	0	0	246	272	316	330	365	45	45	290	1,281	1,802
276	Aug	0	0	167	170	204	213	247	16	20	155	836	1,217
276	Sep	0	0	149	151	177	184	217	7	14	118	628	928
276	Oct	0	0	144	148	171	178	210	5	12	108	633	946
276	Nov	0	0	141	146	169	176	207	5	11	103	882	1,327
276	Dec	0	0	138	139	157	163	193	4	10	95	882	1,329
277	Jan	0	0	136	137	150	155	184	3	9	86	856	1,295
277	Feb	0	0	133	134	144	148	176	3	7	77	880	1,337
277	Mar	0	0	132	133	139	143	169	2	6	70	839	1,280
277	Apr	0	0	131	132	145	158	186	2	6	70	1,053	1,605
277	May	0	0	433	1,316	1,426	1,524	1,576	146	169	954	2,206	3,782
277	Jun	0	0	517	933	1,069	1,177	1,236	180	192	1,139	3,743	5,387
277	Jul	0	0	283	296	355	383	422	46	48	318	1,304	1,814
277	Aug	0	0	172	175	211	222	255	13	17	134	725	1,062
277	Sep	0	0	148	149	176	182	213	6	9	91	687	1,033
277	Oct	0	0	142	143	164	169	199	4	8	81	689	1,043
277	Nov	0	0	139	139	161	167	196	4	7	79	855	1,296
277	Dec	0	0	136	137	157	162	192	3	6	74	846	1,288
278	Jan	0	0	133	134	149	154	182	2	5	66	828	1,265
278	Feb	0	0	132	133	143	147	174	2	3	59	800	1,229

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
278	Mar	0	0	130	131	138	141	167	1	2	53	859	1,321
278	Apr	0	0	130	131	226	314	365	2	20	183	1,107	1,692
278	May	0	0	332	638	761	867	926	79	105	597	1,831	2,786
278	Jun	0	0	360	496	544	568	604	98	106	569	2,109	2,943
278	Jul	0	0	186	195	223	230	262	24	28	188	1,084	1,568
278	Aug	0	0	146	149	168	172	201	9	11	101	647	969
278	Sep	0	0	145	150	168	170	199	6	16	100	616	931
278	Oct	0	0	185	346	404	458	491	29	69	383	823	1,314
278	Nov	0	0	186	288	363	428	464	36	74	440	1,040	1,536
278	Dec	0	0	154	189	232	250	283	15	23	178	940	1,407
279	Jan	0	0	145	160	192	198	230	8	12	112	852	1,281
279	Feb	0	0	141	148	172	175	206	6	9	93	831	1,251
279	Mar	0	0	138	147	181	211	243	5	9	103	928	1,402
279	Apr	0	0	268	808	883	963	1,000	79	108	650	1,301	2,301
279	May	0	0	438	938	1,027	1,092	1,131	128	150	820	1,674	2,805
279	Jun	0	0	342	417	481	501	539	67	62	333	1,265	1,804
279	Jul	0	0	190	193	244	253	290	28	24	179	1,145	1,659
279	Aug	0	0	157	167	208	215	250	17	16	140	1,030	1,525
279	Sep	0	0	171	265	312	335	371	25	44	269	1,773	2,685
279	Oct	0	0	177	297	359	406	444	32	63	365	1,264	1,927
279	Nov	0	0	160	222	292	330	370	26	39	262	3,101	4,658
279	Dec	0	0	154	196	260	278	317	19	22	177	1,830	2,744
280	Jan	0	0	149	181	232	245	282	14	17	145	1,407	2,108
280	Feb	0	0	146	170	211	222	258	9	14	127	1,365	2,047
280	Mar	0	0	144	167	206	216	251	6	14	122	1,796	2,698
280	Apr	0	0	321	1,056	1,153	1,226	1,273	109	135	797	3,313	5,339
280	May	0	0	424	797	911	996	1,047	137	159	943	5,807	8,568
280	Jun	0	0	298	388	450	475	516	46	46	307	3,431	5,063
280	Jul	0	0	193	268	316	331	369	29	32	196	1,641	2,461
280	Aug	0	0	170	176	217	229	266	24	29	173	1,102	1,610
280	Sep	0	0	160	174	207	216	252	18	19	142	1,037	1,534
280	Oct	0	0	159	258	299	331	367	19	40	248	1,673	2,561
280	Nov	0	0	158	218	270	309	347	21	45	277	1,529	2,305
280	Dec	0	0	154	192	239	257	294	15	22	165	1,235	1,851
281	Jan	0	0	151	177	215	227	263	10	16	129	1,046	1,566
281	Feb	0	0	147	167	197	206	240	6	13	111	924	1,383
281	Mar	0	0	144	157	182	191	224	5	12	102	918	1,374
281	Apr	0	0	208	449	553	640	694	38	83	502	1,237	1,934
281	May	0	0	387	822	950	1,052	1,112	90	132	718	2,478	3,807
281	Jun	0	0	339	394	451	479	520	70	72	373	2,189	3,131
281	Jul	0	0	191	196	233	245	281	27	26	181	1,129	1,626
281	Aug	0	0	157	159	187	194	228	14	15	129	721	1,044
281	Sep	0	0	148	149	170	176	208	8	12	108	606	883
281	Oct	0	0	144	145	162	168	199	6	10	97	706	1,042
281	Nov	0	0	141	141	156	161	191	5	9	90	1,080	1,611
281	Dec	0	0	138	140	151	155	184	4	8	81	1,012	1,517
282	Jan	0	0	136	137	144	147	175	3	6	73	1,010	1,519
282	Feb	0	0	134	135	139	141	168	3	5	66	1,000	1,510
282	Mar	0	0	133	134	136	138	164	2	3	60	1,123	1,699
282	Apr	0	0	131	132	217	299	348	2	12	141	2,022	3,057
282	May	0	0	417	1,114	1,229	1,328	1,384	118	127	729	5,543	8,627
282	Jun	0	0	484	964	1,024	1,060	1,098	161	175	923	10,401	15,527
282	Jul	0	0	267	306	356	379	414	58	75	415	2,866	4,157
282	Aug	0	0	169	205	243	253	285	20	23	175	1,774	2,639
282	Sep	0	0	150	174	206	213	245	12	14	126	1,357	2,029
282	Oct	0	0	149	215	253	272	305	14	26	179	2,181	3,307
282	Nov	0	0	147	187	231	253	287	13	29	193	2,079	3,130
282	Dec	0	0	144	169	206	217	250	9	16	133	1,507	2,262
283	Jan	0	0	141	157	187	194	225	6	12	110	1,268	1,902
283	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
283	Mar	0	0	136	137	158	164	194	4	9	93	1,213	1,818
283	Apr	0	0	134	135	155	162	191	4	9	89	1,299	1,953
283	May	0	0	485	1,332	1,401	1,463	1,500	133	141	794	6,977	10,857
283	Jun	0	0	485	792	879	954	994	166	169	955	3,008	4,255
283	Jul	0	0	214	226	272	293	328	40	43	279	1,196	1,679
283	Aug	0	0	156	188	221	230	263	13	17	135	1,037	1,548
283	Sep	0	0	144	146	173	179	210	7	11	105	922	1,369
283	Oct	0	0	141	164	191	197	228	6	14	107	929	1,403
283	Nov	0	0	140	165	203	226	259	6	16	120	1,248	1,881
283	Dec	0	0	138	151	192	219	252	5	13	117	1,147	1,723
284	Jan	0	0	135	141	174	185	217	5	11	106	1,045	1,570
284	Feb	0	0	134	135	160	168	199	4	10	96	1,035	1,556
284	Mar	0	0	132	133	153	159	189	3	9	87	1,053	1,589
284	Apr	0	0	131	132	231	316	368	3	17	169	1,805	2,726
284	May	0	0	440	1,279	1,404	1,507	1,565	132	141	808	3,697	5,953
284	Jun	0	0	457	753	810	836	875	162	159	872	3,921	5,596
284	Jul	0	0	208	221	257	267	301	38	42	270	1,774	2,548
284	Aug	0	0	152	156	182	188	220	12	17	135	805	1,184
284	Sep	0	0	139	141	161	165	196	6	11	102	698	1,045
284	Oct	0	0	135	136	151	155	183	5	8	88	755	1,140
284	Nov	0	0	132	133	144	147	175	4	7	79	1,233	1,865
284	Dec	0	0	130	131	139	141	167	3	5	70	1,029	1,563
285	Jan	0	0	129	130	134	135	161	2	4	63	999	1,523
285	Feb	0	0	128	129	131	131	156	2	3	56	1,004	1,535
285	Mar	0	0	127	128	188	253	291	1	6	106	985	1,513

