APPENDIX 10-1: SURFACE EROSION PREVENTION AND SEDIMENT CONTROL PLAN

Mount Polley Mine
Environmental Management Plan:

Sediment and Erosion Control Management Plan

Last Update: 26 September 2025

Document Revision Control

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1 INTRODUCTION

This “Sediment and Erosion Control Management Plan” (the Plan) provides direction for the management of surface erosion at Mount Polley Mine (the Mine). The Plan addresses existing and potential surface erosion impacts associated with mine expansion (construction activities), and operation phases and applies to all Mount Polley personnel and contractors. This version of the Plan is not intended to apply to mine closure activities.

The main objective of this Plan is to minimize erosion of surficial sediments and intercept and manage sediment laden water as close to the source as possible. Erosion and sediment control measures and best management practices (BMPs) are incorporated in the Plan as approaches to prevent erosion and the introduction of sediment into natural water bodies and watercourses. Guidelines for monitoring the efficacy of measures in this Plan are also presented.

Permitting, notification, and reporting requirements for projects at the site will vary based on their location and proximity to natural water bodies and water. If the project has potential to impact natural watercourses or water bodies (i.e., if the work is outside site contact water collection systems and/or is adjacent to natural waterways), a site-specific environmental management plan (EMP) for project work should be developed. Minimum requirements for an EMP are provided in Section 6.1.

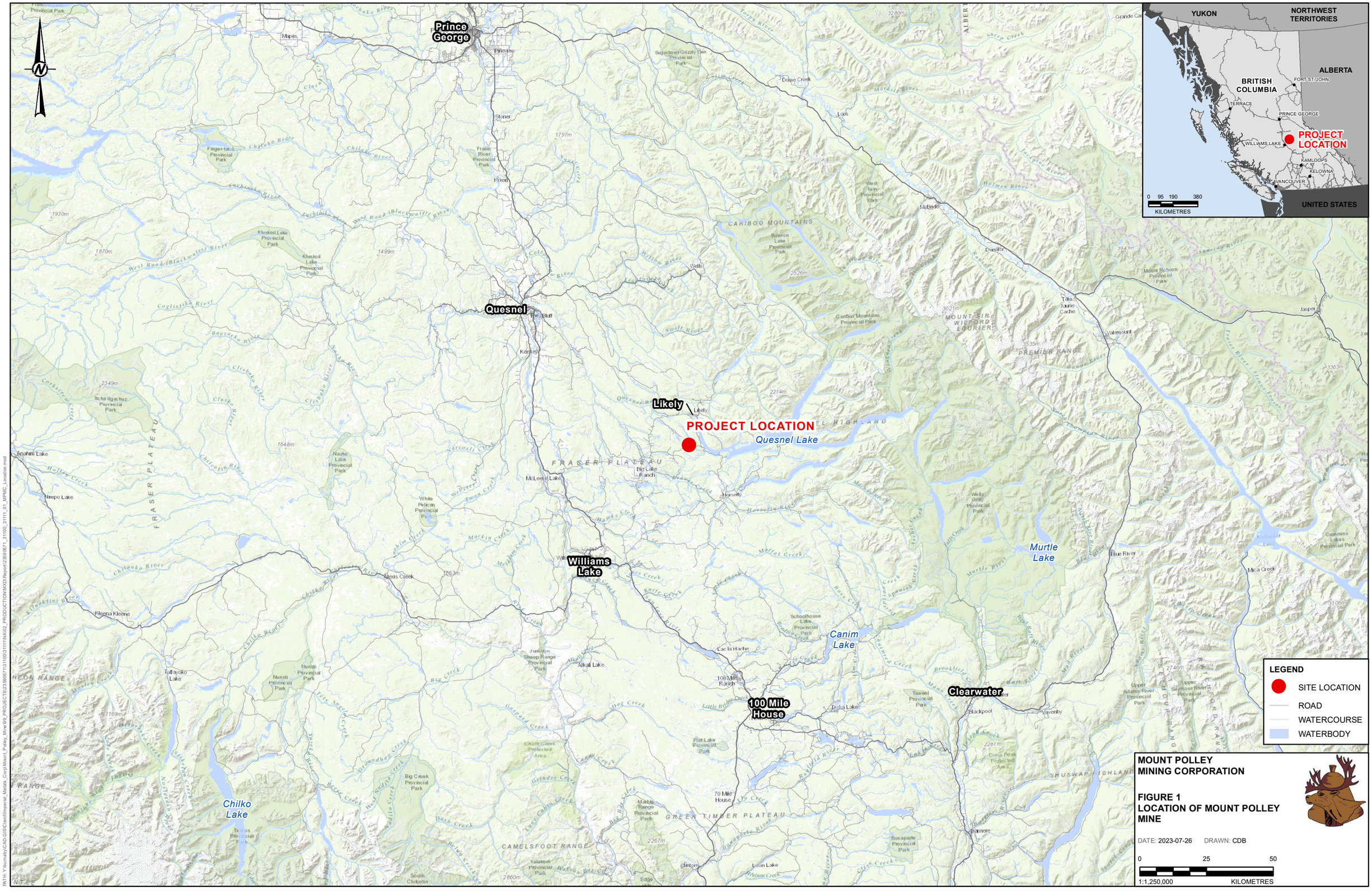
This ESC Plan provides the basis for activities on the project site. Specific construction activities will be addressed in the preparation of Construction Environmental Management Plans as required in the M-200 permit in section C(6) (a), “*No later than 60 days prior to commencing new disturbance in the Permitted Mine Area (Figure 1), the Permittee must submit to the Chief Inspector a site-specific Construction Environmental Management Plans*.”

2 DESCRIPTION OF THE PROJECT

2.1 Project Location

The Mine, operated by Mount Polley Mining Corporation (MPMC, a wholly owned subsidiary of Imperial Metals Corporation), is an open pit copper/gold mine with an underground component located in south-central British Columbia. It is located 8 kilometres (km) southwest of Likely and 56 km northeast of Williams Lake, British Columbia (BC) (refer to Figure 1). The Mount Polley Mine has the capacity to process 20,000 to 22,000 tonnes per day (tpd) of ore when in normal operations. The mine property covers 24,077 hectares (ha), consisting of 7 mining leases totalling 2,007 ha, and 51 mineral claims encompassing 22,070 ha. Mine concentrates are trucked to facilities at the Port of Vancouver, then shipped to overseas smelters or transported by rail to smelters in North America.

The Mine property is located on the eastern edge of the Fraser Plateau physiographic sub-division, characterized by rolling topography and moderate relief. Elevations range from 920 metres above sea level (masl) at Polley Lake to 1266 masl at the summit of Mount Polley.



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2.2 Project History

Clearing of the site and construction of the entire facility began in 1995, with the mill commissioned in June 1997. In May 1997, the Mine received a BC Ministry of Environment and Climate Change Strategy (BC ENV) (previously the Ministry of Water, Land and Air) Effluent Permit, *Environmental Management Act* (EMA) Permit 11678 (PE11678)', issued under the provisions of the provincial EMA. This permit authorized the discharge of concentrator tailings, mill site runoff, mine rock runoff, open pit water, and septic tank effluent to a tailings storage facility (TSF). Approval of the original Mount Polley Mine Reclamation and Closure Plan by the BC Ministry of Energy, Mines and Low Carbon Innovation (BC EMLI) (previously Ministry of Energy, Mines and Petroleum Resources) resulted in the issuance of *Mines Act* Permit M–200 in July 1997.

The first full year of mining and milling at the Mine took place in 1998. The mine suspended operations in October 2001 due to low metal prices, then reopened in December 2004, with mill production commencing in March 2005.
The mine is currently in full scale operations and operations are anticipated until 2033.

2.3 Plan Objectives

The intent of this plan is to provide site-specific sediment and erosion control measures for the activities at the Mount Polley Mine site, including protective measures and guidance to be implemented during all phases of the mine activities, concentrating on construction activities. The sediment and erosion mitigation strategies will follow applicable Best Management Practices (BMPs) along with site-specific measures for water management, and sediment and erosion control during construction. The mitigation measures and strategies outlined in the Plan will assist MPMC in meeting or exceeding the Projects regulatory conditions during mining and construction activities. More specifically, the Plan is intended to prevent or minimize the transport, and deposition of sediments and soil particulates from the mine site into environmentally sensitive areas such as nearby watercourses and affect downstream water quality.

The general approach applied in this document is to reduce sediment sources and minimize contact between sediment sources and water. Where avoidance is not possible, mitigation measures are adopted to reduce erosion. The BC Ministry of Transportation and Infrastructure (MOTI) describes erosion and sediment controls as: (i) erosion control – prevent or minimize the dislodgement of soil particles, and (ii) sediment control – to capture water-borne particles in a controlled manner before undesirable damage is caused (MOTI 2022). Sediment and erosion control measures are, and will continue to be, used during construction, operation, and decommissioning activities at the Mine. Activities that may result in erosion include clearing vegetation and stripping topsoil, stockpiling topsoil, and constructing roads, infrastructure, and tailings and water management structures. Potential hazards from these activities, in the absence of planned mitigation measures, include increased surface erosion from disturbed areas, increased sediment load to downstream receiving environments, and siltation or erosion of downstream watercourses or water bodies.

The main objectives of the Sediment Control and Erosion management plan are:

- Minimize the quantity of contact water by intercepting and/or diverting surface water before it enters a disturbed area with exposed soils or co-mingles with contact water.
- Collect and manage all contact water for treatment before discharge to the environment.
- Allow discharge to the environment if regulatory discharge criteria are met (PE11678).

The following are guidelines applicable to surface erosion prevention and sediment control. These documents may be used as a resource when developing project specific environmental management plans (EMPs) for the Mine.

- “Joint Professional Practice Guidelines – Erosion and Sediment Control” (EGBC 2024)
- "Erosion and Sediment Control Manual” (MOTI 2022).
- “Developing a Mining Erosion and Sediment Control Plan Version 1.0” (BC Ministry of Environment [MoE] 2015).
- “Environmental Best Management Practices for Urban and Rural Land Development in British Columbia” (Draft) (MWLAP 2004).
- “Standards and Best Practices for Instream Works” (MWLAP 2004).
- “Best Management Practices Guide for Storm water: Appendix H Construction Site Erosion and Sediment Control Guide” (Dayton and Knight 1999).
- “Land Development Guidelines for the Protection of Aquatic Habitat” (DFO 1993).

2.4 Roles and Responsibilities

Mine Manager: The Mine Manager will be aware of the Plan and how the proposed or ongoing mining activities could affect soil erosion potential and sediment delivery to adjacent watercourses and water bodies. The Mine Manager is accountable for allocating resources for implementing the measures outlined in the Plan to comply with relevant water quality guidelines and applicable water quality objectives.

Mine Manager Contact:
John Thummerer
Tel: 236.317.4935
Email: john.thummerer@mountpolley.com

Environmental Superintendent: The Environmental Superintendent will be accountable for implementing the requirements of the Plan, including monitoring and reporting activities. The Environmental Superintendent will be aware of and familiar with the relevant legislation and permit requirements listed in Section 2.2 to ensure compliance with the regulatory requirements. Responsibilities of the Environmental Superintendent include:

- Implementation of the Plan.
- Tracking compliance with provincial and federal legislation and applicable permit conditions.
- Communicating environmental requirements and performance to the Mine Manager.
- Investigating and reporting environmental incidents.
- Developing and implementing strategies to address environmental risks, incidents, and non-compliance situations.

The Environmental Superintendent will use external Qualified Professionals (QP) who have specific expertise in erosion protection and sediment control, as necessary, for implementation or improvement of the Plan.

Site Superintendent Contact:
Gabrial Holmes
Tel: 236.317.4939
Email: gabriel.holmes@mountpolley.com

Employees and Contractors: All employees and contractors involved in the planning, design, and carrying out of site preparation and earthworks at the Mine site will be required to undergo basic training and orientation to become familiar with the contents of the Plan.

3 LEGISLATION AND REGULATIONS

3.1 Legislation

The following lists the federal and provincial regulatory requirements with regards to surface erosion prevention and sediment control. The guidance in the subsequent sections is designed to help works proceed in accordance with these regulations:

- BC Water Sustainability Act
- BC Environmental Management Act
- BC Mines Act
  - Health, Safety and Reclamation Code for Mines in British Columbia (EMLI 2021)
- BC *Forest and Range Practices Act* (sections specific to roads and stream crossings)
- Canada Fisheries Act
  - Metal and Diamond Mine Effluent Regulation
- Canada Environmental Protection Act
- EGBC Professional Practice Guidelines – Erosion and Sediment Control (2024)

3.2 Existing Permit Conditions

MPMC has received and is currently operating under two permits that are described in the following sections. The conditions of the respective permits related to the ESC Plan requirements are listed below.

3.2.1 Mines Act Permit M-200 (27 August 2025)

Section C – Protection of Land, Watercourses, and Cultural Heritage Resources
9. Erosion Control and Sediment Control

(a) No later than 30 days after issuance, the Permittee must update and implement the Erosion and Sediment Control Plan and submit to the Chief Inspector. The permitting must ensure the plan considers the professional practice erosion and sediment control guidelines and includes:

- *(i) Project phasing;*
- *(ii) Identification of areas of potential erosion and sediment risk;*
- *(iii) An assessment of potential erosion/soil loss;*
- *(iv) A site-specific erosion and sediment risk assessment;*
- *(v) Site-specific mitigation measures to address identified risks;*
- *(vi) Erosion and sediment control measures, practices, and facilities (applicable to each phase or catchment area);*
- *(vii) Erosion and sediment control specifications (including locations, relevant product information, installation criteria, and applicable maintenance criteria);*
- *(viii) A site-specific event- and activity-based effectiveness monitoring program;*
- *(ix) A Trigger Action Response Plan (TARP) that addresses specific environmental and site conditions that could result in erosion or generation of sediment and includes proactive reporting out procedures if erosion control measures are ineffective or inoperable for any reason;*
- *(x) Erosion and sediment control team members and contact information;*

(xi) Applicable timing restrictions (including wet weather operating restrictions);
(xii) Reference to relevant regulatory criteria;
(xiii) Contingency plans to address circumstances where prescribed erosion control measures are ineffective or inoperable for any reason; and
(xiv) Erosion and Sediment Control Qualified Professional Assurance Statement.

(b) With respect to the Erosion and Sediment Control Plan, referred to in Condition C.8.(a), the Permittee must ensure:
(i) The plan is reviewed annually and updated as required; and
(ii) The review is documented in the Annual Reclamation Report.

(c) The Permittee must ensure inspections are conducted at stream crossings, contact and non-contact water management structures, and snow dumps during rain or snow events and daily during freshet, on the mine site.
(d) When an unauthorized discharge of sediment-laden water to the receiving environment is observed, the Permittee must implement immediate remedial action.
(e) During an unauthorized discharge of sediment-laden water to the receiving environment, the Permittee must sample and characterize the water and report the discharge event to the Chief Inspector within 24 hours.
(f) The Permittee must ensure that characterization of unauthorized discharges of sediment-laden run-off, referred to in Condition C.8.(e), is conducted in accordance with the recommendations of a Qualified Professional.

3.2.2 Environmental Management Act (EMA) PE11678 (2 September 2025)

3.1 Erosion and Sediment Control Plan

3.1.1 The permittee must maintain and implement the Erosion and Sediment Control Plan (ESCP) dated July 31, 2023, or the most recent version of the ESCP.

3.1.2 The permittee must cause a Qualified Professional to conduct a review of the ESCP every five years with the first review to be conducted in 2028, and develop an ESCP Review Report based on the findings of the review. The permittee must submit the ESCP Review Report as part of the annual report, required by Section 5.2, for the year in which the review was required to be conducted.

3.1.3 The ESCP Review Report must include, but is not limited to:
(a) An assessment of whether the ESCP methods being employed on site are being undertaken in accordance with the most recent ESCP,
(b) An assessment of the effectiveness of the ESCP in achieving the objective of the plan,
(c) Recommended improvements to the ESCP to ensure environmental protection, and
(d) Any comments, recommendations, or observations the Qualified Professional considers would be relevant to achieving the objective of the plan.

3.1.4 The permittee must cause a Qualified Professional to update the ESCP based on the recommended modifications included in the ESCP Review Report and submit the updated ESCP to the director within 90 days of submission of the annual report that included the ESCP Review Report. The permittee must provide justification where any of the recommended modifications have not been included in the updated ESCP as part of a cover letter for the updated ESCP.

3.1.5 The permittee must maintain the most recent version of the ESCP onsite for inspection by the Ministry.

3.1.6 The permittee must cause a Qualified Professional to modify or amend the ESCP as required by the director and the permittee must, within the timeframe specified by the director, resubmit to the director the ESCP with required modifications or amendments.

- BC
- BC

4 EXISTING SITE CONDITIONS

4.1 Topography

Terrain and geomorphology of the region comprise flat and gently rolling topography with hummock bedrock exposures, dissected by a network of streams and lakes. Surface drainage patterns are influenced by bedrock topography. In the Tailings Storage Facility (TSF) area, the gentle topography and surface expression of the lowland area at the head of the west arm of Quesnel Lake is the result of glacial advance followed by glacial retreat and inundation by meltwater, creating a glacial lake (glaciolacustrine) environment. The regional surficial geology is predominantly the result of erosion and deposition associated with the most recent glaciation.

4.2 Geologic Setting

Volcanic rocks generally underlay this part of the plateau with inclusions of intrusive rocks. Most of the area is covered by a deposit of unconsolidated till which contains fluvial, lacustrine, and colluvial deposits. Some patches of organic soils are present in poorly drained areas (i.e., wetlands). The property is in an alkali porphyry copper-gold deposit hosted in the Central Quesnel Belt along the Intermountain Belt of BC.

4.3 Vegetation

The site is located within the Interior Cedar Hemlock bio geoclimatic zone. Local forests consist of western red cedar, douglas-fir, hybrid spruce, and subalpine fir, with a lesser presence of trembling aspen, black cottonwood, and paper birch. Much of the area was historically harvested in commercial logging operations and was also used for cattle grazing.

4.4 Soils

The regional surficial geology is predominantly the result of erosion and deposition associated with the late Pleistocene (Wisconsinan) glacial episode referred to as the Fraser Glaciation. The stratigraphic sequence identified in the area of the TSF can be generalized in order of increasing depth as follows:

- Fill and anthropogenic materials.
- Till, interpreted as till derived from sediment entrained within the glacial ice and deposited by melting water and ice (ablation till).
- Glaciolacustrine sediments.

- Glaciofluvial sediments.
- Basal till.
- Bedrock.

The following description is based on Meister (2010). Most soils at the Mine Site are derived from morainal deposits overlying bedrock. The soils are typically loam to sandy loam in texture and contain 15% to 35% (by volume) coarse fragment content (>2 mm diameter). The pH of the parent material ranges from 6.0 to 7.5 ($CaCl_2$ solution). This reflects the calcareous nature of the underlying bedrock. The calcareous horizon occurs generally at 120 to 150 centimetres (cm) in depth. The organic matter content of the mineral soil is low. The dominant soil development process is the downward translocation of clay particles, resulting in a Bt horizon (characterized by the accumulation of clay) and the development of Brunisolic Gray Luvisol soils. In areas where the Luvisolic soil development is weak, soils are therefore classified as Orthic or Eluviated Eutric Brunisols, reflecting a weaker rate of soil formation. In more acidic areas, the soils are classed as Dystric Brunisols.

Detailed soil descriptions and terrain classification from inventories carried out for the Mine Site are provided in Appendix A.

4.5 Watercourses

The Mine is drained by three main watersheds: Hazeltine Creek (30.2 km^2) at Quesnel Lake, Edney Creek (87.4 km^2) at Quesnel Lake, and Morehead Lake (62.7 km^2) (Figure 2). The Hazeltine Creek watershed includes Polley Lake and conveys all water from Polley Lake, the east side of Mount Polley, and the area surrounding the TSF. The Morehead Creek watershed includes the Bootjack Lake catchment area (11.2 km^2). The regional topography, water bodies, and watersheds are shown in Figure 2.

08KH001
(QUESNEL RIVER AT LIKELY STATION)

WB1
(MOREHEAD CREEK)

H1
(UPPER HAZELTINE)

H2
(LOWER HAZELTINE)

H3
(LOWER EDNEY)

MOREHEAD LAKE CATCHMENT AREA

BOOTJACK LAKE CATCHMENT AREA

HAZELTINE CREEK CATCHMENT AREA

EDNEY CREEK CATCHMENT AREA

Mount Polley Mine Site

Morehead Lake
Morehead Creek
Frypan Lake
Cedar Creek
Cogan Creek
Dow Creek
Dag Creek
Nina Lake
Polley Lake
Bootjack Lake
Trio Creek
Jacobie Lake
Trio Lake
Bootjack Creek
Quesnel Lake
Rafi Creek
Hazeltine Creek
Edney Creek
Gavin Lake
Gavin Creek
Moorhouse Creek
Fire Lake
Edney Lake
Moorhouse Lake
Teasdale Creek
Proctor Creek
Shiko Lake

LEGEND

- MPMC HYDROMETRIC STATION
- ENVIRONMENT CANADA HYDROMETRIC STATIONS
- WATER CATCHMENT AREA
- CONTOUR (10m)
- ROAD
- WATERCOURSE
- WATERBODY

MOUNT POLLEY MINING CORPORATION

FIGURE 2
MAJOR DRAINAGES AND FLOW MONITORING STATIONS

DATE: 2023-07-26 DRAWN: CDB

0 1,600 3,200

1:80,000 METRES

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4.6 Climate

The average annual precipitation in the area is 612 millimetres (mm). Precipitation typically occurs as snowfall from November through March, with an average maximum of snowpack of 185 mm snow water equivalent occurring at the end of March. Average monthly temperatures at the Mine range from -13.1 degrees Celsius (°C) in December to 18.9 °C in July. Prevailing winds are from the northwest near the TSF, and from the southwest (and to a lesser extent from the northwest) near the mill.

4.7 Climate Baseline

The climate baseline for the Mine was updated in 2022 (Golder 2022). A summary of the baseline climate parameters is provided in Table 1 and is described in Golder 2022.

Table 1: Summary of Key Climate Parameters

Parameter	Value
Mean annual total precipitation (mm)	612
1:2-year 24-hour rainfall (mm)	33
1:200-year 24-hour rainfall (mm)	69
Projected annual total precipitation anomaly from baseline for 2050's (%)	+5
Projected annual total precipitation anomaly from baseline for 2080's (%)	+8
Mean annual temperature (°C)	3.9
Average winter season (sub-zero mean monthly temperatures)	November to March
Projected annual air temperature anomaly from baseline for 2050's (°C)	+1.8
Projected annual air temperature anomaly from baseline for 2080's (°C)	+2.7
Mean annual relative humidity (%)	68.1
Mean annual solar radiation (W/m^2)	135
Mean annual shallow lake evaporation (mm)	673
Mean annual potential evapotranspiration (mm)	863
Mean snow water equivalent for the month of March (mm)	185

Note: Statistics are based on reviewed historical records from multiple climate stations and measured and derived data (where applicable).

mm = millimetre; ˚C = degrees Celsius; W/m^2 = watts per square metre.

4.8 Land Use

Infrastructure at the Mount Polley Mine site includes open pits, an underground mine, a crusher, a mill, and office spaces, a TSF, a water treatment plant (WTP), waste rock disposal areas, collection and settling ponds, a surface water collection system, haul roads, access roads, and storage facilities. The total lease area associated with the Mine is 18,892 hectares (ha).

5 RISK ASSESSMENT

The sediment and erosion controls required are based on associated risk to the environment. Table 2 relates potential sediment sources to the sensitive areas on and surrounding the Mine site and assigns a level of risk based on sensitivity of the receiving environment (receiver size, fish bearing status, etc.) and erosion potential.

Table 2: Mount Polley Sediment and Erosion Control Risk Matrix

Receiving Environment Area	Area Sensitivity	Primary Potential Source(s)	Secondary Potential Source(s)[1]	Erosion Potential Considerations[2]	Risk[3]
6 km Creek	- Not fish bearing in upper reaches. - Variable forest buffer.	- Access road. - Junction Zone Ditch or 9 km Sump.	- NW PAG Stockpile soil stockpiles - NW PAG Stockpile/Junction Zone Ditch access roads. - NW Sump.	- Established gravel ditch bottom. - Upstream area mostly covered with waste rock. - Soil stockpiles revegetation. - Two high traffic road crossings.	Medium.
Mine Drainage Creek	- Not fish bearing. - Connected to Bootjack Lake.	- Mine Drainage Creek Sump. - West Ditch.	- Waste Haul Road. - Helipad reclamation parcel. - Crusher Access Road. - Ore Switchback Road. - Cariboo Stockpile and soil stockpiles. - Pipeline from Springer Pit to water treatment plant.	- Some unarmoured ditch sections. - Some till placed on outer slope of Waste Haul Road. - Active haul traffic on roads (can develop sediment-laden puddles). - Caribou Stockpile soil stockpiles new. - Helipad reclamation parcel revegetating. - Majority of runoff into ditch (including from reclamation and soil stockpile areas) filters through rock haul road. - Water in pipeline to treatment plant contains low total suspended solids.	Medium.
W20 Creek	- Fish bearing (very low productivity). - Variable forest buffer.	- West Ditch. - West Ditch Access Road.	- Light Vehicle Tailings Road. - Waste Haul Road. - Above Waste Haul Road reclamation parcel. - Pipeline from Springer Pit to water treatment plant.	- Ditch armoured - Reclamation parcel revegetating; upstream of Waste Haul Road. - Active haul traffic on roads (can develop sediment-laden puddles). - Water in pipeline to treatment plant contains low suspended solids. - Majority of runoff into ditch filters though rock haul road.	Medium.

Table 2: Mount Polley Sediment and Erosion Control Risk Matrix

Receiving Environment Area	Area Sensitivity	Primary Potential Source(s)	Secondary Potential Source(s)[1]	Erosion Potential Considerations[2]	Risk[3]
Bootjack Lake	- Fish bearing. - Medium sized receiver. - Variable forest buffer.	- NW Sump. - NW Ditch. - Mine Drainage Creek Sump. - West Ditch. - West Ditch Access Road. - Mine Drainage Creek. - W20 Creek.	- Waste Haul Road. - Helipad reclamation parcel. - Crusher Access Road. - Ore Switchback Road. - Caribou Stockpile and soil stockpiles. - Light Vehicle Tailings Road. - Waste Haul Road. - Above Waste Haul Road reclamation parcel. - Pipeline from Springer Pit to water treatment plant.	- Some unarmoured ditch sections. - Some till placed on outer slope of Waste Haul Road. - Active haul traffic on roads (can develop sediment-laden puddles). - Caribou Stockpile soil stockpiles new. - Reclamation parcels revegetating. - Water in pipeline to treatment plant contains low total suspended solids. - Majority of runoff into ditch filters through rock dumps and rock haul roads.	Medium.
North Dump Creek	- Not fish bearing in upper reaches. - Variable forest buffer.	- Joe's Creek Coffer Dam. - Joe's Creek Pipeline. - Gavin's Ditch (clean water diversion). - Wight Pit Ditch (clean water diversion). - Wight Pit Haul Road.	- North Bell Dump reclamation areas and soil stockpiles. - Access Road. - East Dump reclamation areas and soil stockpiles.	- Joe's Creek Coffer Dam / Pipeline water very low turbidity / suspended solids. - Ditches armoured or have established of have low-erodibility substrates except some potentially erodible sections in Wight Pit Ditch. - East Dump reclamation area in early stages of revegetation. - Varying levels of soil stockpile revegetation (some new). - Two moderate use road crossings.	Medium.
Bootjack Creek	Not fish bearing Connected to Polley Lake.	- Bootjack Creek Sump. - Tailings Access Road Ditch. - SERDS Ditch.	- Tailings Access Road. - Tailings Access Road soil stockpiles. - SERDS access roads. - Southeast Zone soil stockpiles.	- Some erodible ditch sections. - Portion of runoff into ditches filters through waste rock roads/dumps. - Three high use road crossings.	Medium.

Table 2: Mount Polley Sediment and Erosion Control Risk Matrix

Receiving Environment Area	Area Sensitivity	Primary Potential Source(s)	Secondary Potential Source(s)[1]	Erosion Potential Considerations[2]	Risk[3]
Polley Lake	- Fish bearing. - Undergoing rehabilitation. - Sedimentation ponds constructed at outflow.	- Wight Pit Ditch (clean water diversion). - Long Ditch. - North Dump Creek.	- North Bell Dump reclamation areas and soil stockpiles. - Access Road. - NEZ Dump reclamation area and soil stockpile. - East Dump reclamation areas and soil stockpiles. - Tailings Access Road. - Tailings Access Road soil stockpiles. - SERDS access roads. - Southeast Zone/SERDS soils stockpiles.	- Varying levels of revegetation of upstream reclamation areas and soil stockpiles. - Ditches armoured or have established low-erodibility substrates except some potentially erodible sections of Wight Pit Ditch.	Low.
Hazeltine Creek[4]	- Fish bearing. - Undergoing rehabilitation. - Sedimentation ponds constructed at outflow.	- Polley Lake. - Long/SERDS Ditch (combined). - Central Collection Sump. - Perimeter Till Borrow Pit and ditch from Central Collection Sump. - Pipeline from Springer Pit to water treatment plant. - Edney Creek.	- TSF and associated infrastructure. - TSF Perimeter Embankment and PAR soil stockpiles. - TSF Ditch (clean water diversion). - TSF South Toe Drain Ditch. - TSF Main Seepage Pond. - ABR/Main Seepage Pond Ditch.	- High volume water transfers. - Water has time to settle in the TSF and Perimeter Embankment Till Borrow Pit. - Water in pipeline to treatment plant contains low total suspended solids. - Soil stockpiles varying levels of revegetation. - South Till Borrow area revegetation is advanced. - Active TSF construction upstream.	Medium (Risk will increase when the creek returns to fish-bearing status).

Table 2: Mount Polley Sediment and Erosion Control Risk Matrix

Receiving Environment Area	Area Sensitivity	Primary Potential Source(s)	Secondary Potential Source(s)[1]	Erosion Potential Considerations[2]	Risk[3]
Edney Creek	- Fish bearing. - Forest/wetland buffer.	- TSF Ditch (clean water diversion). - TSF South Seepage Pond. - TSF South Toe Drain Ditch. - TSF Main Seepage Pond. - ABR/Main Seepage Pond Ditch. - South Till Borrow reclamation area.	- TSF and associated infrastructure. - South and Main Embankment soil stockpiles.	- Few erodible ditch sections. - Low water volumes managed. - Water seepage ponds contain low turbidity / suspended solids. - New soil stockpiles (early stages of revegetation). - Active TSF construction upstream. - South Till Borrow area revegetation is progressing.	Low.

Notes:

1) Secondary sources are potential sources of sediment that are upstream of (i.e., potentially contribute to) primary erosion.
2) Historic turbidity and total suspended data in relevant water collection infrastructure were considered when assessing erosion potential; water management contingency measures in place across water management system.
3) Based on combination of area sensitivity and erosion potential.
4) Sediment and erosion control in Hazeltine Creek beyond the mine footprint related to the Tailings Storage Facility embankment breach is managed under a separate program.

Based on the risk matrix and site conditions, water management works appear to be the largest risk to receiving environment systems, because:

- Reclamation areas and soil stockpiles on site (with the exception of localized active stripping and stockpile locations) have been seeded or inspected to confirm natural revegetation is underway (Appendix B). Site-specific observations from routine reclamation inspections and annual soil stockpile surveys indicate that minimal erosion occurs at these sites.
- Mine site hydrology is snowmelt dominated, and periods of high flow are experienced annually during freshet, meaning that:
  - There is higher potential for in-ditch erosion.
  - There is higher potential for erosion by surface runoff that reports to collection ditches.
  - Risk of an emergency release of water is elevated.
- Collection ditches are located downstream of disturbed areas on site and collect and convey any turbid water that is generated from disturbed areas on site.

5.1 Soil Loss Estimation

The Revised Universal Soil Loss Equation for Application in Canada (RUSLEFAC; Wall et al. 2002) will be used to estimate the potential. A soil loss estimation will be undertaken on an activity-specific basis, as those activities are planned and implemented. RUSLEFAC is an empirical equation that considers relevant factors to estimate annual erosion rates from land areas:

$$A = R \times K \times LS \times C \times P$$

Where:

A = potential, long-term, average annual soil loss per hectare (tonnes/ha/year)
R = rainfall factor (MJ.mm/ha/hr)
K = soil erodibility factor (dimensionless)
L = slope length and gradient factor (dimensionless)
C = cover management (dimensionless)
P = support practice factor (dimensionless)

The potential soil loss calculated for each worksite / area will be compared to guidelines for assessing potential soil erosion classes summarized in Table 3 (Wall et al. 2002). The suggested soil loss tolerance in Canada is 6 tonnes/ha/year (Wall et al. 2002).

Table 3: RUSLE – Soil Loss Classes

Soil Erosion Class	Potential Soil Loss (tonnes/ha/year)
1 – Very Low	<6
2 – Low	6 – 11
3 – Moderate	11 – 22
4 – High	22 – 33
5 – Severe	>33

6 BEST MANAGEMENT PRACTICES (BMPS)

Best management practices for water and sediment management will be implemented within and around the various construction areas (e.g., roads, tailings embankments, process plant platform, ponds) with the main objective of controlling runoff and seepage from the construction areas at the source, to the extent practicable. BMPs will include:

- Engagement of Qualified Professionals to support the development of specific management plans and update the Plan every 5 years.
- Strive to divert non-contact water around work areas, wherever possible, and convey contact water to the existing contact water system for treatment prior to release.
- Limiting work activities as much as possible to dry weather conditions and covering/ revegetating disturbed areas as quickly as possible after completing work in an area.
- Ensuring that no construction activities take place in, or construction equipment passes through existing watercourses.
- Stockpiling any materials on site as far as possible from watercourses.
- Ensuring that all stockpiles on site with the potential for erosion to a watercourse be covered and/or revegetated to reduce sediment generation.
- Inspecting and maintaining covers and diversion/conveyance ditches on a regular basis.
- Grading the site such that the potential for ponding is minimized.
- Ensuring that extra covers and clean granular materials are available onsite for channel and stockpile maintenance.

The following sections provides general sediment and erosion control guidelines to be followed for future construction projects and/or new surface development on the mine site through the different project phases.

6.1 Pre-project Planning

The BMP guidance documents referenced in Section 3.3 and, when necessary, QPs, are to be consulted to support planning of a specific project. Prior to starting any new construction work, the following should be considered:

- Design of projects to minimize the amount of ground cleared and disturbed.
- Design of projects to minimize disturbance adjacent to receiving environment watercourses and water bodies.
- Planning of works such that areas adjacent to waterways and drainage lines remain undisturbed or protected from erosion for as long as practicable.
- Planning of work to minimize the use of heavy equipment and have equipment conduct work as efficiently as possible.
- Planning of interim water and runoff management strategies to reduce erosion and identify available mitigation techniques if sediment is mobilized.
- Planning of long-term erosion control measures to be implemented after project completion.
- Identification of monitoring and inspection requirements for, during and after the project.
- Design of project criteria, construction plans, and mitigation for stream and other watercourse crossings to meet or exceed all standards and codes established by relevant authorities for the project.

Permitting, notification, and reporting requirements for projects will vary based on their location and proximity to natural water bodies and water. If the project has potential to impact natural watercourses or water bodies (i.e., if the work is outside site contact water collection systems and/or is adjacent to natural waterways), a site-specific environmental management plan (EMP) for project work should be developed. The EMP should include, at minimum:

- A summary of how information requirements, as detailed above, are being implemented.
- Details of drainage patterns over the area, both clean water and potential construction runoff.
- Locations of adjacent environmentally sensitive areas that could be impacted.
- A general outline of the planned work.
- Details of existing or planned erosion and sedimentation control methods to manage construction runoff.
- The location of any existing or planned drainage diversions.
- An inspection and monitoring schedule.
- A revision number and date.

For projects requiring an EMP, appropriate training and awareness to supervisors, workers (employees and contractors) regarding their responsibilities to comply with environmental laws and applicable codes. Workers are to be made aware of the required mitigation measures for a task, in addition to any requirements contained in any public or private approvals and agreement documents.

The following subsections outline additional sediment and erosion control techniques that may be incorporated into planning.

6.1.1 Stabilization and Treatment Methods

Erosion control measures are to be planned and, if required, installed prior to any clearing or earthwork activities. Stabilization measures are put in place to prevent or reduce the mobilization of sediment by stabilizing the source (e.g., exposed soils). Typical erosion control measures that may be used to stabilize areas that have the potential to be sources of sediment to water bodies or watercourses include:

- Seeding or mulching.(BMP#11), (BMP#12)
- Non-vegetative cover (e.g., gravel or straw).(BMP#12)
- Riprap placement.(BMP#16)
- Slope modification, surface texturing to reduce erosive energy (e.g., flattening or benching). (BMP#1)
- Surface ripping and roughening to promote infiltration.(BMP#1)
- Slope drains/chute construction.(BMP#2)
- Erosion blankets.(BMP#18)

While pro-active stabilization measures are used to minimize the presence of sediment laden water, treatment measures may be necessary when it is not possible to completely prevent the mobilization of sediment. Typical sediment control measures that may be used to manage sediment in contact water include the following:

- Check dams or weir structures. (BMP#4)
- Outlet protection, energy dissipator. (BMP#6)
- Sediment retention ponds, sediment traps and sediment basins.(BMP#26)
- Silt fence or similar barrier, such as straw bales.(BMP#23) (BMP#24)
- Swales.(BMP#5)
- Vegetated buffer zones.(BMP#21)

Further descriptions of the Erosion and Sediment Controls mentioned are included in Appendix C adapt for reference and use and are taken from MOTI (2022) Erosion and Sediment Control Manual.

6.1.2 Contact Water Collection Ditches

Contact water collection ditches may be either temporary or permanent structures. Permanent surface runoff control works should be sized to convey runoff from a 1 in 10 year 24-hour flood flow and to withstand a 1:200-year, 24-hour event without significant damage as per BC ENV Permit 11678.

The *Mines Act* M-200 permit states that surface water management structures must convey a least a 1:200 design flow event.

The design of sections of ditch may depend on topography, excavation material (till or bedrock) and design discharge. Different material gradations or design approaches may be used for armouring depending on site-specific conditions and material availability. Any convergences with other ditches or streams should be armoured.

It is expected, in observance of Permit 11678, that new runoff collection ditches will direct flow to the contact water system and result in treatment at the water treatment plant.

6.2 Construction

Construction should comply with the plans developed in the pre-construction phase (Section 7.1) so that work is conducted in a manner that avoids or minimizes erosion and the discharge of silt, sediment, or other deleterious substances into any watercourse. Changes to the construction plan are to be reviewed by the appropriate Environmental Department and Engineering Department staff prior to implementation to allow sediment and erosion control management plans to be revised accordingly. Monitoring is to be carried out as per Section 7 of this document.

Additional measures recommended for all stages of construction include:

- Monitor weather forecasts for upcoming rainfall or other climatic conditions that may affect the construction works and surrounding environment.
- Visually inspect controls on site prior to weather event to ensure that, as far as practicable, they will function as intended.
- Suspend work in areas adjacent to natural water bodies or watercourses during heavy precipitation or runoff conditions.
- Follow the project EMP (especially for pumping, diversion, or relocation of water undertaken) and revise it if the project work plan changes.
- Refer to the site Emergency Response Plan in the event of a major incident.

6.2.1 Soil Salvage

Under MPMC's Mines Act Permit M-200, surficial soils are required to be stripped from the areas to be disturbed in advance of construction of works including waste rock dumps, waste or ore stockpiles, and roads. Stockpiles are often required to store salvaged soils for later use in reclamation, and further erosion control considerations apply, in addition to the earthworks project considerations discussed above. Stockpiles should be promptly seeded with an appropriate native seed mixture. If stockpiles have the potential to impact natural watercourses or water bodies, temporary erosion and sediment control measures should be installed and maintained until a vegetative cover is established.

6.3 Post-Construction

When a project is completed, long-term sediment retention and erosion control measures may need to be considered. These measures may include elements of the stabilization and treatment options in Section 6.1.1, as well as:

- Restricting access to areas being rehabilitated.
- Establishing a vegetative cover.
- Armouring areas receiving surface runoff.
- Slope modification to reduce erosive energy, such as flattening or benching.
- Surface ripping and roughening to promote infiltration.
- Diversion berms and drains (to intercept upstream runoff).

Any interim measures should remain in place until long-term controls are established. When monitoring and inspections (as described in Section 7) find long-term measures are sufficient, interim, or temporary erosion and sediment control features may be reclaimed.

6.4 Decommissioning and Reclamation

This Plan does not address erosion and sediment control measures for closure activities. At closure, MPMC is responsible for leaving the mine site in compliance with all regulations, including site runoff water quality and revegetation to meet end land use and land capability objectives. Detailed soil application and revegetation plans that include methods for reducing erosion are included in the site Reclamation and Closure Plan.

6.5 Mine Operations

Sediment and erosion control practices for new disturbances at the mine site are to follow the procedures outlined in the previous sections, but measures are also to be implemented and maintained on a site-wide scale.

6.5.1 Collection of Mine Contact Water

Collection of runoff from disturbed areas on site that may impact water quality in the receiving environment is to be carried out across the mine site. Water from these collection systems is conveyed to the PETBP and sent to a treatment plant prior to discharge from the site and is not permitted to be discharged to the environment unless specific regulatory requirements are met. These requirements include maximum allowable total suspended solids and turbidity levels.

The overall operating premise at the Mine is that contact water is captured and conveyed via channels, ditches, and pipelines to a centralized location and treated through the water treatment plant (WTP) prior to discharge to Quesnel Lake via submerged diffuser. The WTP outlet is the primary monitoring point for compliance with PE11678 (location HAD-3). There is a secondary PE11678 monitoring point near the diffuser discharge within Quesnel Lake (Location QUL-58).

6.5.2 Emergency Release of Water

If emergency release of water from the site water collection system should occur, sediment and erosion control materials are to be installed, as required, to avoid the displacement of sediment as water moves over land. These materials are stored in the Environmental C-Can located beside the Leach Pad, and the Environmental Department staff is available to guide proper installation. The Mount Polley Emergency Response Plan and Water Management Inspection Manual outline in more detail response protocol for such events, and Section 7.2 outlines event-based monitoring procedures.

7 ENVIRONMENTAL MONITORING AND REPORTING

Water quality is monitored on-site per the Comprehensive Environmental Monitoring Plan (CEMP) (MPMC 2019) to ensure that the water quality conforms to the EMA permit requirements. Monitoring frequency and location of various water quality parameters are outlined in the CEMP. If water quality exceeds trigger levels for any parameter as listed in Section 7.2 of the EMA permit, MPMC will immediately complete Trigger Response Plan actions as outlined in their Annual Discharge Plan (MPMC 2018).

7.1 Routine Inspections

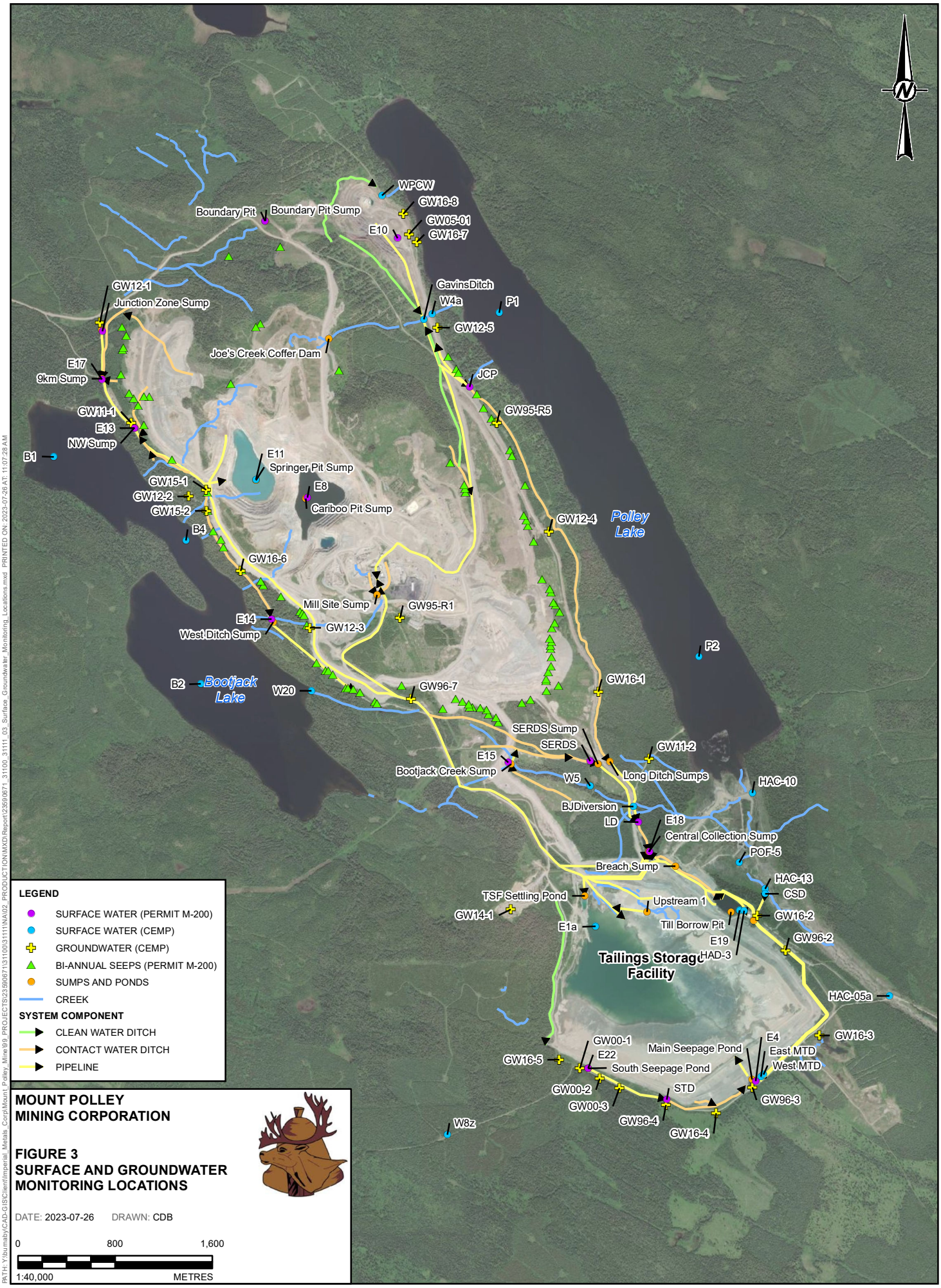
Daily inspections of site water containment infrastructure are completed (refer to the Water Management Inspection Manual, MPMC, 2019 to verify the collection system is working as designed). As per this document, inspections are completed at least once on day shift and night shift during high-risk periods (i.e., freshet). The inspection form template is included as Appendix D. Completed forms are provided to the Environmental Department for review and filing at the end of each seven (7) day set. Note that protocol and triggers are in place for immediate notifications to occur if deficiencies are observed. Daily inspections are the responsibility of Mill Maintenance, and the Environmental and Engineering Departments are responsible for updating the Water Management Inspection Manual, which is a component of the site Operation Maintenance and Surveillance (OMS) Manual.

Inspections of all site water management infrastructure (sumps, ditches, culverts, pipelines, etc.) are completed in spring after freshet and in fall prior to freeze up, as per EMA Permit 11678. This is the responsibility of the Environmental Department. Results are documented in the inspection form (refer to the template provided as Appendix E) and filed internally. Inspection results are used to inform upgrades of water management structures. Noted deficiencies, including areas of erosion or sedimentation, are compiled, and prioritized in a project list which is provided to the Engineering Department to address, based on the identified levels of urgency.

7.1.1 Contact Water Monitoring

Routine monitoring of mine site contact water conveyed through various infrastructure components is conducted as per Mines Act Permit M-200. This sampling program, including sample locations, frequencies, and QA/QC procedures, is detailed in the CEMP, which is regularly updated to account for operational changes at the mine site. All routine samples collected on site are analysed for physical parameters (including total suspended solids and turbidity), anions, nutrients, and total and dissolved metals. Monitoring locations and frequencies (at the time of this update) are shown in Figure 3.

These sample results are included in the annual reporting to BC ENV and BC EMLI. Results from these samples are used, along with inspection results, to identify potential upgrade opportunities for site water conveyance.



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7.1.2 Receiving Environment Monitoring

The Environmental Department conducts water quality monitoring in receiving environment water bodies and watercourses as per MPMC's CEMP, which is required under EMA Permit 11678. Note that chemistry and flow monitoring at a few contact water sites is included under this program, including monitoring related to the permitted effluent discharge. In addition to regular sampling (e.g., monthly, quarterly), a five (5)-week intensive turbidity and total suspended solids monitoring program is conducted in spring and fall in receiving environment streams that could potentially be impacted by erosion from the mine. This includes the following creeks downstream of inflows from runoff diversion ditches:

- North Dump Creek (W4a)
- Bootjack Creek (W5)
- Edney Creek tributary (W8)

7.2 Event/Incident Based Monitoring

Results from routine or freshet / fall rainy period monitoring of receiving environment or general observations from carrying out other work at the mine site may indicate increased sedimentation from mine-related sources. Table 4 outlines the triggers for additional monitoring and required follow up actions if elevated suspended sediment levels are observed or measured.