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
285	Apr	0	0	130	141	225	304	347	3	27	187	1,665	2,523
285	May	0	0	245	313	350	369	402	27	57	256	2,996	4,476
285	Jun	0	0	270	294	318	323	353	34	46	224	2,518	3,709
285	Jul	0	0	165	169	186	188	216	10	17	126	1,141	1,695
285	Aug	0	0	141	142	154	155	182	5	10	98	689	1,035
285	Sep	0	0	135	136	144	144	170	3	8	87	4,092	6,157
285	Oct	0	0	133	134	140	140	165	3	7	82	2,510	3,783
285	Nov	0	0	132	133	137	137	161	3	6	78	1,564	2,363
285	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
286	Jan	0	0	129	130	131	131	154	2	4	63	635	977
286	Feb	0	0	128	129	130	130	152	1	3	57	674	1,043
286	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
286	Apr	0	0	126	127	136	156	179	0	2	54	8,109	12,222
286	May	0	0	617	1,886	2,048	2,191	2,260	269	280	1,508	14,746	22,363
286	Jun	0	0	563	1,031	1,231	1,380	1,461	228	214	1,328	10,074	14,845
286	Jul	0	0	240	390	470	505	547	56	64	400	5,523	8,281
286	Aug	0	0	167	176	230	241	275	20	33	207	2,465	3,672
286	Sep	0	0	146	149	188	193	225	8	13	119	1,049	1,567
286	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
286	Nov	0	0	137	138	161	163	192	4	6	84	1,032	1,558
286	Dec	0	0	134	135	152	154	182	4	5	76	628	957
287	Jan	0	0	132	133	145	146	173	3	4	68	633	970
287	Feb	0	0	130	131	140	140	166	2	3	61	673	1,034
287	Mar	0	0	129	130	135	135	160	2	1	55	1,194	1,820
287	Apr	0	0	128	129	229	318	370	2	14	160	2,311	3,504
287	May	0	0	422	988	1,117	1,225	1,286	118	128	739	5,650	8,663
287	Jun	0	0	439	771	821	844	880	146	142	774	4,973	7,283
287	Jul	0	0	208	220	250	256	286	35	36	238	2,296	3,355
287	Aug	0	0	152	155	176	178	206	11	13	117	1,449	2,163
287	Sep	0	0	139	141	156	156	183	6	7	87	997	1,504
287	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
287	Nov	0	0	132	133	140	140	165	3	4	67	1,034	1,574
287	Dec	0	0	130	131	135	135	159	3	3	60	716	1,101
288	Jan	0	0	129	130	131	131	154	2	1	53	1,061	1,623
288	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
288	Mar	0	0	126	127	140	163	187	1	1	52	1,714	2,612
288	Apr	0	0	135	151	179	209	236	7	33	194	1,985	2,976
288	May	0	0	211	235	262	270	297	18	59	269	2,399	3,535
288	Jun	0	0	227	238	259	262	288	19	35	169	2,027	2,995
288	Jul	0	0	158	161	177	179	204	8	13	108	1,268	1,900
288	Aug	0	0	141	142	154	154	178	4	7	88	699	1,058
288	Sep	0	0	136	137	145	145	168	3	5	78	655	999
288	Oct	0	0	133	134	139	139	161	2	4	70	817	1,248
288	Nov	0	0	131	132	134	134	156	2	3	63	1,065	1,625
288	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
289	Jan	0	0	129	130	130	130	151	1	0	50	778	1,205
289	Feb	0	0	127	128	129	129	149	1	0	46	840	1,303
289	Mar	0	0	126	127	128	128	147	0	0	41	976	1,512
289	Apr	0	0	156	174	227	286	317	15	51	324	1,089	1,612
289	May	0	0	354	392	467	538	573	66	112	587	3,835	5,546
289	Jun	0	0	472	959	1,072	1,162	1,210	137	163	872	2,031	3,242
289	Jul	0	0	350	535	664	759	812	107	127	751	1,478	2,290
289	Aug	0	0	186	201	259	279	314	35	32	238	1,046	1,500
289	Sep	0	0	152	171	209	214	244	18	13	130	756	1,122
289	Oct	0	0	147	207	240	242	272	15	15	123	734	1,133
289	Nov	0	0	145	177	209	212	241	14	17	125	1,147	1,731
289	Dec	0	0	142	161	188	191	219	9	11	108	903	1,359
290	Jan	0	0	139	151	171	173	200	6	9	96	902	1,357
290	Feb	0	0	136	142	157	158	185	5	8	87	830	1,249
290	Mar	0	0	135	142	172	207	235	5	10	112	1,114	1,682
290	Apr	0	0	254	739	810	894	928	71	104	626	1,879	3,043
290	May	0	0	395	769	850	912	948	102	129	741	3,316	4,935
290	Jun	0	0	305	415	473	489	524	47	45	281	1,655	2,420
290	Jul	0	0	184	187	233	241	274	25	22	169	1,408	2,060
290	Aug	0	0	155	156	193	197	229	16	16	132	734	1,076
290	Sep	0	0	148	149	178	182	213	12	14	118	647	955
290	Oct	0	0	146	147	171	174	204	9	13	110	819	1,217
290	Nov	0	0	143	144	164	166	195	5	12	100	1,018	1,523
290	Dec	0	0	140	141	156	158	185	4	11	91	985	1,480
291	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
291	Feb	0	0	135	136	143	143	169	3	8	76	912	1,381
291	Mar	0	0	134	134	139	139	165	2	7	69	1,008	1,530
291	Apr	0	0	148	172	292	394	455	5	54	344	1,231	1,861
291	May	0	0	301	586	739	862	933	49	108	591	4,093	6,249
291	Jun	0	0	309	383	436	463	501	61	74	382	1,840	2,633
291	Jul	0	0	180	215	244	251	282	23	25	172	1,185	1,752
291	Aug	0	0	158	213	238	241	271	20	28	167	947	1,433
291	Sep	0	0	154	165	188	191	220	19	29	168	781	1,146
291	Oct	0	0	152	218	246	260	289	17	27	176	820	1,253
291	Nov	0	0	150	189	222	239	269	16	27	180	983	1,475
291	Dec	0	0	147	173	199	205	234	11	17	134	987	1,476
292	Jan	0	0	144	161	181	184	212	6	14	114	1,331	1,994
292	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
292	Mar	0	0	138	143	154	155	181	4	11	94	1,245	1,866
292	Apr	0	0	136	137	280	397	467	4	29	245	3,508	5,269