Table 4: Event-based monitoring Protocol for Receiving Environment Waterways

Trigger	Actions and Responsibilities
Receiving environment waterway or waterbody is observed to have a “cloudy” appearance.	- Observer to report observation to the Environmental Coordinator (or member of the Environmental Department if Environmental Coordinator cannot be reached). - Environmental Coordinator, or their delegate from the Environmental Department, is to carry out in situ monitoring at this site, following the turbidity triggers and associated protocol below.
80-100% of BC Water Quality Guideline for Protection of Aquatic Life for turbidity observed.	- Environmental Technician to notify Environmental Coordinator. - Environmental Technician to organize investigation into the sediment source, with support from the Environmental Coordinator and other relevant workers, depending on the specific scenario. If the investigation indicates this sedimentation is not related to mine activities: - Document the findings. - If any illegal activity is noted, report it accordingly. - Closely monitor this site until conditions have returned to normal or, it is established that the sedimentation will continue. If the investigation indicates that sedimentation is related to mine activities: - Take actions to control the source. - Increase frequency of receiving environment turbidity monitoring. - Closely monitor the site until the sediment source is being appropriately managed and turbidity readings return to below the BC Water Quality Guideline.
100% of BC Water Quality Guideline for Protection of Aquatic Life for turbidity observed.	- Environmental Technician to notify Environmental Coordinator. - Environmental Technician to organize investigation into the sediment source, with support from the Environmental Coordinator and other relevant workers, depending on the specific scenario. If the investigation indicates this sedimentation is not related to mine activities: - Document the findings. - If any illegal activity is noted, report it accordingly. - Closely monitor this site until conditions have returned to normal or, it is established that the sedimentation will continue. If the investigation indicates that sedimentation is related to a mine activity: - Stop any construction or mine activities that may contribute to or exacerbate erosion and sedimentation. - Take actions to control the source. - Increase frequency of receiving environment turbidity monitoring. - Closely monitor the site until the sediment source is being appropriately managed and turbidity readings return to below the BC Water Quality Guideline.

A detailed event-based monitoring program for the receiving environment should be included in project EMPs. Table 5 provides recommended protocol to incorporate.

Table 5: Recommended Event-based Monitoring Protocol for a Construction Project

Trigger	Actions and Responsibilities
80-100% of BC Water Quality Guideline for Protection of Aquatic Life* for turbidity observed in scheduled construction monitoring.	- Environmental Monitor to notify Environmental Coordinator and construction supervisor. With support from the Environmental Coordinator and construction supervisor (and any workers they designate), the Environmental Monitor is to: - Inspect all erosion and sediment control works and construction areas to identify the source. - Take actions to control the source. - Increase frequency of receiving environment turbidity monitoring.
100% of BC Water Quality Guideline for Protection of Aquatic Life* for turbidity observed in scheduled construction monitoring.	- Environmental Monitor to notify Environmental Coordinator and construction supervisor. - Construction supervisor to stop all local construction work. With support from the Environmental Coordinator and construction supervisor (and any workers they designate), the Environmental Monitor is to: - Inspect all sediment and erosion control works and construction areas to identify the source. - Take actions to control the source. - Increase frequency of receiving environment turbidity monitoring. Work is not to recommence until the sediment source is being appropriately managed and turbidity readings return to below the BC Water Quality Guideline.
Rainfall (or snowmelt) ≤ 10 mm/h or 25 mm/d.	During minor rainfall or snowmelt runoff events, the Environmental Monitor is to: - Increase the frequency of receiving environment turbidity monitoring and follow the turbidity triggers and associated protocol above. - Increase the frequency of visual inspections of potential sediment sources (soil stockpiles, sediment ponds, etc.).
Rainfall (or snowmelt) / 10 mm/h or 25 mm/d.	During major rainfall or snowmelt runoff events, the Environmental Monitor is to: - Notify the Environmental Coordinator and construction supervisor. - Increase the frequency of receiving environment turbidity monitoring and follow the turbidity triggers and associated protocol above. - Increase the frequency of visual inspections of high-risk areas (soil stockpiles, sediment ponds, etc.). Environmental Coordinator and/or construction supervisor are to consider full work stop in the area based on conditions.

Note: Upstream monitoring site may be used as “background” reference.

7.3 Reporting and Performance

Water management at the Mount Polley site involves the collection of all mine contact water (see Environmental Management Act Permit PE11678 for this requirement). Contact water is conveyed through a series of ditches and collection sumps to the Perimeter Embankment Till Borrow Pond (PETBP) which is an influent source to the Water Treatment Plant (WTP). This WTP is designed for the removal of suspended solids from contact water and treated effluent is discharged to a pipe that conveys treated water to Quesnel Lake for discharge through submerged diffuser. This discharge is regulated by PE11678 and has a primary compliance monitoring location at the WTP outlet (HAD-3) and has a secondary compliance monitoring location in Quesnel Lake near the diffuser discharge (QUL-58).

Given the water management in place and the single, monitored discharge point, and given that this point is regulated by permit, this location and the permit limits provide the best point at which measurement of the ESCP performance, in aggregate, be evaluated.

The effluent permit provides a site- and discharge-specific regulatory discharge standard with which MPMC must comply.

8 REPORTING AND RECORD KEEPING

8.1 Annual Reporting

Site inspections and monitoring activities associated with surface erosion prevention and sediment control during construction, operations, and closure activities will be documented and reported in accordance with the requirements of MPMC's EMA Permit 11678 and Mines Act Permit M-200.

8.2 Incident Reporting

Significant releases of sediment-laden water from onsite disturbed areas will be appropriately characterized concerning extent and loading and reported to Emergency Management BC, with follow up reporting to provincial regulatory agencies as required by regulations and permits. The Environmental Superintendent will review the reports internally to identify necessary improvements in water management procedures.

8.3 Emergency Reporting

In the event that an emergency release of water from the site collection system occurs, the protocol in the Water Management Inspection Manual (MPMC, 2019) outlining responsibilities, notification requirements, documentation (refer to the form in Appendix F), and actions to carry out would apply. One key action is the installation of sediment and erosion control materials and/or structures.

Monitoring associated with an emergency release of water is the responsibility of the Environmental Department, and should include the following:

- Assessment of the spatial extent of the release and if the release reached receiving environment waterways or water bodies.
- Monitoring of water released (visual observations, flow measurements/estimates, field parameters including turbidity, and/or sampling, based on the observed location, conditions and size of the release).
- Monitoring (visual observations, field parameters including turbidity, and sampling) of downstream waterways or waterbodies into which water was released.

Reporting to Emergency Management BC and follow up reporting to provincial regulatory agencies will likely require this information, in addition to the information required to be collected as per the Water Management Inspection Manual (refer to the form in Appendix F).

8.4 Record Keeping

Monitoring data will be entered into an electronic database and have quality control checks completed upon receipt of results. Data will be entered into a standard format that allows for data reporting and analyses. Data and data comparisons will be stored in a single file format for each type or monitoring activity.

9 EVALUATION AND ADAPTIVE MANAGEMENT

9.1 Sampling and Monitoring Data

The CEMP is, at minimum, updated every three years, based on the results of detailed three-year monitoring program interpretive reports. More frequent changes are, however, anticipated to reflect changing site conditions and, as per the mechanisms described in the CEMP, written notice of proposed changes will be provided to the BC ENV. First Nations and stakeholders will also be updated, as per MPMC's Communication Plan. The CEMP is also referenced in the site OMS Manual, which is regularly updated to account for operational changes at the mine site.

Results from monitoring completed as per the CEMP are submitted to the BC ENV quarterly and are also included in the Annual Environmental and Reclamation Report, which is submitted to the BC ENV and BC EMLI annually. The Environmental Superintendent or their designate (the Environmental Coordinator) is responsible for ensuring this reporting is carried out.

9.2 Maintenance and Inspection Reports

As per the Water Management Inspection Manual, supplemental inspections are to be completed by Mill Maintenance, Mine Operations, and the Environmental Department during high-risk periods (i.e., during precipitation and/or snowmelt runoff events), with support from the Engineering Department. Inspection reports from high flow periods provide feedback on the functioning of site water collection systems under conditions when erosion potential is high. Noted deficiencies are incorporated into project planning for continuous improvements along with findings from routine inspections as described above.

An annual inspection was completed in June 2023 to review the existing sediment and erosion control measures that are in place at the mine site. A summary of the 2023 inspection is included in Appendix G.

9.2.1 Collection of Mine Contact Water

Collection of runoff from disturbed areas on site that may impact water quality in the receiving environment is to be carried out across the mine site. Thus, runoff from disturbed areas that potentially contains sediments or other parameters of concern is not directly released to the environment. Water from these collection systems is stored on site and is not permitted to be discharged to the environment unless specific regulatory requirements are met. These requirements include maximum allowable total suspended solids and turbidity levels, necessitating removal of suspended sediments through active or passive treatment prior to discharge.

To minimize the volume of contact water collected and stored at the site, upstream ditches to divert non-site contact water may be constructed. As water from these works enters the receiving environment, for construction of new diversion ditches, an EMP should be developed and followed for construction, and the guidelines in Sections 6.1 to 6.3 followed.

Inspection and monitoring requirements for site water collection systems and diversion ditches are outlined in Section 7.

9.3 Onsite Plan Review

Construction should comply with the plans developed in the pre-construction phase (Section 6.1) so that work is conducted in a manner that avoids or minimizes erosion and the discharge of silt, sediment, or other deleterious substances into any watercourse. Changes to the construction plan are to be reviewed by the appropriate Environmental Department and Engineering Department staff prior to implementation to allow sediment and erosion control management plans to be revised accordingly.
Monitoring is to be carried out as per Section 6 of this document. Actions, contingencies and maintenance that may be required based on monitoring observations include:

- Correcting deficiencies of the erosion and sediment control measures as soon as they are observed.
- Removal of any sediment and debris accumulation that compromises the effectiveness of the erosion and sediment control measures.
- Implementation of additional erosion and sedimentation treatment measures listed in Section 6.1.

Additional measures recommended for all stages of construction include:

- Monitor weather forecasts for upcoming rainfall or other climatic conditions that may affect the construction works and surrounding environment.
- Suspend work in areas adjacent to natural water bodies or watercourses during heavy precipitation or runoff conditions.
- Follow the project EMP (especially for pumping, diversion, or relocation of water undertaken) and revise it if the project work plan changes.
- Refer to the site Emergency Response Plan in the event of a major incident.

9.3.1 Adaptive Management

This Plan is designed to be updated as sediment and erosion control science and BMPs develop over time. It is also designed to be adapted for operational changes and water management needs at the mine site. Continuous improvements that may be carried out include:

- Changes to the design of works to eliminate deficiencies that are noted during inspections and require regular maintenance.
- Implementation of mitigation measures in response to water quality trends noted in the receiving environment.
- Implementation of measures that reduce treatment needs prior to discharging water.
- Implementation of measures to reduce maintenance costs.
- Implementation of measures to reduce environmental risk.

10 QUALIFIED PROFESSIONALS

The reader is referred to the Study Limitations section, which precedes the text and forms an integral part of this report.

This Erosion and Sediment and Control Management Plan was revised and reviewed by the following qualified professional:



Nathan Schmidt, P.Eng.
Senior Principal, Water Resources Engineer

11 REFERENCES

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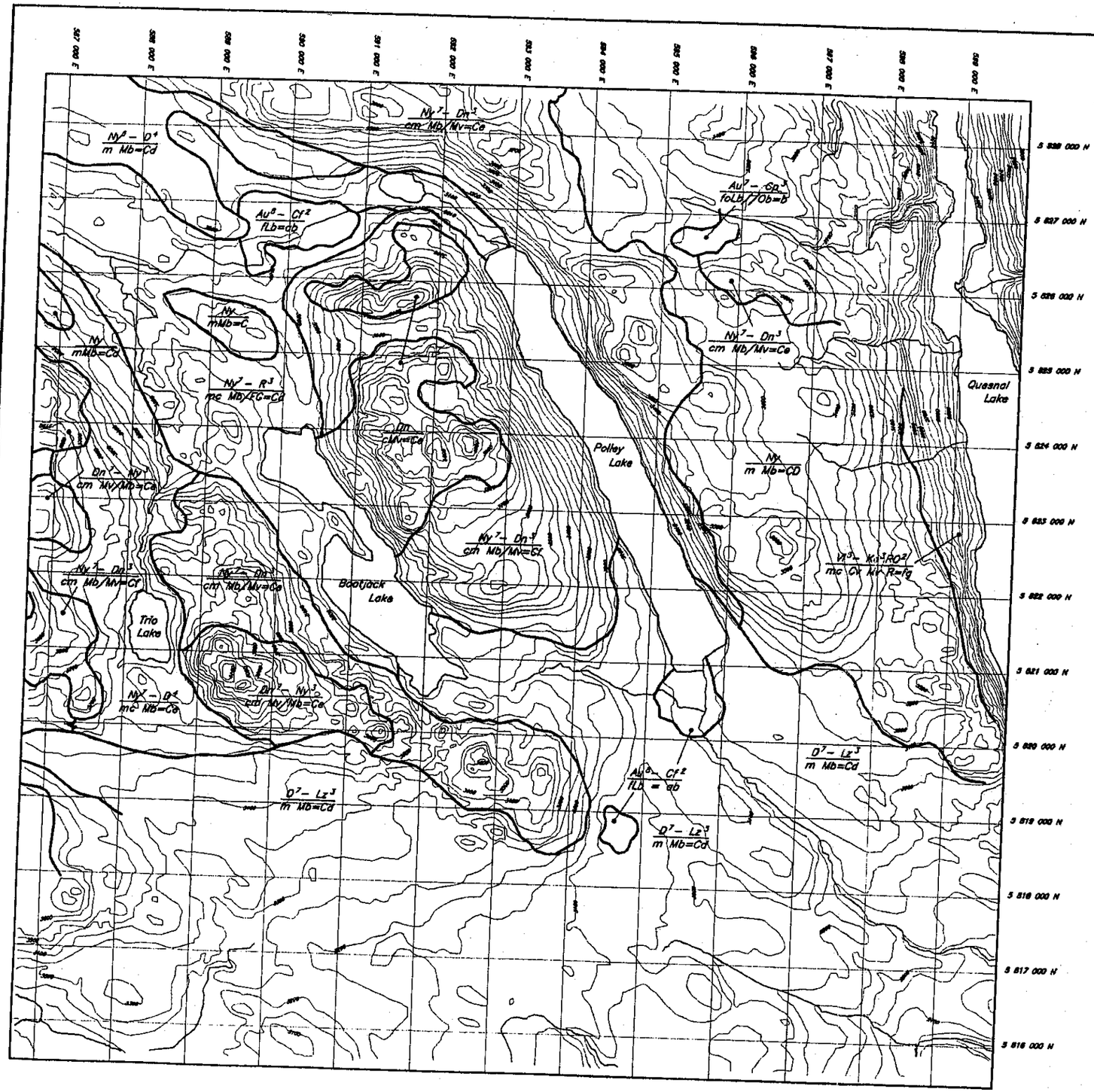
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APPENDIX A

Soils and Landforms Figure



NOTE:
Contours are in feet.

Scale 1000 500 0 1000 2000 3000 Metres

OLD FILE: \PROJECTS\1005\H1221\05.94 1:20000 PRT 1:50 MAR 30, 1995

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

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IMPERIAL METALS CORPORATION

MT. POLLEY PROJECT

SOILS AND LANDFORMS IN THE MOUNT POLLEY AREA
SHEET 1 OF 2
FIGURE 2.3

DESIGNED	DJR
DRAWN	VY
CHECKED	–
APPROVED	
DATE	----
SCALE AS SHOWN	
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REV.	—

IMPERIAL METALS CORPORATION
MT. POLLEY PROJECT
SOILS AND LANDFORMS MAP LEGEND

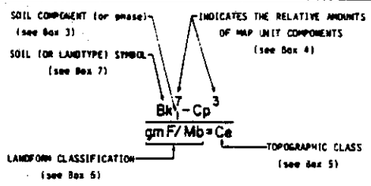
1. Explanatory Notes

The information contained in the following boxes explains some important characteristics of the soils and landforms that were mapped at a reconnaissance level of investigation. Each of the individual boxes is cross referenced.

The information provided in this legend is brief. Further details on the soils and their environment are provided in the soil reports and maps for adjoining soil survey areas No. 24,25,31,36 and 40. The report and maps Soils of the Horsefly Area is in preparation for printing.

This key describes all soils and landforms mapped at a scale of 1:50 000 for maps 93A/3,4,5,6,11,12,13,14

2. Example



3. Soil Components

Where soil components are used they are shown and characterized in Box 7. Some map unit numbers refer to soil component numbers used in adjoining survey areas.

4. Composite Units

Composite units are employed where two or three types of map unit components are intermixed or occupy such small areas that they cannot be designated as separate units at the scale of mapping.

Numbers show the relative amounts of each soil or land type component of a map unit as: 9 (90%), 8 (80%), 7 (70%), 6 (60%), 5 (50%), 4 (40%), 3 (30%), 2 (20%), 1 (10%).

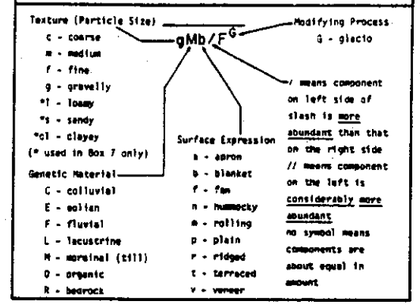
The components of the denominator are described in Boxes 5 and 6.

5. Topographic Classes[1]

Simple Topography	Complex Topography	Slope
Single Slopes (regular surface)	Complex Slopes (irregular surface)	%
A depressional to level	a nearly level	0-0.5
B very gently sloping	b gently undulating	0.5-2
C gently sloping	c undulating	2-5
D moderately sloping	d gently rolling	5-9
E strongly sloping	e moderately rolling	9-15
F steeply sloping	f strongly rolling	15-30
G very steeply sloping	g hilly	30-60
H extremely sloping	h very hilly	over 60

[1]Ref. The System of Soil Classification for Canada 1974, (revised).

6. Landform Classification



7. SOIL ASSOCIATION DESCRIPTIONS

Symbol	Map Unit	Biogeoclimatic Zones and Sub-Zones (see Box 8)	Soil Parent Material (see Box 6)	Most Common Soil	Most Common Soil Drainage (see Box 9)	Comments
Au	Ahbau	SBS b,c	l & clM	Orthic Luvic Gleysol	p	associated with Chief soils
B	Bednesti	SBS b	IL	Brunisolic Gray Luvisol	m	in Soil Reports No. 2, 4, 10, 31
Cf	Chief	SBS b,c	O	Typic Mesisol	vp	in Soil Reports No. 2, 31
Cp	Captain Creek	IWH b, ESSF b	glm	Orthic Humo-Ferric Podzol	m	seepage areas common
D	Deserters	SBS b	gslm	Brunisolic Gray Luvisol	m	drumlinized areas of Fraser Plateau
Dn	Dragon	SBS b, IWH a	slMv	Orthic Humo-Ferric Podzol	w	on high areas of the plateau
(E)	eroded phase					
Hr	Heger	SBS b, ESSF b	gsC	Eluviated Dystric Brunisol	w	associated with lithic soils overlying metamorphic rock
Ko_1	Keno Lake	IWH b	gsM	Orthic Humo-Ferric Podzol	w	
Ko_2	Keno Lake	IWH b	gsM	Orthic Humo-Ferric Podzol	w	associated with imperfectly drained soils
Lz	Lanezi	IWh a	lm	Luvisolic Humo-Ferric Podzol	m	similar to Dominion soils
Hy	Hyland	SBS b	lM	Podzolic Gray Luvisol	m	similar to Dominion soils (Report 23)
R	Ramsey	SBS b, IWH b	gsFG	Orthic Humo-Ferric Podzol	r	wetter valleys
RO	Rockland	land type				
Vl	Vieuland	ESSF b	gslM	Lithic Humo-Ferric Podzol	r	similar to Keno Lake soils

8. Forest Zonation Symbols[1]

Biogeoclimatic zones and subzones are used instead of forest zones.

AT	Alpine Tundra Zone
ESSFb	Engelmann Spruce - Subalpine Fir (wet subzone)
IWHa	Interior Western Hemlock (cedar subzone)
IWHb	Interior Western Hemlock (wet subzone)
SBSb	Subboreal Spruce (Douglas fir - white spruce subzone)
SBSc	Subboreal Spruce (white spruce - subalpine fir - Douglas fir subzone)
IDF b	Interior Douglas fir (pinegrass subzone)

[1]Ref. Annas & Coupé 1979

9. Drainage Classes

r	Rapidly drained	The soil moisture content seldom exceeds field capacity in any horizon except immediately after water additions.
w	Well drained	The soil moisture content does not normally exceed field capacity in any horizon (except possibly the C) for a significant part of the year.
m	Moderately well drained	The soil moisture in excess of field capacity remains for a small but significant period of the year.
i	Imperfectly drained	The soil moisture in excess of field capacity remains in sub-surface horizons for moderately long periods during the year.
p	Poorly drained	The soil moisture in excess of field capacity remains in all horizons a larger part of the year.
vp	Very poorly drained	Free water remains at or within 12 inches (30 cm) of the surface most of the year.

10. References

E.L.U.C. Secretariat, 1976 - Terrain Classification System

Canada Soil Survey Committee (C.S.S.C.), 1978 - The Canadian System of Soil Classification, Can. Dep. Agric. Publ. 1646

Annas, R.M. and R. Coupe 1979. Biogeoclimatic zones and subzones of the Cariboo Forest Region.

Soil Survey Reports No. 2, 4, 10, 25, 31, 36.

Background Materials

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Soil Data File contains physical and chemical data of most soil associations described in the area.

Maps and reports available from and information from SDF (see key):

The Map Library
Assessment and Planning Division
Ministry of Environment
Parliament Buildings
Victoria, B.C.
V8V 1X4

11. Credits

Mapping by T. Lord, Agriculture Canada

Mapping correlated by T. Lord, Agriculture Canada

Date of field mapping: 1971-73

Photography used for Mapping:

Date: 1970

Scale: 80ch ,40ch

Drafted by Cartography Section, Resource Analysis Branch, Ministry of Environment, Victoria, British Columbia

Date: 1972

Revision Dates: 1976, 1980, ____, ____

Base map provided by Map Production Division, Surveys and Mapping Branch, Ministry of Environment, Victoria, British Columbia

SOILS LEGEND
For the Horsefly River – Keithley Creek Map Area
Sheet 2 of 2

CAD FILE: \PROJECT\1000\H1221\FIG84 Plot 1of1

Mar. 23, 1995

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FIGURE 2.3

APPENDIX B

Reclamation Revegetation Assessment Form

MOUNT POLLEY RECLAMATION RE-VEGETATION ASSESSMENT FORM

Date: _____ Transect: _____
Assessor(s): _____ Plot: _____
Reclamation Site: _____ Plot Size: _____
Site Conditions (slope position, slope angle, aspect): _____

Ground Surface

Surface Roughening (present, description):	
Coarse Woody Debris (% cover, types):	

Understorey Vegetation

General

% Cover (all species)	
% Cover (invasive species)	
Average Height (m)	
Vigor (0 - 5)	

Species Specific

Species	# Species	% Cover	Height (m)	Vigor (0 - 5)	Planted/Ingress/Invasive

Trees/Shrubs

Species	# Present	Average Height (m)		Vigour (0 - 5)	Planted/Ingress

Wildlife Value

Wildlife Observations:	
Habitat Types Present:	

Comments

(ex. erosion, variation across plot)

APPENDIX C

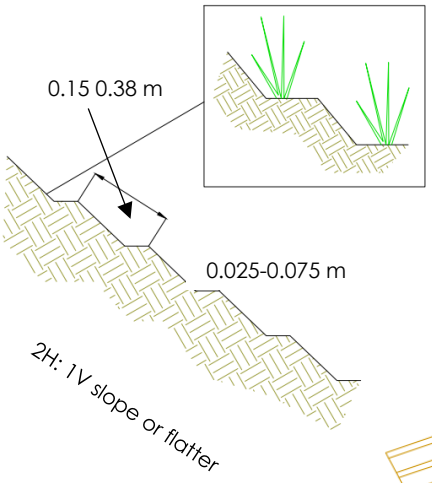
Best Management Practices

Surface Texturing

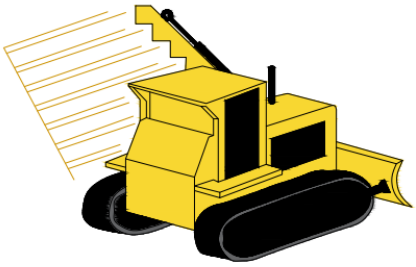
Runoff and Erosion Control BMP

BMP # 1

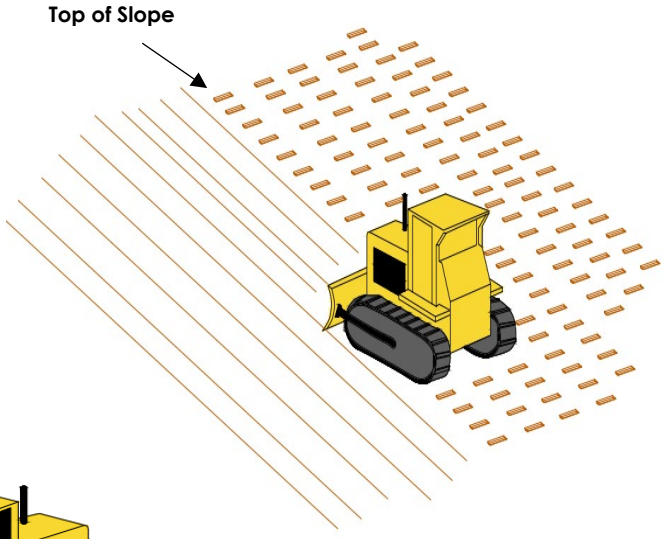
Temporary or Permanent BMP



Surface Roughening



Surface Grooves



Track Packing



Surface Roughening



Track Packing

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Refer to BC Ministry of Transportation & Infrastructure's document titled, *Standard Specifications for Highway Construction* – Section 751 – Topsoil and Landscape Grading for more details.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Surface Texturing

Runoff and Erosion Control BMP

BMP # 1

Temporary or Permanent BMP

Description and Purpose:

- Build textured slopes by roughening the surface, track packing the surface, or installing serrated grooves (horizontal, not vertical which may increase rill and gully erosion).
- Texturing reduces the runoff velocity, traps sediment, and increases the water infiltration and is used in many applications to aid in slope stabilization and re-vegetation prescriptions.

Applications:

- Temporary or permanent slope treatment to allow for vegetation to initialize and reduce the surface runoff velocities.
- May be used to roughen exposed soils (of at least a 2:1 slope or flatter for finer textured soils and a 1.5:1 slope if using a gravel material) in the direction of surface flow to minimize erosion and trap sediment and soils nutrients.
- Application will be dependent on soil texture, environmental conditions (e.g., precipitation, runoff, snow melt), slope angle and length, fill slope (uncompacted soils), cut slope (untouched native soils may be more stable).
- May be used on graded soils with smooth surfaces to interrupt surface flows.
- Can be used on slopes that will not be immediately topsoiled, vegetated, or otherwise stabilized.
- May be applied to topsoiled slopes to provide track serration to further reduce erosion potential.

Construction:

- Surface Roughening (rough and loose):
  - Leave soil in rough grade condition; do not smooth grade soil, the large clods of soil will help slow runoff velocities, trap sediment, and increase infiltration of surface flows.
  - Can place large woody debris (LWD) on the slope surface to enhance recovery.
  - Can excavate holes (excavator bucket size) and mound soils for roughness. Excavating holes and mounding soils along the treatment area will achieve rough and loose.
- Track Packing:
  - Use tracked equipment to move up and down the slope, leaving small depressions on the surface. Limit over-compaction of the surface. Depressions will help with decreasing runoff velocities, trap sediment, and increase infiltration.
  - Track packing a slope will create micro-sites in the soil and promote vegetative growth.
- Surface Grooves:
  - Excavate shallow grooves perpendicularly across the width of the slope. Grooves should be approximately 0.1 to 0.2 m in depth and can be made by hand or via teeth on an excavator's digging bucket.

Considerations:

- It is important to minimize the loosening of soil by turning equipment at the end of each pass.
- Keep tracking passes to 1 or 2-times to avoid over-compaction; over-compacted soils will impede infiltration and vegetation growth.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Surface Texturing

Runoff and Erosion Control BMP

BMP # 1

Temporary or Permanent BMP

- Roughening of low height slopes may not be required as the erosion potential is lower for a slope of low vertical height (3H:1V).
- Re-vegetate the exposed soils as soon as practical.

Inspection and Maintenance:

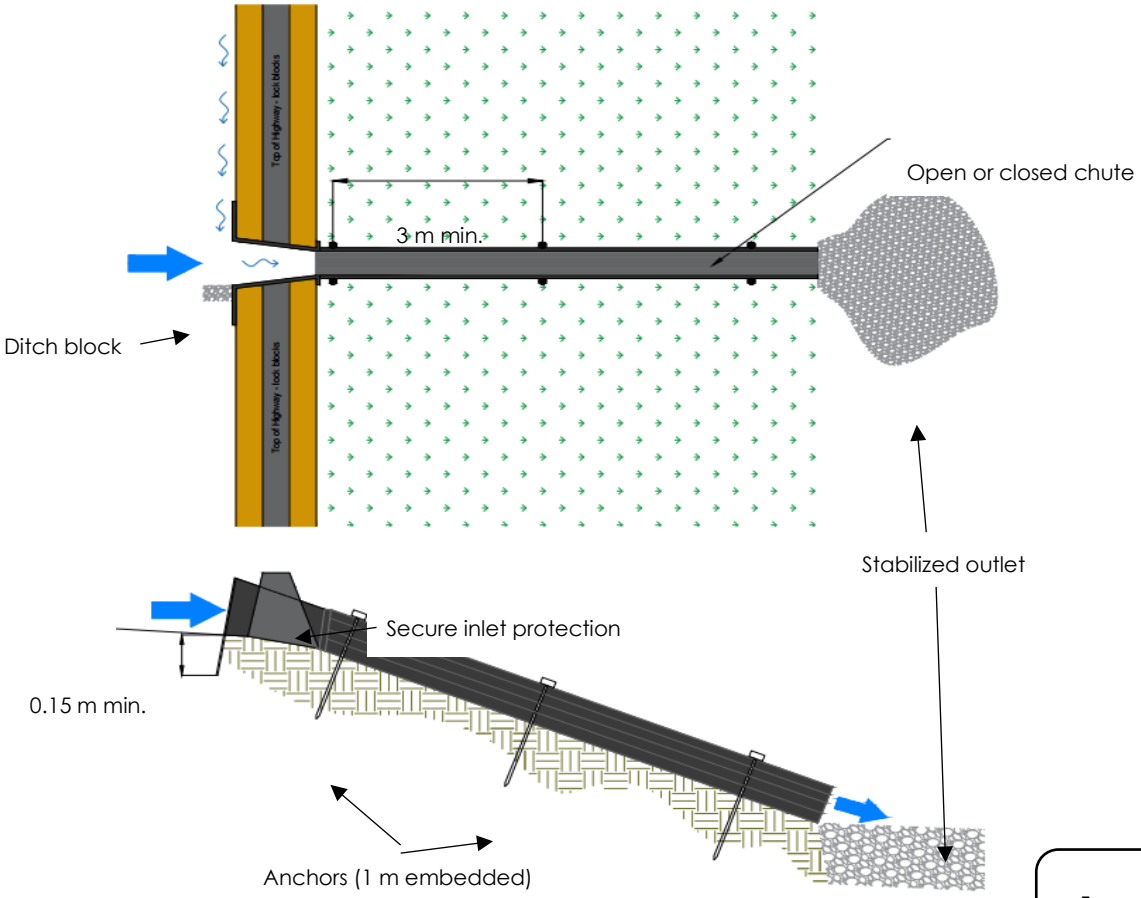
- Inspect slopes following rain events for signs of erosion and assess the effectiveness of vegetation following one growing season; the slope may require more surface preparation and re-vegetation efforts.

Slope Drains

Runoff and Erosion Control BMP

BMP # 2

Temporary or Permanent BMP



Slope Drains



Closed chute flexible drain



Open chute fixed drain

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Slope Drains

Runoff and Erosion Control BMP

BMP # 2

Temporary or Permanent BMP

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Description and Purpose:

- Slope drains are heavy duty (often flexible) pipe that convey runoff from the top of the slope to the bottom while preventing concentrated erosion on the face of the slope.

Applications:

- Temporary or permanent measure.
- Used on slopes where there is a high potential for erosion over the face of the slope.
- Used in conjunction with water containment or diversion structures, such as diversion channels, berms, or barriers to convey and direct runoff into slope drains.

Construction:

- Construct a diversion or intercept channel, ditch block, barrier, or other inflow apron structure at the crest of slope to channel the flow toward the slope drain inflow.
- Install the slope drain through an inlet berm or into the shoulder of the road with a minimum of 0.45 m of soil cover overtop of drainpipe, as to secure or key-in the inlet.
- Install scour inlet protection (such as riprap, sandbags, pavement, or asphalt curb).
- Install an energy dissipator (such as riprap, gravel, or concrete) at the outlet of the slope drain; the outlet must not discharge directly onto unprotected soil.
- Secure the pipe from movement by tying to steel anchor stakes, hold-down grommets, or other approved anchor methods.
- Space anchors on each side of the drainpipe at maximum 3 m intervals along the entire length of the drainpipe.

Considerations:

- Ensure drains are sized correctly to accommodate anticipated flow volumes (Q-10); install more drains if one drain will not carry anticipated flows.
- Armour and secure the drain inlet to ensure runoff will not go around the drain and erode the slope.
- If constructing a temporary inflow apron out of sandbags at the crest of slope, only fill each sandbag ¾ full; this will allow the sandbag to be flexible enough to mould around the drainpipe and remain in continuous contact with the ground.
- Construct an energy dissipator (see BMP#6) at the outlet of the drain to minimize erosion.
- The slope drain must be anchored securely to the face of the slope.

Slope Drains

Runoff and Erosion Control BMP

BMP # 2

Temporary or Permanent BMP

Inspection and Maintenance:

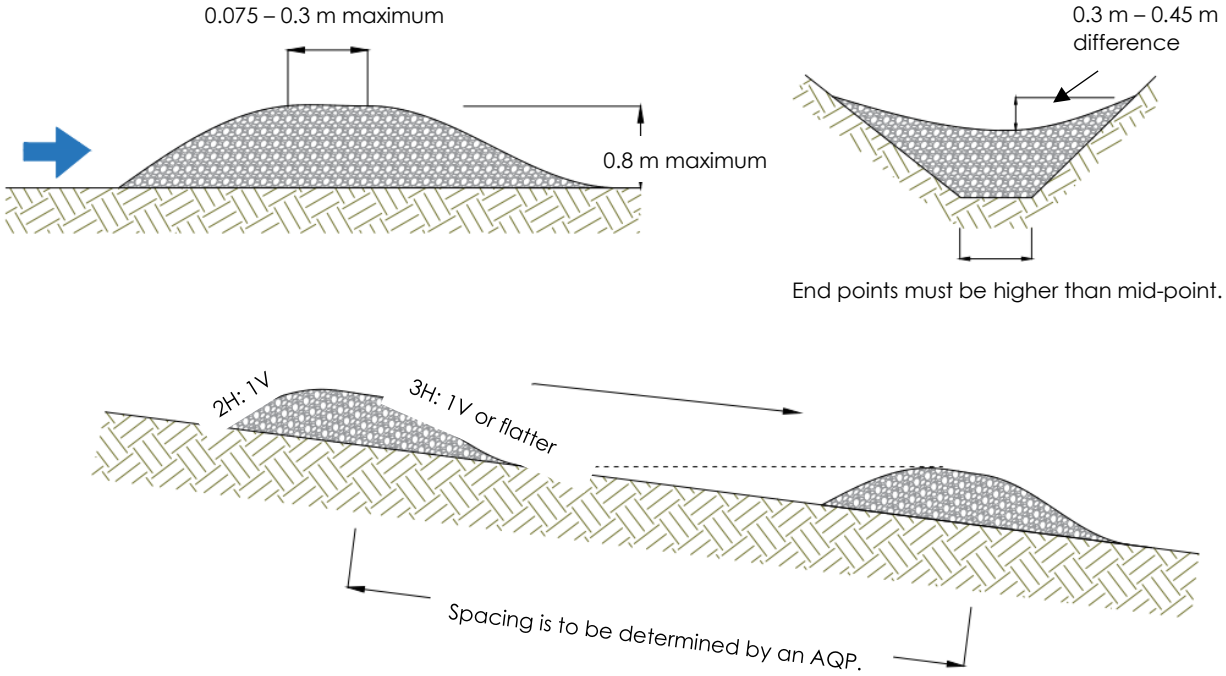
- Regularly inspect drains to ensure that the structures are still anchored and not eroding the face of the slope.
- Repair sections of pipe as soon as possible; install more anchors if the drain is moving.
- Check for signs of erosion at the outlet of the drainpipe.
- Regularly remove sediment from the drain inlet.

Check Dam

Erosion and Sediment Control BMP

BMP # 4

Temporary or Permanent BMP



Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Description and Purpose:

- Small dam constructed of rocks placed across an unnatural roadside drainage course only.
- Decreases flow velocities caused by storm runoff to reduce potential erosion.
- Sediment-laden runoff is retained behind the structure, allowing sediment to settle out.

Applications:

- A permanent measure but can be used temporarily during construction.
- Reduces a long run into shorter intervals of gentle grades between structures.
- Reduces flow velocities and kinetic energy and will decrease erosion potential.
- Used in ditches where control runoff velocities are less than 1.5 m/s.

Construction:

- Key in the structure extending from one side of the ditch or channel to the other side.
- Place non-woven geotextile fabric over footprint area of the rock check dam.

Check Dam

Erosion and Sediment Control BMP

BMP # 4

Temporary or Permanent BMP

- The structure should be constructed so that the centre of the crest is a minimum of 0.3 m lower than the outer edges.
- Height of structures should be less than 0.8 m to avoid impounding large volumes of runoff.

Considerations:

- Height and spacing between structures should be designed to reduce steeper slopes in ditches to intervals of flatter gradient.
- Structures should be constructed of free draining aggregate with limited fines.
- Aggregate used should have a mean diameter (D_{50}) of between 0.075 m and 0.15 m and must be large enough to remain in place during high velocity flow situations. Maximum rock diameter should not exceed 0.15 m if the structure is to be used as a sediment trap.
- If structures are placed in channels with ordinary high flows, they must be properly designed for stone size and structure spacings.
- Check dam not to be used in any fish-bearing watercourse as it will block fish passage.

Inspection and Maintenance:

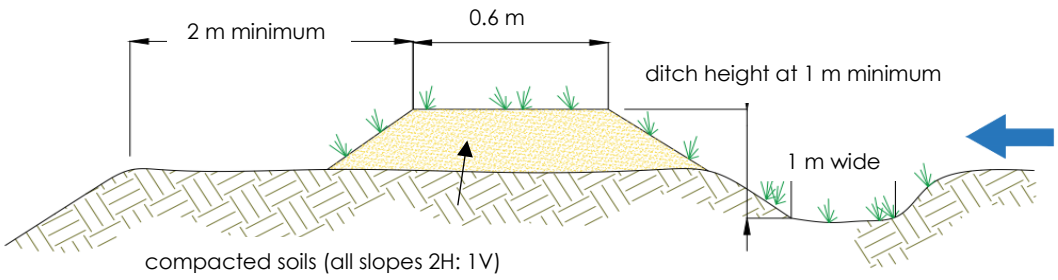
- Regularly inspect structures (i.e., weekly or after a heavy rain event) to ensure they are intact, and water has not eroded around them.
- Repairs should be made immediately.
- Remove sediment build-up before it reaches one half the structure height.
- Replace dislodged aggregate immediately with heavier aggregate.

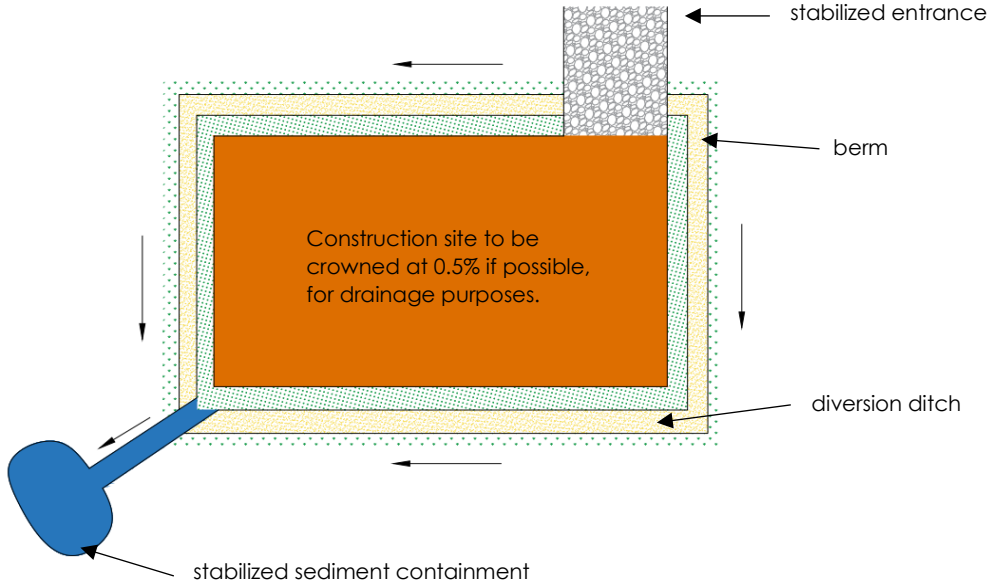
Diversion Ditch

Runoff Control BMP

BMP # 5

Temporary or Permanent BMP







Perimeter Ditch



Diversion Ditch

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Please refer to the *Standard Specifications for Highway Construction* Section 165.10.08 Channel Diversions for more information.

Diversion Ditch

Runoff Control BMP

BMP # 5

Temporary or Permanent BMP

Description and Purpose:

- Channels, or swales, excavated along the top of slopes to intercept and convey runoff away from exposed slopes and to minimize erosion.
- Also used to temporarily convey runoff around a site during the construction phase.
- Often carries water to slope drains or sediment basins which carry water further downslope.

Applications:

- Permanent and temporary measure.
- Effective method of intercepting runoff to avoid excessive sheet flow over a slope and reduce erosion in highly erodible soils.
- Can be used in conjunction with slope drains, sediment traps or sediment basins, check dam structures, or permeable synthetic barriers.
- Temporarily divert surface flows around a construction site on a poly-lined channel.
- The ditch should have positive grade to facilitate drainage.
- For sensitive high-risk areas, the ditch should be stabilized with an impermeable membrane, riprap, or vegetation.

Construction:

- Excavate the ditch a minimum offset distance of 2 m between the crest of the slope and the top of the diversion ditch side slope.
- Alternatively, place the diversion ditch outside of the construction activities but within the limits of construction (i.e., within the highway right-of-way).
- Place and compact excavated soil to form a berm between the crest of slope and the diversion ditch channel to provide adequate depth of the diversion ditch:
    - The consequence of failure of the berm will determine the level of compaction effort.
    - Side slopes of the diversion ditch should not be steeper than 2H:1V.
    - The depth of the diversion ditch (from base of ditch to top of embankment) should be a minimum of 1 m; the width of the ditch should also be 1 m minimum.
    - The ditch should be graded at a minimum of 1% to promote positive drainage and outfall.

Considerations:

- The ditch should be graded toward the nearest outfall or drainage pipe.
- A sediment basin or trap can be installed at the outfall, and the outflow of trap armoured with an energy dissipator.

Diversion Ditch

Runoff Control BMP

BMP # 5

Temporary or Permanent BMP

Inspection and Maintenance:

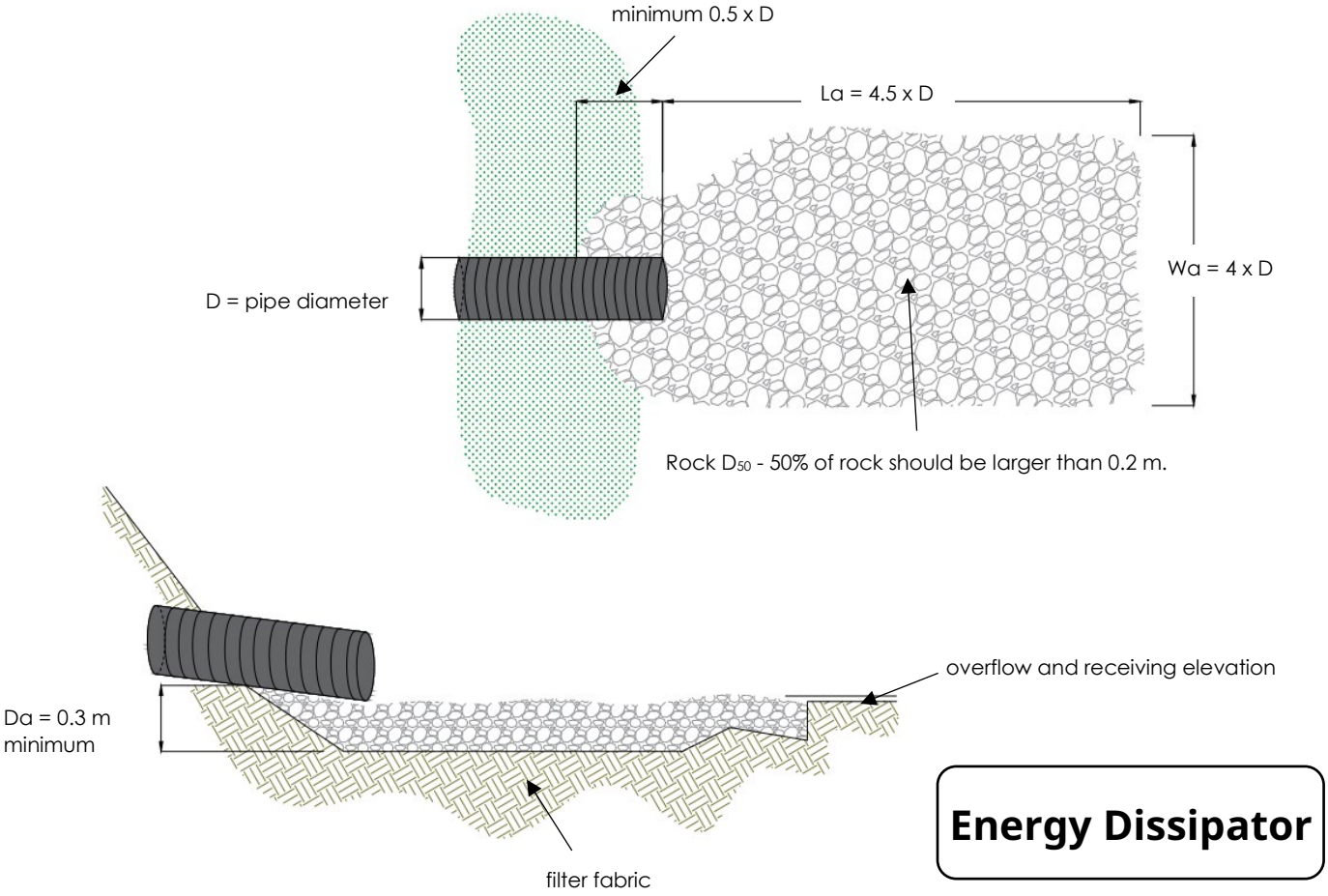
- Regularly inspect ditch (i.e., bi-weekly or after a heavy rain event) to ensure no damage has occurred.
- Repair any damage to the channel immediately.
- Remove any built-up sediment within the channel; sediment removal and ditch maintenance may be difficult due to limited access following construction.

Energy Dissipator

Runoff and Erosion Control BMP

BMP # 6

Temporary or Permanent BMP





Culvert Outlet Energy Dissipator



Ditch Energy Dissipator

Energy Dissipator

Runoff and Erosion Control BMP

BMP # 6

Temporary or Permanent BMP

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Description and Purpose:

- Hard armour (riprap, cobble, cured and washed concrete) placed at pipe outlets, in channels, and at downstream side of check dam structures to reduce velocity and dissipate energy of concentrated flows to withstand a peak runoff event.
- Minimizes scour erosion at outflow.
- Geotextile cloth, plastic, sandbags, or woody debris can be used as a temporary measure.