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
292	May	0	0	358	1,140	1,322	1,463	1,544	116	148	871	3,714	5,958
292	Jun	0	0	466	910	978	1,010	1,052	150	158	877	5,867	8,667
292	Jul	0	0	303	358	399	409	442	48	48	299	2,270	3,273
292	Aug	0	0	180	190	219	223	253	21	22	160	1,170	1,709
292	Sep	0	0	169	266	298	310	341	20	39	226	1,348	2,067
292	Oct	0	0	169	228	269	286	318	22	44	251	919	1,384
292	Nov	0	0	155	191	230	240	271	17	22	162	1,297	1,944
292	Dec	0	0	150	175	206	213	243	12	16	130	990	1,481
293	Jan	0	0	146	163	187	193	222	7	14	113	930	1,393
293	Feb	0	0	143	154	173	177	205	5	12	102	1,026	1,538
293	Mar	0	0	140	145	160	164	192	4	11	94	1,154	1,731
293	Apr	0	0	143	167	314	432	503	5	43	308	1,711	2,584
293	May	0	0	421	1,057	1,240	1,382	1,464	104	139	792	5,778	8,946
293	Jun	0	0	417	664	730	762	805	129	128	692	4,179	6,073
293	Jul	0	0	203	219	256	267	300	36	37	241	1,411	2,019
293	Aug	0	0	155	158	184	189	220	13	17	135	819	1,192
293	Sep	0	0	146	161	182	185	214	8	13	112	657	975
293	Oct	0	0	146	180	205	214	244	9	18	129	1,024	1,544
293	Nov	0	0	144	168	202	214	245	8	20	137	1,092	1,639
293	Dec	0	0	141	158	190	198	229	6	15	120	950	1,424
294	Jan	0	0	139	148	173	179	208	5	12	107	891	1,337
294	Feb	0	0	136	139	161	166	195	4	11	99	877	1,316
294	Mar	0	0	134	135	158	165	194	4	10	96	1,048	1,576
294	Apr	0	0	221	538	633	711	757	49	91	547	1,066	1,822
294	May	0	0	363	665	781	873	924	75	119	675	3,066	4,578
294	Jun	0	0	297	355	410	435	472	38	45	262	1,493	2,149
294	Jul	0	0	178	181	217	228	261	18	21	151	1,378	2,026
294	Aug	0	0	150	151	179	186	217	10	14	116	670	988
294	Sep	0	0	142	143	164	170	199	5	12	100	588	876
294	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
294	Nov	0	0	137	138	150	154	181	4	10	88	1,076	1,618
294	Dec	0	0	135	136	145	148	175	3	9	80	999	1,508
295	Jan	0	0	133	134	140	143	169	3	8	72	979	1,484
295	Feb	0	0	132	133	136	138	163	2	6	65	999	1,518
295	Mar	0	0	131	132	134	135	160	2	5	60	1,075	1,637
295	Apr	0	0	136	147	208	272	309	4	42	260	1,448	2,187
295	May	0	0	306	692	780	858	901	78	131	710	2,662	4,095
295	Jun	0	0	382	688	736	756	790	103	120	640	3,297	4,861
295	Jul	0	0	256	265	301	309	340	37	39	237	1,466	2,083
295	Aug	0	0	167	170	196	201	231	18	17	135	1,140	1,675
295	Sep	0	0	147	149	169	173	201	10	12	105	978	1,454
295	Oct	0	0	141	142	157	160	188	6	10	90	1,008	1,508
295	Nov	0	0	138	139	150	153	179	5	9	82	1,165	1,750
295	Dec	0	0	136	137	146	147	173	4	8	75	1,092	1,647
296	Jan	0	0	134	135	141	142	166	3	6	67	944	1,429
296	Feb	0	0	133	134	136	137	161	3	5	61	939	1,427
296	Mar	0	0	131	132	134	135	158	2	3	56	913	1,393
296	Apr	0	0	130	131	178	232	263	2	9	107	1,276	1,942
296	May	0	0	433	1,127	1,203	1,278	1,314	127	135	766	1,566	2,880
296	Jun	0	0	492	943	1,005	1,045	1,080	165	180	964	2,281	3,361
296	Jul	0	0	258	327	386	412	446	52	69	383	1,411	2,020
296	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
296	Sep	0	0	153	156	198	207	239	17	17	143	724	1,059
296	Oct	0	0	149	211	258	285	319	15	26	187	808	1,242
296	Nov	0	0	147	181	240	276	312	15	29	203	1,116	1,679
296	Dec	0	0	144	167	222	241	276	10	18	146	930	1,395
297	Jan	0	0	141	155	199	211	245	6	14	121	879	1,318
297	Feb	0	0	138	146	181	191	223	5	12	109	852	1,278
297	Mar	0	0	136	137	169	178	210	4	11	103	858	1,287
297	Apr	0	0	135	136	238	321	371	4	18	171	1,070	1,612
297	May	0	0	409	1,219	1,344	1,441	1,497	125	136	782	1,609	3,106
297	Jun	0	0	468	871	935	963	1,003	159	156	863	2,274	3,277
297	Jul	0	0	246	272	316	330	365	45	45	290	1,281	1,802
297	Aug	0	0	167	170	204	213	247	16	20	155	836	1,217
297	Sep	0	0	149	151	177	184	216	7	14	118	628	928
297	Oct	0	0	144	148	171	178	209	5	12	108	633	946
297	Nov	0	0	141	146	169	176	207	5	11	103	882	1,327
297	Dec	0	0	138	139	157	163	193	4	10	95	882	1,329
298	Jan	0	0	136	137	150	155	184	3	9	85	856	1,295
298	Feb	0	0	133	134	144	148	176	3	7	77	880	1,337
298	Mar	0	0	132	133	139	142	169	2	6	69	839	1,280
298	Apr	0	0	131	132	145	158	185	2	6	70	1,053	1,605
298	May	0	0	432	1,310	1,418	1,515	1,567	145	168	949	2,207	3,774
298	Jun	0	0	516	930	1,065	1,172	1,230	179	192	1,134	3,743	5,387
298	Jul	0	0	282	295	354	382	420	45	48	317	1,304	1,815
298	Aug	0	0	172	175	211	221	255	13	17	133	725	1,062
298	Sep	0	0	148	149	175	181	213	6	9	91	687	1,033
298	Oct	0	0	141	143	164	169	199	4	8	81	689	1,043
298	Nov	0	0	138	139	161	166	196	4	7	79	855	1,297
298	Dec	0	0	136	137	157	162	192	3	6	74	846	1,288
299	Jan	0	0	133	134	149	153	182	2	5	66	828	1,266
299	Feb	0	0	132	133	143	147	174	2	3	59	800	1,229
299	Mar	0	0	130	131	138	141	167	1	2	53	859	1,321
299	Apr	0	0	130	131	227	315	367	2	20	185	1,107	1,692
299	May	0	0	333	642	767	873	932	80	106	601	1,831	2,787