Applications:

- Permanent and temporary measure.
- Used at outlets of pipes, slope drains, culverts, conduits, or channels with substantial flows.
- May be used where lined channels or pumping operations discharge into unlined channels.
- May be used as splash pad on downstream side of gabions, check dam structures, berms, barriers, and silt fences to prevent erosion caused by runoff overtopping these structures.

Construction:

- Grade the area to final design grades and elevations; sub-excavate energy dissipater location to thickness of energy dissipater. Outlet grade should be zero and aligned straight out of the pipe.
- Place filtration bedding material on base of excavation; bedding can be composed of well-graded sand and gravel or non-woven geotextile fabric. This acts as a separating filter between fine-grained subgrade and riprap size energy dissipating material.
- Filter material should be geotextile fabric or 0.15 m (minimum grade) gravel layer
- Place energy dissipating material (permanent or temporary) over filtration bedding material.
- The top of the energy dissipater should be flush with the surrounding grade.

Considerations:

- Length of energy dissipater (La) at outlets should be of sufficient length to dissipate energy (La = 4.5 x D; where D = diameter of pipe in m).
- Width (Wa) at outlets should be of sufficient width to contain and dissipate energy (Wa = 4 x D).
- Thickness of energy dissipater (da) at outlets should be a minimum thickness of 0.3 m.
- Energy dissipater should be constructed of well-graded riprap, minimum D_{50} = 0.2 m, (preferable D_{50} = 0.3 m).
- The energy dissipater should be constructed flush with the surrounding grade and should be directly in line with direction of outlet flow.

Energy Dissipator

Runoff and Erosion Control BMP

BMP # 6

Temporary or Permanent BMP

Inspection and Maintenance:

- Regularly inspect ditch (i.e., bi-weekly or after a heavy rain event) to ensure no damage has occurred.
- Repair any damage immediately.
- Remove any built-up sediment within the structure; sediment removal and ditch maintenance may be difficult due to limited access following construction.

Seeding & Hydro Seeding

Erosion Control BMP

BMP # 11

Permanent BMP



Native seed mix along streambanks



Application of hydroseed

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Refer to BC Ministry of Transportation & Infrastructure's document titled, *Standard Specifications for Highway Construction* – Section 757 – Revegetation Seeding for more details.

Description and Purpose:

Seeding

- Planting seed after a layer of organic topsoil has been spread is optimal.
- Provides erosion protection through a shallow root structure from seed germination and plant growth.

Hydroseeding

- Spraying a slurry to a slope or channel surface to provide a layer of seed and growing medium.
- The slurry consists of seed, fertilizer, mulch, tackifiers, and water which are mixed in a tank.
- Hydroseeding enables quick re-vegetation of very steep or rocky/gravelly slopes where re-vegetation by any other method would be very difficult or unsafe.
- When sprayed on the soil, the slurry forms a continuous blanket with seeds, and protects the soil from wind and water erosion and raindrop impact by adhering them in place.
- The slurry conserves moisture, reduces soil moisture evaporation, and decreases soil surface crusting due to evaporation or drying of soil.

Applications:

Seeding

- Revegetation seeding with rapidly growing plants may be applied to exposed soil areas which will be exposed for more than 30 days.
- Revegetation seeding should be applied to exposed soil areas that have been graded to final contours as soon as possible.

Seeding & Hydro Seeding

Erosion Control BMP

BMP # 11

Permanent BMP

- Revegetation seeding may be applied to landscape corridors, slopes, and channels via broadcasting or hydraulically with mulch and tackifier.
- Erosion control can be enhanced with a protective layer of mulches or rolled erosion control products (RECPs) to improve the growth environment and provide protection for the soils.

Hydroseeding

- Slurry is held in suspension through consistent agitation and is sprayed onto disturbed areas using high pressure pumps.
- Can be used for spray-on seeding, covering large areas efficiently after placement of topsoil.
- Can be used to provide temporary or permanent erosion control before vegetation is established.
- May be used to provide soil stabilization for disturbed areas.
- Can also be used with higher efficiency and larger area coverage with advantages over conventional methods (broadcast seeders, drill seeders).
- Can be used in areas where little topsoil is available.

Installation:

- Prepare soil surface by removing large rocks or other deleterious materials.
- Apply topsoil if available.
- Spray on hydroseed as per supplier's recommendations.
- Apply seed as per the **BC MOTI Standard Specifications Section 757**
- Fertilizer should be applied after seeding, only to areas outside of the riparian zone.

Considerations:

- Selection of an appropriate seed mix depends on soil conditions, climate conditions, topography, land use, and regional location.
- Refer to the **BC MOTI Standard Specifications Section 757** for updated regional seed mixtures.
- Planting via hydro-seeding and mulching techniques should be considered for slopes steeper than 3H:1V where seedbed preparation may be difficult.
- Fertilizer use should be carefully controlled as this may increase nutrient loading to receiving environments (i.e., water bodies) if the runoff is not controlled properly.
- Seeding should occur during periods when germination of plants will have enough time to establish before the end of the growing season or periods of drought or frost.
- Mulch is required when broadcast seeding or if seeding is applied outside of the growing season.
- Consult a local seed supplier, Professional Agrologist, or Ministry Representative for specific needs of the local growth environment and specific planting design.
- Seed selection should be made in accordance with BC MOTI regionally approved seed mixes.

Seeding & Hydro Seeding

Erosion Control BMP

BMP # 11

Permanent BMP

Inspection and Maintenance:

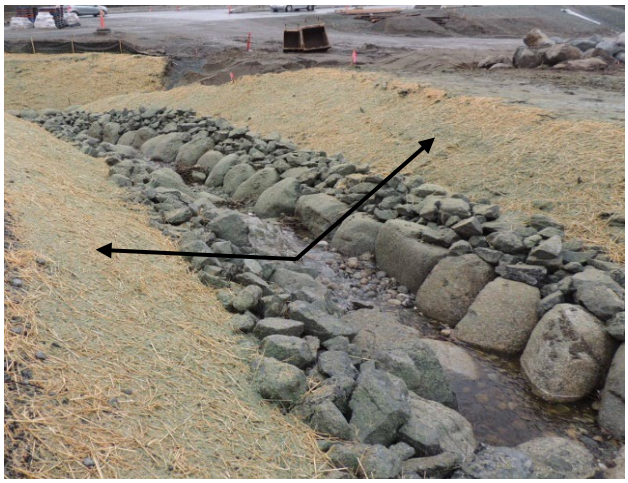
- Inspection frequency should be in accordance with the site-specific Erosion and Sediment control Plan (ESCP).
- Bare or damaged areas may need to be reseeded following initial application.
- Freshly seeded areas should be inspected frequently to ensure successful growth. Reseeding some areas may be required.

Mulching

Erosion and Sediment Control BMP

BMP # 12

Permanent BMP



Straw Mulch



Hydromulch after application

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Refer to BC Ministry of Transportation & Infrastructure's document titled, *Standard Specifications for Highway Construction* –Section 754 – Planting of Trees, Shrubs and Ground Covers and Section 757 – Revegetation Seeding for more details.

Description and Purpose:

Mulching

- Application of organic material or other biodegradable substances as a protection layer to the soil surface to: (a) minimize raindrop/runoff erosion and, (b) conserve a desirable soil moisture regime for plant growth and promote seed germination and plant growth.
- Mulch conserves soil moisture and reduces runoff velocities and surface erosion, as well as controls weeds, helps to establish plant cover, and protects seeds from predators.

Hydromulching

- Spraying a slurry to a slope or channel surface provides a layer of growing medium.
- The slurry consists of cellulose, wood fibre, or a bonded fibre-matrix that conserves moisture, reduces soil moisture evaporation, and decreases soil surface crusting due to evaporation or drying of soil.

Applications:

- Permanent measure.
- Used as an organic medium for seeds where topsoil is not readily available or sufficient.
- May be used with or without seeding in areas that are rough graded or final graded.
- Usually applied in conjunction with an approved seed mix to promote plant growth.

Mulching

Erosion and Sediment Control BMP

BMP # 12

Permanent BMP

- Various organic mulches include straw, wood fibres, peat moss, wood chips, compost, or chemical mulches that are mixed with water.
- Chemical mulches are used to bind hydro-seeding or hydro-mulching applications together.
- Hydromulching can be used in areas where little topsoil is available.

Installation:

- Prepare soil surface by removing large debris and roughening up the soils so they are loosely compacted.
- Apply seed, and if necessary, topsoil to nutrient-deficient soils.
- Apply mulch as per supplier's or qualified professional's recommendations; mulch application should be stated in the ESCP, EMP, or design drawings for specific instructions.
- Spray on hydromulch as per the supplier's recommendations.
- Certain mulches may require additional anchoring to minimize loss of mulch due to wind or water erosion.

Considerations:

Types of mulches:

Manual/dry applied erosion control products

- Straw
  - Refers to stalks or stems of small grain (should be inspected by AQP to ensure it is free of seeds, weeds, and invasive plants).
  - Loose straw should be anchored as it is very susceptible to movement by wind and water.
  - When properly secured to surface, straw creates a suitable micro-climate for promoting grass cover; however, it may be a fire hazard in dry conditions.
  - Do not use hay bales as they are more likely to contain invasive species.
- Bark Mulch
  - Bark mulch shall be sized 25 mm or less, from Douglas Fir or Hemlock bark chips and fines, or a combination of both types, and of the quality used for decorative landscape mulching purposes.
  - It should be free of chunks and sticks, dark brown in colour and free of all soil, stones, roots, or other extraneous matter.

Hydraulically applied erosion control products

- Wood Fibre
  - Composed of whole wood chips and provides quick and uniform method and medium for re-vegetating large areas quickly and economically.
  - Longer fibre length will last longer and has better wet-dry characteristics than cellulose.
  - Provides limited erosion control even when sprayed on with tackifiers.

- Bonded Fibre Matrices (BFM)
    - Slurry composed of either cellulose mulch, wood fibre mulch, or a combination of the two.
    - Mulches are bound together using a chemical bond and/or a mechanical bond.
        - Chemical bond must be limited to periods with no rain during curing period (24-hours).
        - Mechanically bonded BFMs have no curing time and are effective immediately.
    - All fibres and binding agents are premixed by the manufacturer, certifying quality assurance.
    - Well-suited for sites where worker safety and minimal ground disturbance are desired.

Inspection and Maintenance:

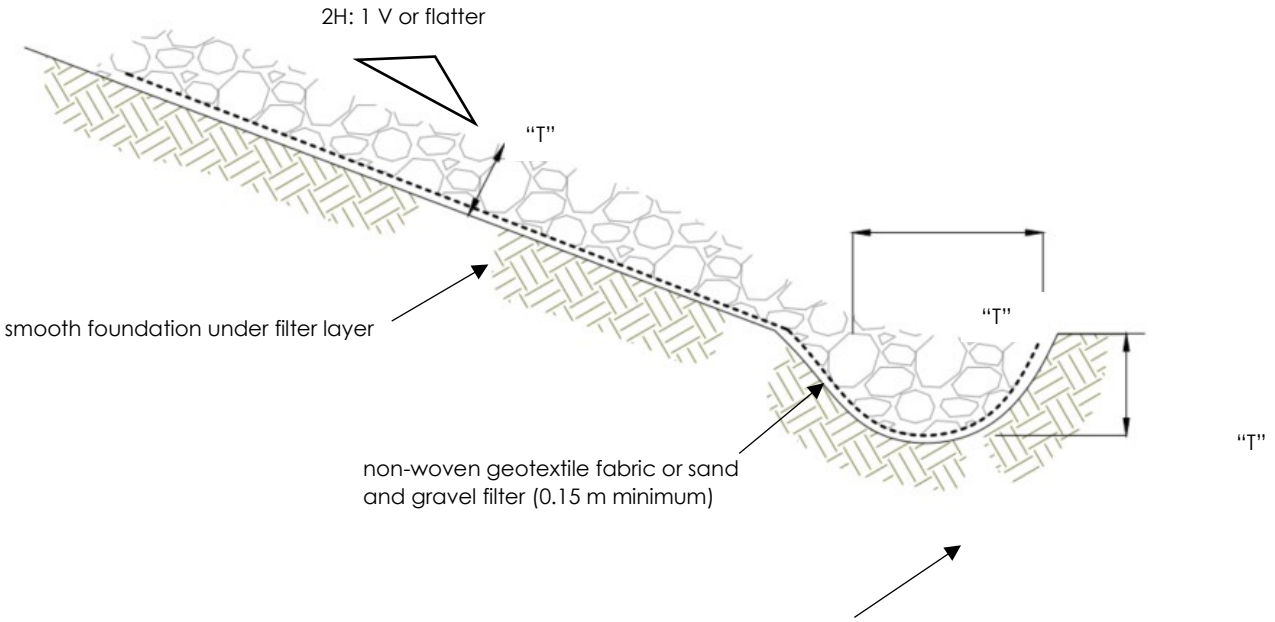
- Inspect mulched areas regularly (i.e., once per year or after significant storm events) until the site has stabilized.
- Areas damaged by washout or rilling should be re-graded and re-covered with mulch.
- Additional stormwater control measures should be considered for areas of severe rilling erosion.
- Small bare spots may need to be re-seeded and re-covered with mulch.

Riprap or Rock Cover

Erosion Control BMP

BMP # 16

Permanent BMP





Riprap cover under bridge



Rock cover on unstable soils

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Riprap or Rock Cover

Erosion Control BMP

BMP # 16

Permanent BMP

Description and Purpose:

- Large, loosely placed cobbles or ballast rock keyed-in along slopes to protect underlying soil from erosion.

Applications:

- Permanent measure for slope and channel protection.
- Often used to hold back slopes with ground water seepage that generally do not exceed 2H:1V
- Also used to protect stream banks from erosion around culverts or bridge structures.
- Other forms of soft armouring (Rolled Erosion Control Product, seeding) can be used to promote vegetation and protect soils at upper portion of slopes above the riprap.
- Should be used in conjunction with a non-woven geotextile underlay or a sand and gravel layer.

Construction:

- Shape the slope to specific design elevation.
- Anchor non-woven geotextile filter cloth on prepared slope before placing riprap.
- Filter layer can also consist of well-graded granular material, depending on seepage conditions; refer to a design engineer for more details regarding the filter layer.
- Riprap should consist of a graded mixture of sound, durable rock, as determined by an engineer.

Considerations:

- Riprap should be placed in a uniform thickness across the slope.
- Blasted rock is preferable (if available); test for acid rock drainage/metal leaching if unsure.
- Riprap layer should be 1.5 to 2 times the thickness of the largest rocks used and 1.5 to 3 times the thickness of the D_{50} material.
- Riprap should be sized according to engineering recommendations.

Inspection and Maintenance:

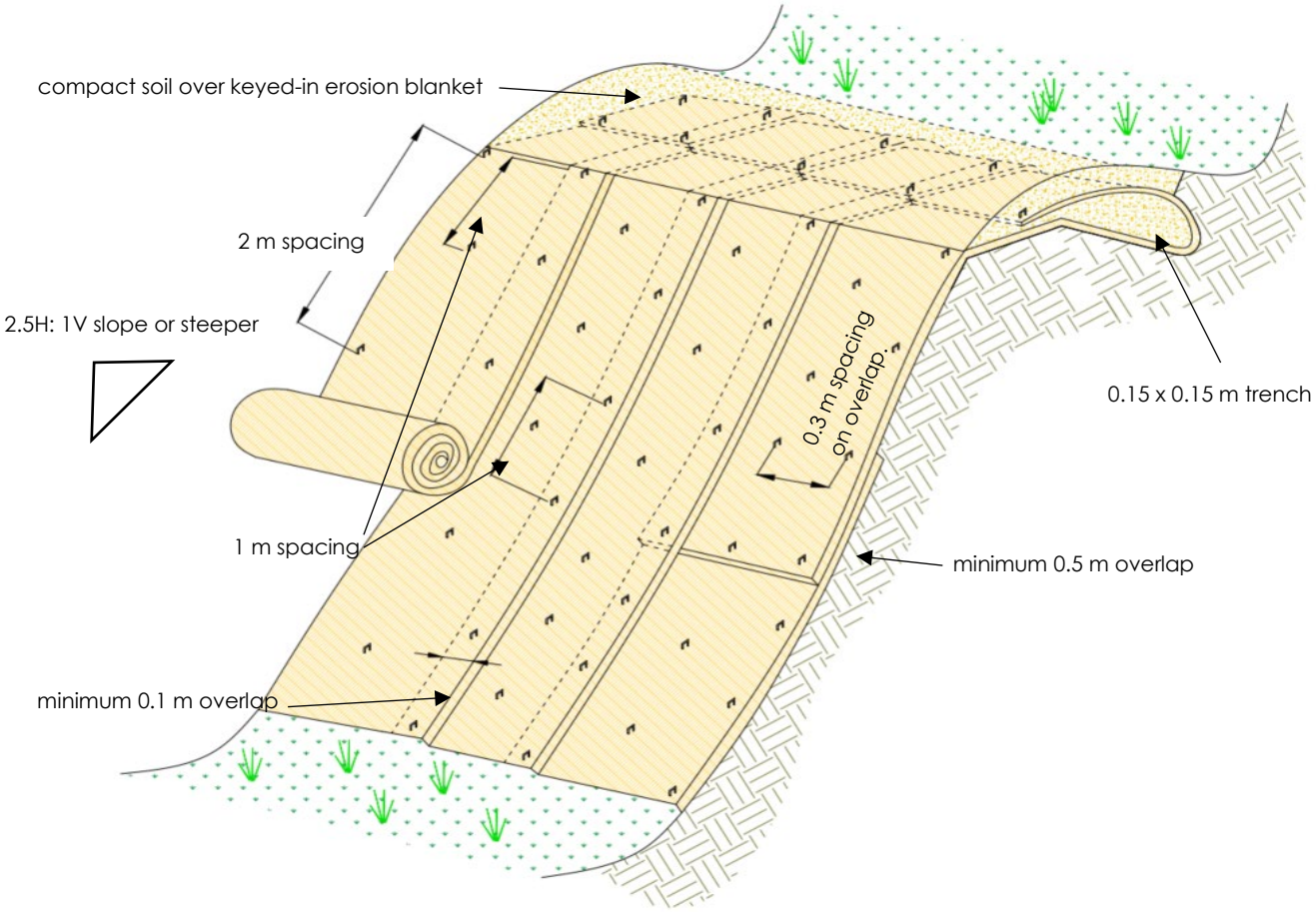
- Inspection frequency should be in accordance with the ESC Plans.
- Periodic inspections to check for erosion of protected material or movement of riprap is recommended.

Rolled Erosion Control Product

Erosion Control BMP

BMP # 18

Temporary or Permanent





RECP installed on a slope



RECP installed on a stream bank

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Rolled Erosion Control Product

Erosion Control BMP

BMP # 18

Temporary or Permanent

Description and Purpose:

- Biodegradable or synthetic covering used for temporary or permanent protection of soils.
- Rolled Erosion Control Product (RECP) may be manufactured of organic material, synthetic material, or as a composite of organic and synthetic materials.
- Protects disturbed soils and seed from raindrop impact, runoff, and wind erosion, increases water infiltration into soil, retains soil moisture, decreases evaporation loss, stabilizes temperatures to promote seed germination, and protects seeds from wildlife predation.

Applications:

- Temporary or permanent measure on slopes 3H:1V or steeper where erosion potential is high.
- May be used on slopes where vegetation is likely to be slow to develop.
- May also be used to protect disturbed exposed soils in ditches and non-fish bearing channels.

Construction:

- RECP should be installed in accordance with the manufacturer's directions:
  - Prepare surface and place seed and topsoil (if required).
  - The surface should be smooth and free of large rocks and debris.
  - The blanket should be anchored at the top of slope in a minimum 0.15 m by 0.15 m trench for the entire width of the blanket and rolled downslope.
- The upslope portion of the blanket should overlap the downslope portion (shingle style), at least 0.5 m with staple anchors placed a maximum 0.3 m apart on the overlap.
- Adjacent rolls of blanket should overlap a minimum of 0.1 m side-to-side and 0.5 m end-to-end.
- Anchors should be placed along the central portion of blanket spaced at $4/m^2$ minimum (0.5 m spacing) for slopes steeper than 2H:1V and $1/m^2$ (1 m spacing) for slopes flatter than 2H:1V.
- Anchors along splices between adjacent rolls should be placed 0.9 m apart.

Considerations:

- Ensure the blanket is in close contact with the soil by properly grading soil and removing rocks or deleterious materials prior to placing the blanket.
- The blanket should be anchored by using wire staples, metal geotextile stake pins, or triangular wooden stakes, of sufficient length to hold the mat in place.
  - Anchors should be between 0.15 to 0.2 m in length; use longer anchors for looser soils.
- Blankets should be placed longitudinal to the direction of flow, with fabric not stretched but maintaining contact with underlying soil.
- Store product out of direct sunlight until ready to install.

Rolled Erosion Control Product

Erosion Control BMP

BMP # 18

Temporary or Permanent

Inspection and Maintenance:

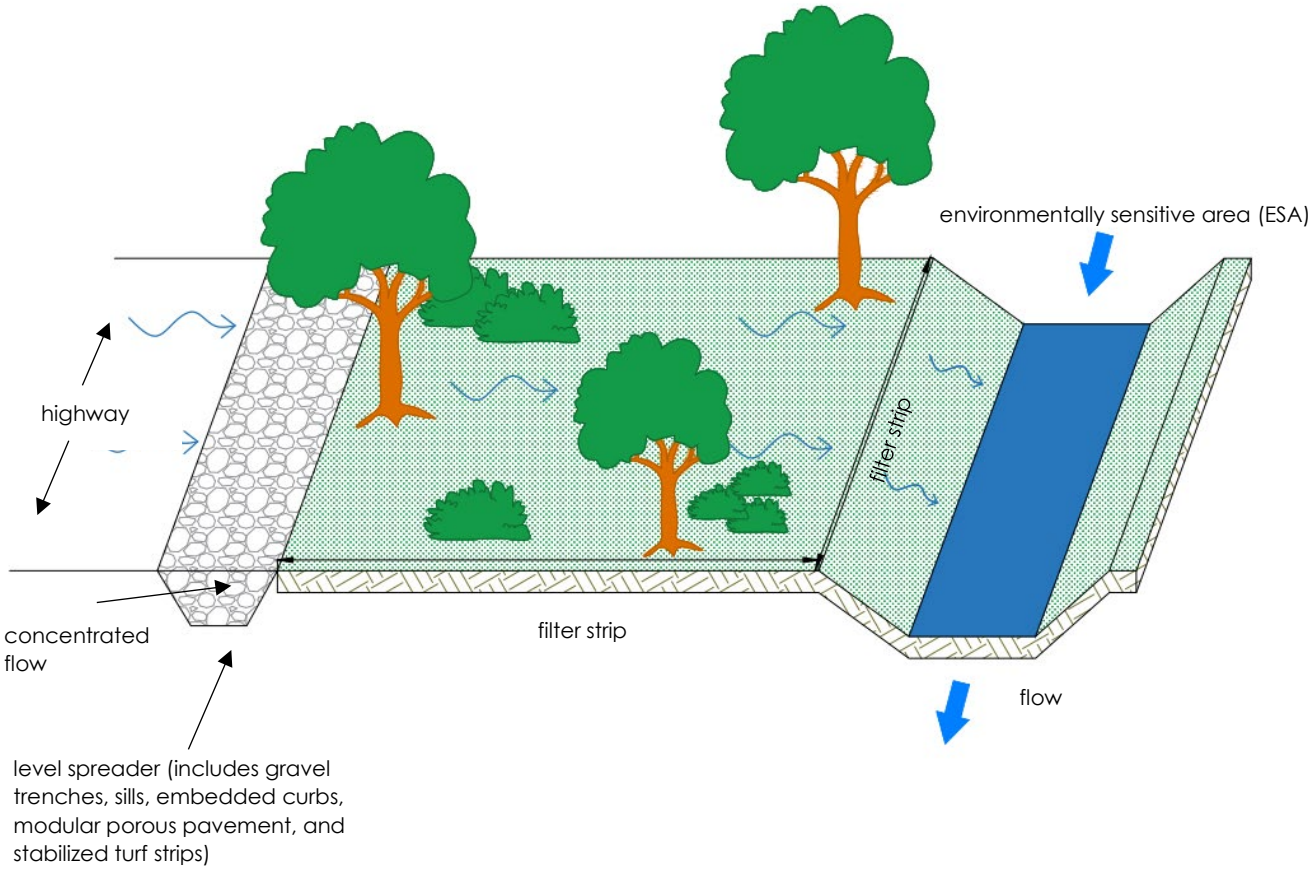
- Inspection and maintenance should continue until dense vegetation is established, especially in the spring and following a heavy rain event.
- In areas with low vegetation density, that section of RECP should be removed, the area reseeded and fertilized, and a new rolled erosion control blanket installed.
- Any damaged or poorly performing areas should be repaired/remediated immediately.

Vegetated Buffer Strip

Erosion and Sediment Control BMP

BMP # 21

Permanent BMP





Vegetated buffer above rock-lined ditch



Vegetated buffer next to ESA (not in photo)

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Vegetated Buffer Strip

Erosion and Sediment Control BMP

BMP # 21

Permanent BMP

Description and Purpose:

- Vegetated buffer strips are vegetated surfaces that are designed to suppress sheet flow from adjacent surfaces.
- They function by slowing the runoff velocities, allowing sediment to settle out and surface flows to infiltrate the soils.

Applications:

- If properly designed and installed, buffer strips can provide reliable water quality benefits and are aesthetically pleasing.
- Either grass or a diverse selection of other low-growing, drought-tolerant native vegetation should be specified. Consult a Professional Agrologist or the Ministry Representative for direction.
- Filter strips are best suited to treating runoff from roads and highways, small parking areas, and pervious surfaces.
- They are also ideal components of the riparian management area as a stream buffer or as a pre-treatment to a structural practice.

Construction:

- Apply to sites where the slope does not exceed 15%.
- Minimum slope distance should be 5 m to a maximum of 20 m (in the direction of flow).

Considerations:

- Install the strips at the time of the year when there is the greatest success of establishing vegetation without requiring irrigation (temporary irrigation may be required depending on the region).
- Where using seed to create a vegetated buffer strip, erosion controls will be necessary to protect the seeds for at least 75 days following the first rainfall after spreading seed.

Inspection and Maintenance:

- Filter strips generally require low vegetative maintenance.
- Inspect strips at least twice per year for erosion and damage to vegetation (end of the spring and fall seasons).
- Inspect strips following a heavy rain event for damage and excessive debris, litter, and sediment accumulation.

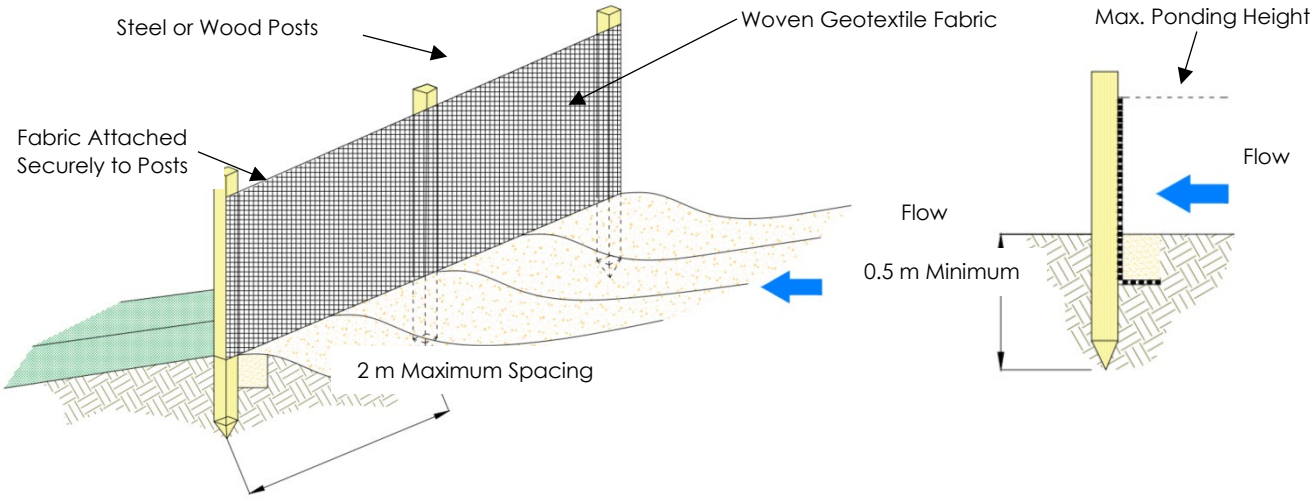
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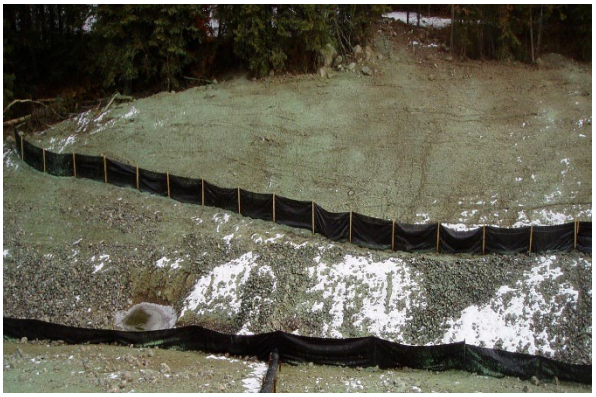
Sediment Fence

Sediment Control BMP

BMP # 23

Temporary BMP





Sediment fence installed along a contour



Sediment fence installed above riprap

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Description and Purpose:

- Permeable woven barrier installed on support posts along contours to collect and/or filter sediment-laden runoff from entering environmentally sensitive areas (i.e., streams).
- Allows coarse sediment to settle out as water filters through the fabric.
- Perimeter control for sediment transport and deposition.

Applications:

- Temporary measure, used at bottom of slopes, along stream banks or channels, and around stockpiles to collect sediment-laden runoff.
  Mid-slope grade break (using "J-hook" or "smile" pattern to effect ponding, filtering, and sedimentation).
- Low permeable sediment fences have high filtering capabilities for fine sand to coarse silt.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

Sediment Fence

Sediment Control BMP

BMP # 23

Temporary BMP

Installation:

- Trench Method:
  - Select location of sediment fence (usually along a contour).
  - Excavate a trench approximately 0.15 m deep by 0.15 m wide for entire length of fence.
  - Drive support posts (approximately 0.5 m) into ground, spaced a maximum of 2 m apart.
  - Backfill and compact soil in the trench, being careful not to damage fence.
- Mechanical Installation Method:
  - Select location of sediment fence (usually along a contour).
  - Use mechanical installation machine to embed the fabric a minimum of 0.15 m into the ground. One mechanical installation method is by slicing the filter fabric to embed into the ground without excavation and backfill. There will be minor disturbance of the ground, if affected, and only tamping of ground is required for compaction.
  - Drive support posts (approximately 0.5 m) into ground, spaced a maximum of 2 m apart.

Considerations:

- Site Selection:
  - The drainage area should be no greater than 0.1 ha per 30 m length of sediment fence.
  - The maximum flow path length above the sediment fence should be no greater than 30 m.
  - The maximum slope gradient above the sediment fence should be no greater than 2H:1V.
- The fence should be placed far enough away from the toe of slope to provide adequate ponding area (minimum of 1.8 m away from toe of slope is recommended).
- Ends of the fence should be angled upslope to collect runoff.
- Posts can be wood or metal material; posts must be placed on the downslope side of the fence.
- The trench should be backfilled and compacted.
- Long runs of sediment fence are more prone to failure than short runs:
  - Maximum length of each section of sediment fence should be 40 m.
  - Sediment fence should be installed in 'J' hook or 'smile' configuration, with maximum length of 40 m, along contours allowing an escape path for ponded water (minimizing overtopping of sediment fence structure).

Inspection and Maintenance:

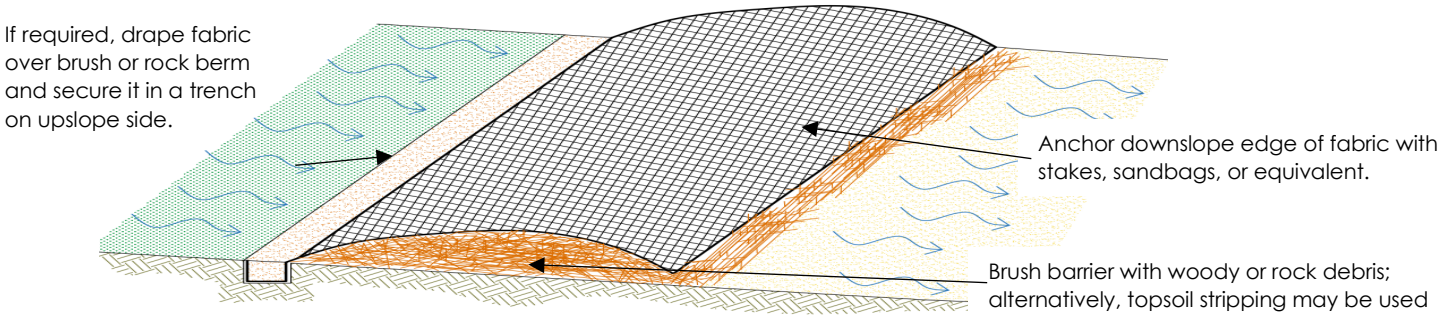
- Regularly inspect structures (as stated in the ESC Plan) to ensure they are intact, and water has not eroded around them.
- Repair undercut fences and repair or replace split, torn, slumping, or weathered fabric.
- Sediment build-up should be removed once it accumulates to a depth of half the height of the fence.
- Deactivate fabric by cutting off the top portion of fabric above ground; if possible, remove the entire fence including trenched-in fabric.

Brush Berm or Earth Dyke

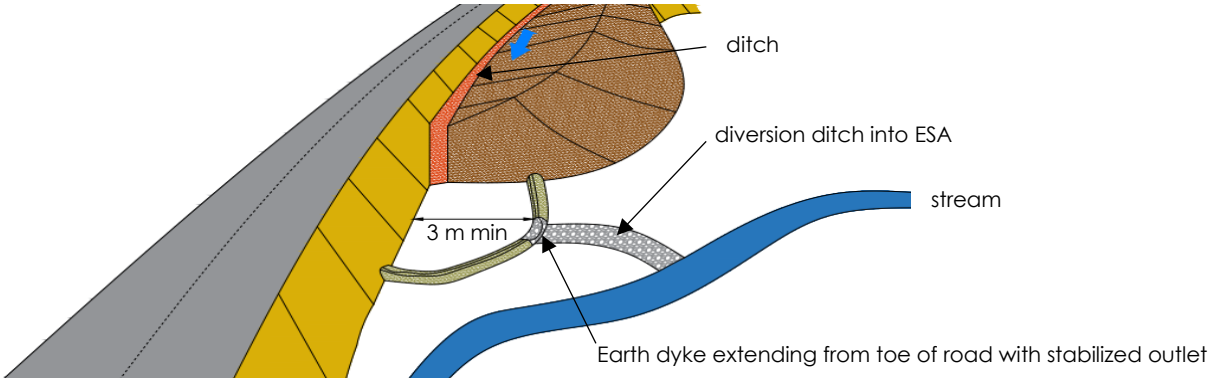
Runoff and Sediment Control BMP

BMP # 24

Temporary or Permanent BMP



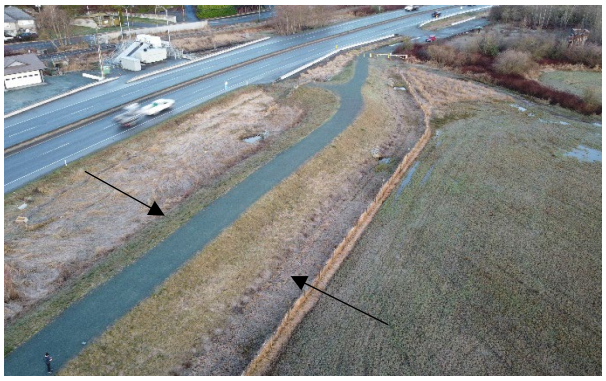
Brush Berm



Earth Dyke



Brush and topsoil berm



Earth dyke retaining runoff on the field

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Brush Berm or Earth Dyke

Runoff and Sediment Control BMP

BMP # 24

Temporary or Permanent BMP

Description and Purpose:

- Temporary or permanent barrier composed of brush or rock that is secured in geotextile fabric.
- Designed to intercept and divert runoff away from environmentally sensitive areas (ESAs).

Applications:

- Temporary or permanent perimeter control measure.
- Constructed near the toe of slopes, along the crest or tops streams and channels, or around drain inlets that are subjected to sheet flow and rill erosion.
- Maximum drainage area of 250 m^2 per 25 m length of barrier.

Construction:

- The size of the brush berm or earth dyke depends on the condition of the site.
- The height of the berm should be at least 1 m and the width should be a minimum of 1.5 m.
- Brush, roots, stumps, and/or stones are piled into a mounded row along contours.
- During clearing and grubbing, equipment can push the material into windrows along toes of slopes or other areas prone to erosion.
- Lay woven geotextile across the berm with edges overlapping, secured in a trench upslope of the berm. The trench should be 0.15 m wide and 0.15 m deep and run the entire berm length.
- The geotextile in the trench should be staked down approximately 1 m apart, then backfilled and compacted over the staked fabric.
- A rock berm should be constructed by replacing brush with rock (D_{50} = 7.5 cm to 15 cm).
- Rock berms should consist of hard, durable, clean aggregate, free of organic matter, clods, soft particles, or other substances that might interfere with drainage and filtering properties.
- An earth dyke barrier should be constructed from the bottom up by placing and compacting subsequent lifts of soil material in a trapezoidal shape.
- The degree of compaction of each lift is to be determined by the design engineer based on consequences of failure.

Considerations:

- Use rock or brush material up to 0.15 m diameter; there is no predetermined shape for berms.
- Water must be forced to pond behind the berm to encourage sediment to settle out.
- Brush barriers can generally be constructed of clean organic material from clearing and grubbing operations that is normally burned or discarded.
- Rock and brush berms are temporary measures and should be removed upon completion of service life, after vegetation is established.

Inspection and Maintenance:

- Inspect berms regularly and after a significant rainfall events or as specified in the ESC Plan.

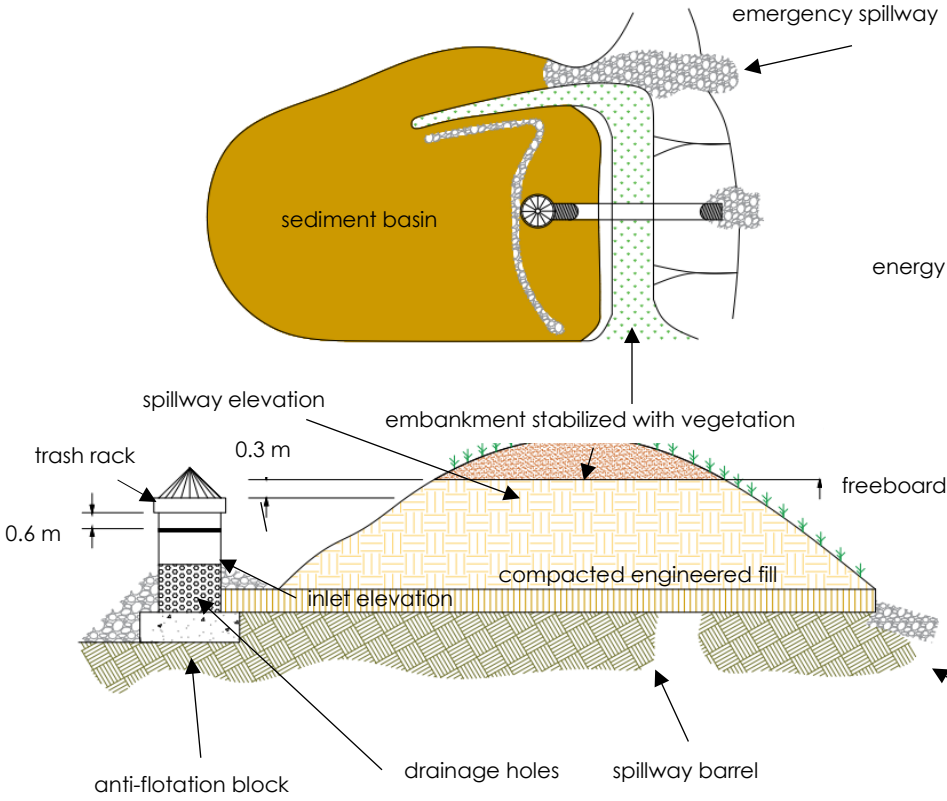
- Reshape berms as needed and replace lost or dislodged rock, brush, and/or geotextile fabric.
- Inspect for sediment accumulation and remove sediment when depths reach approximately one-third the berm height or 0.3 m.
- Inspect for undercutting, defective fabric, end runs, and erosion of the berm, and repair.

Sediment Control Pond

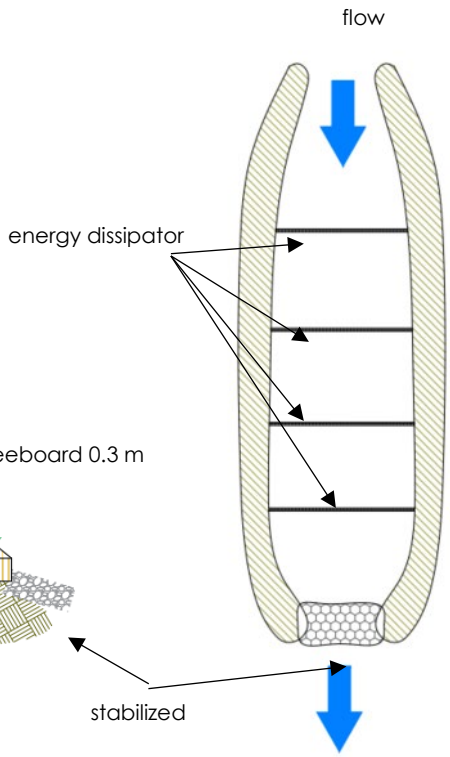
Sediment Control BMP

BMP # 26

Temporary or Permanent BMP



Typical Sediment Pond with Riser and Outlet



Alternate Design



Large sediment pond with riser outlet



Small sediment retention area in ditch

Disclaimer: The guidance provided is for information purposes only. An Erosion and Sediment Control Plan (ESCP) created by an appropriately qualified professional (AQP) may be required for site-specific requirements.

Sediment Control Pond

Sediment Control BMP

BMP # 26

Temporary or Permanent BMP

Refer to BC Ministry of Transportation & Infrastructure's document titled, *Standard Specifications for Highway Construction* – 165.04.03 – Sediment Control Ponds for more details.

Description and Purpose:

- Low height dam enclosure to impound sediment-laden storm water.
- Used to trap storm water and promote sediment to settle out prior to releasing to environment.
- Excavated pit and berm embankment above ground, lined pond if necessary.

Applications:

- Generally, a permanent measure, although it can be used as a temporary measure on longer projects until vegetation is established and the sediment source has stabilized.
- Usually at the end of a ditch with concentrated flows to impound sediment-laden water prior to release further downstream.
- Also used as a sedimentation control measure surrounding construction sites where sediment-laden water may enter a watercourse, storm drain, or other sensitive area.
- Used where there is a need to impound a large amount of sediment from significant areas of land disturbance.
- Where practical, contributing drainage areas should be subdivided into smaller areas and multiple sedimentation impoundments installed.

Construction:

- A qualified professional must design the structure appropriately for anticipated flows (Q-10).
- The sediment pond footprint should be stripped of vegetation, topsoil, and roots to exposed mineral subgrade soils for maximum infiltration.
- Berm fill material should be clean mineral soil and compacted.
- The main outlet structure should be installed at the furthest point from the inflow. Proper inlet and outlet protection should be installed to protect from erosion.
- Build an emergency spillway to accommodate any unexpected storm events (Q-100).

Considerations:

- Strip the mineral soil along the footprint area required to construct the berm of the pond.
- Construct sediment ponds at the site perimeter and around environmentally sensitive areas prior to the wet season and/or construction activities.
- Riser pipe or sediment curtains can be installed at the inflow to aid in settling out the sediment.
- The sediment pond/pond bottom should be flat or gently sloping toward the outlet.
- Berm slopes of the sediment pond should not be steeper than 2H:1V and should be compacted and vegetated; berm height should be a minimum of 1 m.

Sediment Control Pond

Sediment Control BMP

BMP # 26

Temporary or Permanent BMP

Inspection and Maintenance:

- Regularly inspect structure for seepage, structural soundness, outlet damage, debris accumulation, and amount of sediment load, especially after a heavy rain event.
- Sediment should be removed once it has reached half the height of the berm.
- Sediment traps can be deactivated or removed after vegetation of previously disturbed upstream areas has been established and sedimentation is no longer an issue.

APPENDIX D

Daily Water Management Infrastructure Inspection Form

Daily Water Management Inspection Checklist

Inspector: _____ Date: _____

Shift (Crew, D or N):_____ Weather Conditions (ex. hot, windy): _____

Pumps/Pipes/Sumps	Time Checked	Inspection Gauge Readings / Inspection Findings	Pump Notes/ Comments
WTP Well		(m)	
WTP Slurry Line		GOOD / ISSUE	
Perimeter Embankment Till Borrow		RED YELLOW BLACK	
CCS		GOOD / ISSUE	
Bootjack Creek Fish Fence		GOOD / ISSUE	Cleaned? Y / N
Breach Sump		GOOD / ISSUE	
Weir		GOOD / ISSUE	
Polley Fish Fence (Day Shift)		GOOD / ISSUE	Cleaned? Y / N
SERDS Sump		RED YELLOW BLACK	
Long Ditch Sump (Upper)		RED YELLOW BLACK	
Long Ditch Sump (Lower)		RED YELLOW BLACK	
Long Ditch/SERDS Outflow Pipes		GOOD / ISSUE	
South Seepage Collection Pond		RED YELLOW BLACK	
Main Seepage Collection Pond		RED YELLOW BLACK	
Sprinklers		GOOD / ISSUE	
Lower Hazeltine Pond Water Level		(m)	
TSF Settling Pond		GOOD / ISSUE	
Tailings outflow pipe		GOOD / ISSUE	
TSF Upstream		GOOD / ISSUE	
Cariboo Pit Sump		GOOD / ISSUE	
Springer Pit Lake		GOOD / ISSUE	
Junction Zone Seepage Sump		GOOD / ISSUE	
9K Sump **# Starts** _____		RED YELLOW BLACK	
NW PAG Sump **# Starts** _____		RED YELLOW BLACK	
Mine Drainage Creek Sump		RED YELLOW BLACK	
West Ditch Culverts (light vehicle TAR)		GOOD / ISSUE	
West Ditch Culverts (heavy duty TAR)		GOOD / ISSUE	
Springer Pit Dewatering Outflow		GOOD / ISSUE	
Bootjack Creek Sump - Upstream Side		GOOD / ISSUE	
Bootjack Creek Sump		RED YELLOW BLACK	
Wight Pit Water Level		(m)	
Joe's Creek Pipe		GOOD / ISSUE	

Updated November 2, 2016

Is the TSF Generating Dust?

No Minor Moderate Major

Is the Polley Lake Plug Generating Dust?

No Minor Moderate Major

REMEMBER TO DRAIN BACK UP DIESEL PUMPS AFTER TESTING IN FREEZING CONDITIONS

ADDITIONAL COMMENTS/OBSERVATIONS (ex. erosion):

WILDLIFE OBSERVATIONS (include locations):

Daily Water Management Inspection Checklist

*(Controlled Document – **DO NOT COPY**: please ask Environment Department for print out)*

Inspector: _____ Date: _____

Shift: (Crew, D or N) _____ Weather Conditions: (ex. hot, windy, sunny): _____

	Pumps/Pipes/Sumps	Time Checked	Inspection Gauge Readings / Inspection Findings	Pump Notes / Comments
1	Junction Zone Seepage Sump		GOOD / ISSUE	
2	9K Sump # Starts _____		RED YELLOW BLACK	
3	CWTS (Wetland)		GOOD / ISSUE	
4	NW PAG Sump # Starts _____		RED YELLOW BLACK	
5	Mine Drainage Creek Sump		RED YELLOW BLACK	
6	West Ditch Culverts (light vehicle TAR)		GOOD / ISSUE	
7	Booster Station		GOOD / ISSUE	
8	Bootjack Creek Sump – Upstream side		GOOD / ISSUE	
9	Corner 1 Buttress Culverts/Ditch		GOOD / ISSUE	
10	TSF Barge		GOOD / ISSUE	
11	Dredge Outflow Pipe		GOOD / ISSUE	Location:
12	South Seepage Collection Pond		RED YELLOW BLACK	
13	Main Seepage Collection Pond		RED YELLOW BLACK	Percent Full ____%
14	Fish fence at outlet to Quesnel Lake		GOOD / ISSUE	
15	Fish Fences above Gavin Lake Bridge		GOOD / ISSUE	Cleaned? Y / N
16	WTP Well		(m)	
17	WTP Slurry Line		GOOD / ISSUE	
18	Perimeter Embankment Till Borrow Pond		RED YELLOW BLACK	
19	Breach Sump/COW Drain/Upstream Drain		GOOD / ISSUE	
20	CCS		GOOD / ISSUE	
21	Long Ditch Outflow Pipes		GOOD / ISSUE	
22	Long Ditch Sump (Lower)		RED YELLOW BLACK	
23	Long Ditch Sump (Upper)		RED YELLOW BLACK	
24	SERDS Sump		RED YELLOW BLACK	
25	Bootjack Creek Fish Fence		GOOD / ISSUE	Cleaned? Y / N
26	**NEZ Seep Sump**		GOOD / ISSUE	
27	Wight Pit Water Level		(m)	
28	Joe's Creek Pipe		GOOD / ISSUE	
29	**Leachpad LCRS**		(m)	Pumped? Y / N
30	West Ditch Culverts (heavy duty TAR)		GOOD / ISSUE	
31	Bootjack Creek Sump		RED YELLOW BLACK	
32	Mill Site Sump		Pump Hours	

Updated May 25, 2019

Is the TSF Generating Dust? *(Circle one)* No Minor Moderate Major

**REMEMBER TO DRAIN BACK UP DIESEL PUMPS AFTER TESTING FREEZING CONDITIONS **

ADDITIONAL COMMENTS/OBSERVATIONS (EX. EROSION):

NOTE* - Please clean up and report all spills of hydrocarbons or chemicals

WILDLIFE OBSERVATIONS (include locations):

APPENDIX E

Bi-Annual Water Management Infrastructure Inspection Form

Bi-Annual Water Management Infrastructure Inspection Checklist (September 2016)

Location	Initials	Date	OK	Not OK	Photo (Y/N)	Comments/Actions Required
Junction Zone Ditch						
9km Sump						
Junction Zone Seepage Collection Sump						
Northwest Ditch						
Northwest Sump						
West Ditch						
Mine Drainage Creek Sump						
Waste Haul Road Culvert (at MDC)						
Orica Site Settling Pond						
Orica Ditch						
Bootjack Lake Dam						
Bootjack Cr Culverts at TAR						
Bootjack Cr Culverts under Light Vehicle TSF Road						
Bootjack Creek Sump (Upstream)						
Bootjack Creek Sump						
TAR Ditch						
SERDS Ditch						
SERDS Culverts at TSF Road						
SERDS Culverts at TAR						
SERDS Sump						
SERDS Ditch Pipeline						
Wight Pit Clean Water Ditch (N)						
Wight Pit Clean Water Ditch (SW)						
SEZ Ditch						
Gavin's Ditch						
Access Road Culverts						
Joe's Creek Coffer Dam						
Joe's Creek Pipeline						
Long Ditch						
Long Ditch Sump (Upper)						
Long Ditch Pipeline						
Long Ditch Sump (Lower)						
Bootjack Creek Bridge Crossing						
Bootjack Creek Channel						
Mill Site Ditch						
Mill Site Sump						
Crusher Site Ditch						
Tailings Ditch (Mill to Booster Station)						
Tailings Ditch (Booster Station to 5 Corner)						
Tailings Ditch (5 corner to TSF)						
Central Collection Sump						
Breach Sump Ditch						
Perimeter Embankment Till Borrow Pit						
Hazeltine Discharge Pipeline						
Main Seepage Pond						
Ditch below 3 Corner						
South Toe Drain Ditch						
South Seepage Pond						
South Seepage Pond Pipeline						
Borrow Pit Ditch & Settling Pond across from Horsefly-Gavin FSR						
Horsefly-Gavin FSR under permit obligation with MOF (Gavin Lake Road Bridge to W8z)						
TSF Clean Water Ditch						

APPENDIX F

Water Release Form

Water Management Incident Report Form

Please complete and forward to the Environmental Department.

DATE OF REPORT	
DATE AND TIME INCIDENT DISCOVERED	
NAME(S) OF PERSON/PEOPLE REPORTING INCIDENT	
LOCATION OF INCIDENT	
IS WATER RELEASING TO THE ENVIRONMENT?	
If yes, what time did it start releasing, and at what rate is the water flowing?	
If no, at what rate is it approaching release?	
DESCRIPTION OF HOW/WHY INCIDENT OCCURRED	
HAS THE PROBLEM BEING FIXED? HOW?	
If yes, what time did the water stop releasing to the environment (if released)?	
If no, describe actions being taken to fix problem (record timeline of events).	

DESCRIPTION OF MEASURES TAKEN TO PROTECT ENVIRONMENT (ex. sediment and erosion control materials)	
PREVENTATIVE MEASURES TAKEN TO ENSURE INCIDENT DOES NOT OCCUR AGAIN	
SUPERVISOR NAME	
SUPERVISOR SIGNATURE	
FOLLOW UP REQUIRED?	
Environmental Department: Name: _____ Sign: _____	Comments:

APPENDIX G

Sediment and Erosion Site Inspection – June 2023

Sediment and Erosion Site Inspection – June 2023

WSP was retained by MPMC to undertake a visual inspection of the Long Ditch and West Ditch drainage systems at the Mount Polley mine on 7 June and 8 June 2023. Don Kidd, Senior Engineer, Q.P. P.Eng. undertook the visual inspection of both drainage systems. The visual inspection confirmed that both drainage systems were in good condition, with no ditch erosion evident in the mostly vegetated riprap lined ditches.

Based on the visual inspection the following action items are recommended.

- Undertake bathymetry surveys of SFRD and Central Collection Sumps to confirm that adequate storage is available for the design storm events, and if not undertake dredging works to provide the storage required.
- Provide written documentation of pump capacity required at each sump, based on previous hydraulic modelling work undertaken by WSP (formerly Golder) and confirm that the correct pump and backup capacity is available.
- Where the system has sections of ditch replaced by culverts/pipes, confirm the pipe is sized correctly to convey the design storm event.

Monitoring should be carried out in accordance with project specific EMPs developed as per Section 2.2.3 and regulatory permits and legislation requirements. If the project has the potential to impact natural water courses, and requires an EMP, a designated environmental monitor should oversee the project. The environmental monitor's daily tasks are to be defined in the EMP, and should include:

- Visual inspections of erosion and sedimentation controls.
- Visual inspections of equipment for leaks.
- Visual inspections of spill kits to confirm appropriate supplies are available.
- Visual inspections of potential sedimentation sources, such as soil stockpiles, new disturbances, and active construction areas.
- Monitoring of the weather forecast and current conditions.
- Documentation of the above.

If a project does not have the potential to impact natural water courses, and EMP is not developed, monitoring is still expected and BMPs for sediment and erosion control should still be applied. Inspections should be conducted by a designated qualified member of the Mount Polley Environmental or Engineering Department for the tasks outlined above.

In active construction areas where activities could impact receiving environment water quality, additional monitoring may be required beyond routine sampling described in Section 5.1. Monitoring may include in situ turbidity testing and/or partial or full suite water quality sampling (full suite = parameters listed for routine samples in Section 5.1). Results should be compared against pre-construction data and the BC Water Quality Guidelines for Freshwater Aquatic Life. Downstream monitoring site(s) should be located at a sufficient distance to ensure mixing of construction runoff and ambient stream water. An upstream control site of sufficient distance to be isolated from any construction-related impacts may be monitored simultaneously and compared to downstream monitoring results. Monitoring requirements and sampling frequency depend on the specific project and a monitoring plan should be included in the project EMP.

APPENDIX H

Qualified Professional Forms

Appendix A: Erosion and Sediment Control Assurance Statement

Note: This assurance statement is to be read and completed in conjunction with the current *Joint Professional Practice Guidelines-Erosion and Sediment Control,* (jointly published by the College of Applied Biologists, the BC Institute of Agrologists, and Engineers and Geoscientists BC) and is to be provided for Erosion and Sediment Control (ESC) Plans for the purposes of communicating to appropriate Regulatory Authorities the considerations that informed the ESC Plan, and the commitment on behalf of the professional to conduct Field Reviews. Capitalized terms are defined in the *Joint Professional Practice Guidelines-Erosion and Sediment Control.*

Date: 26 September 2025

To: Ministry of Mining and Critical Minerals

(Proponent/Client or Regulatory Authority, as appropriate)

Contact Name: Nathan Schmidt

Businessaddress: 16820-107 Avenue NW, Edmonton, AB

Contact information (email and/or phone number): nathan.schmidt@wsp.com
780.930.8659

Information on the site or project:

Name of site/project and/or description: Mount Polley Mine

Located at (address, coordinates, or description): Likely, BC

Owned by: Mount Polley Mining Corporation

I have signed, sealed, and dated the attached ESC Plan (including any specifications or instructions) in accordance with the *Joint Professional Practice Guidelines-Erosion and Sediment Control,* and have included a statement of qualifications as an individual or multidiscipline team lead in Appendix __ of the ESC Plan.

The above-referenced ESC Plan must be read in conjunction with this Statement.

In preparing the above-referenced ESC Plan, I have (check to the left of applicable items):

- [X] Considered the design objectives and regulatory framework applicable to the site and receiving environment (see Section 1.1).
- [X] Collected and reviewed available and relevant site information, documentation, and data related to topography, Soil types, hydrology, project schedule, construction methods and sequencing, receiving environment, and environmentally sensitive areas (see Section 3.2).

☒ Acknowledged and addressed the variability in Erosion potential and hydrologic changes that may be reasonably expected to occur under various project phases.

No Drawings

☐ Confirmed that the site, construction, and design information contained in these drawings reasonably reflects the physical conditions of the site.

☒ Provided and appropriately described a selection of Best Management Practices (BMPs), specified actions, and field directions to address the erodible surface exposure and changes to site Runoff characteristics reasonably expected in relation to the proposed development with consideration of extreme weather events (see Section 3.2.4).

☒ Confirmed that these BMPs can reasonably achieve the design objectives with respect to the protection of the receiving environment and water quality.

I acknowledge and understand my professional responsibility to (check to the left of each):

☒ Authenticate and take professional responsibility for the above-referenced ESC Plan and its implementation on site.

☒ Address climate change variability and risk(s) associated with extreme events during the ESC Plan design.

☒ Conduct Field Reviews to identify potential deficiencies and prescribe specific remedial measures to address residual project impacts for each phase of the ESC design that is included in the above-referenced ESC Plan; I acknowledge that Field Reviews can be conducted by me, under my direct supervision, or can be assigned to another qualified professional with written confirmation that they are being carried out by a qualified professional.

☒ Remain responsible for material design changes made during construction that are brought to my attention during Field Reviews, monitoring, or auditing until project closeout. Should I cease to be involved on this project, I will notify the Proponent/Client and the Regulatory Authority in writing of the date of my departure.

☒ Review monitoring reports and recommendations from the project team and issue change orders or addenda to ensure that ESC-related risks are managed through to substantial completion of the project or activity.

☒ Provide feedback and support adaptive management to mitigate Erosion and Sediment transfer potential to the receiving environment or water quality impairment, where applicable.

☒ Confirm upon project closeout that substantial completion of the project is achieved and that areas have been stabilized to minimize the risk of adverse Erosion, Sediment transfer, or water quality degradation from natural Erosion processes.

I hereby give my assurance that the attached ESC Plan has been prepared and delivered in my professional capacity or under my direct supervision, and that it is complete for intended use.

Name: Nathan Schmidt

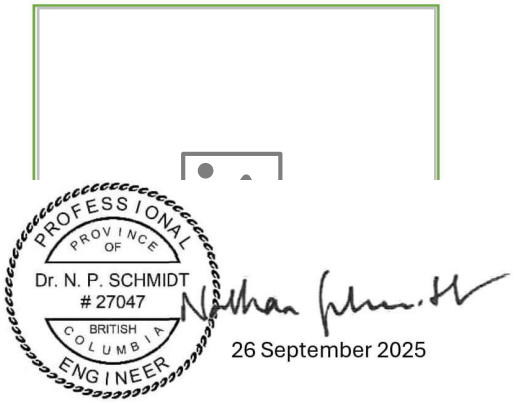
Date: 26 September 2026

Contact Information (email and/or telephone): nathan.schmidt@wsp.com
780.930.8659

Name of Firm: WSP Canada Inc.

Permit to Practice number (if applicable): 27047

(Affix Professional Seal to the right)



BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

a) an ownership interest in the regulated person's business;

b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);

c) a personal or professional interest in a specific outcome;

d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;

e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Nathan Schmidt, as a member of Engineers and Geoscientists BC

declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this Erosion and Sediment Control Plan Review and Update.
I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to Ministry of Mining and Critical Minerals, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

_____

_____

_____

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

This conflict of interest disclosure statement is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Signature: Nathan Schmidt

X _____

Print name: Nathan Schmidt

Witnessed by: Andrew McIntosh

X _____

Print name: Andrew McIntosh

Date: 26 September 2025

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional: Nathan Schmidt

   Title: Senior Principal Water Resources Engineer

2. Are you a registered member of a professional association in B.C.? ☒ Yes ☐ No

   Name of Association: Engineers and Geoscientists of BC / EnviroCert International (CPESC) Registration #: 27047 / 8458

3. Brief description of professional services:

   Erosion and Sediment Control Plan review and update

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: **X** Nathan Schmidt

Print Name: Nathan Schmidt

Witnessed by: **X** Andrew McIntosh

Print Name: Andrew McIntosh

Date signed: 26 September 2025

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

APPENDIX 10-2: SOIL MANAGEMENT PLAN

Mount Polley Mining Corporation

an Imperial Metals company
Box 12 • Likely, BC V0L 1N0 • T 250.790.2215 • F 250.790.2613

Environmental Management Plan:

Soil Management Plan

Last Update: September 24, 2025

Document Revision Control

Rev. No.	Revision	Date	Author
0	Original Soil Salvage and Stockpile Protocol	1997	RM
1	Update to reflect site changes	2012	KM
2	Update to reflect site changes and results of site soil stockpile assessment; addressed *Mines Act P*ermit M-200 conditions	March 2014	KM
3	Update of site specific components; added document tracking and formatting to be consistent with other MPMC EMPs	January 2017	KM
3	Annual Review	November 9, 2022	GH
4	Annual Review	September 24, 2025	GH

1 Introduction

All surficial soil at the Mount Polley Mine (the Mine) identified through soil surveys as being appropriate for plant growth are salvaged and either used immediately in the reclamation program or stored in a suitable manner for future use. This is a requirement of the British Columbia (BC) *Mines Act* and associated BC Health Safety Reclamation Code. In addition, Mount Polley Mining Corporation's (MPMC's) *Mines Act* Permit M-200 contains specific conditions related to soil management that are addressed in this Soil Management Plan (the Plan).

The purpose of this Plan is to outline the procedures to characterize, salvage, store, and apply all suitable growth material in accordance with regulatory requirements and to support reclamation of the Mine site to the desired land capability and end land uses.

2 Soil Handling and Management

The following subsections outline procedures for soil handling and management through the different stages of the mine life at the Mount Polley Mine.

2.1 Soil Characterization

Site-specific soil surveys must be completed for areas scheduled for disturbance by a qualified individual and submitted to the BC Ministry of Energy and Mine (MEM) Chief Inspector for approval. The following survey procedure is recommended and is consistent with soil surveys previously conducted at Mount Polley Mine; however, this methodology may be modified by a qualified individual based on site conditions, existing information, and their experience.

1. Pre-stratify the area according to terrain using aerial photographs. Confirm the stratification is appropriate with a site inspection.

2. Select soil pit locations at representative sites or using a predetermined systematic grid or transect. Soil pit density may range from one pit per half hectare to one pit per two hectares, depending on site variability.

3. Expose the soil profile by machine excavation or hand-dug holes. Existing road cuts and excavations can also be cleaned for use.

4. Describe the soil and site characteristics at each soil profile location as per the BC Ministry of Environment standards and guidance in the "Field Manual for Describing Terrestrial Ecosystems" (MoE, 2010).

5. Sample soils at select, representative sites to provide local soil quality data. Sampling intensity may be adapted based on the level of preexisting soil quality data for the area.

6. Present and interpret the soil survey data in a report and recommend salvage depths for (1) soil appropriate for reclamation, and (2) subsoil which could be used in reclamation with soil amendments or as a subsoil.

For reference, soil and landform inventories completed to date for the Mount Polley Mine include:

- Southeast Dump, Boundary Pit and West PAG Projects (2010)
- Wight Pit Rock Waste Dump Extension Project (2006)
- Southeast Pit Project, Wight Pit to Tailings Pond Road, and Southeast Pit to Tailings Pond Road (2005)
- Northeast Extension Project (2004)

- Springer Pit (2001)
- Baseline Soil Survey and Agricultural Assessment of proposed Tailings Storage Facility, Open Pit, and Waste Rock Dumps (1995).

2.2 Soil Salvage

2.2.1 Salvage Materials and Depths

Material to be salvaged is grouped into four types as described below, which should be stripped and stockpiled separately. Delineation of these materials in the field is to be supported by a qualified individual, as described in Section 2.2, however, some general field guidance is as follows.

1. Non-merchantable woody debris is to be salvaged prior to removing soil and stockpiled for use in reclamation (or immediately used in reclamation, if possible). Small woody debris may be stripped with soil and incorporated into soil stockpiles.

2. Soil appropriate for reclamation should be salvaged to the depth pre-determined in the site-specific survey described in Section 2.1; however, as a general guide, soils are to be salvaged to the effective rooting depth.

3. Underlying subsoil is classified as the material between the soil horizons appropriate for reclamation and the soil parent material.

4. Organic soils from wetlands are recognizable by their black colour and “mucky” texture.

2.2.2 Procedure

A qualified individual representing the Environmental Department should train and oversee equipment operators to ensure salvage operations are completed to the specifications described in this Plan.

Non-merchantable coarse woody debris is to be salvaged first and stockpiled (small woody debris can be mixed in with topsoil piles). Organic matter (grass, plants, chipped woody material, etc.) is to be incorporated into the topsoil piles by salvaging plant materials on the surface with the topsoil. To minimize compaction caused by equipment, use single lift operations rather than repeatedly driving over the surface scraping off thin layers. With a single pass, a bulldozer or backhoe can push the soil into a pile or windrow for storage or for loading into a truck by an excavator or backhoe for transport. If suitable soil is still visible after the initial scraping (this can generally be identified by the presence of roots), another pass will be required to salvage all soil materials appropriate for use in reclamation. Soil inventory and strata delineation information collected prior to salvaging will guide the stripping depths and are to be verified in the field by the Environmental Department representative overseeing salvage operations. Desired volumes of subsoil material are to be stripped in a second lift and stored in separate stockpiles from the topsoil.

Soil should ideally be handled when it is in a loose friable state; operations are to be ceased if the soil is too wet or dry to prevent degradation of its physical structure. If wet soil is sticking to the equipment, wait until the soil has dried. Conversely, if the soil is dry and hard to handle resembling flour, wait until the soil is wetted through precipitation (or active methods, such as sprinkling). In addition, stripping should be ceased in high wind events, if the wind is mobilizing soil as it is being handled. Scheduling stripping work to avoid wet and dry months (e.g., freshet and late summer, respectively) can reduce the risk of having to temporarily stop operations. It is possible to strip in winter months and freezing conditions decrease compaction of the soil being handled, however, snow should be removed prior to stripping and should not be incorporated into soil stockpiles.

2.3 Soil Stockpiling

When possible, it is preferable for soil to be directly applied for reclamation, allowing microbes and viable seeds to remain in the soil. If this is not possible:

1. Carefully select the storage location because once stockpiled, the soil should not be disturbed again until it is used in final reclamation. Minimize exposure to wind, southwest sun, and water/flooding. To minimize risk of sedimentation of natural water courses, stockpiles should, where possible, be located upstream of site water collection ditches.

2. Stockpile the soil in a manner that maximizes surface area and minimizes soil depth. When possible, the maximum depth should be the height of a pile dumped from a haul truck (~2.5m).

3. Promptly seed stockpiles with the custom MPMC native grasses and forbes blend or, in areas where invasive plant establishment is a concern (i.e., seed sources are present nearby), the custom MPMC aggressive seed mix. Both seed mixes are certified weed free. Revegetation will help to mitigate wind and water erosion, reduce risk of weedy species ingress, and maintain microbial activity.

4. Take a representative sample of the stockpile to assess soil quality, as per the procedure in Appendix A.

5. Place signage on the stockpiles to avoid accidental disturbance.

6. Enter stockpile construction date, soil type, location, and soil volume into the Soil Stockpile Inventory spreadsheet and associated GIS map file. Document seeding in the Environmental Department Reclamation Field Book.

7. Add stockpile locations to site maps and plans for Mine Operations to avoid disturbance or loss of stockpiles.

2.4 Soil Stockpile Inspections

Inspection of soil stockpiles is to be completed annually. For each soil stockpile, the following information should be documented: date; photo number (if a photo is taken); percent vegetation coverage; percent invasive plant coverage; species present; signs of erosion and/or sedimentation; any erosion prevention works; and any additional comments or observations. Where possible, inspections should be completed in the summer months when vegetation is actively growing and easiest to identify.

Results are to be reviewed and any stockpiles exhibiting erosion and/or poor vegetation coverage are to be added to MPMC's bi-annual seeding list for re-seeding in spring or fall when weather conditions are most appropriate for seeding. Alternative options for more significant erosion may be implemented, as per the MPMC Sediment and Erosion Control Plan, such as berms or silt fences. Occurrences of invasive species are to be managed as per MPMC's Invasive Plant Management Plan. If a stockpile has been seeded twice, and still exhibits low vegetation cover, alternative vegetation options can be investigated, including:

- Amending the soil with compost tea or compost;
- Hydroseeding with a mulch/tackifier mixture designed for poor soil and/or steep slopes;
- Installation of horizontally placed logs to act as catch berms and retain moisture;
- Development of a seed mixture specifically designed for poor quality soils;

- Planting with primary successional shrubs. Willow and cottonwood can be planted using bioengineering techniques, such as live stakes and wattles, for additional erosion control.

2.5 Soil Amendment

Recommendations for amendment of soils to be used in reclamation are based on results from a site soil stockpile quality assessment conducted in September 2013, as well as results from ongoing reclamation research and progressive reclamation. Soil amendments may include biosolids and fertilizer, and recommendations for use are detailed in the site Reclamation and Closure Plan. Results from the September 2013 assessment are presented in Appendix B.

If biosolids are used as a soil amendment, they can be mixed with the soil prior to application to ensure thorough mixing and to reduce compaction caused by the dual application of soil followed by biosolids.

2.6 Soil Application

Soil should be replaced to the depths specified for that Mine site unit in the site Reclamation and Closure Plan or research trial design.

To reduce compaction, soil placement should only occur under appropriate moisture conditions. Work should be stopped under wet conditions (i.e., if the soil is sticking to the equipment) and very dry conditions (i.e., if the soil resembles flour). In addition, equipment traffic on the reclamation area should be minimized. This can be done by working systematically and planning access routes so equipment do not have to pass over completed areas, and, if applicable, equipment can do multiple tasks at a time (e.g., site preparation and placing of coarse woody debris).

Site preparation of placed soil should be conducted to create increased microtopography, which reduces erosion and provides more diverse plant microsites, including microsites with improved moisture retention. Site preparation methods are described in detail in Appendix C.

If woody debris is not already incorporated into the soil being placed, it should be applied onto the soil surface concurrently with or following site preparation. Even if woody debris is already in the soil, it may be desirable to place additional coarse woody debris as habitat features or for erosion control. Woody debris can help create more diverse microsites and habitats, retain moisture, contribute to long-term soil organic matter, and improve catch of native seeds. Recommendations for coarse woody debris application are:

- Create occasional pyramids or stacks of multiple pieces of woody debris to create more complex habitat structures and vertical structure.
- Lay logs horizontally across the slope, so they’re more likely to stop the flow of water and erosion. This is especially helpful if logs are placed downslope of depressions to help them retain soil and organic matter.
- Mix tree species of the debris, where possible, as different species decompose at different rates, staggering the release of nutrients for vegetation.

If coarse woody debris is not available or only in small amounts, boulders or rock fragments can be placed in piles and individually. Although rocks are not a source of nutrients over time, similar to woody debris they can increase moisture retention, promote plant microsite diversity, provide habitat, and reduce soil erosion.

Following soil application, the site should be inspected and test pits dug to verify that the target soil depth was achieved across the site (accounting for the variability associated with site preparation).

3 Reporting

The following information will be submitted to the MEM, as well as the BC Ministry of Environment, each year in the MPMC Annual Environmental and Reclamation Report:

- An update of soil management and handling activities, including erosion and sediment control measures, and soil replacement depths on reclamation sites;
- An updated soil stockpile inventory, including stockpile volumes and locations;

MPMC also is required to submit an updated Reclamation and Closure Plan to MEM every five years (at minimum), as well as with all major permit amendment applications for changes to the mine plan. The Reclamation and Closure Plan is to include an updated material balance to verify that sufficient quantities of suitable soil are present to reclaim existing and planned disturbed areas to the recommended prescriptions (i.e., soil depths) for meeting land capability objectives. Contingency options are to be assessed if sufficient volumes of suitable soil may not be available.

4 Responsibilities

Responsible individuals for implementing this Plan are described below.

Environmental Superintendent or designate (e.g., Environmental Coordinator):

- Be knowledgeable of and adhere to all aspects of this Plan.
- Ensure all other responsible individuals have reviewed the most up to date version of this Plan.
- Be aware of high level mine planning, to ensure that soil characterization and stripping supervision are incorporated into plans.
- Schedule and assign staff or external contractors to carry out all requirements of this Plan, including soil baseline characterizations, overseeing stripping operations, annual inspections, seeding, and reporting.
- Ensure that individuals conducting soil characterization surveys, overseeing soil stripping, and inspecting soil stockpiles have appropriate training.
- Ensure that this Plan is routinely updated to reflect changes in site conditions and procedures, and that the revised plan is submitted to MEM in the Annual Environmental and Reclamation Report and/or a Reclamation and Closure Plan update.

Qualified individual overseeing salvage operations:

- Be knowledgeable of and adhere to all aspects of this Plan.
- Coordinate with and supervise Mine Operations to ensure soil handling and management procedures are followed during stripping operations.
- Maintain an up to date soil stockpile inventory and provide a soil management update in the Annual Environmental and Reclamation Report, as directed by the Environmental Superintendent.

Mine Planning Engineer and General Foreman:

- Notify the Environmental Superintendent or designate of planned disturbances that will require soil salvaging. Work with that individual to ensure that the soil is characterized prior to stripping and a qualified individual is present to oversee salvage operations.
- Assign appropriate equipment for handling soil.
- Work with the Environmental Superintendent or designate to assign areas for soil to be stockpiled or directly placed.
- Ensure that all material suitable for reclamation is stripped prior to expansion of mine works.

Mine Operations Supervisors:

- Coordinate with the qualified individual overseeing a salvage operation (likely an Environmental Technician or Technologist).
- Only allow operations to proceed when weather and soil moisture conditions are appropriate.
- Notify the General Foreman and qualified individual overseeing the salvage operation of any concerns that arise and address these concerns prior to proceeding with the work.

Mine Operations Operators:

- Follow instructions from the qualified individual overseeing a salvage operation (likely an Environmental Technician or Technologist) and Mine Operations Supervisors.
- Clarify uncertainties or address any concerns that arise with the Mine Operations Supervisor and/or qualified individual overseeing the salvage operation prior to proceeding with work.

References

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Meister, R. 2005 Southeast Pit Project Wight Pit to Tailings Road Southeast Pit to Tailings Pond Road Soil and Landform Inventory. Prepared for Mount Polley Mining Corporation. June 6, 2005.

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Meister, R. 2010. Southeast Dump, Boundary Pit and West PAG Projects Soil and Landform Inventory. Prepared for Mount Polley Mining Corporation. October 24, 2010.

MoE (BC Ministry of Environment). 2010. Field Manual for Describing Terrestrial Ecosystems in the Field – 2nd Ed. Land Management Handbook 25. Victoria, British Columbia: Crown Publications Inc.

Appendix A: Soil Stockpile Sampling Procedure

When taking soil chemistry samples from stockpiles, the following procedure is recommended:

1. Take a photo of the stockpile to document characteristics, including size and vegetative cover.

2. For each sample, use a new (clean), plastic sample bag.

3. Collect a composite sample from a minimum of three locations that are representative of the different sections of the stockpile. Record the GPS coordinates for each location.

4. If the stockpile has recently been created (within one year), samples can be collected from the surface. If stockpiles are older, at each sample location dig a profile using a shovel or mini back-hoe to greater than 1m (from all surfaces of the stockpile). Take a sample from 0.1 to 0.2m and 1.0m depths (this encompasses the more biologically active surface soils, as well as less active soils at depth). Ensure that equal volumes are sampled at every location and depth so that the composite is representative. The minimum total sample volume is approximately 500ml.Label each sample with a unique sample ID and the date.

5. Document sample collection in the MPMC Environmental Department Reclamation Field Book, including date, sample ID and description, collector, and any additional relevant observations or details.

6. Store samples in the refrigerator until ready for shipment to the lab (typically ALS Environmental in Burnaby, BC). Ship in coolers with ice packs within the time frame required to meet lab hold times.

7. Request lab analysis for parameters including, but not limited to:

    - Moisture content
    - Texture
    - pH
    - Electrical conductivity
    - Total nitrogen
    - Available phosphorus
    - Organic matter
    - Micronutrients including sulphur and potassium

Appendix B Soil Stockpile Sample Results

Methods

Soil samples were collected on September 3, 2013 from 23 soil stockpiles across the Mount Polley Mine site. At each stockpile three profiles representing variability across the stockpile were dug to greater than 1m with a mini backhoe. Equal volume samples were collected from 0.3m and 1m depths at each of the three locations and all samples from each stockpile were composited in a clean, labeled plastic sampling bag. Samples were stored in a cooler with ice upon collection, and then transferred to a refrigerator for storage until shipping. Samples were shipped in coolers on ice to ALS Environmental in Burnaby, BC, then were subsequently transported to the ALS Environmental Saskatoon laboratory for analysis. Fertilizer recommendations were generated by ALS, using wheat growing at 36 bushels per acre as a proxy.

Results

Results are presented in Tables B. 1 – B.3. General findings based on analytical results are:

- pH has increased from a baseline average of approximately 5.5 to between 6 and 8.
- Soil is deficient in nitrogen.
- Soil has marginal to deficient phosphorus and organic matter levels.
- Soil is marginal to deficient for potassium levels; however, concentrations are similar to levels in baseline soil samples.
- Micronutrients levels are sufficient for copper, iron, manganese, and zinc.
- Micronutrient levels are marginal to deficient for boron and chloride.
- Nutrient loss increases with stockpile storage time.

Soil Amendments

Direct application of stripped soil helps maintain soil microbial communities, native seed viability, and nutrient levels. When using stockpiled soil, incorporation of woody debris and other organic matter and including nitrogen fixing species in revegetation prescriptions are methods for rebuilding deficient nutrient pools. Soil amendments can also be used for improving levels of nutrients in which soil is deficient. Based on laboratory agricultural recommendations for grass cover:

- Average nutrient requirements to meet target nutrient levels of stockpiled soil are: 52 mg/kg of nitrogen, 13 mg/kg of phosphorus, and 19 mg/kg of potassium, which corresponds to a need for 61.9-15.7-22.5 (nitrogen-phosphorus-potassium) fertilizer at 187 kg/ha.
- Average micronutrient requirements to meet target nutrient levels are 0.2 mg/kg of boron and 7 mg/kg of chloride.

MPMC has historically accepted biosolids from Metro Vancouver for use in reclamation. Typical biosolids (Attachment 1) contain sufficient levels of potassium and phosphorus to ameliorate deficiencies identified in the 2013 soil sampling results. Routine biosolids assessment does not test for boron or chloride; however, these results show that in general, metal and anion levels are elevated. Biosolids also contain an average

of 11 mg/kg of Nitrate-N, which provides more than a six-fold increase over the average soil stockpile concentration of 1.7 mg/kg.

These results are to be incorporated into reclamation prescriptions in the MPMC Reclamation and Closure Plan, which include recommendations for use of soil amendments. Recommendations should be supported by site research and mine reclamation best practices, which will provide guidance on when soil amendments are necessary, and what types and quantities to use. This should include long-term considerations, as soil amendments may only provide a short-term nutrient source.

Table B.1 Soil stockpile sample soil characteristic results

Location	Soil Climatic Zone	Texture	pH (1S:2W)	EC (1S:2W - mS/cm)	EC (Calc. Sat Extr - mS/cm)	Salinity Rating	Organic Matter (%)
Mill Site	Dark Gray	Clay Loam	6.8	0.1	0.2	Non Saline	2.2
SERDS	Dark Gray	Clay Loam	6.0	0.1	0.2	Non Saline	4.4
SEZ 2	Dark Gray	Loam	6.5	0.3	0.7	Non Saline	6.4
Perimeter Embankment 1	Dark Gray	Clay Loam	6.4	0.2	0.4	Non Saline	4.4
PAG Dump	Dark Gray	Clay Loam	7.1	0.3	0.7	Non Saline	3.2
NW Sump Road	Dark Gray	Clay Loam	6.2	0.1	0.2	Non Saline	1.7
North Bell Dump Till	Dark Gray	Clay Loam	8.3	0.2	0.4	Non Saline	0.9
Springer North	Dark Gray	Clay Loam	7.9	0.1	0.2	Non Saline	1.0
North Bell Dump Top	Dark Gray	Clay Loam	7.5	0.2	0.4	Non Saline	2.6
Access Road km 12	Dark Gray	Clay Loam	7.6	0.1	0.2	Non Saline	1.5
EAST RDS	Dark Gray	Clay Loam	8.0	0.1	0.2	Non Saline	1.3
Ore Switchback	Dark Gray	Clay Loam	6.9	0.1	0.2	Non Saline	3.6
NEZ Dump	Dark Gray	Clay Loam	7.0	0.2	0.4	Non Saline	2.5
Highway to Heaven	Dark Gray	Clay Loam	6.9	0.2	0.4	Non Saline	2.6
Wight Pit Till	Dark Gray	Clay Loam	7.7	0.3	0.7	Non Saline	0.9
Wrap Around Road	Dark Gray	Clay Loam	7.4	0.2	0.4	Non Saline	1.9
Till Borrow	Dark Gray	Clay Loam	6.6	0.1	0.2	Non Saline	3.3
Perimeter Embankment 2	Dark Gray	Clay Loam	6.2	0.1	0.2	Non Saline	3.8
South Till Borrow	Dark Gray	Clay Loam	6.6	0.1	0.2	Non Saline	5.2
Main Embankment	Dark Gray	Clay Loam	7.5	0.2	0.4	Non Saline	2.2
TSF Corner 1	Dark Gray	Clay Loam	6.9	0.1	0.2	Non Saline	1.6
TRR	Dark Gray	Clay Loam	6.0	0.1	0.2	Non Saline	3.1
Cariboo Stockpile		Sandy Loam	7.5				2.1
AVERAGE			7.0	0.2	0.3		2.7
1995 Test Pits (Average)			5.7		0.2		2.5
1997 Test Pits (Average)			5.3		0.4		4.4
2006 Test Pits (Average)			6.0		0.2		2.8

Table B.2 Soil stockpile sample soil nutrient results

	Soil Test Nutrient Levels (mg/kg)																			
Location	**NO_3-N**		**P**		**K**		**SO_4-S**		**Cu**		**Mn**		**Zn**		**B**		**Fe**		**Cl**	
Mill Site	1	Deficient	2	Deficient	79.5	Marginal	12	Sufficient	70	Excess	5.1	Sufficient	0.75	Sufficient	0.2	Deficient	91	Sufficient	3	Deficient
SERDS	1.5	Deficient	>27	Marginal	70.5	Deficient	4	Marginal	1.25	Sufficient	24.7	Excess	1.05	Sufficient	0.2	Deficient	123.5	Sufficient	5	Marginal
SEZ 2	1.5	Deficient	26.5	Marginal	109.5	Sufficient	>24	Sufficient	82.5	Excess	21.75	Excess	1.6	Sufficient	0.4	Marginal	98.5	Sufficient	6.5	Marginal
Perimeter Embankment 1	4.5	Deficient	4	Deficient	53.5	Deficient	19	Sufficient	3.85	Sufficient	55	Excess	0.85	Sufficient	0.2	Deficient	141	Sufficient	4.5	Marginal
PAG Dump	1	Deficient	13	Marginal	96	Marginal	>21.5	Sufficient	144	Excess	7.4	Sufficient	1.2	Sufficient	0.6	Sufficient	69.5	Sufficient	5	Marginal
NW Sump Road	1	Deficient	>27	Marginal	91.5	Marginal	5	Marginal	9.8	Sufficient	20.3	Excess	0.85	Sufficient	0.15	Deficient	99.5	Sufficient	3	Deficient
North Bell Dump Till	1	Deficient	8.5	Deficient	101	Marginal	>21.5	Sufficient	25.5	Excess	5.55	Sufficient	0.7	Sufficient	0.25	Deficient	13.5	Sufficient	2	Deficient
Springer North	1	Deficient	13.5	Marginal	59	Deficient	3	Deficient	102.5	Excess	5.95	Sufficient	1.1	Sufficient	0.1	Deficient	61.5	Sufficient	1.5	Deficient
North Bell Dump Top	2	Deficient	>27	Marginal	75.5	Deficient	>21.5	Sufficient	18.05	Excess	25.95	Excess	0.8	Sufficient	0.15	Deficient	47	Sufficient	4.5	Marginal
Access Road km 12	1	Deficient	20	Marginal	63	Deficient	3	Deficient	33.35	Excess	6.05	Sufficient	0.6	Marginal	0.1	Deficient	58.5	Sufficient	1.5	Deficient
EAST RDS	1	Deficient	3.5	Deficient	45.5	Deficient	4	Marginal	10.4	Sufficient	5.85	Sufficient	0.5	Marginal	0.15	Deficient	35.5	Sufficient	1.5	Deficient
Ore Switchback	1.5	Deficient	>27	Marginal	86.5	Marginal	14.5	Sufficient	9.85	Sufficient	21.6	Excess	1.75	Sufficient	0.3	Marginal	86	Sufficient	5	Marginal
NEZ Dump	2.5	Deficient	23.5	Marginal	69.5	Deficient	>21.5	Sufficient	156.5	Excess	7.35	Sufficient	1.7	Sufficient	0.15	Deficient	191	Excess	1.5	Deficient
Highway to Heaven	1	Deficient	13	Marginal	79	Marginal	15.5	Sufficient	92.5	Excess	16.75	Sufficient	0.8	Sufficient	0.15	Deficient	187.5	Excess	1.5	Deficient
Wight Pit Till	1	Deficient	10	Deficient	60.5	Deficient	>21.5	Sufficient	15.05	Sufficient	4.35	Sufficient	0.85	Sufficient	0.15	Deficient	36.5	Sufficient	1	Deficient
Wrap Around Road	1	Deficient	8	Deficient	79.5	Marginal	17	Sufficient	60	Excess	6.45	Sufficient	0.85	Sufficient	0.1	Deficient	119	Sufficient	1.5	Deficient
Till Borrow	1	Deficient	5	Deficient	78.5	Marginal	0.5	Deficient	2.1	Sufficient	16.3	Sufficient	1.1	Sufficient	0.15	Deficient	157.5	Excess	3.5	Deficient
Perimeter Embankment 2	7.5	Deficient	6.5	Deficient	81.5	Marginal	5.5	Marginal	2.65	Sufficient	7.35	Sufficient	0.8	Sufficient	0.25	Deficient	197	Excess	2.5	Deficient
South Till Borrow	1.5	Deficient	9.5	Deficient	85.5	Marginal	1	Deficient	2.4	Sufficient	65	Excess	0.55	Marginal	0.15	Deficient	210	Excess	3.5	Deficient
Main Embankment	1	Deficient	1	Deficient	76.5	Deficient	12	Sufficient	3.25	Sufficient	12.3	Sufficient	0.4	Marginal	0.15	Deficient	105.5	Sufficient	3	Deficient
TSF Corner 1	1.5	Deficient	2.5	Deficient	53.5	Deficient	5	Marginal	5.3	Sufficient	14.65	Sufficient	0.3	Marginal	0.1	Deficient	123.5	Sufficient	2.5	Deficient
TRR	1	Deficient	9.5	Deficient	54	Deficient	3.5	Deficient	1.25	Sufficient	17.05	Sufficient	2.3	Sufficient	0.3	Marginal	175.5	Excess	2.5	Deficient
Cariboo Stockpile	<1.0	Deficient	10.1	Marginal	92	Marginal	14.6	Sufficient	491	Excess	910	Excess	93.8	Excess			35800	Excess		

AVERAGE	1.7		10.0		75.7		8.2		58.4		55.8		5.0		0.2		1662.1		3.0	
1995 Test Pits (Average)			30.0		73.0				305		778		89		19		39556			
1997 Test Pits (Average)			26.7		99.8															
2006 Test Pits (Average)			27.9		91.0															

Table B.3 Fertilizer recommendations based on soil stockpile sample soil characteristic results

	Fertilizer Recommendations (lbs/ac / kg/ha)											
Location	**N**		**P2O5**		**K2O**		**S**		**B**		**Cl**	
Mill Site	105	117.6	37.5	42	20	22.4	5	5.6	0.25	0.28	17.5	19.6
SERDS	105	117.6	17.5	19.6	15	16.8	0	0	0.25	0.28	7.5	8.4
SEZ 2	105	117.6	17.5	19.6	15	16.8	0	0	0.25	0.28	7.5	8.4
Perimeter Embankment 1	115	128.8	22.5	25.2	55	61.6	12.5	14	0.5	0.56	7.5	8.4
PAG Dump	90	100.8	37.5	42	85	95.2	0	0	0.5	0.56	7.5	8.4
NW Sump Road	105	117.6	22.5	25.2	20	22.4	0	0	0	0	7.5	8.4
North Bell Dump Till	105	117.6	17.5	19.6	20	22.4	7.5	8.4	0.5	0.56	17.5	19.6
Springer North	105	117.6	27.5	30.8	20	22.4	0	0	0.5	0.56	17.5	19.6
North Bell Dump Top	105	117.6	22.5	25.2	85	95.2	12.5	14	0.5	0.56	17.5	19.6
Access Road km 12	100	112	17.5	19.6	20	22.4	0	0	0.5	0.56	7.5	8.4
EAST RDS	105	117.6	17.5	19.6	55	61.6	0	0	0.5	0.56	17.5	19.6
Ore Switchback	105	117.6	37.5	42	85	95.2	7.5	8.4	0.5	0.56	17.5	19.6
NEZ Dump	105	117.6	17.5	19.6	20	22.4	0	0	0.25	0.28	7.5	8.4
Highway to Heaven	100	112	17.5	19.6	55	61.6	0	0	0.5	0.56	17.5	19.6
Wight Pit Till	105	117.6	22.5	25.2	20	22.4	0	0	0.5	0.56	17.5	19.6
Wrap Around Road	105	117.6	27.5	30.8	55	61.6	0	0	0.5	0.56	17.5	19.6
Till Borrow	105	117.6	27.5	30.8	17.5	19.6	0	0	0.5	0.56	17.5	19.6
Perimeter Embankment 2	105	117.6	37.5	42	20	22.4	12.5	14	0.5	0.56	17.5	19.6
South Till Borrow	80	89.6	27.5	30.8	20	22.4	7.5	8.4	0.5	0.56	17.5	19.6
Main Embankment	105	117.6	27.5	30.8	17.5	19.6	12.5	14	0.5	0.56	17.5	19.6
TSF Corner 1	105	117.6	37.5	42	20	22.4	5	5.6	0.5	0.56	17.5	19.6
TRR	105	117.6	37.5	42	85	95.2	7.5	8.4	0.5	0.56	17.5	19.6
Cariboo Stockpile						0						
AVERAGE	103	116	26	29	38	42	4	5	0	0.5	14	16

Appendix C: Site Preparation Methods

Surface roughening is a key element for reducing erosion, retaining moisture, and reducing compaction.

Some approaches that can be used are:

1. Ripping (Figure C.1) is used as a soil roughening technique in areas too large to economically roughen with a backhoe or excavator, and is typically best for dry soils. Ripping breaks up compacted layers of soil. Rip soils when they are dry to permit shattering beneath the surface. Ripping guidelines:
    a. Rip to a depth of ~0.5 to 1m (or as deep as possible given the soil texture and coarse fragments).
    b. Make rips contour to the slope.
    c. The distance between rippers should be equal to the depth ripped.
    d. Lift the ripper from the soil every 3 to 6m to allow for some downslope water drainage. Offset drainage breaks in the ripping rows.

2. Trenching can be used for medium moisture level soils. The easiest method is to use a bull dozer and angle the blade to make “horizontal windrows”. Lift the blade every 3 to 6m to allow for some downslope water drainage. Offset the drainage breaks in the trenches.

3. Mounding (Figure C.1) is typically best for wetter sites and can be carried out on slopes or on flat terrain. Mounding can be done with a backhoe or excavator with a digging bucket to create microbasins for extreme surface roughening as follows:
    a. Start at top/bottom of the slope and work up/down in lines parallel to the contours, depending on site access.
    b. Dig, poke, or push a basin that is ~0.5m deep and has the width of the equipment bucket. This allows the basin to be up to ~1 to 1.5m wide.
    c. Drop the excavated soil on the soil surface adjacent to the basin (on the upslope side if working on a slope).
    d. Create one mound every ~2 to 3m in a random pattern that reduces the ability of water to flow straight downslope. The frequency can be increased or decreased depending on erosion risk associated with the terrain.

4. Mechanical Screefing (Figure C.2) can be applied on level ground or on slopes and can be utilized in snowy conditions, as this technique reduces the likelihood of incorporating snow into the soil. The results are similar to mounding, but shallower. Mechanical screefing can an be done with an excavator with a digging bucket as follows:
    a. Start at top/bottom of the slope and work up/down in lines parallel to the contours, depending on site access.
    b. Push bucket into snow and up to ~0.5m into the underlying soil.
    c. Rake bucket downslope ~1m creating a shallow depression with a shallow downslope berm.
    d. Create one screef every ~2 to 3m in a random pattern that reduces the ability of water to flow straight downslope.