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
299	Jun	0	0	361	499	547	571	608	98	107	572	2,109	2,941
299	Jul	0	0	186	195	223	231	262	24	28	189	1,084	1,567
299	Aug	0	0	146	149	168	172	201	9	11	102	647	969
299	Sep	0	0	145	150	168	171	199	6	16	100	616	931
299	Oct	0	0	185	347	405	459	492	29	69	383	823	1,315
299	Nov	0	0	186	288	363	428	465	36	74	440	1,040	1,536
299	Dec	0	0	154	189	232	250	283	15	23	178	940	1,407
300	Jan	0	0	145	161	192	198	230	8	12	112	852	1,281
300	Feb	0	0	141	148	172	175	206	6	9	93	831	1,251
300	Mar	0	0	138	147	181	211	243	5	9	103	928	1,402
300	Apr	0	0	268	808	883	963	1,000	79	108	650	1,301	2,301
300	May	0	0	438	938	1,027	1,092	1,131	127	150	820	1,674	2,805
300	Jun	0	0	342	417	481	501	539	67	62	333	1,265	1,804
300	Jul	0	0	190	193	244	253	290	28	24	179	1,145	1,659
300	Aug	0	0	157	167	208	215	250	17	16	140	1,030	1,525
300	Sep	0	0	171	266	312	335	371	25	44	269	1,773	2,685
300	Oct	0	0	177	297	359	406	444	32	63	365	1,264	1,927
300	Nov	0	0	160	222	292	330	370	26	39	262	3,101	4,658
300	Dec	0	0	154	196	260	278	317	19	22	177	1,830	2,744
301	Jan	0	0	149	181	232	245	282	13	17	145	1,407	2,108
301	Feb	0	0	146	170	211	222	258	9	14	127	1,365	2,047
301	Mar	0	0	144	167	206	216	251	6	14	121	1,796	2,698
301	Apr	0	0	321	1,056	1,153	1,226	1,273	109	135	797	3,313	5,339
301	May	0	0	424	797	911	996	1,047	137	159	943	5,807	8,568
301	Jun	0	0	298	388	450	475	516	46	46	307	3,431	5,063
301	Jul	0	0	193	268	316	331	369	29	32	196	1,641	2,461
301	Aug	0	0	170	176	217	229	266	24	29	173	1,102	1,610
301	Sep	0	0	160	174	207	216	252	17	19	142	1,037	1,534
301	Oct	0	0	159	258	299	331	367	19	40	248	1,673	2,561
301	Nov	0	0	158	218	270	308	347	21	45	277	1,529	2,305
301	Dec	0	0	154	192	239	257	294	15	22	165	1,235	1,851
302	Jan	0	0	151	177	215	227	263	10	16	128	1,046	1,566
302	Feb	0	0	147	166	196	206	240	6	13	111	924	1,383
302	Mar	0	0	144	157	182	190	223	4	12	101	918	1,374
302	Apr	0	0	208	449	552	637	691	38	83	500	1,237	1,934
302	May	0	0	386	817	944	1,045	1,105	89	131	713	2,479	3,807
302	Jun	0	0	338	392	448	476	517	70	71	369	2,189	3,133
302	Jul	0	0	191	196	233	245	281	27	26	180	1,129	1,626
302	Aug	0	0	157	159	186	194	228	14	15	128	721	1,044
302	Sep	0	0	148	149	170	176	208	8	12	108	606	883
302	Oct	0	0	144	145	162	167	198	6	10	97	706	1,042
302	Nov	0	0	140	141	156	160	191	5	9	90	1,080	1,611
302	Dec	0	0	138	139	149	153	182	4	8	81	1,012	1,516
303	Jan	0	0	136	137	144	147	174	3	6	73	1,010	1,520
303	Feb	0	0	134	135	139	141	168	3	5	66	1,001	1,510
303	Mar	0	0	133	134	136	138	164	2	3	60	1,123	1,699
303	Apr	0	0	131	132	217	299	348	2	12	141	2,022	3,057
303	May	0	0	418	1,118	1,234	1,333	1,388	118	127	732	5,542	8,627
303	Jun	0	0	484	968	1,028	1,063	1,101	162	175	927	10,401	15,525
303	Jul	0	0	268	307	357	380	415	58	75	416	2,866	4,156
303	Aug	0	0	169	205	243	253	286	20	23	175	1,774	2,639
303	Sep	0	0	150	175	207	213	245	12	14	126	1,357	2,029
303	Oct	0	0	149	215	254	272	305	13	26	179	2,181	3,307
303	Nov	0	0	147	187	231	253	287	13	29	193	2,079	3,130
303	Dec	0	0	144	169	206	217	250	8	16	133	1,507	2,262
304	Jan	0	0	141	157	187	194	225	6	12	110	1,268	1,902
304	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
304	Mar	0	0	136	137	158	164	194	4	9	93	1,213	1,818
304	Apr	0	0	134	135	155	162	191	4	9	89	1,299	1,953
304	May	0	0	485	1,332	1,401	1,463	1,500	133	141	794	6,977	10,857
304	Jun	0	0	485	792	879	954	994	166	169	955	3,008	4,255
304	Jul	0	0	214	226	272	293	328	39	43	279	1,196	1,679
304	Aug	0	0	156	188	221	230	263	13	17	135	1,037	1,548
304	Sep	0	0	144	146	172	179	210	7	11	105	922	1,369
304	Oct	0	0	141	164	191	197	228	6	14	107	929	1,403
304	Nov	0	0	140	165	203	226	258	6	16	120	1,248	1,881
304	Dec	0	0	138	151	192	219	252	5	13	117	1,147	1,723
305	Jan	0	0	135	141	174	185	217	5	11	106	1,045	1,570
305	Feb	0	0	134	135	160	168	199	4	10	96	1,035	1,556
305	Mar	0	0	132	133	153	159	189	3	9	87	1,053	1,589
305	Apr	0	0	131	132	231	316	368	3	17	169	1,805	2,726
305	May	0	0	440	1,279	1,404	1,507	1,565	132	141	808	3,697	5,953
305	Jun	0	0	457	753	810	836	874	162	159	872	3,921	5,596
305	Jul	0	0	208	221	257	267	301	38	42	270	1,774	2,548
305	Aug	0	0	152	156	182	188	220	12	17	135	805	1,184
305	Sep	0	0	139	141	161	165	196	6	11	101	698	1,045
305	Oct	0	0	135	136	151	154	183	5	8	88	755	1,140
305	Nov	0	0	132	133	144	147	174	4	7	78	1,233	1,865
305	Dec	0	0	130	131	139	140	167	3	5	70	1,029	1,563
306	Jan	0	0	129	130	134	135	161	2	4	63	999	1,523
306	Feb	0	0	128	129	130	131	156	2	2	56	1,004	1,535
306	Mar	0	0	127	128	187	251	289	1	6	105	985	1,513
306	Apr	0	0	130	141	223	302	345	3	27	185	1,665	2,523
306	May	0	0	244	309	347	365	397	26	56	253	2,995	4,476
306	Jun	0	0	270	292	316	321	350	33	46	220	2,519	3,711