Figure C.1 Mounding (left) and ripping (right) site preparation methods

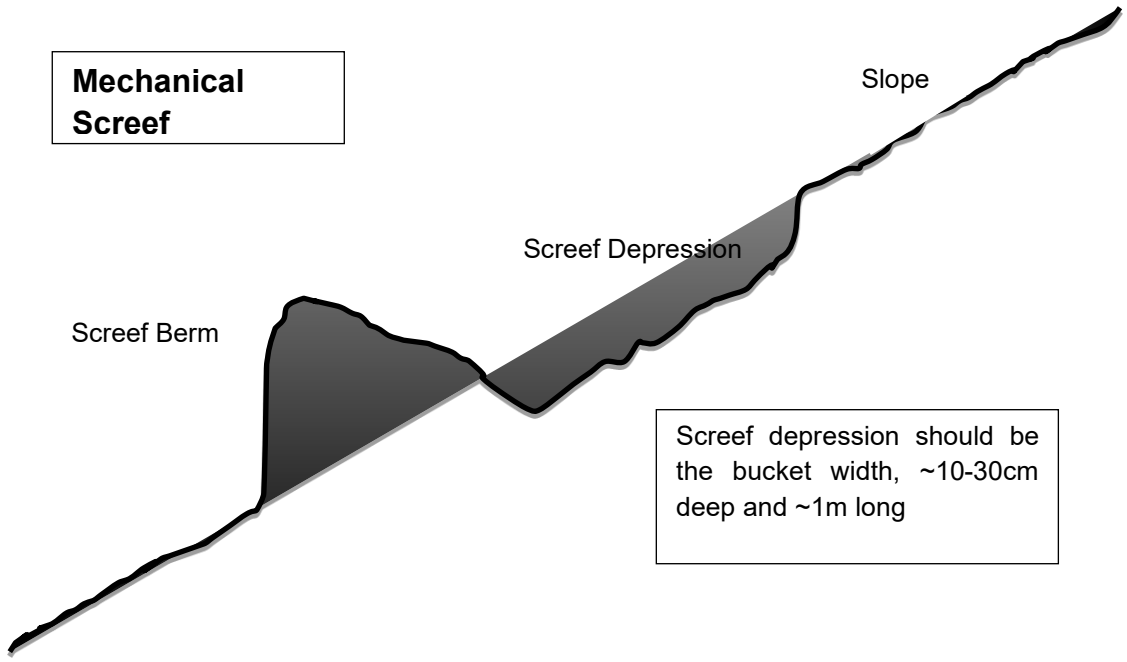


Figure C.2 Mechanical screefing schematic

Attachment 1:
Metro Vancouver Biosolids Composition (2013)

	BC Organic Matter Recycling Regulation		Annacis I. WWTP (Routine QC Station)			
			Numbers of	Dewatered Biosolids (Class A)		
	Class A	Class B	Samples	Period:	15-Apr-13	- 15-Oct-13
	Biosolids	Biosolids	Collected	Mean	Min	Max
Physical Parameters						
Total Solids (%)			32	26.5	23.4	30.3
Volatile Solids (%)			6	70.3	69.1	72.1
Electrical Conductivity (ds/m)			6	6.07	5.50	6.60
Bulk Density						
pH			6	8.1	7.8	8.4
Macronutrients (mg/kg dw)						
Total Kjeldahl Nitrogen (TKN)			6	52,633	49,400	55,300
Ammonia distillation			6	9,560	9,040	10,100
Nitrate/Nitrite-N			0	0.0	0.0	0.0
Nitrate/Nitrite-N (Available)			5	11.0	11.0	11.0
Phosphorus (Total)			31	24,568	22,600	29,200
Phosphorus (Available)			5	2,680	1,900	3,500
Potassium (Total)			20	1,730	1,550	2,050
Potassium (Available)			5	1,282	1,110	1,470
Calcium (Total)			27	23,756	21,900	25,500
Magnesium (Total)			27	6,132	5,460	6,990
Total Trace Elements (mg/kg)						
Aluminum			27	7,701	6,650	8,730
Arsenic	75	75	27	5.2	4.0	7.0
Barium			14	318	294	343
Cadmium	20	20	27	2.4	2.0	3.4
Chromium		1,060	27	64	42	99
Cobalt	150	150	27	4.3	3.7	4.9
Copper		2,200	27	894	759	1,030
Iron			27	33,137	28,500	37,600
Lead	500	500	27	56	36	71
Manganese			27	349	315	395
Mercury	5	15	27	1.8	1.0	3.2
Molybdenum	20	20	27	13.9	10.7	19.5
Nickel	180	180	27	26	18	38
Selenium	14	14	27	7.0	6.1	9.0
Silver			27	6.8	4.6	9.7
Zinc	1,850	1,850	27	1312	1090	1550
Bacteriology (MPN/g)						
Fecal Coliform - discrete	<1,000		79	125	19	820

APPENDIX 10-3: ML/ARD MANAGEMENT PLAN

FINAL

Metal Leaching and Acid Rock Drainage Management Plan

Mount Polley Mine, British Columbia, Canada

Mount Polley Mining Corporation

SRK Consulting (Canada) Inc. ■ CAPR003709 ■ November 2025

srk consulting

FINAL

Metal Leaching and Acid Rock Drainage Management Plan

Mount Polley Mine, British Columbia, Canada

Prepared for:
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The opinions expressed in this document have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. While SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

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Appendices

Appendix A Standard Operating Procedures

Definitions

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

ABA	Acid-base Accounting
AP	Acid Potential
ARR	Annual Reclamation Report
BX1	Breccia 1
JAIR	Joint Application Information Requirements
LIMS	Laboratory Information Management System
LOM	Life of Mine
LSW	Low Sulphur Waste
ML/ARD	Metal Leaching and Acid Rock Drainage
MPIC	Mount Polley Intrusive Complex
MPMC	Mount Polley Mining Corporation
NEZ	Northeast Zone
NP	Neutralization Potential
OMS	Operation, Maintenance and Surveillance
PAG	Potentially Acid Generating
QA/QC	Quality Assurance and Quality Control
QP	Qualified Professional
SERDS	Southeast Rock Disposal Site
SOP	Standard Operating Procedures
TC	Total Carbon
TIC	Total Inorganic Carbon
TSF	Tailings Storage Facility
WTP	Water Treatment Plant

Version Summary

This document replaces earlier versions of similar documents that directed ML/ARD Management at MPM in response to *Mines Act* Permit M-200 issued on August 3, 1995.

Version	Revision Date	Author(s)	Comment
0		Shauna Litke, PEng (SRK) Stephen Day, PGeo (SRK)	Original document
1	November 18, 2025	Shauna Litke, PEng (SRK)	Updated to reflect conditions in Permit M-200 (amended August 28, 2025)

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1 Introduction

This Metal Leaching and Acid Rock Drainage (ML/ARD) Management Plan is for Mount Polley Mine, operated by Mount Polley Mining Corporation (MPMC). It has been prepared in accordance with the Joint Application Information Requirements (JAIR, MCM and ENV 2024) (Table 1-1) as required by the JAIR, the ML/ARD Monitoring Plan is a separate document.

Table 1-1: Table of Concordance with 2024 JAIR (MCM and ENV 2024)

Section Number in Plan	Section Title	Information Required as per 2024 JAIR[1]
3.1	Objectives of Management	Management purposes and objectives for each material to be managed.
2.1	Location and Site Layout	Site map clearly indicating storage facilities and stockpiles.
2.6	Material Handling and Processing	Flow chart or conceptual diagram that illustrates the material processing/movement.
2.6	Material Handling and Processing	Procedure for tracking material movement.
2.5	Material Inventory	Summary table of each storage facility and stockpile (capacity, dates active, reclamation timeline).
3.3	ML/ARD Mitigation Measures	Summary of key ML/ARD mitigation measures.
3.4	Contingency Plans	Presentation of contingency plans for management, handling, and storage of potentially ML and PAG materials.
Appendix A 3.5	Standard Operating Procedures and Work Methods Quality Assurance and Quality Control	SOPs and Quality Assurance/Quality Control (QA/QC) procedures.
3.7	Change Management Process	Process for change management.
4.1	Data Management	Data management protocols.
4.2	Review Schedules	Review schedule.
5	Roles and Responsibilities	Roles and responsibilities.
4.3	Reporting Requirements and Schedules	Reporting requirements and schedules.

Notes:

[1] From Section 10.5.1 and 10.5.3 of MCM and ENV (2024)

2 Background

2.1 Location and Site Layout

Mount Polley Mine (MPM) is located approximately 56 km northeast of Williams Lake and approximately 15 km southwest of the community of Likely, BC. The MPM site layout showing open pits, waste rock dumps, and the Tailings Storage Facility (TSF) is shown in Figure 2-1. Water management infrastructure is shown in Figure 2-2.

Figure 2-1: Mount Polley Mine Site Layout - Open Pits, Waste Rock Dumps, Ore Stockpiles, Major Haul Roads, and Tailings Storage Facility

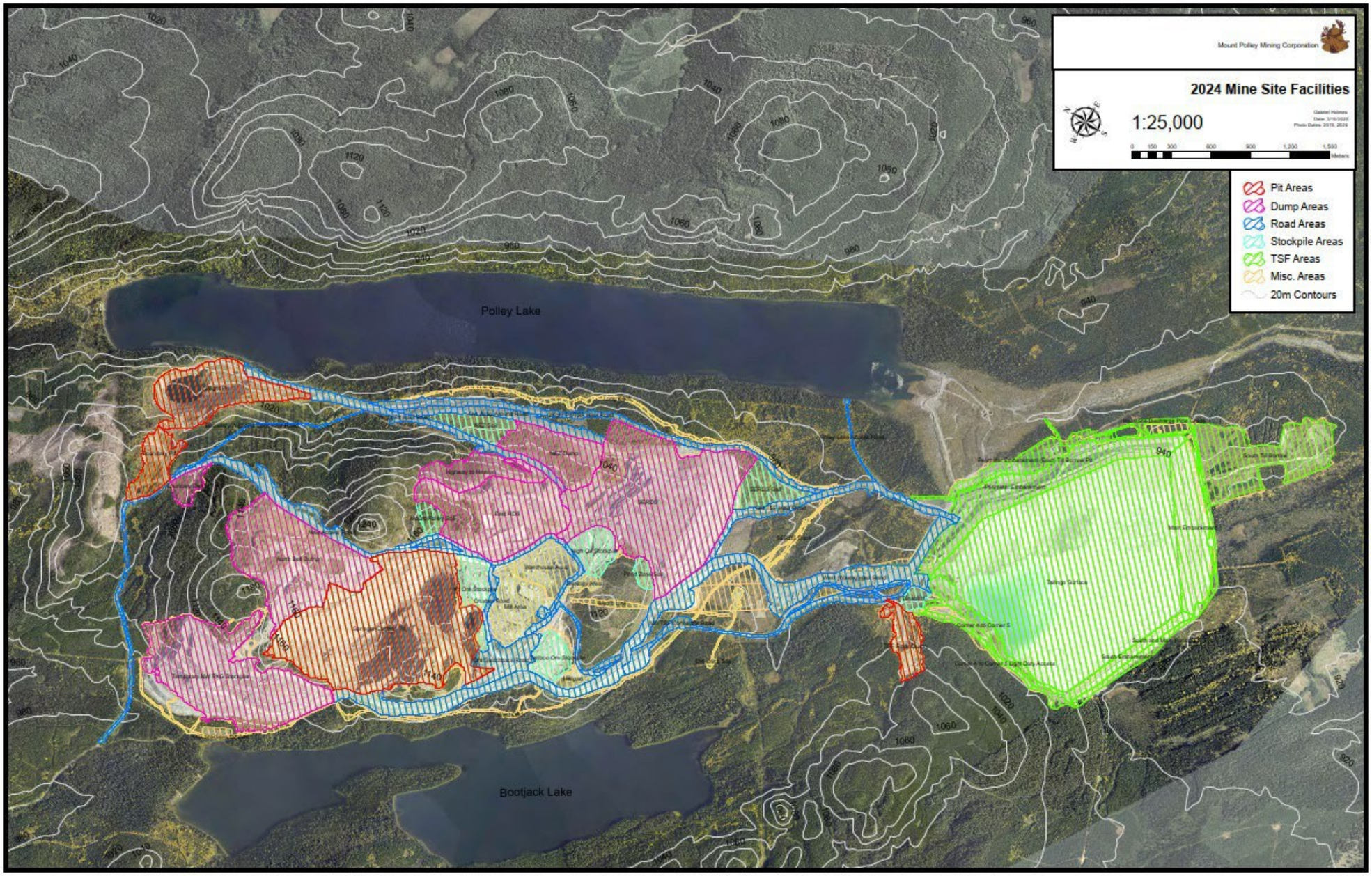
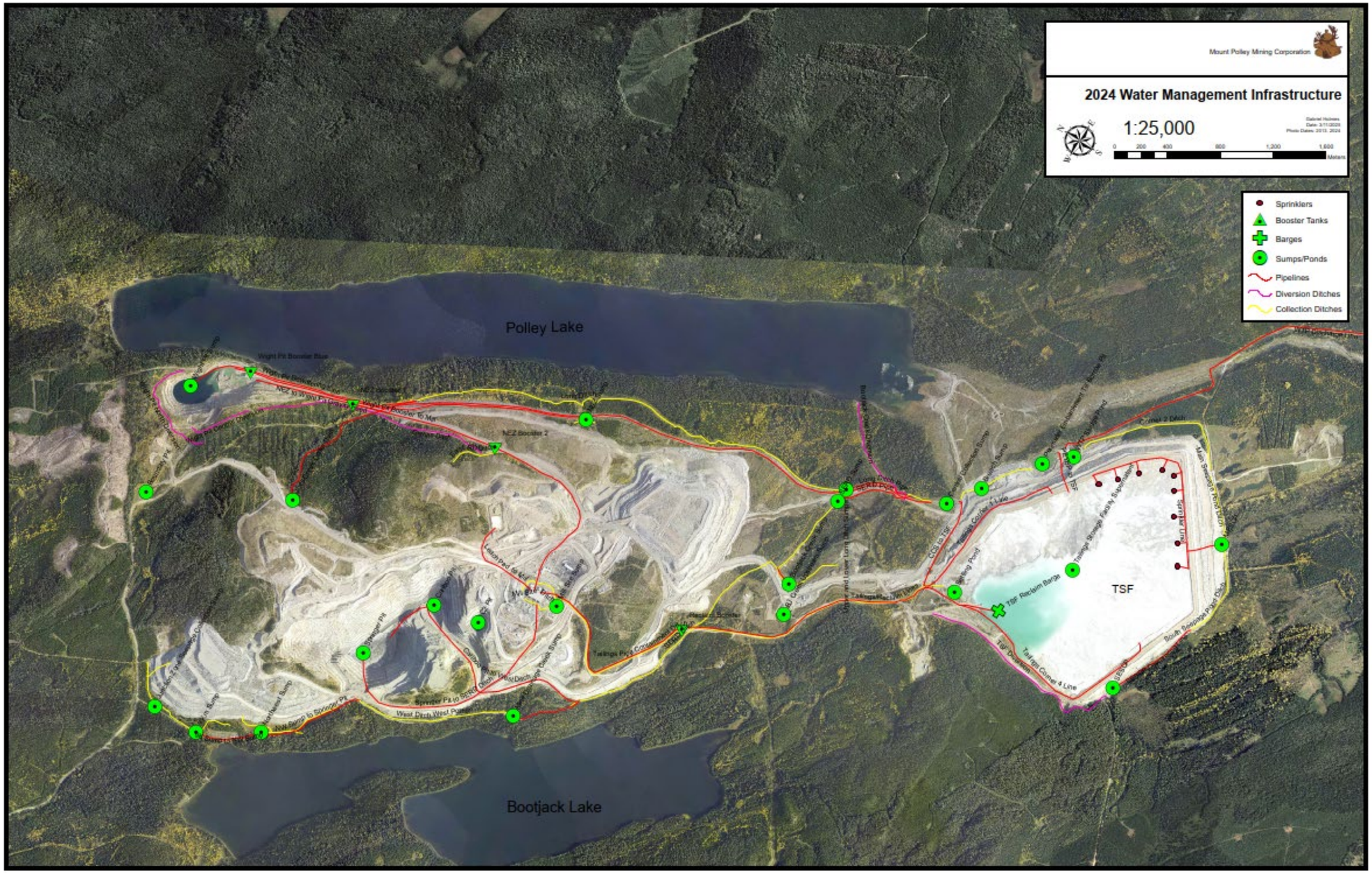


Figure 2-2: Water Management Infrastructure at Mount Polley Mine


Mount Polley Mining Corporation
2024 Water Management Infrastructure
1:25,000
Meters
Sprinklers
Booster Tanks
Barges
Sumps/Ponds
Pipelines
Diversion Ditches
Collection Ditches
Polley Lake
Bootjack Lake
TSF
TSF Reclaim Barge
Settling Pond
Triangle Sloughs Facility Supernatant
Tailings Corner 4 Line
Tailings Corner 3 Line
Tailings Corner 2 Line
Tailings Corner 1 Line
Main Seepage Pond Dam
South Seepage Pond Dam
Wright Pit Booster Blue
NEZ Booster 2
Upper Dyke Sump
Upper and Lower Dyke Sump
Lower Dyke Sump
Bootjack Sump
Northwest Sump
Southwest Sump
Sprinkler Pit
Sprinkler Pit to Sprinkler Pit
Sprinkler Pit to SERD Ditch
West Ditch West Pumpback
Talings Pit to Corner 4 Line
Talings Pit to Corner 3 Line
Talings Pit to Corner 2 Line
Talings Pit to Corner 1 Line
Talings Pit to Settling Pond
Talings Pit to Triangle Sloughs
Talings Pit to Main Seepage Pond
Talings Pit to South Seepage Pond
Talings Pit to TSF
Talings Pit to Reclaim Barge
Talings Pit to Sprinkler Pit
Talings Pit to SERD Ditch
Talings Pit to Upper Dyke Sump
Talings Pit to Lower Dyke Sump
Talings Pit to Bootjack Sump
Talings Pit to Northwest Sump
Talings Pit to Southwest Sump
Talings Pit to West Ditch West Pumpback
Talings Pit to Upper and Lower Dyke Sump
Talings Pit to Corner 1 Line
Talings Pit to Corner 2 Line
Talings Pit to Corner 3 Line
Talings Pit to Corner 4

2.2 Geological Setting

The Mount Polley deposit is classified as an alkalic porphyry copper gold deposit (BC MINFILE No. 093A 008). With the exception of the distinctive small Pond Zone, it has been mined from several mineralized zones which have the following common features:

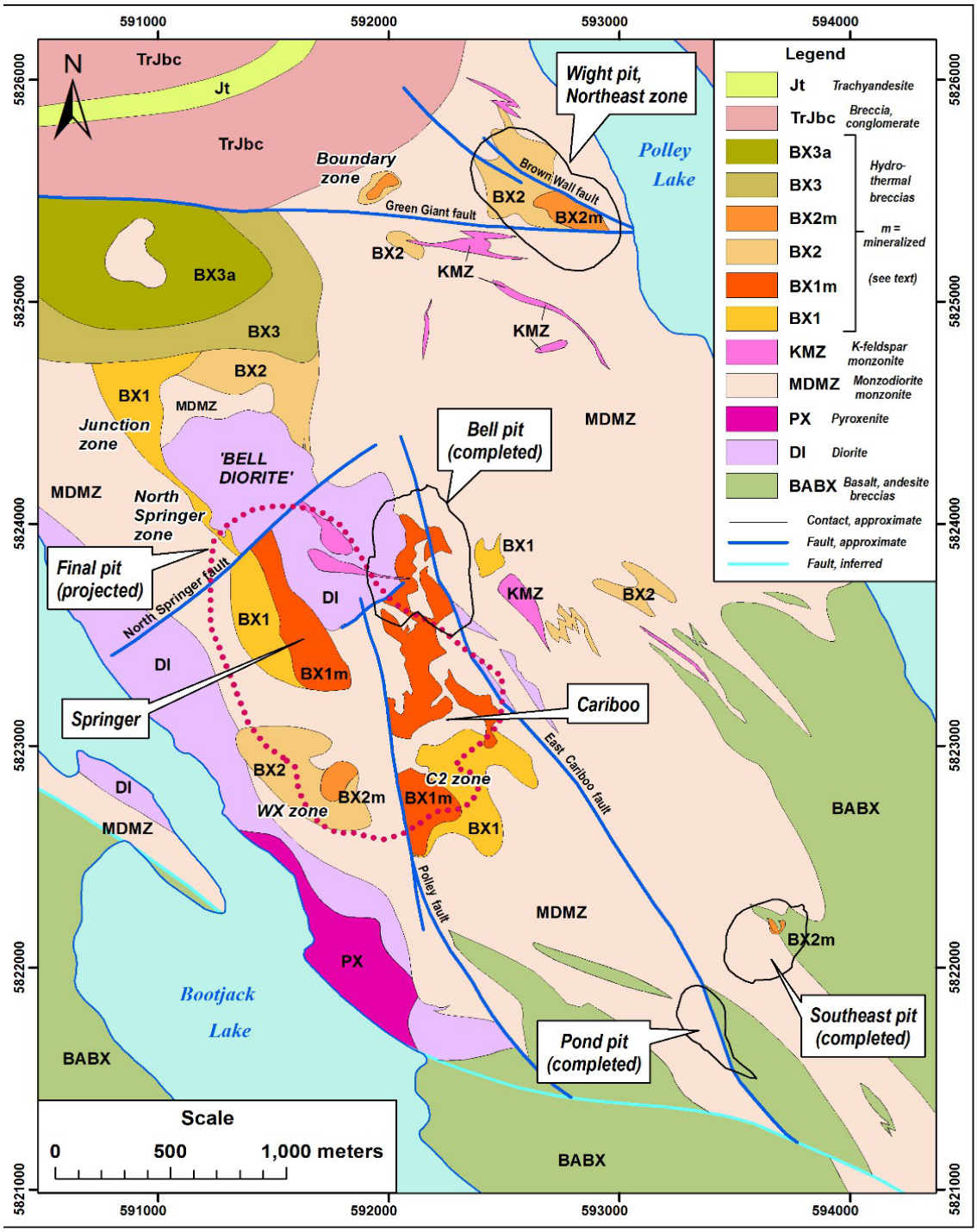
- The host rock for porphyry mineralization is the Mount Polley Intrusive Complex (MPIC) which intruded into Nicola Group Volcanics (Figure 2-3). The MPIC is primarily monzonite to monzo-diorite in composition. Smaller phases vary in composition from diorite to syenite.
- Mineralization is associated with magmatic-hydrothermal breccias. Alteration and mineralization occur in the matrix of the breccias, and in veins and swarms distributed around the breccias. Distinct breccia units are subdivided by texture, composition, and alteration. Breccia 1 (BX1) is the main host for the bulk of the mineralization at MPM which is mined in the Cariboo and Springer Pits (Figure 2-3). BX1 is characterized by alteration which resulted in the strongest destruction of both primary and breccia textures. Breccia bodies BX2 host satellite mineralization in the Southeast Zone, Wight Pit, and Boundary Zone. BX2 is less intensively altered and original textures are more apparent. BX3 is unmineralized and has not been mined.
- Alteration at Mount Polley deposit is classified as potassic (sodic and calcic) with salmon-pink potassium feldspar as the main alteration mineral. Biotite is less common. Sodic alteration is defined by albite and calcic alteration has actinolite, diopside, epidote, clinozoisite, and sporadic andraditic garnet. Calcite is pervasive. Alteration is zoned with the strongest calcic-potassic alteration in the core associated with BX1. Nicola Group rocks and fringing MPIC rocks are propylitically-altered and characterized by occurrence of epidote and pyrite.
- Like other alkalic porphyry deposits in BC (e.g., Copper Mountain, Brenda), MPM lacks the strong hydrothermal alteration zoning that is commonly observed in calc-alkalic porphyry deposits (e.g., Highland Valley Copper, Island Copper, Gibraltar). In particular, phyllic alteration is absent at MPM. A common feature of calc-alkalic porphyry deposits is often a pronounced pyritic halo that surrounds the copper mineralization and is associated with phyllic and propylitic alteration. At MPM, discontinuous pyritic zones are present. MPM geological staff identified a pyritic zone in the south wall of the Springer Pit which extends into the adjacent Cariboo Pit and into the WX zone. Samples from the Bell Pit blast holes collected in the early years of operations were identified as being from a pyritic zone but the location of this feature is not known.
- Sulphide mineralization consists mainly of chalcopyrite ($CuFeS_2$) and pyrite (FeS_2), with lesser bornite (Cu_5FeS_4), and minor covellite (CuS) and digenite (Cu_9S_5). Bornite is relatively more abundant in the Northeast and Boundary Zones in comparison to the other zones.
- Carbonate occurs principally as calcite, with occurrences of malachite ($Cu_2CO_3(OH)_2$) formed as a natural weathering product. Iron carbonates have not been identified.
- A significant portion of the copper mineralization at the MPM is not associated with sulphides (upwards of 50% in the upper portions of each pit). This fraction has been termed ‘copper oxide’ by MPM personnel and is associated primarily with chrysocolla ($(Cu,Al)_2H_2Si_2O_5(OH)_4 \cdot nH_2O$) and malachite ($Cu_2CO_3(OH)_2$) in equal proportions (Henry 2009). SRK (2015b) has shown that copper

can be hosted within chlorite. It is assumed that chlorite formed hydrothermally and incorporated copper as part of the mineralizing event rather than due to weathering. Suarez et al. (2009) found that the form of copper in chlorite at the Aguablanca Ni-Cu-PGE sulphide deposit was native copper between silicate layers rather than as a substitution in the crystal lattice. It is not known whether this same form of copper is also present at MPM.

Copper mineralization at the small Pond Zone is classified as andradite-clinopyroxene-magnetite skarn occurring at the contact between a diorite to monzodiorite intrusion and a localized occurrence of limestone in the Nicola Group.

From an ML/ARD perspective, a significant feature of the Mount Polley mineralization is the lack of reported arsenic, lead, and zinc minerals. Since arsenic, zinc, and associated cadmium are relatively mobile under neutral to slightly alkaline conditions typical at the MPM, the lack of the minerals hosting these elements indicates that potential for leaching concerns is lower than other porphyries. Based on the copper sulphide and copper oxide dominated mineralogy, the primary metal leaching concern is expected to be copper. In addition, the lack of a distinctive pyrite halo means that pyrite abundance is lower than other porphyry deposits and ARD potential is expected to be lower.

Figure 2-3: Geological Map of the Mount Polley Mine



Sources: Rees (2013)

2.3 Geochemical Characterization

2.3.1 Existing and Future Mined Rock

SRK (2025a) presented geochemical characterization of existing and future waste rock, ore, and LGO according to MPMC's updated mine plan and geological model. The main conclusions of the geochemical characterization are as follows:

- General findings from existing and future waste rock, ore, and LGO geochemical characterization were that sulphur content was the primary control on ARD potential and sulphide occurs primarily as pyrite. For future rock, Springer 6 and WX had the highest sulphur content and therefore the highest proportions of PAG rock on the basis of both the mine plan and ARD classifications using ABA data.
- Existing and future waste rock, ore, and LGO had a similar list of elements that were enriched relative to the screening criteria. Copper and selenium concentrations were comparable for existing and future mining areas.
- HCT trends for samples representing existing mined rock and future waste rock were similar, as were leachate concentrations.
- For existing mined rock, future waste rock, ore, and LGO, lithological classification was determined to not be a control on ML/ARD potential.
- Delay to onset of ARD for PAG materials is of the order of decades due to the presence of calcite.

2.3.2 Tailings

Metallurgical tailings generated from testing of Springer 5, Springer 6, C2 and WX zones were not available for geochemical testing at the time of reporting. Because the processing of the ore for the Project will use the same standard flotation technology that is currently being used, ore and LGO from these zones were initially compared to previously mined rock in SRK (2025a) to determine if similar characteristics of future ore and LGO are anticipated in these zones. SRK (2025a) concluded this was the case, but also recommended geochemical characterization of tailings from metallurgical test work be completed on samples from Springer 5, Springer 6, WX, and C2 areas. The main conclusions of geochemical characterization of tailings at MPM were:

- Total sulphur concentrations in Mount Polley tailings range from 0.01% to 1.1% (median concentration of 0.10%). Almost all of tailings samples (99%) were found to be NAG based on their TIC/AP values.
- Median concentrations of copper and selenium were present in the tailings at an order of magnitude higher concentrations compared to average crustal concentrations for low calcium granite. Copper is partially deported in silicate minerals. Selenium is associated with the sulphide component of the tailings and is also correlated with copper content.
- Kinetic testing on tailings samples has to-date confirmed they are non-acid generating.

2.4 Mine Plan

MPMC's current Life of Mine (LOM) plan is anticipated to run into the year 2032 and includes the following activities:

- **Pit and waste rock dump extensions:** expansion of the Springer Pit in two phases (Phase 5 and Phase 6), as well as further mining of C2 Pit and pushback into the WX Zone, both near the current Cariboo Pit (Figure 2-3). PAG waste rock will be placed in the temporary Northwest PAG stockpile while non-PAG (referred to as NAG at MPM) waste rock will be placed in an extension of the existing Southeast Rock Disposal Site (SERDS). Magnetite will be continued to be temporarily stockpiled after separation from the tailings stream.
- **Disposal date of rehandled PAG waste rock in Temporary NW PAG Stockpile:** the disposal timeframe of PAG waste rock into the completed Springer-Cariboo Pit is December 31, 2033.
- **Tailings storage expansion:** raise of the existing Tailings Storage Facility (TSF) to accommodate additional tailings from the extended mine life. No modifications in processing are proposed.
- **Treated water discharge to Quesnel Lake extension:** the discharge to Quesnel Lake will continue to the end of mining operations in 2031.

2.5 Material Inventory

2.5.1 Waste Rock

Table 2-1 summarizes major waste rock disposal locations as of October 31, 2025, which are shown in Figure 2-1. The primary NAG rock disposal locations are the North Bell Dump, which includes backfill in the Bell Pit, the South East Rock Disposal Site (SERDS), which also includes the backfilled Southeast Zone and Pond Zone Pits, and the Northeast Zone (NEZ) Dump. NAG rock has been used for construction purposes (Waste Haul Road and the TSF). NAG rock from the open pits has been disposed at a variety of different locations resulting in waste rock dumps containing non-unique source materials. The exception is that the NEZ Dump received waste primarily from the Wight Pit.

As described in SRK (2016), prior to 2005 (i.e., before operations were re-started), limited PAG waste rock was mined and was placed into the bottom of the Bell Pit. A small amount was dumped over the north end of the Cariboo Pit, but it was re-handled to the bottom of the Cariboo Pit. Acid-base accounting (ABA) analyses were performed by an external lab.

Since 2005, PAG waste rock has primarily been disposed in the Temporary NW PAG Stockpile (which includes the NAG/PAG Pad and called Ex-pit PAG in this report) which is planned to be backhauled to the Springer-Cariboo Pit at closure for subaqueous disposal. PAG rock has also been disposed sub-aqueously in the Cariboo Pit backfill and Southeast Zone Pit. PAG rock mainly originates from the Cariboo Pit and Springer Pit. The PAG waste rock in the North Bell Dump originated from the Southeast Zone Pit which was dominated by PAG waste rock.

An amendment to Mines Act Permit M-200 on July 8, 2009 allowed the placement of low sulphur (less than 0.3%) waste (LSW) as 2 m layers with Springer Zone NAG waste rock to create a NAG waste

rock blend. The quantity of PAG rock mined from the Pond Zone was 6,615 t, which was disposed in a portion of the Northeast Zone Dump referred to as the Sandwich Dump.

2.5.2 Ore

The current quantity of ore as of October 31, 2025, is summarized in Table 2-2.

2.5.3 Future Waste Rock and Ore

Table 2-3 summarizes the future waste rock and ore stockpiling schedule to LOM.

2.5.4 Tailings

As of December 31, 2024, 66.3 Mm^3 were stored inside phreatic containment of the main TSF. Included in this volume was a free water pond of 620,000 m^3, the remainder of the stored volume is primarily saturated tailings with minor amounts of NAG rockfill used to aid in upstream construction (email from Shane Flynn, Imperial Metals, to Shauna Litke, SRK, on March 18, 2025). The life of mine requires a TSF raise to 987 m and up to 36.6 Mm^3 of additional saturated tailings being stored in the facility, resulting in a total of 102.3 Mm^3 of saturated tailings stored inside containment at closure.

Between August 2015 and June 2016, tailings were deposited into the Springer Pit after the TSF breach. Ore sources for the tailings included the Cariboo Pit and Wight Pit underground. Ore was processed using the previous milling process: comminution followed by froth flotation. Approximately one third of the tailings were removed in 2018 and 2019 by dredging and placed in the TSF. About 3.5 Mt (2.2 Mm^3) of tailings remained and in 2023, co-disposal of these tailings with waste rock in the SERDS was started on May 8, 2023, and was completed in May 2024. The tailings removal strategy involved placing waste rock on top of tailings and shoveling the mixture (10% waste rock, 90% tailings) into haul trucks which were later disposed as a mixture in the SERDS (SRK 2022c).

Table 2-1: Waste Rock Disposal Locations as of October 31, 2025

Placement Location	NAG		PAG	
	Mass (kt)	Percent of NAG	Mass (kt)	Percent of PAG
Bell Pit Rock Disposal	55,949	21%	-	0%
Boundary Pit Rock Disposal	821	0%	-	0%
NAG PAG Pad (NPP)	9,786	4%	35,616	66%
East Rock Disposal Site	28,502	11%	-	0%
SERD (southeast rock disposal)	73,843	28%	-	0%
Tailings in SERD	3,543	1%	-	0%
Northeast Zone Dump	34,590	13%	-	0%
Southeast Pit Backfill	36	0%	10,171	19%
Wight Pit Backfill	363	0%	8,089	15%
Crusher Haul Road	3,956	2%	-	0%
SERD Lower Haul Road	6,953	3%	-	0%
TSF Access and Haul Roads	10,203	4%	-	0%
TSF Dam	29,446	11%	-	0%
Other (Minor Road Construction and Maintenance)	2,999	1%	-	0%
Bell Pit Rock Disposal	55,949	21%	-	0%
Total (kilotons)	**260,990**		**53,876**	

Sources: MPMC

Table 2-2: Mill-Feed Stockpiled Ore Inventory as of October 31, 2025

Ore Inventory	Mass (t)
High Oxide	1,647,845
High Gold	664,637
Low Grade	2,281,085
#3	1,538,444
Sandwich	12,195
Total (kilotons)	**6,144,206**

Sources: MPMC

Table 2-3: Future Waste Rock and Stockpiled Ore Schedule

Name of Facility	Total Mined Rock – End of Year Totals (in tonnes)										Total (Future)	Total (Existing + Future)
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		
Waste Dumps												
1. Southeast Rock Dump (NAG rock)	2,796,019	6,973,637	8,259,427	13,300,144	15,421,268	238,796	0	0	0	0	46,989,291	125,539,291
2. Temporary NW PAG Stockpile (PAG rock)	668,775	2,313,147	5,508,889	10,308,373	5,061,465	1,376	-9,352,790	-19,488,100	-22,940,000	-7,536,135	-35,455,000	0
3. Springer Pit (WX, C2, and PAG rehandle)	0	0	0	0	0	19,714,457	22,849,285	22,905,727	22,940,000	7,458,915	95,868,384	95,868,384
4. All Other NAG	0	0	0	0	0	0	0	0	0	0	0	143,272,000
5. All Other PAG (Permanent, Submerged)	0	0	0	0	0	0	0	0	0	0	0	18,260,000
Total	**3,464,794**	**9,286,784**	**13,768,316**	**23,608,517**	**20,482,733**	**19,954,629**	**13,496,495**	**3,417,627**	**0**	**-77,220**	**107,402,675**	**382,939,675**
Construction (NAG)												
1. Tailings Storage Facility	4,895,000	8,400,000	8,400,000	450,000	400,000	350,000	300000	0	0	0	23,195,000	46,622,000
2. Tailings Access Road	14,067,158	2,443,323	0	0	0	0	0	0	0	0	16,510,481	23,134,481
Total	**18,962,158**	**10,843,323**	**8,400,000**	**450,000**	**400,000**	**350,000**	**300,000**	**0**	**0**	**0**	**39,705,481**	**69,756,481**
Stockpiled Ores												
1. HG Ore	2,752	1,550,355	33,425	2,752	1,567,272	2,665,077	0	0	0	0	0	0
2. LG Ore	2,701,557	3,116,615	4,307,642	2,526,707	3,673,578	4,330,001	4,126,866	664,539	0	0	0	0
3. High Oxide	2,564,475	2,564,475	2,564,475	2,257,566	2,257,566	2,257,566	1,475,816	404,605	0	0	0	0
4. Marginal Grade	1,695,236	3,866,521	5,964,109	5,964,109	7,309,986	8,191,129	8,281,845	8,316,118	2,317,881	0	0	0
Total	6,964,020	11,097,966	12,869,651	10,751,134	14,808,402	17,443,773	13,884,527	9,385,262	2,317,881	0	**0**	**0**

Sources: MPMC

2.6 Material Handling and Processing

Table 2-4 summarizes the material handling and processing for the Project with details provided below. A simplified flowchart for material processing and movement is shown in Figure 2-4.

Prior to mining, material is classified as waste rock, low-grade ore, or ore based on total copper, non-sulphide copper, iron, and gold content that are determined at the on-site assay laboratory, as described in the ML/ARD Monitoring Plan. Material identified as PAG waste rock is sent to the Temporary NW PAG Stockpile, which will be rehandled and backfilled to the Springer-Cariboo Pit at closure. Material identified as NAG waste rock is sent to either the SERDS or is used for construction fill. Confirmatory testing of placed NAG material is conducted to confirm material can remain in place or if rehandling is needed (see Section 3.4).

Ore is sent to active stockpiles. Currently, MPM has four active mill-feed stockpiles for ranges of ore grades (i.e., classified as “high grade” or “low grade” based on mill head value), as well as the “high ox” (high oxide) and “high gold” (mill head value of gold content is higher than copper content). MPM also stockpiles non-economical ore (referred to as “marginal grade” by MPM) that may or may not be processed, depending on metal prices. Marginal grade ore is segregated based on ARD potential, where marginal grade ore classified as PAG is segregated and placed on the Temporary NW PAG Dump.

As material is trucked from the pit, timecards are filled out by operators, logging material type (ore, NAG waste, PAG waste), tonnage, source, and destination. These values are input into a material tracking database by Ore Control. Daily surveys are conducted, and volume of material moved is logged by Ore Control, while monthly flyovers using drones of the pit, stockpiles, and rock disposal sites support monthly reconciliation.

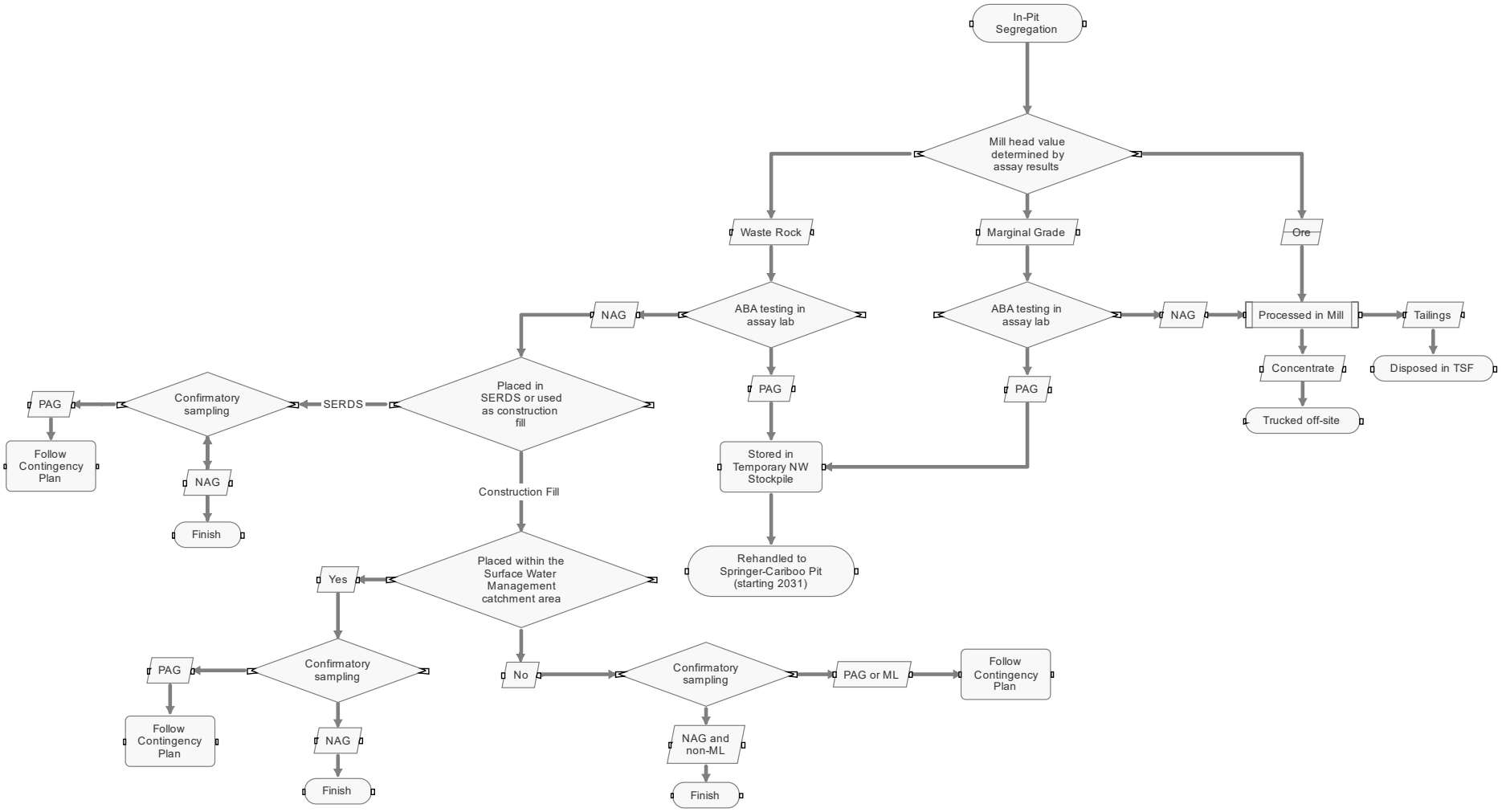
Ore is processed at the plant, which is capable of processing 22,000 t/d of ore using standard mineral flotation technology. The final tailings from the plant are placed in the TSF as a slurry, while the copper concentrate is trucked off-site for smelting.

Material from borrow sources is excavated as needed for construction and is stockpiled in the short-term for material staging.

Table 2-4: Material Handling and Processing Summary

Material Type	Material	Handling, Processing and Usage
Ore	Ore placed in mill-feed stockpiles	Processed through mill.
	NAG Marginal Grade	Place in SERDS, processed through mill if economics allow.
	PAG Marginal Grade	Re-handle at LOM to place in completed Springer-Cariboo Pit.
Waste Rock	Mined waste rock classified as NAG	Remain as-is or cover by new waste rock.
	Mined waste rock classified as PAG	Re-handle at LOM to place in completed Springer-Cariboo Pit.
	Future waste rock classified as NAG (not used as construction fill)	Place in SERDS.
	Future waste rock classified as PAG	Re-handle at LOM to place in completed Springer-Cariboo Pit.
Tailings	Historical tailings in TSF	Remain as-is.
	Future tailings	Dispose in TSF.
Construction rock fill	Production waste rock classified as NAG.	Construction of site infrastructure (e.g., roads, pads) within the Surface Water Management catchment area.
	Production waste rock classified as NAG and non-ML.	Construction of infrastructure outside the Surface Water Management catchment area.
Borrow Source Material	Borrowed glacial sediments (e.g., till, sand, gravel, etc.)	Construction of site infrastructure which may include dams.

Figure 2-4: Flowchart for Material Processing and Movement



Sources: https://srk.sharepoint.com/sites/NACAPR003709/Deliverables/MLARD_ManagmentPlan&MonitoringPlan-Update/040_Figures/MPMC_MaterialFlowchart_CAPR003709_Rev01_SJL.mmap

2.7 Water Management

MPMC maintains a system of drainage diversion and collection ditches to minimize contaminant loadings from areas of disturbance or waste disposal (Figure 2-1). The water management system is designed to accommodate flows all flows up to a 1 in 10-year 24-hour storm event and withstand all flows up to a 1 in 200 year 24-hour storm event, without significant damage. Sump and ditch inspections are required bi-annually under EMA Permit 11678, and daily water management infrastructure inspections, environmental monitoring, and other observational activities are carried out as per MPMC's Operation, Maintenance and Surveillance (OMS) Manual (MPMC 2024).

The Mount Polley Mine site has historically had a positive water balance, meaning more yearly precipitation occurs at the site than evaporation (MPMC 2023). This means that water discharge is needed regardless of whether MPM operates or manages the site on Care and Maintenance, or in operations. As described in MPMC (2023), the Water Treatment Plant (WTP) at MPM removes suspended solids using Veolia ACTIFLO® water treatment technology prior to discharge. The feed water is dosed with an aluminum polychloride coagulant and a polymer to create floc particles. Microsand is added to ballast the flocculants, which settle and create a sludge. The clarified water is discharged, and the sludge is separated from the microsand, which is recycled in the process. The sludge is discharged into the TSF.

2.8 Regulatory Requirements

The following permits contain stipulations relevant to the management of ML/ARD Potential in the Mines Act Permit.

This ML/ARD Management Plan considers policy and guidance provided in the following:

- British Columbia Ministry of Mining and Critical Minerals. 1998a. Policy for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. July 1998.
- British Columbia Ministry of Mining and Critical Minerals.1998b. Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. August 1998.
- Price, W.A. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Materials. Report prepared for MEND Program. MEND Report 1.20.1. 579.
- British Columbia Ministry of Mining and Critical Minerals and Ministry of Environment and Parks, 2024. Joint Application Information Requirements (JAIR) Guidance Document Version 3.0. Published April 2024.

3 Geochemical Management

3.1 Objectives of Management

The objective of ML/ARD material management at MPM is to prevent acid generation and reduce metal leaching from waste materials to support long-term water management goals.

3.2 Classification of Mine Waste

3.2.1 Acid Rock Drainage Potential

Definitions of Acid Rock Drainage

According to the *Mines Act* Permit M-200 (referred to as the M-200 Permit in this document), materials are defined as acid generating (AG) if they have a past pH < 6 or a rinse pH <5. Potentially acid generating (PAG) materials are defined as:

- Neutralization potential (NP) is calculated using total inorganic carbon (TIC).
- Acid potential (AP) is calculated using total sulphur.
- All waste rock, quarry rock, borrow materials, and tailings are classified as PAG if they have an NP/AP ratio of less than 2.0.

Sulphur Speciation and Acid Potential

As established in SRK (2025) total sulphur is a proxy for sulphide sulphur in rock and tailings because other forms of sulphur (including sulphate) are rare at MPM.

Accordingly, acid potential (AP) is calculated using total sulphur:

$$AP\ [kg\ CaCO_3/t] = 31.25 \times \text{Total Sulphur } [\%]$$

Carbon Speciation and Neutralization Potential

Total carbon (TC) was determined to be a reliable proxy for reactive carbonate minerals (SRK 2025). The assumption is supported by the observed dominance of calcite confirmed by detailed mineralogy, the lack of reported iron carbonate and the strong correlation and equivalence of total carbon and total inorganic carbon TIC. The dominant plutonic geological setting also supports the lack of non-carbonate carbon. As TC equals TIC, NP is represented by carbonate content as represented by TC (NP*). NP* is calculated as follows:

$$NP^*\ [kg\ CaCO_3/t] = TC\ [\%] \times 83.33$$

Criterion for ARD Onset

SRK (2025) determined the time to ARD onset following the same method as SRK (2016) and SRK (2010). The straight-line average of the correlation between initial NP/AP (i.e., at time = 0, NP/AP_0) and calculated time for the onset of acidification (t_{onset}, in years) for all humidity cells from MPM was updated using an NP/AP_{crit} of 1.6:

$$t_{onset} = 63 \times \left(\frac{NP}{AP}\right)_0$$

The equation indicates that a sample with NP/AP of 1 might be expected to generate acid in 63 years. The calculated lower 95% confidence on the 63 years coefficient was 55 years.

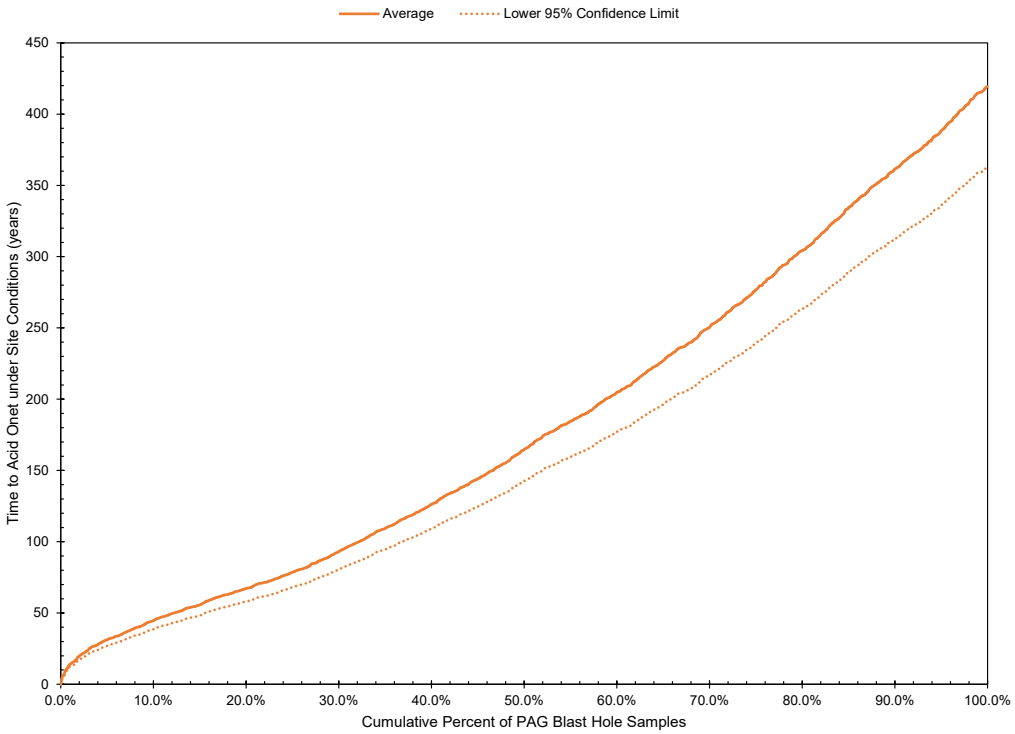
To estimate the exposure time PAG waste rock can be stored sub-aerially before the onset of acidification, t_{onset} (average and lower 95% confidence limit) was calculated for samples classified as PAG from the MPM blast hole database (Figure 3-1). A temperature correction of 0.3 to reflect slower reaction rates under cooler site conditions was included in the calculation.

The distribution for faster-reacting components represented by the lower dashed line indicates that about 2% of the rock might become acidic in 20 years, and 10% after 40 years. The majority of the rock with higher NP/AP might take over 100 years to become acidic. A number of factors complicate the actual estimate for higher NP/AP materials. Increasing acidification along with heating would result in accelerated oxidation and NP depletion though decreasing oxidation rates due to sulphide depletion and formation of secondary mineral coatings would result in lower oxidation rates and greater time to onset of acidic conditions.

The general finding from the kinetic testing is that acidification of PAG materials at MPM will take on the order of decades to centuries to develop. This is consistent with the widespread pH neutral weathering conditions at MPM in both natural and mined materials. Initial mining at Mount Polley was 25 years ago but waste rock has not acidified.

The Temporary NW PAG Stockpile contains less than 0.1% of rehandled PAG waste rock that was mined between 2001 – 2007 and initial construction of the NAG/PAG Pad began in 2011 (14 years ago). The Springer Pit Expansion Project proposes to rehandle PAG waste rock stored in the Temporary NW PAG Stockpile starting in 2032 and finishing by the end of 2034. Based on the assessment above, the risk of developing widespread acidic conditions within this timeframe is low (24 years after initial construction of the Temporary NW PAG Stockpile).

Figure 3-1: Distribution of t_{onset} for PAG Waste Rock at Mount Polley Mine



Sources: https://srk.sharepoint.com/sites/NACAPR002434/Internal/!020_Project_Data/010_SRK/Source_Terms/TimeOnset_CAPR002434_Rev00_SJL.xlsx

3.2.2 Metal Leaching Potential

Definition of ML Potential

According to the *Mines Act* Permit M-200 (referred to as the M-200 Permit in this document), potentially ML materials are defined as borrow material or waste rock containing soluble metal levels (as determined by the shake flask test) higher than the receiving water objectives.

Criterion for ML Onset

The classification of ARD potential of waste materials is used to determine the expected pH conditions after material placement. Material classified as PAG is expected to generate acidic conditions in the future, increasing their ML potential (specifically cation species mobile at acidic pH), whereas material classified as NAG is expected to maintain neutral pH conditions during and after construction.

The time to onset for increased metal leaching for cation species mobile at acidic pH is therefore expected to be the same as for acid onset (Section 3.2.1). Species mobile at neutral pH, such as selenium, are expected to leach upon placement (i.e., immediately).

3.3 ML/ARD Mitigation Measures

MPM has adopted segregation of wastes with ML/ARD potential, and subaqueous disposal of PAG wastes in completed open pits to prevent leaching. This Plan also complies with waste management specifications in Mines Act Permit M-200, which are:

- Construction Rock
  - AG or PAG materials are not used for construction purposes.
  - Potentially ML materials are not used for construction purposes, except in locations where all contact water is collected by a Surface Water Management Structure and conveyed directly to the Perimeter Embankment Till Borrow Pond, TSF, or an operating water treatment plant (WTP).
- Waste Rock
  - PAG waste rock can only be permanently disposed of in the Cariboo, combined Cariboo/Springer, Wight, and Southeast Zone pits, ensuring that:
    - PAG waste rock in the Wight Pit and Southeast Zone Pit is maintained permanently submerged beneath a water cover.
    - PAG waste rock in the Cariboo/Springer Pit is permanently submerged beneath a water cover within 20 years of placement.
  - A maximum of 62 million tonnes of PAG waste rock can be stored in the Temporary NW PAG Stockpile.
  - No later than December 31, 2033, all PAG rock stored in the NW Temporary PAG Stockpile must be permanently disposed into the bottom of the Cariboo/Springer Pit.
  - If water quality monitoring at the NW Temporary PAG Stockpile seeps and/or seepage collection infrastructure indicate decreasing pH conditions or increasing concentrations of constituents related to ML/ARD, as identified by a Qualified Professional, all PAG rock stored in the NW Temporary PAG Stockpile must be permanently disposed into the bottom of the Cariboo/Springer Pit within three years.
  - Isolated pockets of PAG materials (less than 1,000 tonnes) may be blended with non-PAG materials within the waste rock dumps, at a minimum non-PAG:PAG ratio of 20:1.
- Tailings
  - PAG tailings may not be cycloned for use in dam construction.
  - Cyclone tailings must have an NP/AP ratio greater than 2.0.
  - Cycloned tailings may be used for construction of the following TSF components:
    - The upstream and downstream faces of the Perimeter Embankment.
    - The upstream side of the Main Embankment.
    - The maintenance of a till core in the Perimeter and Main Embankments.

  - Tailings must not be used in reclamation activities, except for in reclamation trials that have been designed and constructed in accordance with the recommendations of a Qualified Professional.
- Ore (including low-grade ore)
  - Ore classified as PAG that is not directed to the mill-feed stockpiles must only be stored in the Temporary NW PAG Stockpile.
  - Individual ore stockpiles outside of the Temporary NW PAG Stockpile includes a maximum of 10% ore classified as PAG, where the proportion of PAG is determined from blast hole ML/ARD samples and verified by confirmatory monitoring of stockpiled ore.

Standard operating procedures (SOPs) are provided in Appendix A.

3.4 Contingency Plans

In the event that a confirmatory sample or other activities result in the discovery of AG or PAG material in a NAG-designated area (e.g., SERDS, construction material), or potentially ML material used as construction fill outside of the Site-Wide Water Collection Infrastructure, a Qualified Professional (QP) will be retained to define remedial actions which depend on the specific findings and could include:

- Re-sampling of materials identified as having ML/ARD potential.
- Updates to the ML/ARD Monitoring Plan.
- Blending of products to achieve low ML/ARD potential.

If there are non-conformances while executing this plan, the Chief Inspector will be notified upon discovery of the non-conformance. MPMC will work in consultation with the QP to investigate the cause of the non-conformance and implement actions to resolve the issue. A report will be submitted to MCM and, if necessary, changes will be made to the ML/ARD Management Plan.

3.5 Quality Assurance and Quality Control

Quality assurance and quality control is described in the ML/ARD Monitoring Plan (SRK 2025).

3.6 Material Tracking

Quantities and storage locations of all mined materials, including ore, waste rock, tailings, construction materials, and water treatment plant by-products, will be tracked by MPMC.

3.7 Change Management Process

Changing any part of this management plan requires a formalized process. For any planned significant changes to objectives, management plan structure, key operational milestones, communication, or information management, the Change Management Procedure described below is required.

For minor edits or updates to the management plan, SharePoint versioning settings and content approval functions are used. Changing any part of the management plan will be controlled using workflows established on the SharePoint Site. These workflows will record version history, prompt reviewers for input, and identify who has formally signed off updates to the plan.

Significant changes are updated in the version summary table at the beginning of this plan. Significant changes must be reviewed and approved by the Engineering Superintendent and the Environment Superintendent (or designates) in the table at the beginning of this document.

A QP will be required to review the changes, provide comments, and provide a signed memo to validate the management plan if those changes relate to recommended changes arising from Mines Act Permit M-200 conditions 2.(d)(i). The changes will be documented in the Annual Reclamation Report, updated in the ML/ARD Management Plan, and submitted to the Chief Inspector by March 31, annually.

Changes that relate to the other Mines Act Permit M-200 conditions, Environmental Management Act Effluent Discharge Permit 11678, or would otherwise be deemed significant as outlined above must also be submitted to MCM for review and approval. No changes will be made to PAG handling procedures, mitigation strategies, or materials monitoring program without the approval of the Chief Inspector.

4 Reporting

4.1 Data Management

Field data collected during sampling (e.g., sample ID, sample location, sample date, field observations) are compiled in a database maintained by the Environmental Coordinator. The compiled data are provided to the QP to include in the annual report and to assist with interpretation of laboratory results.

The on-site laboratory data are reported in MPMC's Laboratory Information Management System (LIMS). Blasthole cuttings results are compiled by MPMC's Ore Control to define dig limits for in-pit segregation and placed rock sample results are compiled by MPMC's Environmental Coordinator when results are available. Any PAG samples found in non-PAG areas are reported to the QP as described in Section 3.4.

External laboratory results are reported both to MPMC's Environmental Coordinator and the QP. Once the laboratory data have passed QA/QC checks conducted by the QP, the results are compiled with previous monitoring results in a centralized database.

The QP will conduct routine review of compiled external laboratory monitoring data to identify PAG samples, ML samples, and changes in trends of key parameters. The QP will notify the MPMC's Environmental Coordinator when a PAG sample is identified in a non-PAG area or if a construction sample is classified as having ML potential.

4.2 Review Schedules

The ML/ARD Management Plan and ML/ARD Monitoring Plan are reviewed and signed off by a QP on an annual basis. Proposed management and monitoring procedures will be reviewed and updated by a QP if results of monitoring programs require a change or adaptation of the ML/ARD management procedures or monitoring, following the Change Management Process outlined in Section 3.7.

4.3 Reporting Requirements and Schedules

Data collected and corresponding interpretation regarding the ML/ARD program are included in the Annual Reclamation Report (ARR), due annually to the British Columbia Ministry of Mining and Critical Minerals on March 31 of each year, reflective of the previous calendar year. All recommended changes arising from the review of the ML/ARD program are documented in the ARR and the updated ML/ARD Management Plan and ML/ARD Monitoring Plan are submitted to the Chief Inspector, by March 31 annually.

5 Roles and Responsibilities

The implementation of the ML/ARD Management Plan at MPM is overseen by the MPMC Mine Manager.

The Ore Control Geologist is responsible for ensuring in-pit material management processes are followed and material tracking is completed.

The Environmental Coordinator is responsible for coordinating with the field technicians, as well as Mine Engineering, Ore Control, and Metallurgical teams for timely collection of confirmatory samples by following the sampling procedures outlined in the attached SOPs. The Environmental Coordinator will also ensure timely submission of samples to the on-site assay laboratory and shipment of samples to the selected external laboratory, as specified by the ML/ARD Monitoring Plan. The Environmental coordinator liaises with the laboratory to ensure analytical instructions as outlined in the ML/ARD Monitoring Plan are provided to the laboratory.

SRK is currently acting as the technical QP for ongoing ML/ARD monitoring programs at MPM. The QP is responsible for conducting QA/QC on external laboratory results, compiling and managing external laboratory data, routinely reviewing the external laboratory data as received, and notifying MPMC's Environmental Coordinator in the event that a sample is classified as PAG and/or ML. The QP is also responsible for annual reporting of ML/ARD monitoring results as outlined in Section 4.3.

Closure

This report, Metal Leaching and Acid Rock Drainage Management Plan, was prepared by Shauna Litke. If you have any questions, please contact the undersigned.



Shauna Litke, PEng
Senior Consultant (Geochemistry)

and reviewed by



Stephen Day, PGeo
Corporate Consultant (Geochemistry)

EGBC Permit to Practice: 1003655

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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Appendix A Standard Operating Procedures

Mount Polley Mining Corporation
an Imperial Metals company

MPMC – SOP – 016:
ABA and Soil Sampling

Purpose

To monitor the operational MPMC ARD/ML sampling and segregation program by collecting weekly waste rock samples (when PAG material is being mined), as per Permit M-200, the *ML/ARD Management Plan*, and the ML/ARD Monitoring Plan, and to assess the variability and suitability of reclamation materials on site, as per Permit M-200 and the *MPMC Soil Management Plan*. ABA grab sampling will not be considered when the mine is in Care & Maintenance or Closure.

Scope

This procedure outlines the ABA and soil sampling requirements that are the responsibility of MPMC Environmental Department staff.

Introduction

ABA grab samples are taken from active rock dumping sites; typical sample sites include, but are not limited to, active rock disposal sites, stockpiled ore, new road construction and road surfaces, water treatment plant (WTP) waste, and TSF construction. These samples are a randomized audit of detailed geological mapping done by MPMC geologists to ensure proper segregation and management of acid generating, PAG, and NAG materials. Sample types include placed blast rock (waste rock and stockpiled ore), WTP waste, and borrow source material used for construction (e.g., till, sand, gravel, etc.).

Soil samples are taken from stockpiles to monitor soil degradation and for characterization purposes of previously applied soil to reclamation sites. All new soil stockpiles are to be sampled upon creation, and a site wide soil stockpile sampling program is to be carried out every 5 years. Additional soil sampling may be completed on progressive reclamation sites to monitor soil development.

Site specific soil surveys must be completed by a qualified professional for areas schedule to be disturbed by mine expansion. This is discussed in the *MPMC Soil Management Plan* and is beyond the scope of this document.

Responsibilities

Environmental Superintendent/Coordinator:

- Ensure that sampling is completed on a regular schedule, as required in the *ML/ARD Management Plan.*
- Ensure that results are reported in the Annual Environmental and Reclamation Report, which is to be submitted to ENV and EMLI.

Environmental Technologist/Technician:

- Coordinate sampling schedule.
- Ensure that samples are collected and handled in accordance with *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*, and this document.

Preparation

On the Day of Sampling:

- Pre-select area(s) for soil samples to be taken (refer to *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling* for details).
- Call Pit-Shifter (or designate) and ask if any rock waste is being hauled, its location and if it is safe to enter the area (refer to *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling* for details).
- Review the associated JHA and completed a FLHA, if necessary.
- Ensure all workers have appropriate PPE and are fit for the task.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure*.

Procedure

ABA Grab Sampling:

- Take a composite sample of a minimum of 1 kg of randomly selected material, as described in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*, and place in clean sample bag.
- Record the GPS Coordinates, elevation, and sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Enter sample information into the spreadsheet on the Environmental Network Drive and submit an analysis request in LIMS.
- Tag and date sample bag.
- Deliver sample(s) to the Bucking Room.

Soil Stockpile Sampling:

- Take a photo of the stockpile to document characteristics, including size and vegetative cover.
- Collect a composite sample from a minimum of three sub-sample locations in a clean, labelled, plastic sample bag, taking soil from the surface and at depth at each subsample location.
- Record the sample location GPS coordinates and record sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Store samples in the refrigerator until they can be shipped to the analytical laboratory.

The detailed procedure is outlined in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*.

Soil Sampling of Reclamation Sites:

- Pre-select soil sample locations and record GPS coordinates.
- Collect a composite sample from minimum three locations at each site in a clean, labelled plastic sample bag, taking a representative sample from the entire soil profile at each location.
- Record sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Store samples in the refrigerator until they can be shipped to the analytical laboratory.

A detailed procedure is outlined in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling;* however, it may need to be adapted for specific sampling objectives.

Documents and Records

- ABA analysis results are recorded in the MPMC LIMS and into the spreadsheet on the Environmental Network Drive.
- All soil sample results are recorded on the Environmental network drive.
- ABA and Soil results are reported to ENV and EMLI in the Annual Environmental and Reclamation Report.

References & Related Documents

- *MPMC Soil Management Plan*
- *MPMC ML/ARD Management Plan*
- *MPMC ML/ARD Monitoring Plan*
- Permit M-200
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-WORK-016: Acid Base Accounting and Soil Sampling*

Mount Polley Mining Corporation
an Imperial Metals company

MPMC – WORK – 016:
ABA and Soil Sampling

Objective

To take ABA and soil samples required by Permit M-200, the *MPMC Soil Management Plan*, and the ML/ARD Monitoring Plan, as outlined in *MPMC-SOP-016: Acid-Base Accounting and Soil Sampling*. ABA grab sampling is not considered during Care and Maintenance or Closure phases.

Work Methods

ABA Grab Samples:

Rock and Borrow Source Sampling

1. Pre-select area(s) to be sampled, including:
    - Where active NAG dumping is occurring, including rock disposal sites and construction material.
    - Where active ore stockpiling is occurring.
    - Where active construction with borrow source materials (e.g., till, sand, gravel, riprap, etc.) is occurring.
2. Using a shovel, take a composite sample of a minimum of five equal volume sub-samples from an approximately 50 metre span. Distance between samples should be based on a pre-determined number of steps (ex. 10) and sample should always be taken from a predetermined height on the berm or dump toe (ex. knee height) to avoid sample selection bias.
3. Collect sample in a clean plastic sample bag labelled with the sample site, sample number, and date.

4. Record sample location UTM co-ordinates and elevation using a handheld GPS (refer to *MPMC-WORK-005-6: GPS*).
5. Complete an ABA Sample tag (refer to Figure 1). All samples may be discarded. Tear off "Lab" tag and insert into sample bag and leave tag tab in label booklet. If sample is wet, staple tag to bag.
6. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
7. Input sample number and analysis request into Assay Lab LIMS system for waste rock or ore samples only. Borrow source samples are not submitted to the Assay Lab and are sent to an external laboratory, as per the ML/ARD Monitoring Plan. A subset of waste rock and ore samples will also be sent to an external laboratory as part of the analytical testing program.
    a. The Environmental Department username is "env" and the password is "enviro".
    b. Under the File menu, select "Analysis Request".
    c. Select "ABA Environmental" from the Analysis Suit menu. Note if this menu is not available, you must exit and update the Selection Filter to include the day's date (button with arrows below the File menu).
    d. Enter the "sample Id" (number on the sample tag) and enter the sample name (ex. SERDS) under "Notes" for the sample.
    e. In the general "Notes" field, write the sample date.
8. Deliver samples to the Bucking Room.
9. Input UTM co-ordinates into the 'grabs' spreadsheet on Environmental network drive and update the spreadsheet with any new results. New results are found in LIMS:
    a. Update the Selection Filter (button with arrows below the File menu) to include the dates of interest.
    b. Click on jobs in the left-hand menu bar to view results from each job.
    c. Copy any new results into the spreadsheet on the Environmental network drive.

Figure 1. ABA Sample Label

ABA Sample Date: _____ Location: _____ UTM: _____ Elevation: _____ Sample #: 1078	**ABA Sample** Date: _____ Location: _____ Analysis: ABA Dispose of sample? YES Sample #: 1078

Water Treatment Plant Waste

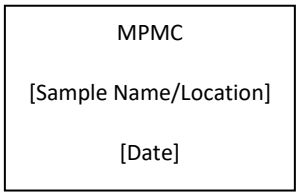
1. Record the value on the waste line totalizer monthly when Water Treatment Plant (WTP) data are downloaded.
2. Samples shall be taken of material that has exited the sludge line, to the West of the WTP and down-flow from where microsand is cycloned for re-use.
3. Using a shovel, take a composite sample of a minimum of five equal volume sub-samples from the pile. Distance between samples should be based on a pre-determined number of steps (e.g., 5) to avoid sample selection bias.

4. Collect sample in a clean plastic sample bag labelled with the sample site, sample number, and date.
5. Record sample location UTM co-ordinates and elevation using a handheld GPS (refer to *MPMC-WORK-005-6: GPS*).
6. Complete an ABA Sample tag (refer to Figure 1). All samples may be discarded. Tear off "Lab" tag and insert into sample bag and leave tag tab in label booklet. If sample is wet, staple tag to bag.
7. Samples are sent to an external laboratory as per the ML/ARD Monitoring Plan.

Soil Stockpile Samples:

1. Take a photo of the stockpile to document characteristics, including size and vegetative cover.
2. Collect a composite sample from a minimum of three sub-sample locations that are representative of the different sections of the stockpile.
3. Record the GPS coordinates for each sub-sample 1ocation.
4. For each sample, use a new (clean) plastic sample bag. Label the bag as shown in Figure 2.
5. At each sub-sample location, dig a profile with a shovel or mini backhoe to greater than 1.0 m depth (from all surfaces of the stockpile). Take the sub- sample half from 0.3 m deep and half from 1.0 m deep (this of the more biologically active surface soils, and the "dead zone" below approximately 1.0 m). Ensure that equal volumes are sampled at every location and depth so that the composite is representative (minimum sample volume is approximately 500 mL).
6. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
7. Store samples in the refrigerator until ready for shipment to the lab. Ship in coolers with ice packs.
8. Request lab analysis for parameters including, but not limited to:
    - Texture
    - pH
    - Electrical conductivity
    - Total nitrogen
    - Available phosphorus
    - Organic matter
    - Micronutrients including sulphur and potassium

Figure 2. Example soil sample label



Soil Sampling of Reclamation Sites:

1. Pre-select soil sample locations on a map using techniques, such as transects (to reduce sample selection site bias), and record GPS coordinates. Ensure that reclamation site strata are defined based on soil properties.
2. Take a photo at each sample site to document characteristics, including soil appearance and vegetative cover.
3. For each sample, use a new (clean) plastic sample bag. Label the bag as shown in Figure 2.
4. Dig a hole down through the soil to waste rock (or the substrate below the soil applied in reclamation).
5. Each sample should be made up of a minimum of three sub-samples (five to ten sub-samples is recommended) from the same strata. Complete at minimum one sample per hectare. Ensure that equal volumes are sampled at every location and depth so that the composite is representative (minimum sample volume is approximately 500 mL).
6. Because the soil depth on reclaimed sites is shallow, for each sub-sample use a trowel or shovel to take a sample of the entire profile, evenly representing every depth.
7. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
8. Store samples in the refrigerator until ready for shipment to the lab. Ship in coolers with ice packs.
9. Request lab analysis for parameters including, but not limited to:
    - Texture
    - pH
    - Electrical conductivity
    - Total nitrogen
    - Available phosphorus
    - Organic matter
    - Micronutrients including sulphur and potassium

This procedure will need to be refined based on the sampling program objective and reclamation site specifications. Third party consultant recommendations may be required.

Safety in the Field

- Review the associated JHR and fill out a FLHA if necessary.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure.*
- Make sure to be wearing P.P.E and use proper radio communication. This includes contacting the Pit Shifter and/or area supervisor of your location(s).
- Follow all MPMC protocol when working around equipment. Use radio communication with operators as necessary when sampling at or below active dumpsites.

References and Related Documents

- *MPMC Soil Management Plan*
- *MPMC ML/ARD Monitoring Plan*
- *MPMC ML/ARD Management Plan*
- Permit M-200
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-SOP-016: Acid Base Accounting and Soil Sampling*
- *MPMC-SOP-017: Record Keeping*

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MPMC – SOP – 022:
Seep Sampling

Purpose

To safely sample seep water quality from rock dumps in accordance with Permit M-200, *BC Field Sampling Manual 2013*, *BC Environmental Laboratory Manual*, the Comprehensive Environmental Monitoring Plan (CEMP), and the *ML/ARD Monitoring Plan*.

Scope

This procedure outlines the seep water quality monitoring requirements that are the responsibility of MPMC Environmental Department staff.

Introduction

Seep samples are collected from seeps emerging close to the toe of waste rock dumps and temporary PAG stockpiles. This SOP outlines the procedure required to maintain compliance with Permit M-200, including who is responsible for the sampling, and when monitoring needs to occur.

Samples must be taken on or before Thursday, as they must be shipped to the laboratory in Burnaby by Thursday afternoon at the latest. The seep sampling program is conducted in the spring and the fall of each year. The waste dumps, haul roads, and stockpiles sampled are:

- Temporary NW PAG Stockpile (PAG);
- Waste Haul Road (WHR);
- Tailings Storage Facility Haul Road (TSF);
- Southeast Rock Disposal Site (SERDS);
- Northeast Zone Dump (NEZ);
- East Rock (East RDS) Dump;
- North Bell Dump (NBD); and

- Boundary Dump.

Note: Sample locations may vary with expansion of dumps and seasonal flow conditions and only seeps with observed flow are monitored.

Responsibilities

Environmental Superintendent/Coordinator:

- Follow CEMP and M-200 requirements (as described in the ML/ARD Monitoring Plan) on seep sampling, and arrange sampling in accordance.
- Review sample results regularly to identify any QA/QC issues or water quality concerns.
- Report seep sampling results to ENV and MCM in the Annual Environmental and Reclamation Reports.

Environmental Technologist/Technician:

- Ensure that samples are collected and handled in accordance with the *BC Field Sampling Manual 2013*, *MPMC-WORK-002: Surface Water Sampling*, and this document.
- Ensure samples are preserved, packed, and shipped according to *MPMC-WORK-004: Sample Preservation and Shipping*.
- Ensure sample record keeping follows *MPMC-WORK-017 Field Sampling Record Keeping.*
- Enter field data into the MonitorPro database and/or spreadsheets on the Environmental network drive.

Preparation

Two Weeks Before Sampling:

- Make sure there are sufficient sampling supplies and ice (for shipping) on site (refer to Appendix X – Sample Supplies Inventory Checklist).

One Week Before Sampling:

- Arrange for a second person to assist with sampling, as required.
- Plan for shipping of samples to ensure there is not a conflict with statutory holidays.
- Ensure sample sites are loaded onto the GPS, see *WORK-005-6: GPS* on how to use the GPS.

On the Day of Sampling:

- Make enough sample sets for each sampling event.
- Place sample bags in cooler(s) and bring the field backpack.
- Place ice in the coolers.
- Check all equipment required for sampling is functioning correctly and has sufficient battery life.
- Carry out any necessary equipment maintenance and calibrations as required by *MPMC-WORK-005 Data Collection Equipment*.

- Coordinate sampling with the pit shifter and communicate work locations so that potential hazards from rock dumping can be avoided.
- Review the associated sampling JHA and complete FLHA, if necessary – use caution when walking along the toe of rock dumps/PAG stockpile and be aware of wildlife.
- Review safety concerns at individual sites if needed.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure*.

Procedure

Collection:

- Collect all bottles and equipment necessary for sampling.
- Walk along the toe of the assessment area using the Environmental Monitoring Locations Map (Appendix I), the Sample Site UTMs (Appendix II), and the Site Matrix (Appendix IV) as reference for the possible seeps in the area. Newly discovered seeps should be labeled with flagging tape and marked in the GPS for future reference.
- Only seeps with observed flow are to be monitored. Seeps within approx. 100 m and have consistent field parameters with each other can be attributed to the same source and the seep with the highest flow rate is sampled (only field parameters and flow estimates conducted at the other seep(s)).
- Carry out the in-situ tests (as per *MPMC-WORK-005-5: EXO Sonde Profiler*) and estimate the flow rate. Preserve the samples and record parameters at each sample location in accordance with *MPMC-SOP-17: Field Sampling Record Keeping*.
- For each sample follow the guidelines as presented in the *BC Field Sampling Manual 2013*.
- Place the samples in a cooler with ice.
- Upon returning to the trailer/office, create a COC, and pack the coolers for shipping as per *MPMC-WORK-004: Water Sample Preservation and Shipping*.
- Ensure samples are collected on or before Thursday so that they may be shipped out to the lab in a timely manner.
- Enter field data into the MonitorPro database and/or necessary spreadsheets on the Environmental network drive.

Documents and Records

- Seep water sample results are stored in the MonitorPro database and on the Environmental network drive.

References

- Permit M-200
- *BC Field Sampling Manual (most recent version: 2013)*

- *BC Environmental Laboratory Manual (most recent version: 2020)*
- CEMP (2019)
- MLARD Management Plan
- ML/ARD Monitoring Plan

Related Documents

- *MPMC-SOP-005: Data Collection Equipment*
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-SOP-017: Record Keeping*
- *MPMC-WORK-002: Surface Water Quality Monitoring*
- *MPMC-WORK-004: Water Sample Preservation and Shipping*
- *MPMC-WORK-005-5: EXO Sonde Profiler*
- *MPMC-WORK-005-6: GPS*
- Environmental Monitoring Locations Map (Appendix I)
- Sample Site UTMs (Appendix II)
- Site Matrix (Appendix IV)
- Sample Supplies Inventory Checklist (Appendix X)

APPENDIX 10-4: ML/ARD MONITORING PROGRAM

FINAL

Metal Leaching and Acid Rock Drainage Monitoring Plan – 2025 Update

Mount Polley Mine, British Columbia, Canada

Mount Polley Mining Corporation

SRK Consulting (Canada) Inc. ▪ CAPR003709 ▪ November 2025

srk consulting

FINAL

Metal Leaching and Acid Rock Drainage Monitoring Plan – 2025 Update

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Definitions

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

CEMP	Comprehensive Environmental Monitoring Plan
CRM	Certified Reference Material
JAIR	Joint Application Information Requirements
LOD	Limit of Detection
ML/ARD	Metal Leaching and Acid Rock Drainage
MPMC	Mount Polley Mining Corporation
PAG	Potentially Acid Generating
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percent Difference
SFE	Shake Flask Extraction
SOP	Standard Operating Procedures
WM	Work Methods
WTP	Water Treatment Plant

1 Introduction

This Metal Leaching and Acid Rock Drainage (ML/ARD) Monitoring Plan is for Mount Polley Mine, operated by Mount Polley Mining Corporation (MPMC). It has been prepared in accordance with the Joint Application Information Requirements (JAIR, MCM and ENV 2024) (Table 1-1). As required by the JAIR, the ML/ARD Management Plan is a separate document. The ML/ARD Monitoring Plan is a companion document to the ML/ARD Management Plan.

Table 1-1: Table of Concordance with 2024 JAIR (MCM and ENV 2024)

Section Number in Plan	Section Title	Information Required as per 2024 JAIR[1]
2.1	Objectives	Objectives
2.3	Rock Sampling	Sampling frequencies and locations
2.4	Tailings Sampling	
2.5	Water Treatment Plant By-Products	
2.6	Borrow Source Sampling	
2.7	Seepage and Pit Sump Water Sampling	
2.8	Analytical Methods	Details of geochemical characterization tests
2.8	Analytical Methods	Detailed sampling and analytical testing procedures, including SOPs
Appendix A	Standard Operating Procedures	
2.3.2	Field Observations	Diagnostic features significant to ML/ARD that will be recorded during sampling
2.8	Analytical Methods	Name of the certified laboratories used to analyze samples
2.9	Quality Assurance and Quality Control	QA/QC protocols
2.10	Change Management	Change management procedure for updates to the monitoring program

Notes:

[1] From Section 10.5.3 of MCM and ENV (2024)

2 Monitoring Plan

2.1 Objectives

The objective of the monitoring plan is to implement the ML/ARD management plan and maintain a geochemical inventory of mined materials.

2.2 Standard Operating Procedures

Standard operating procedures (SOPs) and associated Work Methods (WMs) are provided in Appendix A.

2.3 Rock Sampling

2.3.1 Sample Collection

Blasthole Cuttings

On each bench, blastholes are systematically sampled across each blast pattern to ensure spatial coverage. Blasthole sample tags recording bench elevation, pattern number, and blasthole number are inserted in each bag and analyzed for total copper, non-sulphide copper, iron, and gold at the on-site assay laboratory. Areas of ore and waste are identified by interpolation of these assay results and the economic analysis of the resulting metal grades. Ore/waste boundaries are then established based on the calculated mill head values. Detailed methods are described in the attached SOP (Appendix A).

Waste Rock

In areas which have proven to be consistently not potentially acid generating (non-PAG, referred to as NAG at Mount Polley Mine) on previous adjacent benches in blasthole samples, frequency of sampling for blasthole cuttings is one sample per 40,000 t of mined rock for all areas.

In areas where PAG has been modelled through either exploration sampling, from results of previous blasthole sampling on other nearby benches, or where NAG and PAG may coincide, the sample density is one per 20,000 t (approximately 1 in every 9 blastholes). This approach results in greater sampling density in areas of suspected NAG/PAG boundaries and increases the certainty of defining PAG. Typically structures at MPM are vertically oriented, and relatively continuous. This provides some assurance that blasthole samples from previously mined benches have relevance for determining where additional samples should be taken on new benches.

The analytical results for waste rock blastholes are used to determine ARD classification. The ARD potential classifications of the blast hole samples for waste rock are then used to generate a block model through interpolation.

Mining ore and waste contacts are delineated within specialized mining software, leveraging the interpolated block model and individual sample data to categorize material types into minable blocks by ARD classification. The model is based on a 5 m x 5 m x 12m block system, where the blocks between samples receive a weighted average of the sample total carbon and total sulphur grades.

Each mining contact is provided to the survey team for precise field mark-out of Ore/NAG/PAG. Each material type is assigned a distinct color for easy identification in the field, with placards and stakes indicating the boundaries and labels of each contact. Dig maps are generated and distributed to operations personnel.

During excavation and handling of blasted material, each load of material is recorded by operators, including material type and the location name of its destination.

Ore

Any ore designated for marginal grade ore stockpiles rather than placed in a mill feed ore stockpile is sampled at a frequency of one per 20,000 t to determine if it is classified as PAG or NAG. Mill feed ore areas are excluded from ABA analysis, as this material will be processed through the Mill.

Placed Blast Rock

For confirmatory monitoring of placed NAG waste rock and marginal grade ore, grab samples will be collected weekly from any area where NAG rock is being deposited or used for construction. Detailed sampling methods are described in the attached SOP (Appendix A).

For geochemical inventory, grab samples will be collected monthly from mill-feed stockpiles where deposition occurred.

2.3.2 Field Observations

Field observations for placed blast rock sampling will include:

- GPS location of each sample.
- Geological description, such as lithology, carbonate and sulphide mineralogy and abundance, alteration, significant structural features, and texture, if possible.
- Weathering colour.

2.4 Tailings Sampling

Composite tailings samples are generated using shift composites (i.e., two a day) and analyzed every month when processing of ore occurs to represent the tonnage of tailings deposited.

2.5 Water Treatment Plant By-Products

For geochemical inventory, grab samples will be collected quarterly during water treatment plant (WTP) operation.

2.6 Borrow Source Sampling

For confirmatory monitoring of placed borrow source material used for construction (e.g., till, sand, gravel), grab samples of each source will be collected weekly when being used for construction.

2.7 Seepage and Pit Sump Water Sampling

Water chemistry monitoring of seepage from rock disposal sites, water treatment plant wastes, and contact water from the site water collection systems is completed to inform development of geochemical source terms and long-term water quality predictions.

Contact water monitoring locations are sampled quarterly as described in the Comprehensive Environmental Monitoring Plan (CEMP) (MPMC 2019). Sampling of pit sump water is also included in contact water monitoring. Pit sumps are sampled when the pit is not storing water from other sources on site to inform long-term geochemical predictions.

Seepage from all rock disposal sites (e.g., waste rock dumps and haul roads) is monitored under a twice annual seep survey program, also described in the CEMP. A map showing seep sampling locations is provided in Appendix B.

2.8 Analytical Methods

2.8.1 Blasthole Cuttings

All blasthole cutting samples are analyzed for total carbon and total sulphur by induction furnace at the MPMC on-site laboratory. A subset (as described in Section 2.9.1) are sent to an off-site laboratory of ALS Group companies located in Kamloops, BC or North Vancouver, BC for total carbon and total sulphur by induction furnace for comparison to on-site laboratory results.

Once a month, 5% of all pulped samples that were analyzed for total sulphur and total carbon at the on-site laboratory are randomly selected and sent to ALS Minerals in North Vancouver, BC for comparison to the on-site laboratory results and geochemical inventory. These samples are analyzed for:

- Paste pH, total sulphur (by induction furnace), sulphate-sulphur (HCl leach).
- Total carbon (by induction furnace), total inorganic carbon (by direct measurement of evolved CO_2 following a weak acid leach), modified Sobek NP, Net Acid Generation test.
- Mineralogical analysis by X-ray diffraction (XRD).
- Element scan using aqua regia digestion and ICP-MS finish.
- Element scan using four acid digestion and ICP-MS finish.
- Shake flask extraction (SFE) following MEND (2009).

2.8.2 Placed Blast Rock

For placed NAG waste rock and NAG marginal grade ore, each sample is analyzed for total carbon and total sulphur by combustion at the MPMC on-site laboratory. The as-received rejects of 5% of all samples will be shipped to ALS Minerals in North Vancouver, BC and analyzed for:

- Paste pH, total sulphur (by induction furnace), sulphate-sulphur (HCl leach).
- Total carbon (by induction furnace), total inorganic carbon (by direct measurement of evolved CO_2 following a weak acid leach), modified Sobek NP, Net Acid Generation test.
- Mineralogical analysis by X-ray diffraction (XRD).
- Element scan using aqua regia digestion and ICP-MS finish.
- Element scan using four acid digestion and ICP-MS finish.
- Shake flask extraction (SFE) following MEND (2009).

2.8.3 Tailings Samples

All tailings composite samples are analyzed for total carbon and total sulphur by combustion at the MPMC on-site laboratory and shipped to ALS Minerals in North Vancouver, BC for comparison to the on-site laboratory results and geochemical inventory. These samples are analyzed for:

- Paste pH, total sulphur (by induction furnace), sulphate-sulphur (HCl leach).
- Total carbon (by induction furnace), total inorganic carbon (by direct measurement of evolved CO_2 following a weak acid leach), modified Sobek NP, Net Acid Generation test.
- Mineralogical analysis by X-ray diffraction (XRD).
- Element scan using aqua regia digestion and ICP-MS finish.
- Element scan using four acid digestion and ICP-MS finish (5% of samples only).
- Shake flask extraction (SFE) following MEND (2009).

2.8.4 Water Treatment Plant By-Products

All WTP by-product samples are shipped to ALS Minerals in North Vancouver, BC and are analyzed for:

- Paste pH, total sulphur (by induction furnace), sulphate-sulphur (HCl leach).
- Total carbon (by induction furnace), total inorganic carbon (by direct measurement of evolved CO_2 following a weak acid leach), modified Sobek NP, Net Acid Generation test.
- Element scan using aqua regia digestion and ICP-MS finish.
- Element scan using four acid digestion and ICP-MS finish.
- Shake flask extraction (SFE) following MEND (2009).

2.8.5 Borrow Source Samples

All borrow source samples are shipped to ALS Minerals in North Vancouver, BC and analyzed for:

- Paste pH, total sulphur (by induction furnace), sulphate-sulphur (HCl leach).
- Total carbon (by induction furnace), total inorganic carbon (by direct measurement of evolved CO_2 following a weak acid leach), modified Sobek NP, Net Acid Generation test.
- Mineralogical analysis by X-ray diffraction (XRD) (5% of samples only).
- Element scan using aqua regia digestion and ICP-MS finish.
- Element scan using four acid digestion and ICP-MS finish (5% of samples only).

If the sample is overburden, the fine (<2 mm) fraction only is also analyzed for:

- Shake flask extraction (SFE) following MEND (2009).

2.8.6 Water Samples

Water samples are analyzed for:

- pH
- Conductivity
- Alkalinity
- Anions (sulphate, chloride, fluoride, phosphate)
- Nitrogen species (nitrate, nitrate, ammonia)
- Dissolved trace element scan by ICP-MS.

2.9 Quality Assurance and Quality Control

2.9.1 Quality Control Samples

Solid-Phase Samples

Quality control testing for rock samples is summarized in Table 2-1.

Table 2-1: Quality Control Testing for Solid-Phase Tests

Material Type	Sample Type	Frequency	Details on QC testing
Rock	Blast cuttings (waste rock and ore)	10%	Cuttings are split and analyzed in duplicate.
	Placed blast rock grab samples	10%	Field duplicates are collected.
Tailings	Monthly composites	10%	Composites are split and analyzed in duplicate.
WTP By-Products	Grab samples	10%	Field duplicates are collected.
Borrow Sources	Placed grab samples	10%	Field duplicates are collected.

Water Samples

For water samples, quality control samples will be collected as a component of the overall water quality monitoring program as per the MPMC QA/QC Manual (MPMC 2024). Quality control testing will consist of 10-20% QA/QC samples consisting of travel blanks, field blanks and duplicates

2.9.2 On-Site Laboratory

The frequency of in-house duplicates and off-site confirmatory analysis is performed on 10% of all samples analyzed in-house until acceptable performance is achieved, as determined by a Qualified Professional, after which 5% will be appropriate. Variability between on-site and off-site results is determined using relative percent difference (RPD) as follows:

$$\text{RPD } (\%) = \frac{|(\text{sample conc. 1})-(\text{sample conc. 2})|}{|[(\text{sample conc. 1})+ (\text{sample conc. 2})]/2|} \times 100 \qquad \textbf{(Eq. 1)}$$

Certified Reference Material (CRM) and blank samples are analyzed at a frequency of 5%.

2.9.3 Solid-Phase Samples

Variability between duplicates is determined using RPD.

The quality assurance and quality control (QA/QC) checks to be conducted and passing criteria for static analyses conducted at the external laboratory (ALS Minerals in North Vancouver, BC) is provided in Table 2-2.

Table 2-2: QA/QC Checks and Criteria for Solid Phase Samples Analyzed at External Laboratory

Parameter	Criterion
Sulphur Balance	Total S ≥ Sulphate-S.
Duplicates	Relative percent difference (RPD) better than about ±30% for values >10 times limit of detection (LOD).
Laboratory Pulp Duplicates	Relative percent difference (RPD) better than about ±30% for values >10 times limit of detection (LOD).
Certified Reference Materials (CRMs)	CRMs are included in each batch and results are within certified values.
Method Blanks	<5X LOD.

2.9.4 Water Samples

The QA/QC checks to be conducted are the same as those applied to other water samples collected under the CEMP (MPMC 2019).

2.10 Change Management

Changes to this monitoring plan require the engagement and approval of the Qualified Professional.

Closure

This report, Metal Leaching and Acid Rock Drainage Monitoring Plan – Springer Expansion Project, was prepared by Shauna Litke. If you have any questions, please contact the undersigned.



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EGBC Permit to Practice: 1003655

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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Appendix A Standard Operating Procedures and Work Methods

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MPMC – SOP – 016:
ABA and Soil Sampling

Purpose

To monitor the operational MPMC ARD/ML sampling and segregation program by collecting weekly waste rock samples (when PAG material is being mined), as per Permit M-200, the *ML/ARD Management Plan*, and the ML/ARD Monitoring Plan, and to assess the variability and suitability of reclamation materials on site, as per Permit M-200 and the *MPMC Soil Management Plan*. ABA grab sampling will not be considered when the mine is in Care & Maintenance or Closure.

Scope

This procedure outlines the ABA and soil sampling requirements that are the responsibility of MPMC Environmental Department staff.

Introduction

ABA grab samples are taken from active rock dumping sites; typical sample sites include, but are not limited to, active rock disposal sites, stockpiled ore, new road construction and road surfaces, water treatment plant (WTP) waste, and TSF construction. These samples are a randomized audit of detailed geological mapping done by MPMC geologists to ensure proper segregation and management of acid generating, PAG, and NAG materials. Sample types include placed blast rock (waste rock and stockpiled ore), WTP waste, and borrow source material used for construction (e.g., till, sand, gravel, etc.).

Soil samples are taken from stockpiles to monitor soil degradation and for characterization purposes of previously applied soil to reclamation sites. All new soil stockpiles are to be sampled upon creation, and a site wide soil stockpile sampling program is to be carried out every 5 years. Additional soil sampling may be completed on progressive reclamation sites to monitor soil development.

Site specific soil surveys must be completed by a qualified professional for areas schedule to be disturbed by mine expansion. This is discussed in the *MPMC Soil Management Plan* and is beyond the scope of this document.

Responsibilities

Environmental Superintendent/Coordinator:

- Ensure that sampling is completed on a regular schedule, as required in the *ML/ARD Management Plan.*
- Ensure that results are reported in the Annual Environmental and Reclamation Report, which is to be submitted to ENV and EMLI.

Environmental Technologist/Technician:

- Coordinate sampling schedule.
- Ensure that samples are collected and handled in accordance with *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*, and this document.

Preparation

On the Day of Sampling:

- Pre-select area(s) for soil samples to be taken (refer to *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling* for details).
- Call Pit-Shifter (or designate) and ask if any rock waste is being hauled, its location and if it is safe to enter the area (refer to *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling* for details).
- Review the associated JHA and completed a FLHA, if necessary.
- Ensure all workers have appropriate PPE and are fit for the task.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure*.

Procedure

ABA Grab Sampling:

- Take a composite sample of a minimum of 1 kg of randomly selected material, as described in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*, and place in clean sample bag.
- Record the GPS Coordinates, elevation, and sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Enter sample information into the spreadsheet on the Environmental Network Drive and submit an analysis request in LIMS.
- Tag and date sample bag.
- Deliver sample(s) to the Bucking Room.

Soil Stockpile Sampling:

- Take a photo of the stockpile to document characteristics, including size and vegetative cover.
- Collect a composite sample from a minimum of three sub-sample locations in a clean, labelled, plastic sample bag, taking soil from the surface and at depth at each subsample location.
- Record the sample location GPS coordinates and record sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Store samples in the refrigerator until they can be shipped to the analytical laboratory.

The detailed procedure is outlined in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling*.

Soil Sampling of Reclamation Sites:

- Pre-select soil sample locations and record GPS coordinates.
- Collect a composite sample from minimum three locations at each site in a clean, labelled plastic sample bag, taking a representative sample from the entire soil profile at each location.
- Record sample information in the field notebook as per *MPMC-SOP-17: Record Keeping.*
- Store samples in the refrigerator until they can be shipped to the analytical laboratory.

A detailed procedure is outlined in *MPMC-WORK-016: Acid-Base Accounting and Soil Sampling;* however, it may need to be adapted for specific sampling objectives.

Documents and Records

- ABA analysis results are recorded in the MPMC LIMS and into the spreadsheet on the Environmental Network Drive.
- All soil sample results are recorded on the Environmental network drive.
- ABA and Soil results are reported to ENV and EMLI in the Annual Environmental and Reclamation Report.

References & Related Documents

- *MPMC Soil Management Plan*
- *MPMC ML/ARD Management Plan*
- *MPMC ML/ARD Monitoring Plan*
- Permit M-200
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-WORK-016: Acid Base Accounting and Soil Sampling*

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MPMC – WORK – 016:
ABA and Soil Sampling

Objective

To take ABA and soil samples required by Permit M-200, the *MPMC Soil Management Plan*, and the ML/ARD Monitoring Plan, as outlined in *MPMC-SOP-016: Acid-Base Accounting and Soil Sampling*. ABA grab sampling is not considered during Care and Maintenance or Closure phases.

Work Methods

ABA Grab Samples:

Rock and Borrow Source Sampling

1. Pre-select area(s) to be sampled, including:
    - Where active NAG dumping is occurring, including rock disposal sites and construction material.
    - Where active ore stockpiling is occurring.
    - Where active construction with borrow source materials (e.g., till, sand, gravel, riprap, etc.) is occurring.
2. Using a shovel, take a composite sample of a minimum of five equal volume sub-samples from an approximately 50 metre span. Distance between samples should be based on a pre-determined number of steps (ex. 10) and sample should always be taken from a predetermined height on the berm or dump toe (ex. knee height) to avoid sample selection bias.
3. Collect sample in a clean plastic sample bag labelled with the sample site, sample number, and date.

4. Record sample location UTM co-ordinates and elevation using a handheld GPS (refer to *MPMC-WORK-005-6: GPS*).
5. Complete an ABA Sample tag (refer to Figure 1). All samples may be discarded. Tear off "Lab" tag and insert into sample bag and leave tag tab in label booklet. If sample is wet, staple tag to bag.
6. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
7. Input sample number and analysis request into Assay Lab LIMS system for waste rock or ore samples only. Borrow source samples are not submitted to the Assay Lab and are sent to an external laboratory, as per the ML/ARD Monitoring Plan. A subset of waste rock and ore samples will also be sent to an external laboratory as part of the analytical testing program.
    a. The Environmental Department username is "env" and the password is "enviro".
    b. Under the File menu, select "Analysis Request".
    c. Select "ABA Environmental" from the Analysis Suit menu. Note if this menu is not available, you must exit and update the Selection Filter to include the day's date (button with arrows below the File menu).
    d. Enter the "sample Id" (number on the sample tag) and enter the sample name (ex. SERDS) under "Notes" for the sample.
    e. In the general "Notes" field, write the sample date.
8. Deliver samples to the Bucking Room.
9. Input UTM co-ordinates into the 'grabs' spreadsheet on Environmental network drive and update the spreadsheet with any new results. New results are found in LIMS:
    a. Update the Selection Filter (button with arrows below the File menu) to include the dates of interest.
    b. Click on jobs in the left-hand menu bar to view results from each job.
    c. Copy any new results into the spreadsheet on the Environmental network drive.

Figure 1. ABA Sample Label

ABA Sample Date: _____ Location: _____ UTM: _____ Elevation: _____ Sample #: 1078	**ABA Sample** Date: _____ Location: _____ Analysis: ABA Dispose of sample? YES Sample #: 1078

Water Treatment Plant Waste

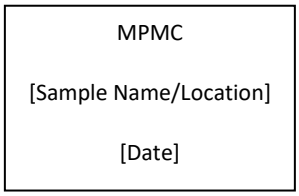
1. Record the value on the waste line totalizer monthly when Water Treatment Plant (WTP) data are downloaded.
2. Samples shall be taken of material that has exited the sludge line, to the West of the WTP and down-flow from where microsand is cycloned for re-use.
3. Using a shovel, take a composite sample of a minimum of five equal volume sub-samples from the pile. Distance between samples should be based on a pre-determined number of steps (e.g., 5) to avoid sample selection bias.

4. Collect sample in a clean plastic sample bag labelled with the sample site, sample number, and date.
5. Record sample location UTM co-ordinates and elevation using a handheld GPS (refer to *MPMC-WORK-005-6: GPS*).
6. Complete an ABA Sample tag (refer to Figure 1). All samples may be discarded. Tear off "Lab" tag and insert into sample bag and leave tag tab in label booklet. If sample is wet, staple tag to bag.
7. Samples are sent to an external laboratory as per the ML/ARD Monitoring Plan.