Knight Piésold CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
306	Jul	0	0	165	169	186	187	215	10	17	125	1,141	1,696
306	Aug	0	0	141	142	154	155	182	5	10	98	689	1,035
306	Sep	0	0	134	136	144	144	170	3	7	86	4,092	6,157
306	Oct	0	0	133	134	140	140	165	3	7	82	2,510	3,783
306	Nov	0	0	132	133	137	137	161	3	6	78	1,564	2,363
306	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
307	Jan	0	0	129	130	131	131	154	1	4	63	635	978
307	Feb	0	0	128	129	130	130	152	1	3	57	674	1,043
307	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
307	Apr	0	0	126	127	136	156	179	0	2	54	8,109	12,222
307	May	0	0	618	1,890	2,053	2,196	2,266	270	281	1,515	14,745	22,360
307	Jun	0	0	563	1,033	1,234	1,384	1,466	228	214	1,330	10,074	14,845
307	Jul	0	0	240	390	471	506	548	56	64	400	5,523	8,281
307	Aug	0	0	167	177	230	241	275	20	33	207	2,465	3,672
307	Sep	0	0	146	149	188	193	225	8	13	119	1,049	1,567
307	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
307	Nov	0	0	137	138	160	163	192	4	6	84	1,032	1,558
307	Dec	0	0	134	135	152	154	182	4	5	76	628	957
308	Jan	0	0	132	133	145	146	173	3	4	68	633	970
308	Feb	0	0	130	131	140	140	166	2	3	61	673	1,034
308	Mar	0	0	129	130	135	135	160	2	1	55	1,194	1,820
308	Apr	0	0	128	129	229	318	370	2	14	160	2,311	3,504
308	May	0	0	423	988	1,118	1,226	1,286	118	128	739	5,650	8,664
308	Jun	0	0	440	772	821	844	880	146	142	774	4,973	7,283
308	Jul	0	0	208	220	249	256	286	35	36	238	2,296	3,355
308	Aug	0	0	152	155	176	178	206	11	13	117	1,449	2,163
308	Sep	0	0	139	141	156	156	183	6	7	87	997	1,504
308	Oct	0	0	135	136	147	147	173	4	6	76	781	1,188
308	Nov	0	0	132	133	140	140	165	3	4	67	1,034	1,574
308	Dec	0	0	130	131	135	135	159	3	3	60	716	1,101
309	Jan	0	0	129	130	131	131	154	2	1	53	1,061	1,623
309	Feb	0	0	127	128	129	129	151	2	0	48	1,066	1,637
309	Mar	0	0	126	127	140	163	187	1	1	52	1,714	2,612
309	Apr	0	0	135	151	179	209	236	7	33	194	1,985	2,976
309	May	0	0	211	235	262	270	297	18	59	269	2,399	3,535
309	Jun	0	0	227	238	259	262	288	19	35	169	2,027	2,995
309	Jul	0	0	158	161	177	178	203	7	13	108	1,268	1,900
309	Aug	0	0	141	142	154	154	178	4	7	88	699	1,058
309	Sep	0	0	136	137	145	145	168	3	5	78	655	999
309	Oct	0	0	133	134	139	139	161	2	4	70	817	1,248
309	Nov	0	0	131	132	134	134	156	2	3	63	1,065	1,625
309	Dec	0	0	130	131	131	131	153	1	1	57	875	1,344
310	Jan	0	0	129	130	130	130	151	1	0	50	778	1,205
310	Feb	0	0	127	128	129	129	149	1	0	45	840	1,303
310	Mar	0	0	126	127	128	128	147	0	0	41	976	1,512
310	Apr	0	0	156	174	226	286	316	15	51	324	1,089	1,612
310	May	0	0	354	392	467	538	573	66	112	587	3,835	5,546
310	Jun	0	0	472	959	1,072	1,163	1,211	137	163	872	2,031	3,242
310	Jul	0	0	350	535	664	759	812	107	127	751	1,478	2,290
310	Aug	0	0	186	201	259	279	314	35	32	238	1,046	1,500
310	Sep	0	0	152	171	209	214	244	18	13	130	756	1,122
310	Oct	0	0	147	207	239	242	272	15	15	123	734	1,133
310	Nov	0	0	145	177	209	212	241	14	17	125	1,147	1,731
310	Dec	0	0	142	161	188	191	219	9	11	108	903	1,359
311	Jan	0	0	139	151	171	173	200	6	9	96	902	1,357
311	Feb	0	0	136	142	157	158	185	5	8	87	830	1,249
311	Mar	0	0	135	143	172	207	236	5	10	112	1,114	1,682
311	Apr	0	0	255	739	812	897	931	71	104	627	1,879	3,043
311	May	0	0	396	772	854	917	953	102	129	744	3,316	4,936
311	Jun	0	0	305	416	474	491	526	47	45	282	1,655	2,420
311	Jul	0	0	184	187	234	241	275	26	22	170	1,408	2,060
311	Aug	0	0	155	156	193	197	230	16	16	132	734	1,076
311	Sep	0	0	148	149	178	182	213	12	14	118	647	954
311	Oct	0	0	146	147	171	174	204	9	13	110	819	1,217
311	Nov	0	0	143	144	164	166	195	5	12	100	1,018	1,523
311	Dec	0	0	140	142	156	158	186	4	11	91	986	1,480
312	Jan	0	0	137	138	149	150	177	4	9	83	884	1,333
312	Feb	0	0	135	136	143	143	170	3	8	76	912	1,381
312	Mar	0	0	134	135	139	139	165	2	7	69	1,008	1,530
312	Apr	0	0	148	173	293	395	455	5	54	345	1,231	1,862
312	May	0	0	301	587	740	863	933	49	108	591	4,093	6,249
312	Jun	0	0	309	383	436	463	501	61	74	382	1,840	2,633
312	Jul	0	0	180	215	245	251	282	23	25	172	1,185	1,752
312	Aug	0	0	158	213	238	241	271	20	28	167	947	1,433
312	Sep	0	0	154	165	188	191	220	19	29	168	781	1,146
312	Oct	0	0	152	218	246	260	289	17	27	176	820	1,253
312	Nov	0	0	150	189	222	239	269	16	27	180	983	1,475
312	Dec	0	0	147	173	199	205	234	11	17	134	987	1,476
313	Jan	0	0	144	161	181	184	212	6	14	114	1,331	1,994
313	Feb	0	0	141	152	167	169	196	5	12	103	1,194	1,788
313	Mar	0	0	138	143	154	155	181	4	11	94	1,245	1,866
313	Apr	0	0	136	137	280	397	466	4	29	245	3,508	5,269
313	May	0	0	358	1,140	1,322	1,463	1,544	116	148	871	3,714	5,958
313	Jun	0	0	466	910	978	1,010	1,052	150	158	877	5,867	8,667
313	Jul	0	0	303	358	398	408	442	48	48	298	2,270	3,273

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
313	Aug	0	0	180	190	218	223	253	21	22	160	1,170	1,709
313	Sep	0	0	169	266	298	310	341	20	39	226	1,348	2,067
313	Oct	0	0	169	228	269	286	318	22	44	251	919	1,384
313	Nov	0	0	155	191	230	239	271	17	22	162	1,297	1,944
313	Dec	0	0	150	175	206	212	243	12	16	130	990	1,481
314	Jan	0	0	146	163	187	193	222	7	14	113	930	1,393
314	Feb	0	0	143	153	172	177	205	5	12	101	1,026	1,538
314	Mar	0	0	140	145	160	164	191	4	11	93	1,154	1,731
314	Apr	0	0	143	167	312	430	500	5	42	306	1,711	2,584
314	May	0	0	420	1,051	1,232	1,374	1,454	103	138	787	5,779	8,945
314	Jun	0	0	416	661	726	758	800	128	128	688	4,180	6,074
314	Jul	0	0	203	218	255	266	299	36	37	240	1,411	2,019
314	Aug	0	0	155	158	184	189	219	13	17	134	819	1,193
314	Sep	0	0	146	160	181	185	214	8	13	112	657	975
314	Oct	0	0	146	179	205	214	244	9	18	129	1,024	1,544
314	Nov	0	0	144	168	201	213	244	8	20	137	1,092	1,638
314	Dec	0	0	141	158	189	198	228	6	15	119	950	1,424
315	Jan	0	0	138	147	172	179	208	5	12	107	891	1,337
315	Feb	0	0	136	139	160	166	195	4	11	99	877	1,316
315	Mar	0	0	134	135	158	165	194	4	11	96	1,048	1,576
315	Apr	0	0	222	539	635	713	759	49	92	549	1,066	1,825
315	May	0	0	364	668	785	878	930	75	119	677	3,066	4,579
315	Jun	0	0	297	356	411	436	473	39	45	263	1,493	2,149
315	Jul	0	0	178	181	218	228	261	18	21	151	1,378	2,026
315	Aug	0	0	150	151	179	186	217	10	14	116	670	987
315	Sep	0	0	142	143	164	170	199	5	12	100	588	875
315	Oct	0	0	139	140	156	160	189	4	11	93	899	1,348
315	Nov	0	0	137	138	150	154	181	4	10	88	1,076	1,618
315	Dec	0	0	135	136	145	148	175	3	9	80	999	1,507
316	Jan	0	0	133	134	140	143	169	3	8	72	979	1,484
316	Feb	0	0	132	133	136	138	163	2	6	65	999	1,518
316	Mar	0	0	131	132	134	135	160	2	5	60	1,075	1,637
316	Apr	0	0	136	147	208	272	309	4	42	260	1,448	2,187
316	May	0	0	306	694	782	860	903	78	131	710	2,661	4,096
316	Jun	0	0	382	688	736	756	790	103	120	640	3,297	4,861
316	Jul	0	0	256	265	301	309	340	37	39	237	1,466	2,083
316	Aug	0	0	167	170	196	201	231	18	17	135	1,140	1,675
316	Sep	0	0	147	149	169	173	201	10	12	105	978	1,454
316	Oct	0	0	141	142	157	160	187	5	10	90	1,008	1,507
316	Nov	0	0	138	139	150	153	179	5	9	82	1,165	1,750
316	Dec	0	0	136	137	145	147	173	4	8	75	1,092	1,647
317	Jan	0	0	134	135	140	142	166	3	6	67	944	1,429
317	Feb	0	0	133	134	136	137	161	3	5	61	939	1,427
317	Mar	0	0	131	132	134	134	158	2	3	56	913	1,393
317	Apr	0	0	130	131	178	232	262	2	9	107	1,276	1,942
317	May	0	0	433	1,128	1,204	1,279	1,315	127	135	766	1,566	2,881
317	Jun	0	0	492	943	1,005	1,045	1,080	165	180	964	2,281	3,361
317	Jul	0	0	258	328	386	412	446	52	69	383	1,411	2,020
317	Aug	0	0	170	208	258	270	303	24	25	184	793	1,172
317	Sep	0	0	153	156	198	207	239	17	17	143	724	1,059
317	Oct	0	0	149	211	258	285	319	15	26	187	808	1,242
317	Nov	0	0	147	182	240	276	312	15	29	203	1,116	1,679
317	Dec	0	0	144	167	222	241	276	10	18	146	930	1,395
318	Jan	0	0	141	155	199	211	245	6	14	121	879	1,318
318	Feb	0	0	138	146	181	190	223	5	12	109	852	1,278
318	Mar	0	0	136	137	169	177	209	4	11	103	858	1,287
318	Apr	0	0	135	136	237	318	368	4	18	169	1,070	1,612
318	May	0	0	408	1,213	1,336	1,433	1,488	124	135	777	1,610	3,098
318	Jun	0	0	467	868	931	959	999	158	155	860	2,275	3,274
318	Jul	0	0	246	271	315	328	364	44	45	289	1,281	1,803
318	Aug	0	0	167	170	204	213	246	16	20	155	836	1,218
318	Sep	0	0	149	151	177	184	216	7	14	118	628	929
318	Oct	0	0	144	147	170	177	209	5	12	108	633	945
318	Nov	0	0	141	146	168	175	206	5	11	103	882	1,327
318	Dec	0	0	138	139	157	163	193	4	10	94	882	1,329
319	Jan	0	0	136	136	150	155	183	3	9	85	856	1,296
319	Feb	0	0	133	134	143	148	175	3	7	77	880	1,337
319	Mar	0	0	132	133	139	142	169	2	6	69	839	1,280
319	Apr	0	0	131	132	145	158	185	2	6	70	1,053	1,605
319	May	0	0	433	1,315	1,424	1,523	1,575	146	169	954	2,206	3,781
319	Jun	0	0	517	933	1,069	1,177	1,236	180	192	1,139	3,743	5,387
319	Jul	0	0	283	296	355	383	422	45	48	318	1,304	1,814
319	Aug	0	0	172	175	211	221	255	13	17	133	725	1,062
319	Sep	0	0	148	149	175	181	213	6	9	91	687	1,033
319	Oct	0	0	142	143	164	169	199	4	8	81	689	1,043
319	Nov	0	0	138	139	161	166	196	4	7	79	855	1,296
319	Dec	0	0	136	137	157	162	192	3	6	74	846	1,288
320	Jan	0	0	133	134	149	153	182	2	5	66	828	1,266
320	Feb	0	0	132	133	143	147	174	2	3	59	800	1,229
320	Mar	0	0	131	131	138	141	167	1	2	53	859	1,321
320	Apr	0	0	130	131	227	315	367	2	20	185	1,107	1,692
320	May	0	0	333	643	768	874	933	80	106	601	1,831	2,788
320	Jun	0	0	361	499	547	571	608	98	107	572	2,109	2,941
320	Jul	0	0	186	195	223	231	262	24	28	189	1,084	1,567
320	Aug	0	0	146	149	168	172	201	9	11	102	647	969