Soil Stockpile Samples:

1. Take a photo of the stockpile to document characteristics, including size and vegetative cover.
2. Collect a composite sample from a minimum of three sub-sample locations that are representative of the different sections of the stockpile.
3. Record the GPS coordinates for each sub-sample 1ocation.
4. For each sample, use a new (clean) plastic sample bag. Label the bag as shown in Figure 2.
5. At each sub-sample location, dig a profile with a shovel or mini backhoe to greater than 1.0 m depth (from all surfaces of the stockpile). Take the sub- sample half from 0.3 m deep and half from 1.0 m deep (this of the more biologically active surface soils, and the "dead zone" below approximately 1.0 m). Ensure that equal volumes are sampled at every location and depth so that the composite is representative (minimum sample volume is approximately 500 mL).
6. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
7. Store samples in the refrigerator until ready for shipment to the lab. Ship in coolers with ice packs.
8. Request lab analysis for parameters including, but not limited to:
    - Texture
    - pH
    - Electrical conductivity
    - Total nitrogen
    - Available phosphorus
    - Organic matter
    - Micronutrients including sulphur and potassium

Figure 2. Example soil sample label



Soil Sampling of Reclamation Sites:

1. Pre-select soil sample locations on a map using techniques, such as transects (to reduce sample selection site bias), and record GPS coordinates. Ensure that reclamation site strata are defined based on soil properties.
2. Take a photo at each sample site to document characteristics, including soil appearance and vegetative cover.
3. For each sample, use a new (clean) plastic sample bag. Label the bag as shown in Figure 2.
4. Dig a hole down through the soil to waste rock (or the substrate below the soil applied in reclamation).
5. Each sample should be made up of a minimum of three sub-samples (five to ten sub-samples is recommended) from the same strata. Complete at minimum one sample per hectare. Ensure that equal volumes are sampled at every location and depth so that the composite is representative (minimum sample volume is approximately 500 mL).
6. Because the soil depth on reclaimed sites is shallow, for each sub-sample use a trowel or shovel to take a sample of the entire profile, evenly representing every depth.
7. Record sample information in the field notebook as per *MPMC-SOP-017: Record Keeping.*
8. Store samples in the refrigerator until ready for shipment to the lab. Ship in coolers with ice packs.
9. Request lab analysis for parameters including, but not limited to:
    - Texture
    - pH
    - Electrical conductivity
    - Total nitrogen
    - Available phosphorus
    - Organic matter
    - Micronutrients including sulphur and potassium

This procedure will need to be refined based on the sampling program objective and reclamation site specifications. Third party consultant recommendations may be required.

Safety in the Field

- Review the associated JHR and fill out a FLHA if necessary.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure.*
- Make sure to be wearing P.P.E and use proper radio communication. This includes contacting the Pit Shifter and/or area supervisor of your location(s).
- Follow all MPMC protocol when working around equipment. Use radio communication with operators as necessary when sampling at or below active dumpsites.

References and Related Documents

- *MPMC Soil Management Plan*
- *MPMC ML/ARD Monitoring Plan*
- *MPMC ML/ARD Management Plan*
- Permit M-200
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-SOP-016: Acid Base Accounting and Soil Sampling*
- *MPMC-SOP-017: Record Keeping*

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MPMC – SOP – 022:
Seep Sampling

Purpose

To safely sample seep water quality from rock dumps in accordance with Permit M-200, *BC Field Sampling Manual 2013*, *BC Environmental Laboratory Manual*, the Comprehensive Environmental Monitoring Plan (CEMP), and the *ML/ARD Monitoring Plan*.

Scope

This procedure outlines the seep water quality monitoring requirements that are the responsibility of MPMC Environmental Department staff.

Introduction

Seep samples are collected from seeps emerging close to the toe of waste rock dumps and temporary PAG stockpiles. This SOP outlines the procedure required to maintain compliance with Permit M-200, including who is responsible for the sampling, and when monitoring needs to occur.

Samples must be taken on or before Thursday, as they must be shipped to the laboratory in Burnaby by Thursday afternoon at the latest. The seep sampling program is conducted in the spring and the fall of each year. The waste dumps, haul roads, and stockpiles sampled are:

- Temporary NW PAG Stockpile (PAG);
- Waste Haul Road (WHR);
- Tailings Storage Facility Haul Road (TSF);
- Southeast Rock Disposal Site (SERDS);
- Northeast Zone Dump (NEZ);
- East Rock (East RDS) Dump;
- North Bell Dump (NBD); and

- Boundary Dump.

Note: Sample locations may vary with expansion of dumps and seasonal flow conditions and only seeps with observed flow are monitored.

Responsibilities

Environmental Superintendent/Coordinator:

- Follow CEMP and M-200 requirements (as described in the ML/ARD Monitoring Plan) on seep sampling, and arrange sampling in accordance.
- Review sample results regularly to identify any QA/QC issues or water quality concerns.
- Report seep sampling results to ENV and MCM in the Annual Environmental and Reclamation Reports.

Environmental Technologist/Technician:

- Ensure that samples are collected and handled in accordance with the *BC Field Sampling Manual 2013*, *MPMC-WORK-002: Surface Water Sampling*, and this document.
- Ensure samples are preserved, packed, and shipped according to *MPMC-WORK-004: Sample Preservation and Shipping*.
- Ensure sample record keeping follows *MPMC-WORK-017 Field Sampling Record Keeping.*
- Enter field data into the MonitorPro database and/or spreadsheets on the Environmental network drive.

Preparation

Two Weeks Before Sampling:

- Make sure there are sufficient sampling supplies and ice (for shipping) on site (refer to Appendix X – Sample Supplies Inventory Checklist).

One Week Before Sampling:

- Arrange for a second person to assist with sampling, as required.
- Plan for shipping of samples to ensure there is not a conflict with statutory holidays.
- Ensure sample sites are loaded onto the GPS, see *WORK-005-6: GPS* on how to use the GPS.

On the Day of Sampling:

- Make enough sample sets for each sampling event.
- Place sample bags in cooler(s) and bring the field backpack.
- Place ice in the coolers.
- Check all equipment required for sampling is functioning correctly and has sufficient battery life.
- Carry out any necessary equipment maintenance and calibrations as required by *MPMC-WORK-005 Data Collection Equipment*.

- Coordinate sampling with the pit shifter and communicate work locations so that potential hazards from rock dumping can be avoided.
- Review the associated sampling JHA and complete FLHA, if necessary – use caution when walking along the toe of rock dumps/PAG stockpile and be aware of wildlife.
- Review safety concerns at individual sites if needed.
- Follow *MPMC-SOP-011: Check In and Check Out Procedure*.

Procedure

Collection:

- Collect all bottles and equipment necessary for sampling.
- Walk along the toe of the assessment area using the Environmental Monitoring Locations Map (Appendix I), the Sample Site UTMs (Appendix II), and the Site Matrix (Appendix IV) as reference for the possible seeps in the area. Newly discovered seeps should be labeled with flagging tape and marked in the GPS for future reference.
- Only seeps with observed flow are to be monitored. Seeps within approx. 100 m and have consistent field parameters with each other can be attributed to the same source and the seep with the highest flow rate is sampled (only field parameters and flow estimates conducted at the other seep(s)).
- Carry out the in-situ tests (as per *MPMC-WORK-005-5: EXO Sonde Profiler*) and estimate the flow rate. Preserve the samples and record parameters at each sample location in accordance with *MPMC-SOP-17: Field Sampling Record Keeping*.
- For each sample follow the guidelines as presented in the *BC Field Sampling Manual 2013*.
- Place the samples in a cooler with ice.
- Upon returning to the trailer/office, create a COC, and pack the coolers for shipping as per *MPMC-WORK-004: Water Sample Preservation and Shipping*.
- Ensure samples are collected on or before Thursday so that they may be shipped out to the lab in a timely manner.
- Enter field data into the MonitorPro database and/or necessary spreadsheets on the Environmental network drive.

Documents and Records

- Seep water sample results are stored in the MonitorPro database and on the Environmental network drive.

References

- Permit M-200
- *BC Field Sampling Manual (most recent version: 2013)*

- *BC Environmental Laboratory Manual (most recent version: 2020)*
- CEMP (2019)
- MLARD Management Plan
- ML/ARD Monitoring Plan

Related Documents

- *MPMC-SOP-005: Data Collection Equipment*
- *MPMC-SOP-011: Check In and Check Out Procedure*
- *MPMC-SOP-017: Record Keeping*
- *MPMC-WORK-002: Surface Water Quality Monitoring*
- *MPMC-WORK-004: Water Sample Preservation and Shipping*
- *MPMC-WORK-005-5: EXO Sonde Profiler*
- *MPMC-WORK-005-6: GPS*
- Environmental Monitoring Locations Map (Appendix I)
- Sample Site UTMs (Appendix II)
- Site Matrix (Appendix IV)
- Sample Supplies Inventory Checklist (Appendix X)

Appendix B Map of Seep Sampling Locations

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2024 Seepage Monitoring Locations

1:20,000

Gabriel Holmes
Date: 3/13/2025
Photo Dates: 2013, 2024

0 100 200 400 600 800 1,000
Meters

Seepage Sites
20m Contours

Polley Lake

Bootjack Lake

NEZ 7
NEZ 14
NEZ 13
NEZ 12
NEZ 11
NEZ 10
NEZ 9
NEZ 8
NEZ 4
NEZ 3
NEZ 2
NEZ 1
East RDS 4
East RDS 2
East RDS 3
East RDS 1
SERDS 17
SERDS 14
SERDS 13
SERDS 24
SERDS 23
SERD 25
SERD 22
SERD 28
SERD 26
TSF Road 16
TSF Road 6
TSF Road 5
TSF Road 8
TSF Road 1
WHR 22
WHR 29
WHR 17
WHR 27
WHR 4
WHR 2
WHR 24
WHR 9
WHR 8
PAG 4
PAG 8
PAG 7
PAG 5

APPENDIX 10-5: MINE SITE WATER MANAGEMENT PLAN

REPORT

Water Management Plan - Mount Polley Mine

TSF Raise to 987m Permit Amendment Application

Submitted to:

Mount Polley Mining Corporation

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Likely BC V0L 1N0

Submitted by:

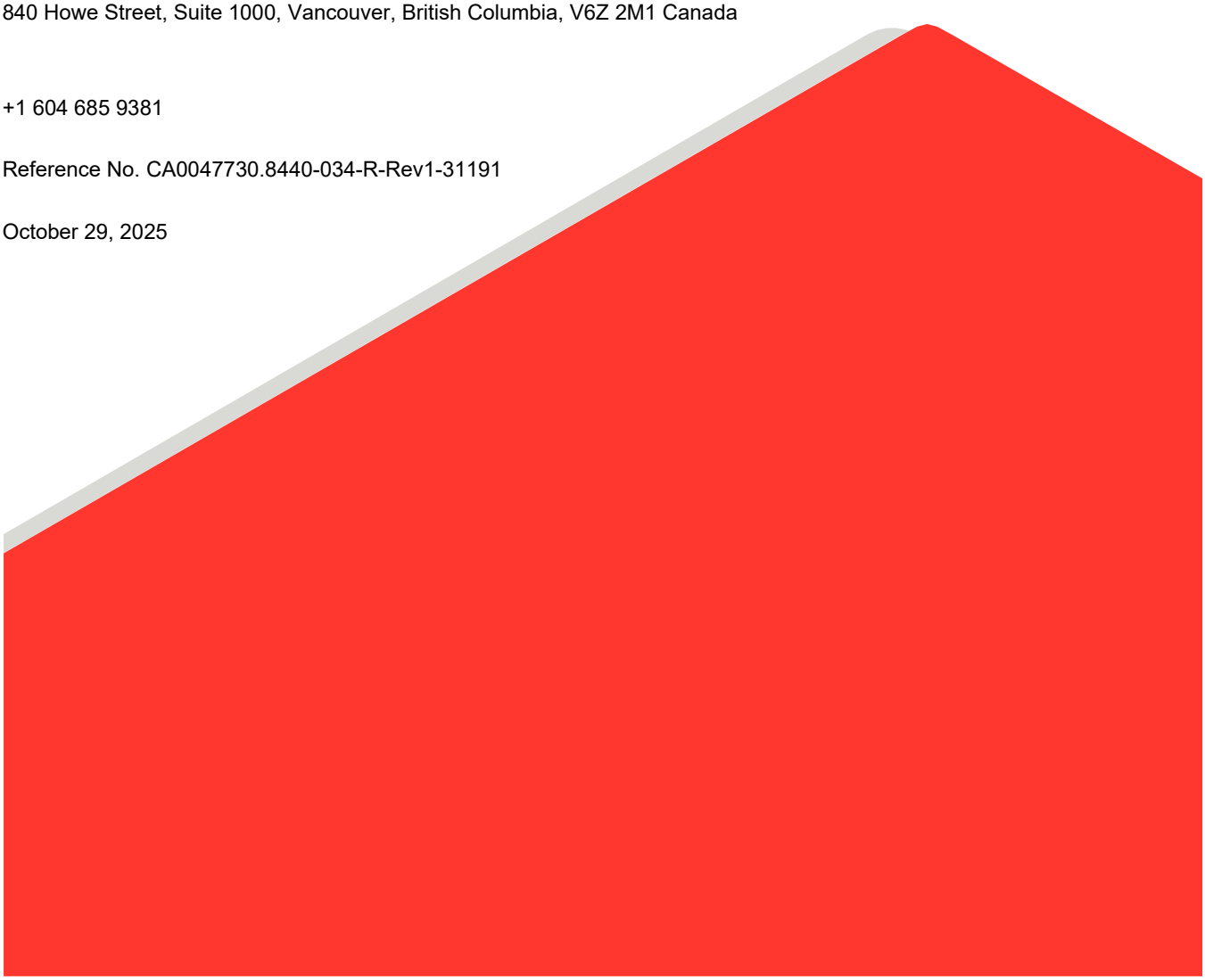
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October 29, 2025



Distribution List

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Executive Summary

Background

The Mount Polley Mine (The Mine, or Site) is a copper-gold mine owned and operated by Mount Polley Mining Corporation (MPMC), a subsidiary of Imperial Metals Corporation. The Mine is located 56 km northeast of Williams Lake, British Columbia. MPMC began production at the mine in 1997 and operated until October 2001 when operations were suspended temporarily for economic reasons. In March 2005, the Mine restarted production and it was in continuous operation until August 4, 2014. As a result of a foundation failure of the Tailings Storage Facility (TSF) in 2014, mining and milling operations were suspended and MPMC did not have a permitted water discharge. An interim restricted operations M-200 permit application was submitted to regulators on March 20, 2015, and approval to resume operations was received on July 9, 2015. Milling operations resumed on August 4, 2015. Tailings and mine contact water were conveyed to and temporarily stored in the Springer Pit until 2016 when the Tailings Storage Facility was repaired and authorized for use under Mines Act Permit M-200 and *Environmental Management Act* (EMA) Permit 11678.

Also in 2016, MPMC submitted a Long Term Water Management Plan Technical Assessment Report (LTWMP) to the British Columbia Ministry of Environment and Climate Change Strategy. The LTWMP provided details of the proposed Long-term Water Management Plan for the Mine, including the discharge quantity and quality for the operations, closure, and post-closure phases of mine life. It included a technical assessment of the effluent discharge during operations to identify whether or not receiving water uses would be impaired and recommended a preferred discharge approach using an active treatment system and a pipeline discharging treated mine water at depth in Quesnel Lake.

Under Section 1.2.3 of the December 01, 2022 EMA Permit 11678, the “authorized discharge period” for discharge of effluent to Quesnel Lake expired on June 30, 2025. This discharge period supported the permitted Phase 4 Cariboo-Springer Pit mine operations phase. MPMC has now received an updated EMA Permit 11678 (September 02, 2025) for the next mine operations phase (Springer Expansion) and permit Section 1.2.2 now states that “the discharge period is authorized until Closure”, where Closure is defined as when the “mine has ceased all mining activities, as defined in the *Mines Act*”.

This Water Management Plan (WMP) addresses permit requirements for current and assumed future operations of the site, which at the time of writing are expected to run through July 31, 2031. This WMP also summarizes and discusses predicted water quantity, quality, and treatment during closure (assumed August 1, 2031, through July 31, 2041) and post-closure (assumed August 1, 2041, through July 31, 2131) phases. It should be noted that these dates are expected dates for mining operations; however, as with all mines, such schedules are subject to changes that result from commodity pricing and other factors.

This current issue of the WMP has been authored to support the Permit Amendment Application for the Tailings Storage Facility Raise to 987 m. This WMP should be considered a live document, which is updated frequently per stated revision triggers and updated to support permit applications.

Approach

The timeline for operations and closure has been assumed based on mine planning information available at the time of writing and is subject to change over time. The current Reclamation and Closure Plan (MPMC 2022a) describes the plan for closing the site. This WMP maintains closure assumptions aligned with the 2022 Reclamation and Closure Plan. The next update to the Reclamation and Closure Plan will occur in 2027 as per requirements in the BC HSRC.

This WMP describes the water management approach for the Site during both operations and closure. The regulatory framework for the Site is described in detail, including a table of concordance outlining how the WMP addresses application information requirements and existing permit requirements. The proposed mine plan is described, including the assumed dates for operation, closure, and post-closure phases for modelling purposes.

Baseline information is summarized for the Site, including geology, climate, hydrology, and the receiving environment water quality. A major component of this WMP is a summary of the water balance and water quality models developed for the Mine, including a summary of inputs into these models and a summary of the results. These two models are described in detail in the appended reports (Appendix A and Appendix B). The results of the water balance and quality models provide critical information to water treatment needs for the site (summarized in this WMP), during operations and during closure/post-closure. An update of treatment technology development for closure/post-closure is also provided.

Final Design and Technology Development

For the purposes of this WMP, the “final design” of the site is defined as the water management infrastructure design in place at closure of the site. During operations, the water management infrastructure (i.e., collection ditches, pipes, sumps, pumps, etc.) will remain in its current configuration. During the remainder of operations, plans will be put in place to develop the final design for water management and treatment into closure and post-closure.

A key component of developing the final design during operations is developing alternative treatment technologies that could be considered for closure of the site. This WMP provides an update on progress on a number of possible treatment technologies included in the water treatment technology inventory.

Study Limitations

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APPENDICES

APPENDIX A
Site-wide Water Balance Model (SWWBM)

APPENDIX B
Site-wide Water Quality Model (SWWQM)

1.0 INTRODUCTION

1.1 Background

The Mount Polley Mine (the Mine, or Site) is a copper and gold mine operated by Mount Polley Mining Corporation (MPMC), a subsidiary of Imperial Metals Corporation. The Mine is located 56 km northeast of Williams Lake, British Columbia (BC), and is located between Polley Lake and Bootjack Lake. The Mine location is shown in Figure 1 and the Mine site layout is shown in Figure 5.

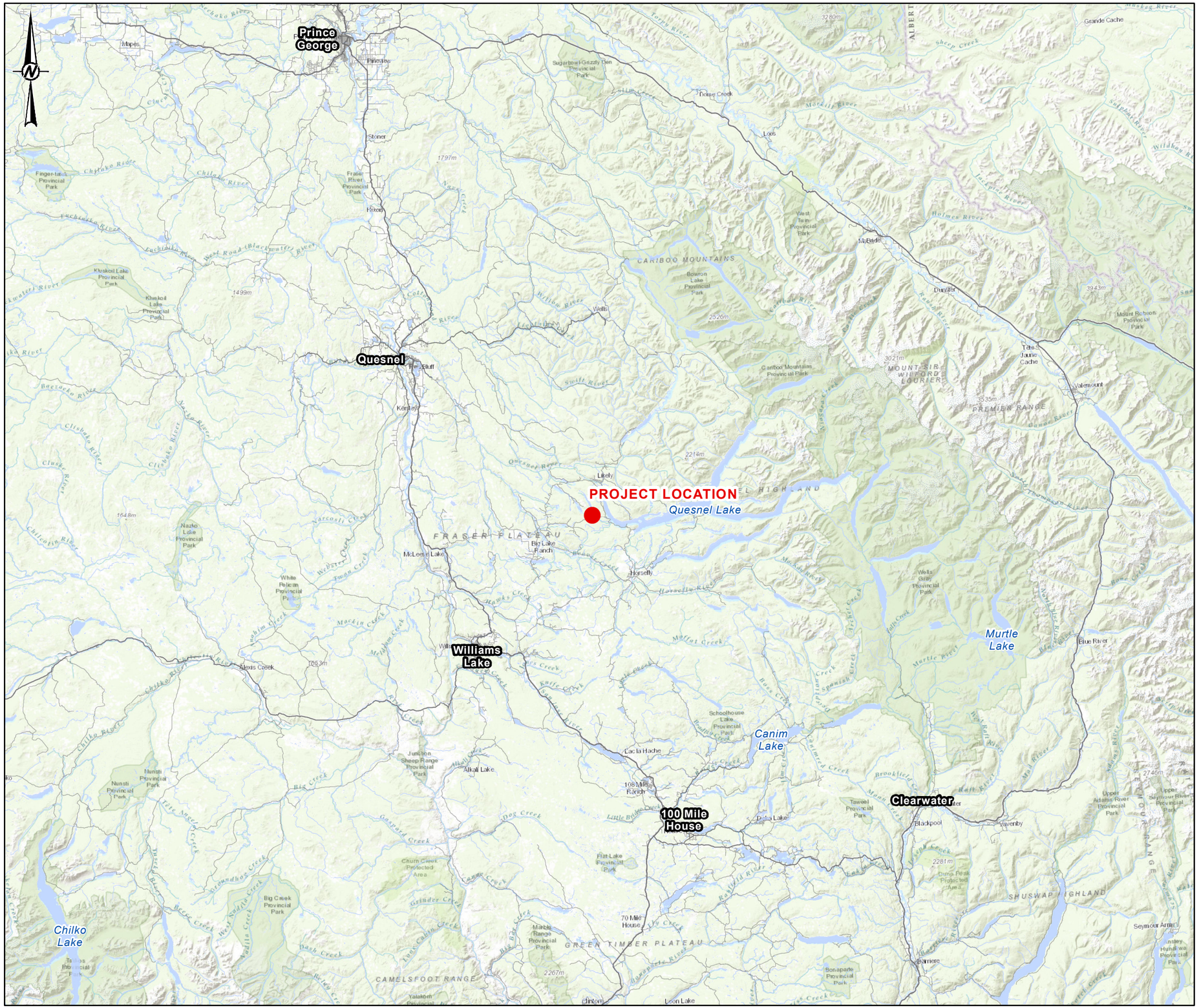
MPMC began production at the mine in 1997 and operated until October 2001 when operations were suspended temporarily for economic reasons. In March 2005, the Mine restarted production and it was in continuous operation until August 4, 2014, when a subsurface failure of the Tailings Storage Facility (TSF) foundation resulted in mining and milling operations being suspended. MPMC was subsequently issued with a Pollution Abatement Order (Order #107461) by the BC Ministry of Environment and Climate Change Strategy (BC ENV). Containment infrastructure for collection of drainage from the breached section of the TSF was constructed by September 4, 2014, and all contact water was subsequently directed to and contained within the Springer Pit. This measure was implemented as part of the emergency response and was considered a temporary Water Management Plan to deal with changed conditions arising from the breach.

On July 9, 2015, MPMC was provided approval by the Ministry of Energy, Mines and Petroleum Resources (MEMPR) to return to restricted operations for a one-year period using the Springer Pit for tailings deposition and subject to the conditions stated in the M-200 Permit (Mine No. 1101163). On June 23, 2015, MPMC was provided approval by MEMPR to return to normal operations using the TSF for tailings deposition under an approved four-year mine plan as stated in the M-200 Permit.

MPMC had been in care and maintenance since May 31, 2019, which resulted in an extension to the operational period needed to develop the permitted Phase 4 Cariboo-Springer Pit. In addition to this, the results of exploration and strong resource prices have provided the basis for an extended life of mine plan that will result in mining activity beyond Phase 4 Cariboo-Springer Pit, to include additional phases that will expand Springer Pit to consolidate Springer and Cariboo pits adding approximately 8 years to the life of the mine. On March 27, 2025, MPMC received an updated M-200 permit which allowed raise of the TSF to 974m elevation, construction of which is currently underway. On August 28, 2025, MPMC received another updated M-200 permit which authorized the current mine operation phase (Springer Expansion). On September 02, 2025, received an updated EMA Permit 11678, which authorized treated water discharge from site for the Springer Expansion operations period (authorized discharge until Closure). A further M-200 permit amendment application is currently under development with MPMC to propose raise of the TSF facility to 987m elevation, in which this iteration of the WMP is intended to support.

For the purposes of this WMP, WSP Canada Inc. (WSP) has assumed that the mine will be in operation until July 31, 2031, followed by a closure phase from August 1, 2031, to July 31, 2041, and a post-closure phase from August 1, 2041, to July 31, 2131. It should be recognized that this mine life may change as a result of metal prices, new exploration, care and maintenance periods, revisions to the mine plan, and other factors that are common to mining operations. These are only assumed mine phase dates to allow completion of modelling and should not be considered by regulators as static dates.

This WMP is revised annually to meet M-200 permit requirements in Section C.3.(a) (Surface Water and Groundwater Management). This WMP also supports requirements in EMA Permit 11678 Section 5.2 (Annual Report). This WMP is also provided with permit applications to support water management information requirements. This WMP seeks to provide a practical plan for managing mine water for the proposed life of mine and to do so in a manner that reflects permit requirements, based on information available at the time of writing. This WMP should be considered a live document, which is updated frequently per stated revision triggers and updated to support permit applications.


Prince George
Quesnel
Williams Lake
100 Mile House
Clearwater
PROJECT LOCATION
Quesnel Lake
Likely
Horsefly
Wells
Barkerville
Wells Gray Provincial Park
Murtle Lake
Canim Lake
Blue River
Valemount
McBride
Dunster
Tête Jaune Cache
Grande Cache
Dome Creek
Loos
Stoner
Prince George
Mapes
Penny
Hixon
Quesnel
Red Bluff
Kersley
Wells
Likely
McLees Lake
Big Lake Ranch
Horsefly
Alexis Creek
Lac la Hache
Alkali Lake
108 Mile Ranch
Dog Creek
Williams Lake
Deka Lake
Blackpool
Tavernby
Barriere
Seymour Arm
Clinton
Lillooet
Lytton
Yalakom
Leon Lake
Chilko Lake
Finger-tatuk Provincial Park
Fraser River Provincial Park
Kluskoil Lake Provincial Park
Khuskoil Lake Provincial Park
Nazko Lake Provincial Park
White Pelican Provincial Park
Sugarbowl-Grizzly Den Provincial Park
West Twin Provincial Park
Bowron Lake Provincial Park
Caribou Mountains Provincial Park
Mount Robson Provincial Park
Junction Sheep Range Provincial Park
Nuntsi Provincial Park
Big Creek Provincial Park
Churn Creek Protected Area
Flat Lake Provincial Park
Marble Range Provincial Park
Bonaparte Provincial Park
Schoolhouse Lake Provincial Park
Taweel Provincial Park
Upper Adams River Provincial Park
Upper Seymour River Provincial Park
Wells Gray Provincial Park
Hyas Provincial Park
Dunn Peak Protected Area
CARIBOU MOUNTAINS
MOUNT SIR WILFRID LAURIER
PREMIER RANGE
FRASER PLATEAU
SHUSWAP HIGHLAND
GREEN TIMBER PLATEAU
CAMELSFOOT RANGE
3280m
1797m
1499m
2526m
3021m
3535m
3943m
2214m
1648m
2267m
2281m
2740m
Fraser River
Chilko River
Chilcotin River
Quesnel River
Swift River
Willow River
Horsefly River
Mitchell River
Holmes River
Jackpine River
Sulphur River
Wolverine River
Smoky River
Murtle River
Azure River
Raft River
Canoe River
Thompson River
Clearwater River
Dunlevy Creek
Roaring Creek
Sheep Creek
Moffat Creek
Spanish Creek
Knife Creek
Boss Creek
Big Creek
Dog Creek
Gaspard Creek
Churn Creek
Grinder Creek
Deception Creek
Hawks Creek
Mackin Creek
Meadow Creek
Alexis Creek
Tatlayoko Lake
Taseko Lake
Eagle Bay
Shuswap Lake
Seymour Arm
Mabel Lake
Sicamous
Salmon Arm
Revelstoke
Mica Creek
Valemount
Tête Jaune Cache
Grande Cache
Dunster
McBride
Dome Creek
Loos
Stoner
Hixon
Penny
Mapes
Red Bluff
Kersley
Wells
Barkerville
Likely
Horsefly
McLees Lake
Big Lake Ranch

1.2 Water Management Approach and Framework

1.2.1 Introduction

This document presents a WMP that addresses water management throughout the future operational, closure, and post-closure phases. This WMP is primarily intended to meet current permit requirements for the Mine, but it also provides support for permit applications requiring site water management information. A Table of Concordance outlining the EMA and M-200 permit requirements, and how this WMP addresses those requirements, can be found in Table 1.

This WMP outlines the Regulatory Framework for the Mine, describes the assumed mine plan for remaining operations and closure phases, and summarizes the geological and climate and hydrology baseline for the Mine.

A site-wide water balance model (SWWBM) and site-wide water quality model (SWWQM) were developed as core components of this WMP (Appendix A and Appendix B) which describe proposed mine water management quantities and qualities for operations, closure, and post-closure phases of the Mine. A discussion of water treatment during operations and closure/post-closure is also provided, including treatment requirements discussion for these Life-of-Mine (LOM) phases.

An additional objective of this WMP is to provide updates on treatment technology development and alternative water treatment strategies that are being explored by MPMC for implementation both in operations and upon closure of the site.

The timeline for operations and closure has been assumed based on mine planning information available at the time of writing and is subject to change over time. The current Reclamation and Closure Plan (MPMC 2022a) describes the plan for closing the site. This WMP maintains closure assumptions aligned with the 2022 closure plan. The next update to the Reclamation and Closure Plan will occur in 2027 as per requirements in the BC HSRC.

1.2.2 Water Management Approach

The primary approach to water management on-site is to separate contact (mine affected) and non-contact (non-mine affected) sources of runoff and seepage. The distinction between the two water sources can be characterized as follows:

- **Contact water:** water that may have come into direct contact with mining or milling activities. This water generally requires management or treatment before release to the environment and is captured by the requirements of PE-11678.
- **Non-contact water:** non-contact water is understood as runoff originating from areas unaltered by mining activity that does not contact mining areas. Such water is not captured under the effluent permit (PE-11678). It is typically diverted to the extent practicable and allowed to discharge directly to the receiving environment.

In 2016, MPMC submitted a LTWMP (Golder 2016g) describing the water management strategy and configuration for the resumption of normal operations. The main objective of the LTWMP was to define the water management practices that will help prevent the year-over-year accumulation of contact water at the mine, and to mitigate the potential for unplanned and/or non-compliant releases to the environment. Managing water to prevent a year-over-year accumulation of stored water is also consistent with the advice from the TSF Engineer of Record and from the Independent Engineering Review Panel, both of whom act in roles created under the *Mines Act*.

The following strategies were proposed to meet this objective:

- To the extent practicable, reduce the volume of non-contact water collected on-site by diverting non-contact water away from mine-impacted areas and from site contact water collection systems.
- Treat and discharge surplus contact water so that minimal water accumulates from year to year, and infrastructure is in place to store and treat all contact water flows up to a 1-in-10-year 24-hour storm event and convey all contact water flows up to the 1-in-200-year 24-hour storm event.
- Maintain a maximum contact water volume of 0.75 M-m^3 in the TSF prior to freshet, consistent with the 2025 Quantitative Performance Objectives (QPOs) for the TSF (WSP 2025a).
- After the required period for temporarily storing high freshet inflow, return the TSF contact water storage volume to below 1.5 M-m^3, consistent with the 2025 QPOs for the TSF (WSP 2025a).
- For contact water in excess of TSF QPOs, transfer and store contact water in Wight Pit, then transfer to treatment and discharge following the required freshet storage period.

These strategies assume that there will be minimal storage of contact water on-site; however, during freshet (April through June) and storm events, the volume of mine water runoff will exceed the discharge and treatment capacity. Therefore, temporary detention of freshet and storm runoff volume will be necessary to equalize flows prior to discharge. Temporary detention is planned to occur in both the TSF (within QPOs) and Wight Pit.

This WMP builds on the strategies listed above by validating existing water management practices against applicable regulatory decisions and permit requirements that have come into effect since the LTWMP was submitted. This has been achieved through a review of the following information:

- Approved and assumed mine plans.
- Water management infrastructure works (e.g., pumps, sumps, channels, ditches).
- Current surface and groundwater monitoring practices.
- Annual calibration of the site wide water balance and water quality models.
- Water treatment effectiveness during operations and anticipated water quality mitigations predicted for closure/post-closure.
- The review of the above information has been facilitated by revisions to the calibrated SWWBM and SWWQM, with appropriate sensitivity to a range of applicable water quality parameters. The water balance and water quality data outputs from the calibrated models have been used to address water management and treatment planning for mining operations through closure and post-closure.

1.2.3 Water Management Framework

Figure 2 provides a visual representation of the water management framework used in this WMP, and the subsections that follow the figure describe these concepts in more detail.

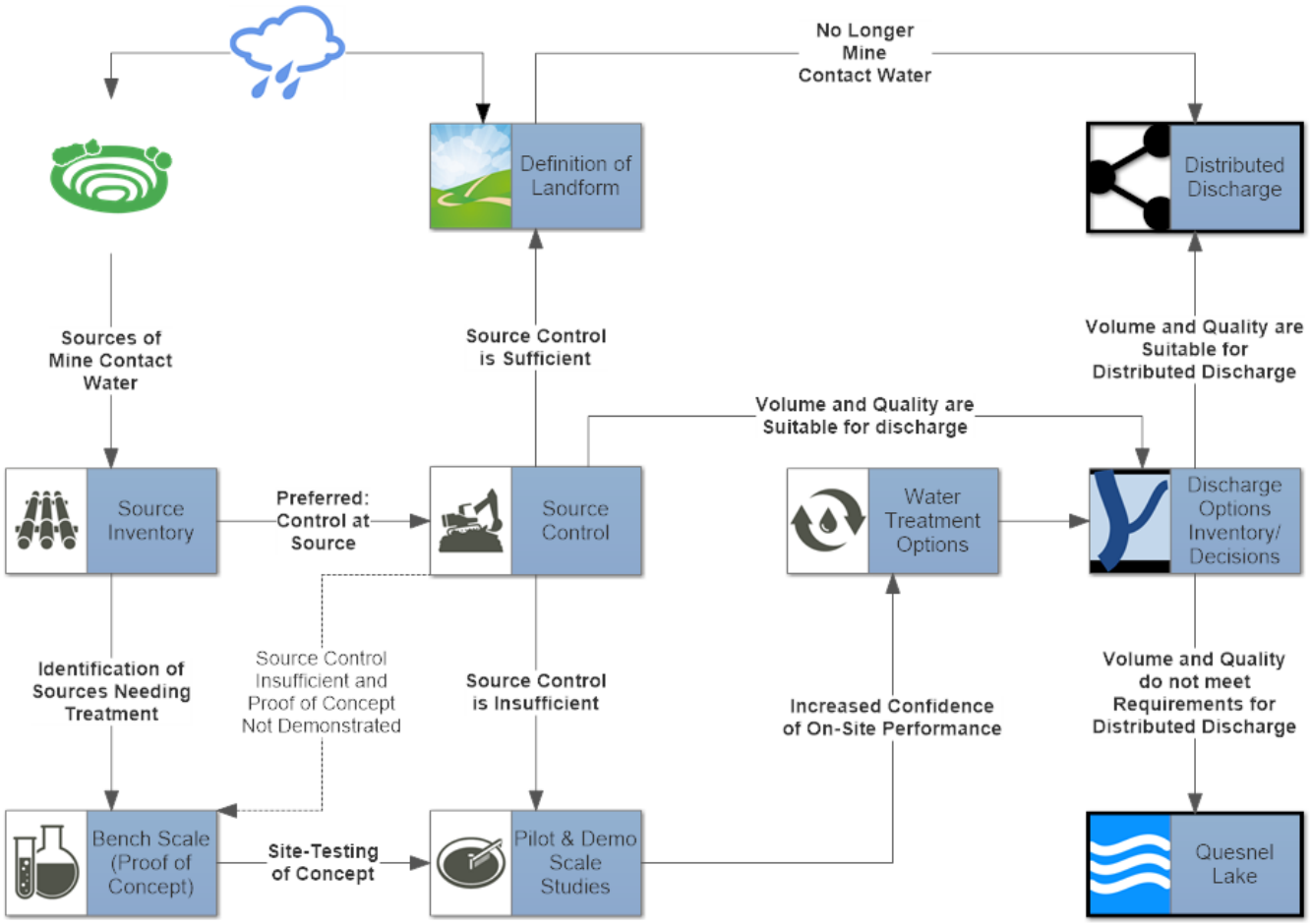


Figure 2: Water Management Plan Framework

Source Inventory

A source inventory has been developed to identify areas of the site that generate contact water. The source inventory includes information on location, modelled or measured flow, modelled or measured water quality, and current on-site collection or discharge locations. This inventory provides a list of sources where water management (i.e., diversion, source control, to other means) or water treatment is required. This has been developed to be a “living database” that will be updated as the Mine layout changes over time, or as the Mine transitions into closure and post-closure.

Source Control

Source control is the preferred approach to managing water quantity and quality. Source control is a preferred option in most waste management hierarchies because it controls risks at their source. Where source control measures are effective in reducing the volumes of mine contact water (i.e., runoff from a reclaimed landform without containing mining materials), then it would be suitable and prioritized for distributed discharge, subject to receiving waterbody or watercourse’s volume and flow capacity. Typically, this latter form of source control would be implemented as part of closure.

Water Treatment

Contact water would require management in accordance with the MPMC's effluent permit and may include treatment using active, passive, or semi-passive technologies. It may also include direct bypass where the water, treated through settling in situ and not through an active treatment system, is found to meet the permit limits.

This is a multi-phase process starting with identifying sources, modelling quantity and quality of water needing treatment, followed by bench-scale, pilot-scale, and demonstration-scale studies to systematically test and demonstrate the viability and feasibility of developed technologies for the Site. The length of time it takes for a specific technology or treatment process to advance from pre-conceptual to the permitted execution stage is typically on the order of years.

Since the LTWMP (Golder 2016g) was issued, one focus of the water treatment work has been to identify opportunities to treat waters at source through passive or semi-passive treatment options. Passive treatment is being pursued with the desire of it providing a low energy, low-reagent use and therefore low greenhouse gas footprint post-closure treatment method. To that end, several technologies and treatment options have been subject to conceptual level studies and testing trials and updates to this technology development process has been provided in this WMP.

Discharge Inventory

Discharge options for contact water would be decided based on the Best Achievable Technology (BAT; BC ENV 2015) selected for water treatment, the modelled quantity and quality of treated water expected to be discharged, and the assimilative capacity of the receiving waterbodies. A decision gate would use this information to determine the best choice of discharge options, whether that is a local watercourse or waterbody.

Non-contact water and treated water suitable for distributed discharge would be discharged to site watercourses, subject to volume and quality decision gates and applicable regulatory requirements. The only current permitted treated water discharge under PE-11678 is discharge to Quesnel Lake via submerged diffuser and must show that the concentrations of the water quality parameters in Table 1 of the permit are met at the treatment plant outlet and at the "Edge of Quesnel Lake Initial Dilution Zone (IDZ)" in Quesnel Lake. This WMP only provides update regarding the Quesnel Lake receiving environment (the assumed discharge location for the remainder of operations); details regarding alternative discharge locations distributed around the Site are discussed in Golder 2020e.

1.2.4 Temporary Water Management Infrastructure during Construction

During the construction of mine facilities at the Site, such as the TSF embankment lift to 987m crest elevation, temporary water management infrastructure may be employed to manage contact water in the construction area. The use of temporary water management components during construction is common on mine sites, where the interim configuration of water management components may not fully match designed water management infrastructure until the completion of the final facility construction. This WMP describes the intended function of water management infrastructure at facility construction completion and does not attempt to describe temporary water management components that may be required, and may change significantly, throughout construction progression. In the M-200 permit, temporary water management structures used during construction are excluded from the definition and requirements of "Surface Water Management Structures" in the permit. Annual inspection of temporary water management infrastructure still occurs for water infrastructure downstream of the TSF in order to meet requirements in the M-200 permit Condition B.6.(d).(i).

1.3 Regulatory Framework

1.3.1 Overview

This section provides an overview of the applicable regulatory documents and bodies that are relevant to the development of this WMP. The applicable legislation for effluent discharges to aquatic receiving environments in BC includes the provincial EMA, which contains a general prohibition against causing pollution, and the federal *Fisheries Act* (RSC 1985, c. F-14), which contains a general prohibition against the deposit of a deleterious substance into waters frequented by fish (Section 36). What constitutes a deleterious substance is a matter of expert opinion; however, for the purposes of discharges involving a metal mine, what constitutes a deleterious substance is specifically defined in the Metal and Diamond Mining Effluent Regulations (MDMER; SOR/2002-222). The *Mines Act* (RSC 1996, c. 293) and Health, Safety and Reclamation Code for Mines in British Columbia (BC HSRC, EMLI 2024) also hold applicable legislation related to water management for the Mine, and the M-200 permit outlines requirements for water management for the Mine under this legislation.

While this WMP has been prepared in support of MPMC's water management planning, existing permit requirements, and provincial permit applications, federal requirements have also been addressed in the evaluations carried out, either through this plan, the 2020 WMP (Golder 2020e), or through the LTWMP submitted in 2016 (Golder 2016g), because MPMC must comply with both provincial and federal laws.

1.3.2 Environmental Management Act

The EMA is BC's principal pollution control statute with regulations made pursuant to that Act for more specific regulatory purposes. The EMA prohibits causing pollution, and (per subordinate regulation) requires specified dischargers to obtain an effluent discharge permit. Because federal legislation has no effluent permitting system, federal agencies (i.e., Environment and Climate Change Canada and Fisheries and Oceans Canada) utilize the provincial permit process to communicate their specific requirements to the proponent. However, the proponent remains responsible for compliance with the general prohibitions of those federal laws (described further below), notwithstanding the presence of a provincial permit. The amended permit for the effluent discharge falls under the Waste Discharge Regulation (B.C. Reg. 154/2019), pursuant to the EMA.

In the EMA, pollution is defined as "the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment." The common expectations under the EMA are two-fold:

- Acutely lethal conditions should not exist at the point of discharge or within the initial dilution zone (IDZ) of the effluent.
- Chronic sublethal effects should not occur outside of the IDZ. A lack of chronic sublethal effects is reliably predicted when the parameter of concern has a concentration lower than applicable BC ambient water quality guidelines (WQGs) (BC ENV 2016). However, while WQGs are a convenient "first pass" benchmark of pollution, they do not reliably predict the actual presence of pollution. BC ENV offers alternatives to the BC WQGs to provide evidence that pollution has not occurred.

The IDZ is the three-dimensional zone around the point of discharge where mixing of the effluent and the receiving water occurs. For a large waterbody, the IDZ is commonly defined as a cylindrical body of water around the outfall with a lateral radius the lesser of 100 m from the outfall or 25% of the width of the body of water and extending upwards to the surface of the water column. However, the process for delineation of an IDZ is described in BC ENV 2019a and any new discharges would be expected to follow this technical guidance.

1.3.3 Fisheries Act

With respect to the *Fisheries Act*, a deleterious substance is a substance that, if added to water, would degrade, or alter or form part of a process of degradation of that water such that it would likely be rendered deleterious to fish or fish habitat, or the use by humans or fish that frequent that water. The specific properties defining a substance as being deleterious under the parent Act are up to interpretation by experts, except where sector-specific regulations have been developed, such as the MDMER. If a water of a certain quality is determined to be suitable for discharge in accordance with EMA, it is expected (but is also confirmed) that the water is also not a deleterious substance.

Fisheries and Oceans Canada also regulates fish habitat under the *Fisheries Act*. This includes, among other things, provisions for minimum flows; a prohibition against harmful alteration, disruption, or destruction (e.g., such as could occur if a watercourse were overloaded and scoured with too much flow); or the placement of physical structures into fish habitat (e.g., outfall).

1.3.4 Metal and Diamond Mining Effluent Regulations

The MDMER is a sector-specific regulation written under the authority of the *Fisheries Act*. The MDMER includes specific definition of what constitutes a deleterious substance in effluent from a metal mine. The MDMER also contains a requirement to undertake an environmental effects monitoring program. Undertaking an environmental effects monitoring program provides assurances that the technology-based effluent limits specified in the MDMER are sufficient to protect the aquatic receiving environment.

1.3.5 Mines Act and Health, Safety and Reclamation Code

BC MCM (previously MEMPR and EMLI) has issued permit M-200 to MPMC under the *Mines Act*, with the most recent August 2025 amendment titled: Approving Springer Pit Expansion. The permit is issued in accordance with Sections 10(1), 10(6), 10(7), and 11(1) of the *Mines Act*, and Sections 10.1.2 and 10.1.18 of the Health, Safety and Reclamation Code for Mines in British Columbia (EMLI 2024). The M-200 permit includes Section C (Protection of Land and Watercourses) and annual revision of this WMP is a requirement within that section.

1.3.6 Water Sustainability Act

In BC, legislation of matters relating to the use of surface water and groundwater, and protection of water resources, are governed by the *Water Sustainability Act* (WSA; SBC 2014). The WSA was brought into force on February 29, 2016, replacing the *Water Act*. Five new regulations were introduced under the WSA, consisting of the Water Sustainability Regulation (BC Reg. 32/2023), the Water Sustainability Fees, Rentals and Charges Tariff Regulation (BC Reg. 37/2019), the new Groundwater Protection Regulation (BC Reg. 253/2022), the new Dam Safety Regulation (BC Reg. 32/2023), and the Water Districts Regulation (BC Reg. 38/2016). The Water Sustainability Regulation includes requirements for the licensing, diversion, and use of groundwater and surface water to protect water resources and ecosystems, while the Groundwater Protection Regulation specifically addresses protection of the groundwater resource and identifies requirements for the construction of wells.

MPMC currently holds three surface water licences, specifically:

- C132360 (file #5002458), which authorizes the diversion and storage of Polley Lake and its tributaries, Hazeltine Creek and Edney Creek in Polley Lake (4,000,000 m^3/yr) for industrial (sediment control) and conservation (storage for habitat remediation) purposes appurtenant to the stream rehabilitation project.

- C101763 (file #5000995), which authorizes water to be stored in Polley Lake of 811 acre feet/yr (1,000,352 m^3/yr) and diverted and used for processing ore of 100,000 gallons/d (454.6 m^3/d).
- C111741 (file #5000995), which authorizes water to be stored in Polley Lake to be used for dust suppression of 180,000 gallons/d (818.3 m^3/d) and work camps of 8,000 gallons/d (36.4 m^3/d).

With the introduction of the WSA, these licences continue to be valid under the WSA rather than the former *Water Act*.

Section 11 of the WSA requires an authorization for Changes In and About a Stream, which includes a broader definition of “stream” in law than what is commonly understood to be a stream in ordinary use. There are certain activities that are authorized by regulation; however, the need for a written authorization will depend on the specific effluent discharge infrastructure being constructed.

1.4 Table of Concordance

The Table of Concordance serves as a single table reference of how this WMP meets existing permit requirements and how this WMP meets joint information requirements for a *Mines Act* (MA) permit application, issued by BC MCM, and an effluent discharge permit application under the *Environmental Management Act*, by BC ENV. These various requirements, and how this WMP addresses those requirements, are listed in Table 1. The WMP and supporting documents are all prepared and/or reviewed by the Qualified Professionals presented in Table 2. For clarity, the current permit application for the TSF raise to 987m is proposed as a *Mines Act* permit application only.