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
320	Sep	0	0	145	150	168	170	199	6	16	100	616	931
320	Oct	0	0	185	347	405	459	492	29	69	383	823	1,315
320	Nov	0	0	186	288	363	428	464	36	74	440	1,040	1,536
320	Dec	0	0	154	189	232	250	283	15	23	177	940	1,407
321	Jan	0	0	145	161	192	198	230	8	12	112	852	1,281
321	Feb	0	0	141	148	172	175	206	6	9	93	831	1,251
321	Mar	0	0	138	147	181	211	243	5	9	103	928	1,402
321	Apr	0	0	268	808	883	963	1,000	79	108	650	1,301	2,301
321	May	0	0	438	938	1,027	1,092	1,131	127	150	820	1,674	2,805
321	Jun	0	0	342	417	481	501	539	67	62	333	1,265	1,804
321	Jul	0	0	190	193	243	253	290	28	24	179	1,145	1,659
321	Aug	0	0	157	167	208	215	250	17	16	140	1,030	1,525
321	Sep	0	0	171	266	312	335	371	25	44	269	1,773	2,685
321	Oct	0	0	177	297	359	405	444	32	63	364	1,264	1,927
321	Nov	0	0	160	222	292	330	370	26	39	262	3,101	4,658
321	Dec	0	0	154	196	260	278	317	19	22	177	1,830	2,744
322	Jan	0	0	149	181	232	245	282	13	17	145	1,407	2,108
322	Feb	0	0	146	170	211	221	257	9	14	127	1,365	2,046
322	Mar	0	0	143	167	205	215	250	6	14	121	1,796	2,698
322	Apr	0	0	320	1,052	1,147	1,219	1,266	108	134	793	3,313	5,338
322	May	0	0	422	794	906	990	1,041	136	159	938	5,808	8,569
322	Jun	0	0	297	387	448	474	514	46	45	306	3,431	5,063
322	Jul	0	0	192	268	316	330	368	29	32	196	1,641	2,461
322	Aug	0	0	170	176	217	228	265	24	29	173	1,102	1,610
322	Sep	0	0	160	173	206	216	251	17	19	142	1,037	1,534
322	Oct	0	0	159	258	299	330	366	19	40	248	1,673	2,561
322	Nov	0	0	158	218	270	308	346	21	45	277	1,529	2,305
322	Dec	0	0	154	192	239	256	294	15	22	165	1,235	1,851
323	Jan	0	0	151	177	215	227	262	10	16	128	1,046	1,566
323	Feb	0	0	147	166	196	206	240	6	13	111	924	1,383
323	Mar	0	0	144	157	182	191	223	5	12	102	918	1,374
323	Apr	0	0	208	449	553	640	694	38	83	501	1,237	1,934
323	May	0	0	387	822	950	1,052	1,112	90	132	717	2,478	3,807
323	Jun	0	0	339	394	451	479	520	70	72	373	2,189	3,131
323	Jul	0	0	191	196	233	245	281	27	26	181	1,129	1,626
323	Aug	0	0	157	159	186	194	228	14	15	129	721	1,044
323	Sep	0	0	148	149	170	176	208	8	12	108	606	883
323	Oct	0	0	144	145	162	167	198	6	10	97	706	1,042
323	Nov	0	0	140	141	156	160	191	5	9	90	1,080	1,611
323	Dec	0	0	138	140	150	154	183	4	8	81	1,012	1,517
324	Jan	0	0	136	137	144	147	174	3	6	73	1,010	1,519
324	Feb	0	0	134	135	139	141	168	3	5	66	1,001	1,510
324	Mar	0	0	133	134	136	138	164	2	3	60	1,123	1,699
324	Apr	0	0	131	132	217	299	348	2	12	142	2,022	3,057
324	May	0	0	418	1,120	1,235	1,334	1,390	118	127	732	5,542	8,629
324	Jun	0	0	484	968	1,028	1,063	1,101	162	176	927	10,401	15,525
324	Jul	0	0	268	307	357	380	415	58	75	416	2,866	4,156
324	Aug	0	0	169	205	243	253	286	20	23	175	1,774	2,639
324	Sep	0	0	150	175	207	213	245	12	14	126	1,357	2,029
324	Oct	0	0	149	215	254	272	305	13	26	179	2,181	3,307
324	Nov	0	0	147	187	231	254	287	13	29	193	2,079	3,130
324	Dec	0	0	144	169	206	217	250	8	16	133	1,507	2,262
325	Jan	0	0	141	157	187	194	225	6	12	110	1,268	1,902
325	Feb	0	0	138	148	171	177	207	5	10	99	1,235	1,854
325	Mar	0	0	136	137	158	164	194	4	9	93	1,213	1,818
325	Apr	0	0	134	135	155	161	191	4	9	89	1,299	1,953
325	May	0	0	485	1,332	1,401	1,463	1,500	133	141	794	6,977	10,857
325	Jun	0	0	485	792	879	954	994	166	169	955	3,008	4,255
325	Jul	0	0	214	226	272	293	328	39	43	279	1,196	1,678
325	Aug	0	0	156	188	221	230	263	13	17	135	1,037	1,548
325	Sep	0	0	144	146	172	179	210	7	11	105	922	1,369
325	Oct	0	0	141	164	191	197	228	6	14	107	929	1,403
325	Nov	0	0	140	165	203	226	258	6	16	120	1,248	1,881
325	Dec	0	0	138	151	192	219	252	5	13	117	1,147	1,723
326	Jan	0	0	135	141	174	185	217	5	11	106	1,045	1,570
326	Feb	0	0	134	135	160	168	199	4	10	96	1,035	1,556
326	Mar	0	0	132	133	153	159	188	3	9	87	1,053	1,589
326	Apr	0	0	131	132	229	315	366	3	17	167	1,805	2,726
326	May	0	0	439	1,273	1,397	1,499	1,557	131	140	804	3,698	5,951
326	Jun	0	0	456	751	807	833	871	161	158	868	3,921	5,597
326	Jul	0	0	208	220	256	267	300	38	42	269	1,774	2,549
326	Aug	0	0	152	155	182	188	219	12	17	135	805	1,184
326	Sep	0	0	139	141	161	165	195	6	11	101	698	1,045
326	Oct	0	0	135	136	151	154	183	5	8	88	755	1,141
326	Nov	0	0	132	133	144	146	174	4	7	78	1,233	1,865
326	Dec	0	0	130	131	138	140	167	3	5	70	1,029	1,563
327	Jan	0	0	129	130	134	135	161	2	4	62	999	1,523
327	Feb	0	0	128	129	130	131	156	2	2	56	1,004	1,535
327	Mar	0	0	127	128	188	253	290	1	6	105	985	1,513
327	Apr	0	0	130	141	224	304	347	3	27	186	1,665	2,523
327	May	0	0	245	311	349	367	400	27	57	256	2,995	4,474
327	Jun	0	0	270	294	318	323	352	33	46	223	2,518	3,709
327	Jul	0	0	165	169	186	188	216	10	17	125	1,141	1,696
327	Aug	0	0	141	142	154	155	182	5	10	98	689	1,035
327	Sep	0	0	135	136	144	144	170	3	7	87	4,092	6,157

Knight Piésold
CONSULTING

Mine Year	Month	Davidson Creek							Creek 661			Chedakuz Creek	
		11-DC[3]	H2[4,5]	FWR/ Wetland[6]	Plunge Pool[7]	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC[8]	H5[8]
327	Oct	0	0	133	134	140	140	165	3	7	82	2,510	3,783
327	Nov	0	0	132	133	137	137	161	3	6	78	1,564	2,363
327	Dec	0	0	131	132	133	133	157	2	5	71	1,161	1,762
328	Jan	0	0	129	130	131	131	154	1	4	63	635	978
328	Feb	0	0	128	129	130	130	152	1	3	57	674	1,043
328	Mar	0	0	127	128	129	129	150	1	1	51	1,195	1,831
328	Apr	0	0	126	127	136	156	179	0	2	54	8,109	12,222
328	May	0	0	618	1,894	2,056	2,199	2,269	270	281	1,515	14,745	22,363
328	Jun	0	0	563	1,033	1,234	1,384	1,466	228	214	1,330	10,074	14,845
328	Jul	0	0	240	390	471	506	548	55	64	400	5,523	8,281
328	Aug	0	0	167	177	230	241	275	20	33	207	2,465	3,672
328	Sep	0	0	146	149	188	193	225	8	13	119	1,049	1,567
328	Oct	0	0	140	141	171	175	205	5	8	95	855	1,286
328	Nov	0	0	137	138	160	163	192	4	6	84	1,032	1,558
328	Dec	0	0	134	135	152	154	182	4	5	76	628	957
329	Jan	0	0	132	133	145	146	173	3	4	68	633	970
329	Feb	0	0	130	131	140	140	166	2	3	61	673	1,034
329	Mar	0	0	129	130	135	135	160	2	1	55	1,193	1,820
329	Apr	0	0	128	129	229	318	370	2	14	160	2,311	3,504
329	May	0	0	423	989	1,118	1,226	1,287	118	128	739	5,650	8,664
329	Jun	0	0	440	772	821	844	880	146	142	774	4,973	7,283
329	Jul	0	0	208	220	249	256	286	35	36	238	2,296	3,355
329	Aug	0	0	152	155	176	178	206	11	13	117	1,449	2,163
329	Sep	0	0	139	141	156	156	183	6	7	87	997	1,504
329	Oct	0	0	135	136	146	146	173	4	6	76	781	1,188
329	Nov	0	0	132	133	140	140	165	3	4	67	1,034	1,574
329	Dec	0	0	130	131	135	135	159	3	3	60	716	1,101
330	Jan	0	0	129	130	131	131	154	2	1	53	1,061	1,623
330	Feb	0	0	127	128	129	129	151	1	0	47	1,066	1,637
330	Mar	0	0	126	127	140	162	187	1	1	52	1,714	2,612
330	Apr	0	0	135	151	179	209	235	7	33	193	1,985	2,976
330	May	0	0	211	234	261	269	296	17	58	266	2,400	3,536
330	Jun	0	0	226	237	258	261	287	18	35	166	2,027	2,996
330	Jul	0	0	158	161	177	178	203	7	13	107	1,268	1,901
330	Aug	0	0	141	142	154	154	178	4	7	87	699	1,059
330	Sep	0	0	136	137	144	144	168	3	5	78	655	1,000
330	Oct	0	0	133	134	138	138	161	2	4	70	817	1,248
330	Nov	0	0	131	132	134	134	156	2	3	63	1,065	1,625
330	Dec	0	0	130	131	131	131	153	1	1	56	875	1,345
331	Jan	0	0	129	130	130	130	151	1	0	50	778	1,206
331	Feb	0	0	127	128	129	129	149	1	0	45	840	1,304
331	Mar	0	0	126	127	128	128	147	0	0	41	976	1,513
331	Apr	0	0	156	174	226	286	316	15	51	324	1,089	1,612
331	May	0	0	354	392	466	537	573	65	112	587	3,835	5,546
331	Jun	0	0	472	952	1,064	1,155	1,203	136	163	872	2,031	3,234
331	Jul	0	0	350	535	663	759	812	107	127	750	1,478	2,289
331	Aug	0	0	186	201	258	279	314	35	32	237	1,046	1,500
331	Sep	0	0	152	171	208	214	244	18	13	130	756	1,122
331	Oct	0	0	146	207	239	242	271	15	15	123	733	1,133
331	Nov	0	0	145	177	209	211	241	14	17	125	1,147	1,731
331	Dec	0	0	142	161	188	190	219	9	11	107	903	1,359
332	Jan	0	0	139	151	171	173	200	6	9	95	902	1,357
332	Feb	0	0	136	142	157	158	184	5	8	87	830	1,249
332	Mar	0	0	135	143	172	207	235	5	10	112	1,114	1,682
332	Apr	0	0	255	739	812	896	930	71	104	627	1,879	3,043
332	May	0	0	396	772	854	916	953	102	129	744	3,316	4,936
332	Jun	0	0	305	416	474	491	526	47	45	282	1,655	2,420
332	Jul	0	0	184	187	233	241	274	25	22	170	1,408	2,060
332	Aug	0	0	155	156	193	197	230	16	16	132	734	1,076
332	Sep	0	0	148	149	178	182	213	12	14	118	647	954
332	Oct	0	0	146	147	171	174	204	9	13	110	819	1,217
332	Nov	0	0	143	144	164	166	195	5	12	100	1,018	1,523
332	Dec	0	0	140	141	156	158	186	4	11	91	985	1,480

M:\1\01\00457\22\A\Correspondence\VA17-00219 - Updated Watershed Modelling in Support of Water Quality Assessment\Appendix C\[Appendix C - Flow Tables_r0.xlsx]Table C1

NOTES:

1. STREAMFLOWS ARE IN L/S.
2. ESTIMATED STREAMFLOW VALUES WERE OBTAINED FROM THE LIFE OF MINE WATERSHED MODEL AND REPRESENT MONTHLY MEAN STREAMFLOWS.
3. NODE LOCATION 11-DC IS LOCATED AT SITE C WEST DAM WHICH IS A SURFACE WATER DIVIDE AFTER MINE YEAR -2.
4. NODE H2 IN DAVIDSON CREEK REPRESENTS THE DOWNSTREAM EXTENT OF THE ENVIRONMENTAL CONTROL DAM DURING OPERATIONS, CLOSURE AND POST-CLOSURE. STREAMFLOWS AT NODE H2 DO NOT INCLUDE INPUTS FROM THE FRESH WATER SUPPLY MITIGATION SYSTEM WHICH WILL PROVIDE WATER TO DAVIDSON CREEK IMMEDIATELY DOWNSTREAM OF THE H2 NODE LOCATION IN OPERATIONS AND CLOSURE.
5. STREAMFLOW ESTIMATES IN DAVIDSON CREEK ASSUME NO GROUNDWATER OR SURFACE WATER FLOW PASSES THE ENVIRONMENTAL CONTROL DAM EXCEPT 0.5 L/S SEEPAGE THAT IS PREDICTED TO BYPASS THE ENVIRONMENTAL CONTROL DAM.
6. THE FWR/WETLAND NODE REPRESENTS FLOWS LEAVING THE FRESH WATER RESERVOIR IN OPERATIONS AND CLOSURE AND IMMEDIATELY UPSTREAM OF THE PLUNGE POOL IN POST-CLOSURE.
7. STREAMFLOWS IN DAVIDSON CREEK ASSUME THE TSF CLOSURE SPILLWAY CHANNEL IS CONSTRUCTED IN YEAR 10, BUT IS NOT OPERATIONAL UNTIL POST-CLOSURE. THE TSF SPILLWAY CHANNEL IS DIRECTED TO THE PLUNGE POOL ON DAVIDSON CREEK.

0	14FEB'17	ISSUED WITH MEMO VA17-00219	KTD	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

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CONSULTING

TABLE C2

NEW GOLD INC.
BLACKWATER GOLD PROJECT

UPDATED LIFE OF MINE WATERSHED MODEL
ESTIMATED AVERAGE MONTHLY STREAMFLOWS - POST-CLOSURE

Print Feb/14/17 14:22:02

Month	Davidson Creek							Creek 661			Chedakuz Creek	
	11-DC	H2	FWR/ Wetland	Plunge Pool	H4B	4-DC	1-DC	H1	1-505659	1-661	15-CC	H5
January	0	0	137	146	165	170	198	5	9	91	960	1,450
February	0	0	136	142	157	161	188	4	7	82	959	1,452
March	0	0	134	137	155	165	193	3	7	80	1,105	1,675
April	0	14	163	279	358	429	473	20	43	292	1,976	3,037
May	0	54	390	919	1,030	1,119	1,171	107	133	746	4,078	6,310
June	0	35	399	650	720	760	801	114	119	659	3,551	5,201
July	0	8	222	257	304	321	355	39	42	268	1,698	2,479
August	0	2	160	172	205	212	244	17	19	147	1,014	1,499
September	0	0	149	163	190	196	226	11	16	127	1,028	1,539
October	0	1	148	184	213	225	256	12	21	150	1,031	1,563
November	0	1	145	167	198	212	242	11	19	144	1,268	1,909
December	0	0	140	153	179	186	216	7	12	107	1,031	1,553
Annual	**0**	**10**	**194**	**281**	**323**	**346**	**380**	**29**	**37**	**241**	**1,642**	**2,472**

M:\1\01\00457\22\A\Correspondence\VA17-00219 - Updated Watershed Modelling in Support of Water Quality Assessment\Appendix C\[Appendix C - Flow Tables_r0.xlsx]Table C2

NOTES:
1. STREAMFLOWS ARE IN L/S.
2. AVERAGE MONTHLY STREAMFLOWS ARE AVERAGED OVER ONE 21-YEAR CLIMATE CYCLE DURING THE POST-CLOSURE PERIOD. YEARS 55 TO 75 WERE SELECTED FOR THE AVERAGING.
THE WATERSHED MODEL.
4. STREAMFLOW ESTIMATES IN DAVIDSON CREEK DO NOT INCLUDE INPUTS FROM THE FRESH WATER SUPPLY MITIGATION SYSTEM, WHICH IS ASSUMED TO BE DECOMMISSIONED.

0	14FEB'17	ISSUED WITH MEMO VA17-00219	KTD	CAS
REV	DATE	DESCRIPTION	PREP'D	RVW'D

— Appendix E —

Pit Lake Modelling for Blackwater Gold Project: Assumptions Relating to Depth of Surface Mixed Layer in Pit Lake (Lorax 2017)

TECHNICAL MEMORANDUM

To: Sachi DeSouza (NewGold)

Cc: Keith Ferguson (Sustainability Engineering), Kelsey Norlund (ERM)

Date: February 8, 2017

From: Alan Martin and Don Dunbar (Lorax Environmental Services Ltd.)

Subject: Pit Lake Modelling for Blackwater Gold Project: Assumptions Relating to Depth of Surface Mixed Layer in Pit Lake

The water quality prediction model for the Blackwater Gold Project incorporates a mixed-layer depth of 3 m for the pit lake, which is predicted to form a meromictic (permanently stratified) density structure upon filling. In this context, the mixed layer defines the upper portion of the pit lake that maintains homogeneous conditions due to wind mixing and convective overturn. The depth of the mixed layer has relevance to the water quality exiting the pit at the time of overflow, since variations in mixed layer thickness (and hence storage) will affect the extent of seasonal and inter-annual water quality variability.

To support the assumption of a 3 m thick mixed layer in the water quality model, a review of the literature was conducted for pit lake systems in a range of geographic locations and climate conditions. Depths of the surface mixed layer, as defined by the salinity gradient (pycnocline) or seasonal temperature gradient (thermocline), were shown to range from 5 to 30 m. In this regard, a minimum mixed layer thickness of 3 m adopted for the Blackwater pit lake represents a conservatively low estimate.

Table 1: Case studies describing the thickness of the surface mixed layer in pit lake systems

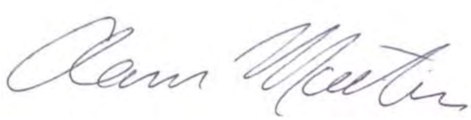
Pit Lake and Location	Depth of Mixed Layer	Reference
Grum Pit, Faro Mine, Yukon	Mixed layer defined by chemocline depth of 15-30 m. Seasonal mixed layer of 5-6 m as defined by summer thermocline.	SRK, 2010
Faro Pit Lake, Faro Mine, Yukon	Spring mixed layer depth of 5 m; Fall mixed layer depth of 10 m defined by pycnocline	Pieters and Lawrence, 2012
St. Louis pit lake, France	Mixed layer defined by chemocline depth of 20 m. Seasonal mixed layer of 5 m as defined by summer thermocline.	Denimal et al., 2005
Fouthiaux pit lake, France	Mixed layer defined by chemocline depth of 20 m. Seasonal mixed layer of 5 m as defined by summer thermocline.	Denimal et al., 2005
Udden pit lake, Sweden	Mixed layer defined by chemocline and summer thermocline, both at depth of 5 m.	Ramstedt et al., 2003

Table 1: Cont.

Pit Lake and Location	Depth of Mixed Layer	Reference
Merseburg-Ost pit lake, Germany	Seasonal mixed layer of 5-6 m as defined by summer thermocline.	Von Roden and Ilmberger, 2001
Dexter pit lake, Nevada USA	Summer mixed layer depth of 7 m defined by pycnocline.	Balistrieri, et al., 2006
Island Copper pit lake, BC Canada	Summer mixed layer depth of 7 m defined by pycnocline.	Stevens, et. al., 2005
Goitsche pit lake, Germany	Summer mixed layer depth of 12 m defined by pycnocline.	Boehrer and Schultze, 2006
Sphinx pit lake, Canada	Seasonal mixed-layer depth of at least 5 m defined by pycnocline.	Pisces, 2006
Pit Lake 50 A-North, Rocky Mountains, Canada	Seasonal mixed-layer depth of 5-10 m defined by pycnocline.	Pisces, 2006
Pit Lake 51-B4, Rocky Mountains, Canada	Seasonal mixed-layer depth of 5-10 m defined by pycnocline.	Pisces, 2006
Pit Lake 51-C0, Rocky Mountains, Canada	Seasonal mixed-layer depth of 5-10 m defined by pycnocline.	Pisces, 2006
Pit Lake 51-C5, Rocky Mountains, Canada	Seasonal mixed-layer depth of at least 5 m defined by pycnocline.	Pisces, 2006

We trust that this memorandum meets your requirements. Please contact us should you have any questions or concerns, or require additional information.

Yours sincerely,



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