Table 1: Table of Concordance

Requirement Section Name	Requirement Description	WMP Section or Document that Addresses Requirement
Section C.3.(a) Surface Water and Groundwater Management; M-200 Permit		
C.3.(a).(i) Water Management Plan	The Permittee must maintain a Surface Water and Groundwater Management Plan, including standard operating procedures (SOPs) and a QA/QC program.	This WMP document. SOPs and QA/QC program are provided under separate cover within MPMC’s Annual Report.
C.3.(a).(i).(a). (i, ii, and iii). Description and Schematics	The Surface Water and Groundwater Management Plan includes (i) description and schematics of overall site water management processes and infrastructure, (ii) description of existing water management infrastructure, and (iii) plan view maps depicting existing water management infrastructure.	WMP Sections 4.1 and 4.3 (site water management description), and WMP Figure 5, Figure 15, Figure 16, and Figure 17 (site water infrastructure layout and schematics).
C.3.(a).(i).(b and c). Qualified Professional Requirements	Site-wide surface and groundwater management is reviewed by a Qualified Professional on an annual basis; the Surface Water and Groundwater Management Plan is authenticated by a Qualified Professional.	WMP Table 2 (QPs involved with this WMP and responsible section list), and WMP Section 6.0 Signature Page (signatures and seals of QPs).
Section 5.2. Annual Report; EMA Permit 11678		

Table 1: Table of Concordance

Requirement Section Name	Requirement Description	WMP Section or Document that Addresses Requirement
5.2.1 Annual Report	The permittee must prepare annual report by March 31 each year. The annual report must include (i) updates of the water balance, and a calibration assessment of the water balance and water quality models; and (l) comparison of monitoring data with water quality guidelines, predictions from the most recent water quality model, and targets.	WMP Section 4.3 and Appendix A (water balance updates), WMP Section 4.3.2 (water balance model calibration), and WMP Section 4.4.5 (water quality model calibration). WSP 2025b (2024 water balance calibration report). WSP 2025c. (2024 water quality calibration report).
Section 3. Baseline Information; Joint Application Information Requirements		
3.1. Meteorology and Climate	A summary of relevant meteorological and climate information will be provided, based on existing monitoring data. The baseline information will include parameters relevant for site water management, such as precipitation, snowpack, temperature, and evapotranspiration.	WMP Section 3.2
3.2 Geology	A summary of relevant mine site geology will be provided, including descriptions of major rock units, stratigraphy, structure, metamorphism, and geochemistry.	WMP Section 3.1
3.4 Water Quantity	The hydrology and groundwater baseline information for the Project will be provided, with references to existing studies, where applicable, and previously published hydrological datasets. The baseline information will be summarized from data collection programs already in place.	WMP Sections 3.2.2 (hydrology), 3.2.3 (pit seepage), 3.2.4 (TSF seepage)
3.5 Water Quality	A summary of the surface water quality of the receiving environment of Quesnel Lake will be provided. The Annual Groundwater Report provides a summary of the groundwater quality.	WMP Section 3.3 (Quesnel Lake) WSP 2025g (2024 Annual Groundwater Monitoring Report)
Section 6. Water Quality Mitigation and Modelling; Joint Application Information Requirements		
6.1 ML/ARD Characterization & 6.2 Geochemical Source Terms	A summary of ML/ARD characterization and geochemical source terms is provided with reference to geochemistry assessment studies undertaken by SRK. The model inputs section summarizes how geochemical source terms are used during modelling.	WMP Section 3.1.3 (ML/ARD characterization by SRK) WMP Section 4.4.3 (model inputs using geochemical source terms)
6.4.1 Source Control & 6.4.2 Water Management Measures	A summary of source control approach and water management measures is provided.	WMP Sections 1.2, 4.1, 4.2, 4.5, and 4.6.1
6.4.3 Technology Selection	A summary of previous BAT assessment and outcomes are provided.	WMP Section 4.1

Table 1: Table of Concordance

Requirement Section Name	Requirement Description	WMP Section or Document that Addresses Requirement
6.4.4 Water and Effluent Treatment	A summary of existing water effluent and treatment is provided.	WMP Section 4.6.1
6.4.5 Water Treatment R&D	A summary of underway water treatment research and development is provided.	WMP Section 4.6.2
6.5 Hydrogeologic Modelling	A summary of hydrogeologic modelling and results are provided.	WMP Sections 3.2.3 (pits) and 3.2.4 (TSF)
6.6 Site-wide Water Balance Model	A summary of the water balance model, inputs, calibration, and results for various mine phases are provided.	WMP Section 4.3
6.7 Surface Water Quality Model	A summary of the water balance model, inputs, calibration, and results for various mine phases are provided.	WMP Section 4.4
Section 7. Effluent Discharges to the Environment; Joint Application Information Requirements		
7.2 Effluent Discharge	An overview of discharge options is summarized, including existing performance of the Quesnel Lake discharge.	WMP Section 4.5 (discharge options) and 4.6.1 (existing Quesnel Lake discharge)
7.2.1 Non-Point Source Discharges	A summary of TSF-related non-point discharge quantity is summarized. Annual groundwater quality monitoring for the entire site is summarized in the Annual Groundwater Monitoring Report (WSP 2025g). A trigger response plan regarding groundwater quality is also currently being developed for the site.	WMP Section 3.2.4 (TSF non-point discharge). WSP 2025g. (Annual Groundwater Monitoring Report). GW TRP (in development). Due to BC ENV under EMA permit requirements December 31, 2025.
7.3 Receiving Environment Modelling	A characterization of existing water quality of Quesnel Lake is summarized. Assessment of the Quesnel Lake IDZ is provided annually (2024 assessment: WSP 2025h)	WMP Section 3.3 (Quesnel Lake characterization). WSP 2025h. (2024 IDZ assessment)

BAT = Best Achievable Technology; GW = Groundwater; IDZ = Initial Dilution Zone; LOM = Life of Mine; SOPs = Standard Operating Procedures; TRP = Trigger Response Plan; TSF = Tailings Storage Facility; WTP = Water Treatment Plant; WMP = Water Management Plan; QP = Qualified Professional.

Table 2: Qualified Professionals List

Name	Title, Accreditation, and Number	Section of Water Management Plan Responsible For
Jesse Maddaloni	Senior Mechanical Engineer, EGBC P.Eng., #36620	Sections 1.0, 2.0, 3.2.4, 4.1, 4.5, 4.6, 5.0
Curtis VanWerkhoven	Senior Water Resources Engineer, EGBC P.Eng., #159723	Sections 3.2.1, 3.2.2, 4.3
Connie Romano	Senior Hydrogeologist, EGBC P.Geo, #25728	Section 3.2.3
Steve Mitchell	Senior Water Quality Modeller	Sections 4.2, 4.4

2.0 PROJECT DESCRIPTION AND MINE PLAN

2.1 Approved Mine Plan

In September 2025, MPMC received approved amended *Mines Act* Permit M-200 and *EMA* Permit 116678, authorizing the Springer Expansion LOM Plan. For the Springer Expansion, the majority of mining will occur in the Springer and Cariboo Pit which is the focus of the Springer Expansion LOM plan. The plan has the life of mine concluding in 2031, then rehandled Potentially Acid Generating (PAG) material is rehandled (RH) and placed back into the combined Springer-Cariboo Pit. The open pit mining operation mines on average 6.1 million tonnes of ore and 7.7 million tonnes of waste per annum. The Springer Expansion which includes Phase 5, Phase 6, C2, and WX, will supplement ore production into the year 2031. A Life of Mine planned total material moved is presented in the Table 3 below and shown in Figure 3.

A M-200 permit amendment application is currently being prepared for lifting of the TSF dam crest to the ultimate elevation of 987 m, which would be the final anticipated lift of the TSF crest for the ultimate LOM buildout for the facility, and in which this Water Management Plan is supporting.

Table 3: Springer Expansion LOM Plan Waste Mined (t)

Year	Total Waste Mined by Pit Phase (NAG)							Total Waste Mined by Pit Phase (PAG)					
	C2-B/ Car-RR	WX	Springer 4	Springer 5	Springer 6	Un-Prod Waste RH	Spr Talls Dump Fill	C2-B/ Car-RR	WX	Springer 4	Springer 5	Springer 6	PAG Rehandle
2024			1,090,714	17,263,779		735,262	1,671,460			233,148	921,548		
2025	2,223,438		278,717	21,627,577		843,869	374,554	340,301		35,350	803,264		
2026				22,028,147		725,000	11,627				386,955		
2027				14,094,795	2,385,013	689,769	18,825				398,216	407,957	
2028				1,476,896	11,813,839	827,026	41,901				732	13,015,868	
2029	840,294	1,999,546			8,114,673	756,210	1,912,244	38,380	12,173			11,060,273	
2030		5,817,474			7,383,626	700,000	9,326		2,869,174			6,503,661	
2031		2,391,839			191,651	841,868	4,110		2,346,898			38,382	22,500,000
2032													30,000,000
2033													21,429,209



Figure 3: Springer Expansion LOM Plan Waste Mined (t)

The ore mined by Pit Phase is presented below in Table 4 and shown in Figure 4.

Table 4: Springer Expansion LOM Ore Mined (t)

Year	ORE Above C/O by Pit Phase				
	C2-B/Car-RR	WX	Springer 4	Springer 5	Springer 6
2024			5,733,351	1,326,649	
2025	1,626,030		3,883,659	1,550,312	
2026				5,795,978	
2027				8,131,599	72,751
2028				4,013,289	1,258,489
2029	1,908,094	48,935			550,232
2030		802,009			6,083,558
2031		495,484			1,802,980
2032					
2033					

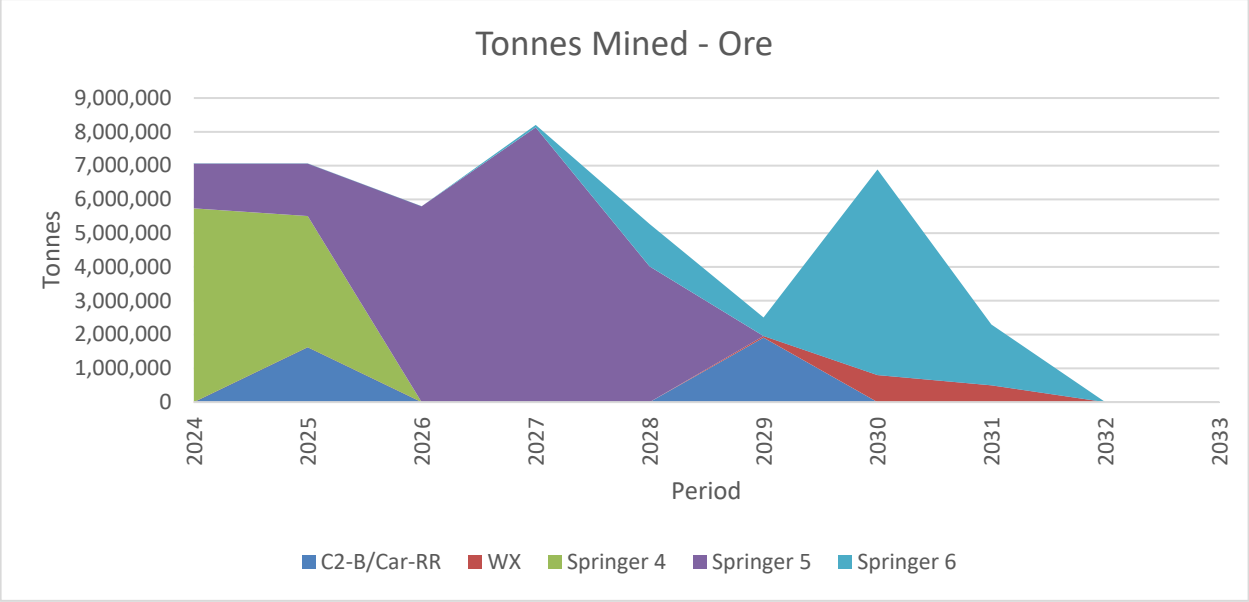


Figure 4: Springer Expansion LOM Plan Ore Mined (t)

A summary of the mine development dates for each phase of the LOMP plan sub-components is shown in Table 5.

Table 5: Springer Expansion LOM Plan Mine Development Schedule

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Springer 4										
Springer 5										
C2-B/Car-RR										
Springer 6										
WX										
PAG RH										

2.1.1 Surface Disturbances

The expansion of Springer Pit will require little stripping or preparation as the area has been previously disturbed mining the Bell, C2 and Cariboo pits. An inventory of areas disturbed to date, and projection of the land to be disturbed up to the projected end of mine life can be found in the Joint Application for the Springer Expansion.

2.1.2 Assumptions

For the purposes of the modelling undertaken for this WMP, WSP has assumed that the mine will be in operation for an additional mine life of over six years (from January 1, 2025, to July 31, 2031). Ore will be processed at an average milling rate of 20,000 tonnes per day (tpd). Tailings from processing the ore will be pumped to the Tailing Storage Facility.

The TSF crest elevation is currently approximately 972 m and additional TSF raises will continue into operations with a permitted interim raise to 974 m (ongoing currently) and an ultimate crest raise to 987 m planned sequentially following the 974 m lift.

The catchment of the combined Springer-Cariboo pit is assumed to expand through operations: from its current extents to combination of both Springer and Cariboo pits into a single catchment, and the incorporation WX and C2 area catchments. The catchments surrounding the TSF are also assumed to expand through operations: from the current 972 m crest design to the 974 m crest design, and ultimately to the 987 m crest design. It has also been assumed that the waste rock generated during assumed future operations will be placed within the same footprint of the existing waste rock dumps and that the footprint of Wight Pit and Boundary Pit will not vary from their current footprints.

It should be recognized that the mine life duration, the production rate, the design of the mine facilities (e.g., TSF) have been assumed for the purposes of advancing this WMP and this will be confirmed or adjusted as part of the detailed mine plan being developed by MPMC. Details of the proposed amendments to the existing mine plan are anticipated to be presented in a *Mines Act* Permit M-200 amendment application when required.

2.2 Project Description

2.2.1 Project Development Phases

This section provides a description of the forecasted future mining phases associated with the Springer Expansion LOM Plan:

- **Future operational phase:** The future operational phase has been assumed for this WMP for the period from January 1, 2025, through July 31, 2031, in line with the Springer Expansion LOM Plan. Future operations are anticipated to include the following:
  - Deepening of the Cariboo and Springer pits (Phases 5, 6, C2, WX).
  - Tailings will be deposited into the TSF until July 2031 (subject to approvals for dam raises to 987 m).
- **Closure phase:** will begin when mining is finished and will include closure and reclamation activities as identified in the Reclamation and Closure Plan (RCP; MPMC 2022a) over the assumed period of August 1, 2031, through July 31, 2041. PAG waste rock will be placed at the bottom of Springer-Cariboo and the covering pit lake will begin forming. The remainder of site water management infrastructure remains active through closure.
- **Post-closure phase:** will begin when the closure period is finished and will continue indefinitely. For the purposes of modelling and this WMP, post-closure has been assumed over the period of August 1, 2041, through July 31, 2131 (100 years including the closure phase). Pit lakes will develop in the combined Springer-Cariboo Pit and Wight Pit. Most site areas are assumed remediated and directly discharge to local environments, except for the TSF contact water systems, which continue to collect and treat contact water prior to discharge. TSF catchment areas are expected to be remediated to allow direct discharge to the local environment at some point during Post-closure. Pit lakes will directly discharge to local environments or may require treatment pending long-term geochemical trends of the pit lake catchments.

It should again be noted that these mine phase dates are assumed for the general purpose of modelling and that these assumed dates may change as a result of metal prices, new exploration, care and maintenance periods, revisions to the mine plan, and other factors that are common to mining operations.

2.2.2 Future Operational Phase

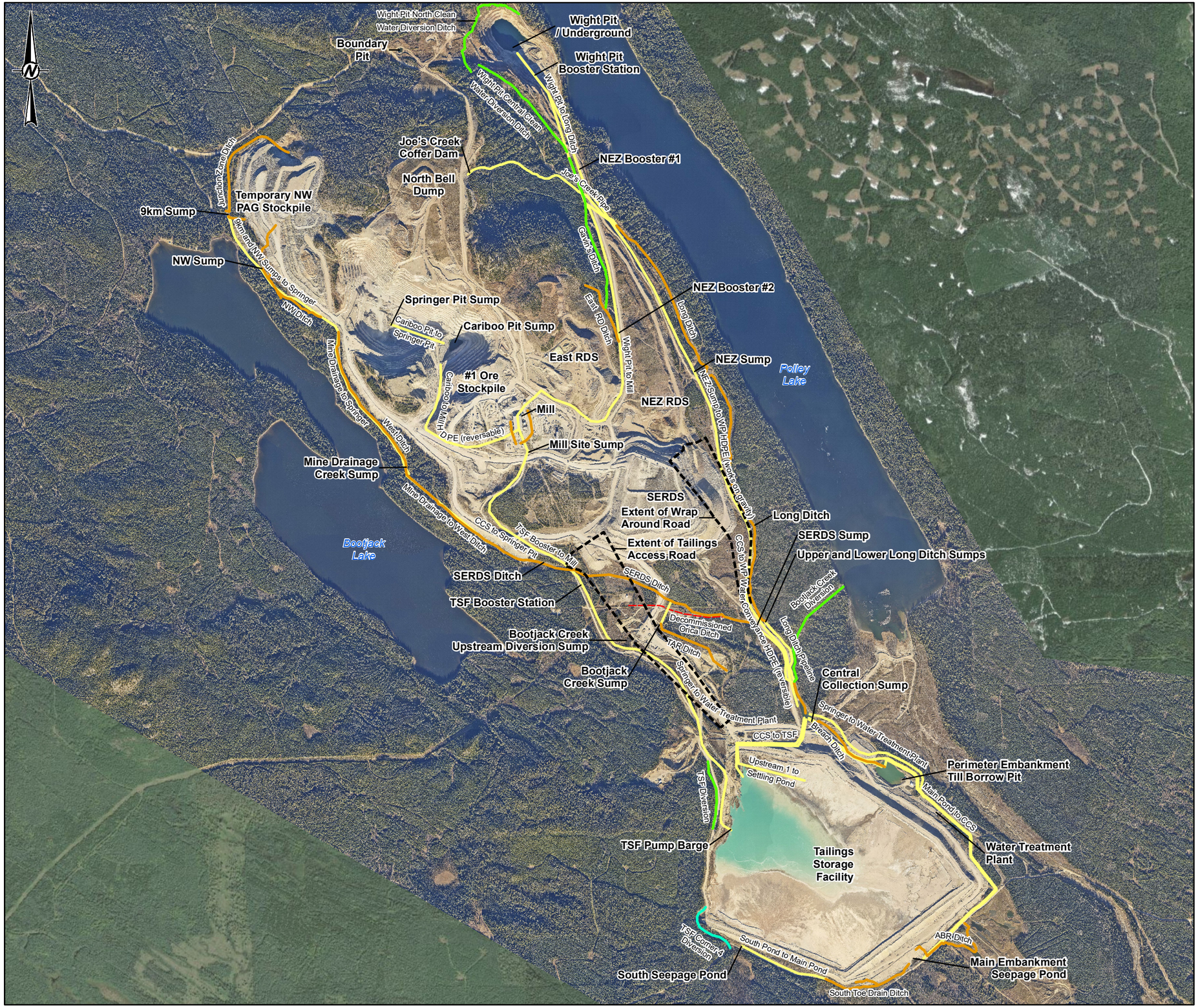
During the remaining future operation phase, all current site mine facilities and water management infrastructure will remain in operation. Current operations site water management components are shown in Figure 5 and shown schematically in Figure 15. Contact water collection on-site is centralized to the Central Collection Sump (CCS), then either sent to the Perimeter Embankment Till Borrow Pit (PETBP) for treatment and discharge, or stored in the TSF or Wight Pit for future mill use or future treatment and discharge. As the operations phase progresses and as site water management infrastructure evolves into the future, this WMP will be updated annually to reflect current and future anticipated conditions.

2.2.3 Closure Phase and Post-closure

The SWWBM and SWWQM includes projection of water management into the closure and post-closure phases based on the Reclamation and Closure configuration update (MPMC 2022a), with adjusted closure dates to match the Springer Expansion LOM plan. The following objectives of the closure and post-closure phases have been identified:

- Long-term preservation of water quality within and downstream of decommissioned operations.
- Long-term stability of the TSF.
- Removal of all access roads, ponds, ditches, pipelines, structures, and equipment not required following mine closure.
- Long-term stabilization of all exposed materials that are susceptible to erosion.
- Establishment of a self-sustaining vegetative cover consistent with existing forestry, grazing, and wildlife needs.
- Natural integration of disturbed lands into the surrounding landscape and restoration of the natural appearance of the area.

As the closure phase ends and the post-closure phase begins, it is assumed that some catchments will produce non-contact water as areas are successfully remediated. Some active pumping systems are assumed to be decommissioned to allow passive drainage from catchments. If long-term water quality allows, pits are assumed to fill and overflow directly into the environment. More details regarding the closure and post-closure assumptions regarding operating or decommissioned water management components within the mine facilities are found in Section 4.0 and within the detailed SWWBM and SWWQM reports in Appendices A and B.



LEGEND

- ROAD EXTENT

WATER COLLECTION SYTEMS

- CLEAN WATER DITCH
- CLEAN WATER PIPELINE
- CONTACT WATER DITCH
- DECOMMISSIONED CONTACT WATER DITCH
- CONTACT WATER PIPELINE

0 600 1,200

1:30,000 METRES

REFERENCES

1. WATER MANAGEMENT INFRASTRUCTURE INFORMATION PROVIDED BY MOUNT POLLEY MINING CORPORATION (2025).
2. PROJECT IMAGERY OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2023).
3. BASE IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.
4. DATUM: NAD 1983 UTM ZONE 10N

CLIENT
MOUNT POLLEY MINING CORPORATION

PROJECT
WATER MANAGEMENT PLAN

TITLE
MINE SITE LAYOUT

CONSULTANT

YYYY-MM-DD	2025-09-26
DESIGNED	SC
PREPARED	CDB
REVIEWED	JDM
APPROVED	JDM

PROJECT NO.	PHASE	REV.	FIGURE
CA0047730.8440	31100A/31191	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: W:\Client\Imperial_Metals_Corp\Mount_Polley_Mine\99_PROJECTS\CA0047730_8440\31100A\31191\02_PRODUCTION\MXD\Report\CA0047730_8440_31100A_31191_05_MINE_SITE_LAYOUT.mxd

3.0 BASELINE INFORMATION

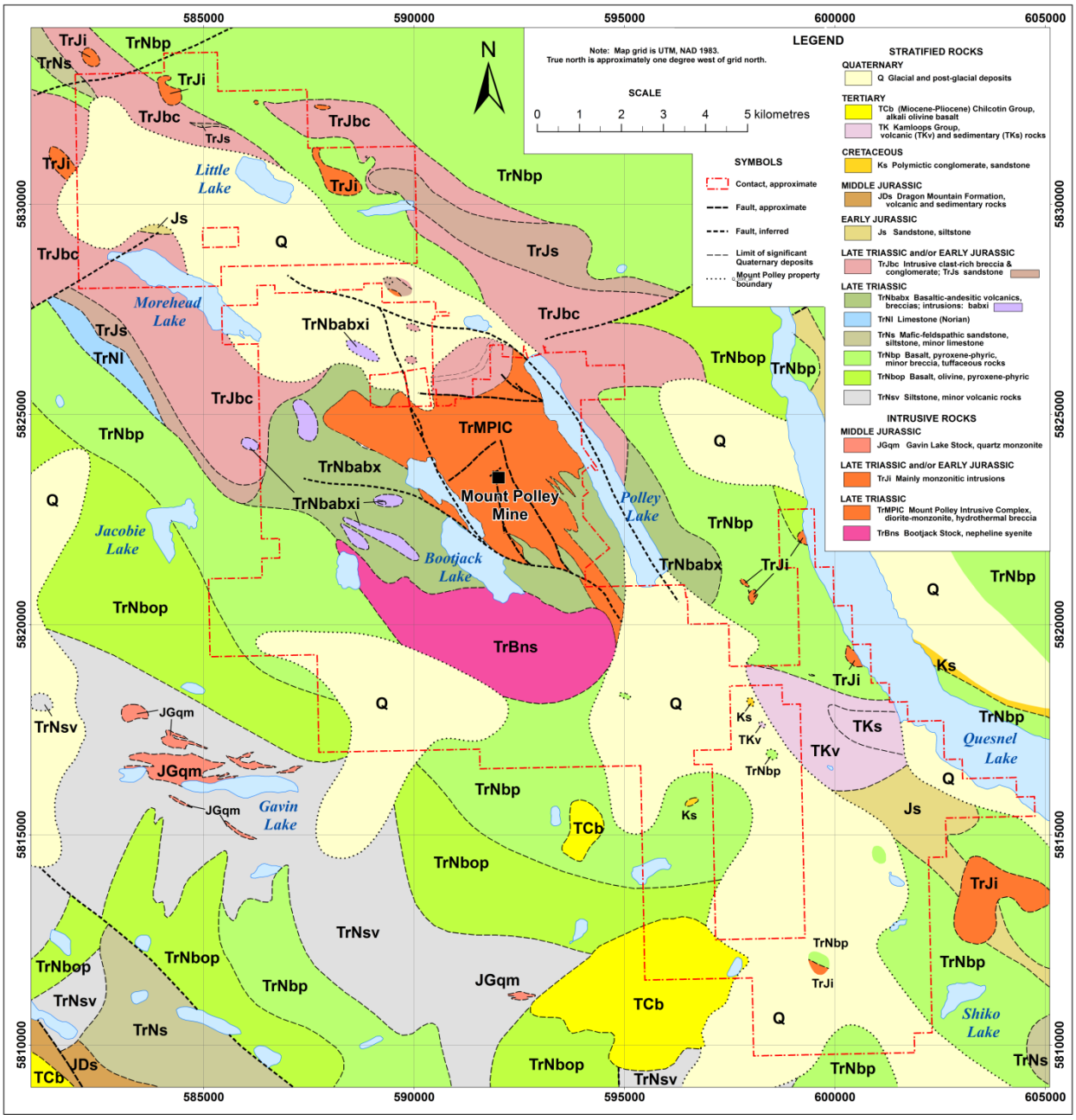
3.1 Geology

An understanding of the regional and local geology and the geochemical characteristics of the different mine materials (e.g., waste rock, ore) aids in developing an understanding of how these materials will weather, and to identify the processes that will control the release of constituents under ambient conditions. The following subsections (adapted from the LTWMP) provide a summary of the mine geology and geochemical characteristics that were subsequently used to derive the geochemical source terms (refer to Appendix C of the LTWMP, Golder 2016g; SRK 2015) for inclusion into the site-wide water quality model (refer to Appendix D of the LTWMP, Golder 2016g). The subsections of Section 3.1 were written by SRK Consulting (Canada) Inc. (SRK). The SWWQM uses source terms developed through historic on-site water quality monitoring of operations-phase contact water to predict future water quality based on witnessed conditions but also uses geochemical source terms developed by SRK in 2016 (SRK 2016), and updated in 2023 (SRK 2023) and 2025 (SRK 2025), to predict future potential long-term conditions.

3.1.1 Regional Geology

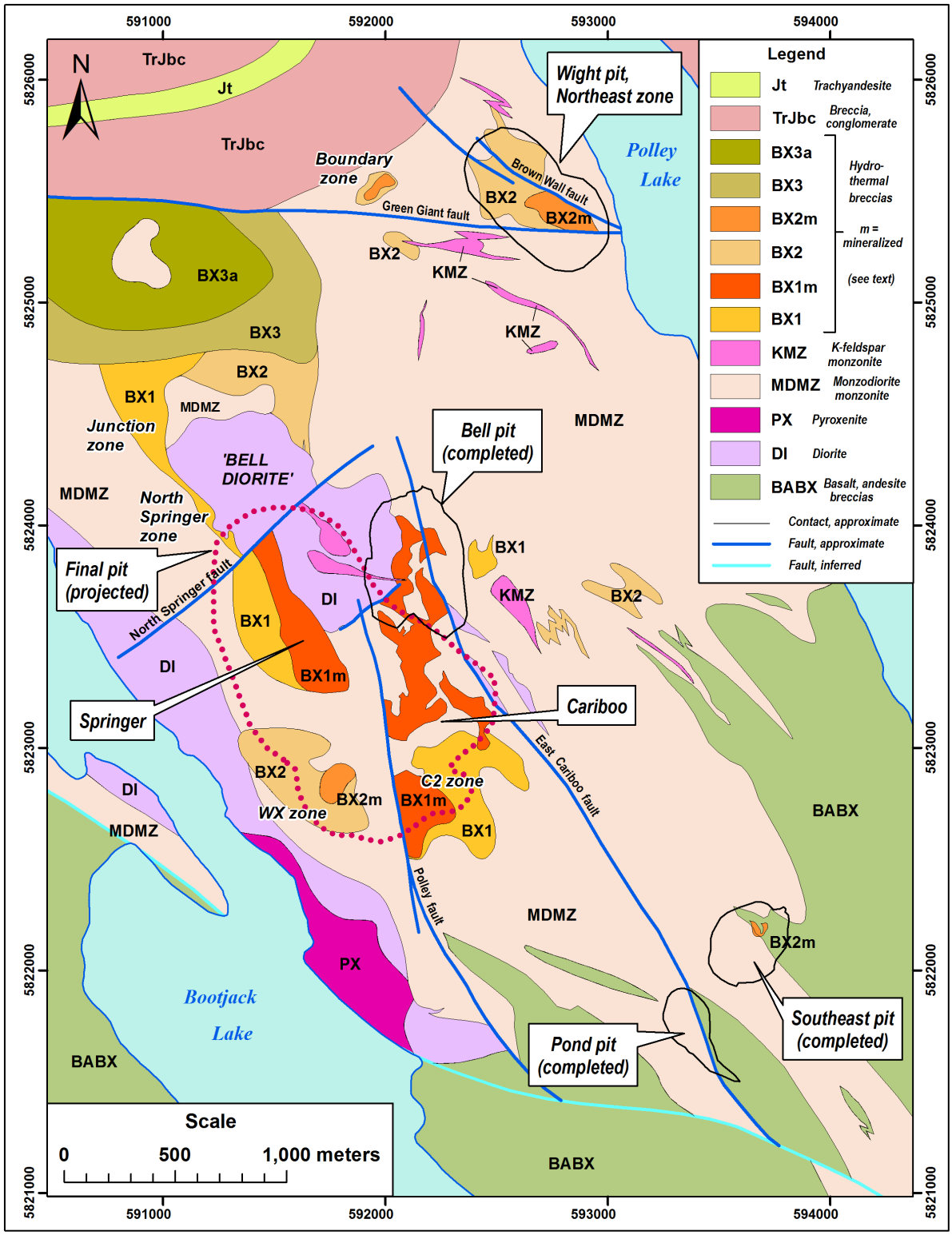
The mine is in Quesnellia, an accreted terrane in the Intermontane Belt of the Canadian Cordillera. Quesnellia is characterized by Triassic to Jurassic volcanic, sedimentary, and mafic to intermediate intrusive rocks formed in a west-facing arc that developed west of the continental margin of ancestral North America. The mine is within the Mount Polley Intrusive Complex (MPIC), situated in the Central Quesnel Belt, a region of Quesnellia roughly between latitudes 51.5° and 53.5°N (Figure 6 and Figure 7). In this area, the arc and a marginal basin immediately to its east were obducted eastwards onto the then continental margin in the late Early Jurassic. Continued crustal shortening in the Middle Jurassic resulted in regional metamorphism and southwest-verging back-folding of the now coupled arc-marginal basin and continental margin assemblages. The mine lies in the core of a broad regional, northwest-trending upright syncline at the western limit of this Middle Jurassic folding. Regional metamorphic grade at the mine is no more than zeolite facies.

Stratified Triassic rocks surrounding the site are assigned to the Nicola Group, the type-area of which is in southern Quesnellia, where the Nicola hosts other porphyry copper deposits such as the Highland Valley, Copper Mountain, and New Afton mines. The arc stratigraphy in the Mount Polley district extends from the Middle and Late Triassic Nicola Group into the Early Jurassic. From the base, the Nicola Group consists of Middle to early Late Triassic sedimentary and minor volcanic rocks, overlain by a thick Late Triassic succession of submarine, trachybasaltic volcanics and related tuffaceous sediments and volcaniclastic breccias. The youngest assemblage, which extended into the Early Jurassic, consists of volcanic, plutonic, and sedimentary rocks representing a more mature stage of arc activity, and more differentiated magmatism, when the MPIC was formed. The youngest arc rocks are polymictic breccia and conglomerate that unconformably overlie the MPIC and are products of late arc uplift and erosion. In the southern part of the Mount Polley property, Nicola Group country rocks are covered by post-accretion units, including outliers of unnamed Cretaceous sandstone and conglomerate, early Tertiary andesitic volcanic and sedimentary rocks of the Kamloops Group, and Miocene-Pliocene basaltic volcanics of the Chilcotin Group.



Source: Rees 2013.

Figure 6: Regional Geology of the Mount Polley Property



Source: Rees 2013.

Figure 7: Simplified Geology of the Mount Polley Intrusive Complex

3.1.2 Deposit Geology

Geological details of the Mount Polley deposit are found in Rees 2013 and the findings are summarized below.

The MPIC hosts the Mount Polley copper-gold porphyry deposit (Figure 6 and Figure 7). It is a Late Triassic magmatic centre approximately 6 km by 4 km, elongated in a north-northwest direction. It consists of alkalic, marginally silica-undersaturated intrusions and magmatic-hydrothermal breccias. The age of the deposit is approximately 205 million years based on uranium-lead isotopic dating; there is close agreement between age determinations from MPIC intrusions and minerals associated with sulphide mineralization. Mineralization occurs in almost all constituent rock types of the MPIC and thus occurred late in its formation. Nearly all economic mineralization is in breccias, or in mineralized stockwork veins in adjacent wall rock intrusion. Country rocks of the Nicola Group closest to the MPIC are mafic to intermediate volcanic and subvolcanic coherent rocks, and related breccias, and may form components of mineralized hydrothermal breccias in the periphery of the MPIC.

3.1.3 Metal Leaching/Acid Rock Drainage Geochemistry

Details of the characterization of metal leaching/acid rock drainage potential at the mine are provided in Appendix C of the LTWMP (Golder 2016g). Findings are summarized below.

The Mount Polley deposit is classified as an alkalic porphyry copper-gold deposit. With the exception of the distinctive small Pond Zone skarn deposit, it has been mined from several mineralized zones (Springer, Cariboo, Bell, Southeast, Northeast, Boundary) with common geological features including mainly a monzonitic plutonic host rock, association with breccia bodies in the intrusion, dominantly potassic hydrothermal alteration, lack of pronounced pyrite haloes, enrichment in copper and selenium relative to global norms, pervasive calcite, and natural oxide alteration. As a result, geochemical characteristics are consistent between zones, allowing a site-wide approach to geochemical characterization.

Potentially acid generating (PAG) and non-acid generating (NAG) waste rock materials occur locally as pyrite zones, but NAG rock dominates. Acid rock drainage potential has been used to segregate waste rock, with NAG waste rock being placed in several waste rock disposal sites and PAG waste rock either deposited in completed pits that are projected to flood at the closure of the mine (in accordance with the management practice of subaqueous disposal) or placed in the Temporary NW PAG Stockpile for final subaqueous disposal in the Springer Pit. Metal Leaching/Acid Rock Drainage (ML/ARD) potential of waste rock, and how that is considered during waste rock management at site, is governed by MPMC's ML/ARD Management Procedure Manual (MPMC 2023d).

Tailings are classified as NAG based on operational monitoring and testing of tailings spilled into Hazeltine Creek in August 2014 (Appendix C of SRK 2015).

The ML/ARD assessment was used to inform the development of geochemical source terms for use in the SWWQM. The reader is referred to SRK 2016, SRK 2023, and SRK 2025 for details on the derivation and update of geochemical source terms and Section 4.4 for how these source terms are applied in the model.

3.2 Climate and Hydrology

3.2.1 Climate

The Site is located 56 km northwest of Williams Lake, British Columbia (BC) near the eastern edge of the Fraser Plateau physiographic subdivision, approximately 10 km west of its boundary with the Quesnel Highland subdivision, as defined by Holland (1976).

Within the area of the Mine, the plateau has somewhat higher relief, with the Mine rising approximately 300 metres (m) above the surrounding terrain. Topographically, the Site area consists of north–south trending ridges of moderate elevation and relief. Local elevations range from 922 metres above sea level (masl) at Polley Lake to 1,266 masl at the top of Polley Mountain with an average elevation of 1,038 masl. The total surface area of the Site is 17.8 square kilometers (km^2).

In 2022, WSP updated the climate baseline data for the Site to include the most recent climate data. The climate of the mine site was characterized in the Baseline Climate Update Report (Golder 2022a) using historical measurements recorded at local climate stations, supported by data collected from five nearby regional Environment and Climate Change Canada (ECCC) climate stations. The baseline climate update report is summarized below, and more details can be found in Golder 2022a.

MPMC has operated climate stations on-site since 1995, although the station data records are not continuous. From 1995 through 2012, MPMC maintained one climate station at the Mill Site that measured and recorded rainfall (1997 to 2012), temperature (1995 to 2012) and wind velocity and direction (1997 to 2003). In 2012, this station was replaced with two stations: one near the mill site (WS1) and one adjacent to the TSF (WS2). These new stations measure and record wind speed, relative humidity, solar radiation, temperature, and rainfall.

Five ECCC climate stations: Likely, Spokin Lake, Williams Lake, Barkerville, and Quesnel, were selected to support and extend the long-term climate dataset for the Site due to their proximity to the Site, length of record, elevation range, and concurrent period of record with the local climate stations at the Site. In addition, the ECCC Prince George climate station was added to include an additional station with solar radiation data. Historical records were retrieved from ECCC's Historical Climate Data web server (ECCC 2022a). More recent records were compiled through e-mail correspondence with ECCC staff (ECCC 2022b).

The details of these stations are shown in Table 6. The locations of the mine weather stations are shown in Figure 8. The Mill Site Weather Station, now decommissioned, is no longer shown on Figure 8.

Table 6: Local and Regional Climate Stations for the Mount Polley Mine

Station Name (ID)	Northing (m N)[a]	Easting (m E)[a]	Elevation (masl)	Approximate Distance to Site (km)	Data Type	Period of Record[b]
Mill Site Weather Station	5822420	592495	1,118	-	R, T, WS, WD	1995-2012
Weather Station #1 (WS1) [near mill]	5822420	592792	1,171	-	R, T, RH, SR, E, WS	2012-2021[d]
Weather Station #2 (WS2) [TSF]	5819955	594059	964	-	R, T, RH, SR, E, WS	2012-2021[d]
Likely (1094616)	5828785	599332	724	9	P, R, S, T	1974-1993

Table 6: Local and Regional Climate Stations for the Mount Polley Mine

Station Name (ID)	Northing (m N)[a]	Easting (m E)[a]	Elevation (masl)	Approximate Distance to Site (km)	Data Type	Period of Record[b]
Williams Lake A (1098940)	5781820	564666	940	50	P, R, S, T, RH, SR	1961-2021[d]
Spokin Lake 4E (1097646)	5782274	589827	1,033	40	P, R, S, T	1983-2021[d]
Barkerville (1090660)	5880996	599515	1,283	59	P, R, S, T	1888-2021[c], [d]
Quesnel A[e] (1096630)	5873987	546720	545	80	P, R, S, T, RH	1946-2021[d]
Prince George A (1096450)	5971423	521103	691	163	P, R, S, T, RH, SR	1973-1995

(a) UTM Coordinate system – Zone 10U.

(b) Length of record from start year to end year may not reflect the number of complete years of data.

(c) Provisional data for the period January 2016 to December 2021 were provided by ECCC.

(d) Station still in operation.

(e) Combined record from Quesnel A and Quesnel Airport Auto stations. Stations are located at the same location.

ID = Identification; masl = metres above sea level; km = kilometre; P = Precipitation; R = Rainfall; S = Snowfall; T = Temperature; RH = Relative Humidity; SR = Solar Radiation.

During the winter, snowpack is measured at four snow course sites at a minimum frequency of once per month, with more frequent measurements typically being taken during the melt phase. The details of these stations are provided in Table 7, and their locations are shown in Figure 8.

Table 7: Local Snow Course Sites at the Mount Polley Mine

Station Name	ID	Northing (m N)[a]	Easting (m E)[a]	Approximate Elevation (m)[b]	Period of Record
Snow Course # 1 (near mill)	N/A	5823182	592792	1,171	1997–2010, 2015–current
Snow Course # 2 (near TSF)	N/A	5819976	594092	964	1997–current
Snow Course # 3	N/A	5823895	593632	976	2012–current
Snow Course # 4	N/A	5823537	590835	1,112	2015–current

(a) UTM Coordinate system – Zone 10U.

(b) Elevation for on-site climate stations measured with handheld GPS device.

masl = metres above sea level; N/A = not applicable; TSF = Tailings Storage Facility.



LEGEND

- CLIMATE STATION
- CONTOUR (10m)

0 600 1,200

1:30,000 METRES

REFERENCES

1. CONTOURS OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2019).
2. PROJECT IMAGERY OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2023).
3. CLIMATE AND SNOWCOURSE STATION LOCATIONS OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2016).
4. BASE IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.
5. DATUM: NAD 1983 UTM ZONE 10N

CLIENT
MOUNT POLLEY MINING CORPORATION

PROJECT
WATER MANAGEMENT PLAN

TITLE
MOUNT POLLEY CLIMATE AND SNOWCOURSE STATIONS

CONSULTANT
wsp

YYYY-MM-DD	2025-03-12
DESIGNED	SC
PREPARED	CDB
REVIEWED	GD
APPROVED	JM

PROJECT NO.	PHASE	REV.	FIGURE
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Air Temperature

Air temperature statistics for the Site were developed using historical data from the nearby ECCC climate station in Likely approximately 9 km northeast of the Site. The historical Likely data set was adjusted to the average elevation of the Mount Polley mine by applying the regional monthly lapse rate (Golder 2022a). Data gaps were infilled using data from the four regional ECCC climate stations in a prioritized sequence and applying the monthly temperature lapse rate to adjust for elevation.

Monthly and annual air temperature statistics for the Site (1974-2021) are presented in Table 8. The estimated mean annual temperature varies between 1.7°C and 6.3°C, with a long-term mean of 3.9°C. Mean monthly temperatures vary between -6.7°C in January and 15.1°C in July. The historical daily maximum and minimum air temperature from the derived long-term data set was 38.1°C in June 2021 (measured at the Site) and -39.8°C in December 1996, respectively.

Table 8: Derived Air Temperature (°C) Statistics for Mount Polley Mine, 1974 to 2021

Month	Temperature (°C)							
	Monthly						Daily	
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile	Maximum	Minimum
January	-16.0	-6.7	-0.3	-8.7	-6.3	-4.0	11.2	-39.4
February	-13.0	-4.8	0.7	-7.7	-4.3	-2.1	13.6	-35.4
March	-6.7	-1.0	3.2	-2.2	-0.8	0.5	18.4	-32.7
April	-0.7	3.7	12.0	2.8	3.7	4.3	27.5	-16.7
May	5.2	8.5	13.1	7.5	8.3	9.6	33.1	-7.9
June	8.6	12.2	15.5	11.1	12.2	13.2	38.1	-4.9
July	11.8	15.1	21.2	13.3	14.8	16.4	36.0	0.6
August	11.0	14.6	17.1	13.6	14.8	15.7	33.0	-4.1
September	6.8	10.0	14.2	8.7	9.6	11.2	36.3	-7.1
October	0.8	4.1	8.7	3.4	4.1	4.7	31.1	-26.4
November	-13.7	-2.4	2.6	-3.8	-2.1	-0.4	17.3	-36.9
December	-13.7	-6.6	-1.2	-9.5	-5.5	-3.9	11.3	-39.8
Annual	**1.7**	**3.9**	**6.3**	**3.2**	**3.9**	**4.5**	**38.1**	**-39.8**

Precipitation

The MPMC precipitation dataset was extended and infilled using the available data record from the five regional stations as described below to derive a daily and 24-hour long-term synthetic precipitation dataset for the Site. The Likely ECCC Station data were used to extend the precipitation record for the Site given the station's length of record and proximity to the Site.

Precipitation data gap infilling was completed following a priority sequence determined by analyzing measured daily rainfall from April to November for all climate stations; it was assumed that precipitation occurring between December and March occurred as snowfall. The regional climate station priority sequence considered the best-fit measured concurrent daily rainfall correlation (Rainfall Correlation), rainfall ranking correlation (Rainfall Rank), and percentage of time rain was recorded on the same day (Concurrent Daily Rain) between the raw data collected at the MPMC climate stations and each ECCC climate station (Golder 2022a).

A precipitation-elevation orographic factor was applied to adjust the raw precipitation data from the ECCC climate stations used to infill gaps. The adjustment was based on the April-to-November rainfall ranking factor of the raw ECCC climate station and Site rainfall records.

The Site experiences high summer precipitation due to summer storms, with the lowest monthly precipitation occurring in February. Precipitation typically occurs as snowfall starting in November and accumulates until March. Average annual total precipitation at the Site is estimated to be 612 mm with a standard deviation of 118 mm. Frequency analyses of the derived long-term precipitation time series for the Site were undertaken to generate the variability in monthly and annual precipitation of the Site. Estimated annual wet and dry precipitation depths for a range of return periods are shown in Table 9.

Table 9: Long-Term Precipitation at the Mount Polley Mine Site

Month[a]	Total Precipitation (mm)				
	Average	1:200 Year Wet	1:25 Year Wet	1:25 Year Dry	1:200 Year Dry
January	49.4	74.3	66.5	33.2	28.2
February	35.8	54.0	48.3	24.1	20.5
March	29.7	44.7	40.0	20.0	16.9
April	44.7	67.3	60.2	30.1	25.5
May	49.9	75.2	67.2	33.6	28.5
June	70.8	107	95.4	47.7	40.4
July	63.6	95.8	85.7	42.9	36.3
August	50.6	76.2	68.1	34.1	28.8
September	52.3	78.8	70.5	35.2	29.9
October	58.1	87.5	78.2	39.1	33.1
November	49.8	75.0	67.1	33.5	28.4
December	57.6	86.8	77.7	38.8	32.9
Annual Total[b]	**612**	**922**	**825**	**412**	**349**

(a) Wet and Dry Monthly values assumed to follow the same monthly distribution as the Average.

(b) Annual total precipitation depths were rounded to the nearest mm for presentation purposes; therefore, it may appear the sum of the monthly values do not equal the annual total.

Relative Humidity

Relative humidity data are available for the Site from 2019 to 2021 and for ECCC climate stations Quesnel (1953 to 2021) and Williams Lake (1961 to 2021). The MPMC WS1 relative humidity record is more complete than WS2's record; therefore, WS1 data were used for the analysis and infilled with WS2 data where necessary and if available. However, relative humidity data for the Site are insufficient for characterizing long-term climatic conditions of the Site due to the short period of record. Therefore, data from Quesnel and Williams Lake stations were reviewed and analyzed to define a representative relative humidity estimate for the Site. A long-term relative humidity time series for the Site was developed using ECCC Williams Lake A data infilled with ECCC Quesnel A data with an adjustment factor of 1.13 and 1.04 (Golder 2022a).

Statistics for relative humidity are presented in Table 10. Mean annual relative humidity is 68.1%. Monthly mean values vary between 57.7% in April to 82.2% in December. The 25th and 75th percentiles for monthly relative humidity show little variation from the median indicating the Site experiences relatively constant relative humidity on a monthly basis from year to year.

Table 10: Derived Monthly and Annual Relative Humidity Statistics for the Site (1974-2021)

Month	Relative Humidity (%)					
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile
January	69.2	81.3	90.1	78.9	81.7	84.0
February	65.5	75.0	84.8	72.0	75.6	77.8
March	55.4	64.9	76.2	61.0	64.0	68.3
April	47.9	57.7	69.4	54.9	57.4	60.5
May	45.6	58.1	70.3	54.1	57.8	61.5
June	44.2	60.4	72.4	54.4	60.2	67.7
July	42.2	59.0	72.9	52.6	58.6	65.9
August	48.4	60.2	81.2	55.0	58.8	63.6
September	47.5	66.4	79.1	61.3	66.1	71.3
October	54.3	72.3	86.7	69.7	72.0	76.1
November	61.4	80.1	87.8	77.6	80.4	83.5
December	70.8	82.2	89.3	78.9	82.6	85.0
Annual	**54.4**	**68.1**	**80.0**	**64.2**	**67.9**	**72.1**

Solar Radiation

Solar radiation data are available for the Site from 2001 to 2003 and 2019 to 2021, and for ECCC climate stations Williams Lake (1961 to 2001) and Prince George (1973 to 1995). Solar radiation data for the Site are insufficient for characterizing climatic conditions of the Site due to the short period of record, and as the data recorded in 2001 is incomplete and not concurrent with either ECCC climate station. Solar radiation statistics for the Site were determined from the ECCC Williams Lake data. Missing values were infilled by adjusting the Prince George records by a factor of 1.04 (Golder 2022a).

Statistics for solar radiation for the Site are presented in Table 11. Mean annual solar radiation is 135 W/m^2, with a minimum of 127 W/m^2 and maximum of 148 W/m^2. Mean monthly solar radiation varies between 20 W/m^2 in December to 257 W/m^2 in July following the same seasonal pattern for monthly air temperature. The 25th and 75th percentiles show greatest variation in solar radiation occurs in the summer months when solar radiation is greatest during the year, and less variation in winter months when solar radiation is lowest.

Table 11: Estimated Monthly and Annual Solar Radiation Statistics for the Site (1974-2001)

Month	Solar Radiation (W/m^2)					
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile
January	16	27	40	23	27	32
February	37	60	86	54	61	67
March	85	114	152	108	113	123
April	143	180	215	161	179	201
May	196	230	275	214	227	250
June	192	246	302	228	244	267
July	211	257	318	234	258	276
August	158	225	261	211	228	248
September	99	152	188	139	149	168
October	55	79	103	71	79	86
November	23	33	50	28	32	37
December	12	20	27	18	20	23
Annual	**127**	**135**	**148**	**132**	**135**	**140**

Evaporation

Evaporation monitoring (pan evaporation) data are available for the Site from 2019 to 2021; however, the data are not continuous, and the length of record is not sufficient for characterizing the evaporation conditions at the Site. Therefore, a mathematical model (Morton 1983) was used to calculate evaporation and evapotranspiration (actual and potential) for the Site based on the long-term synthetic records for air temperature, relative humidity, and solar radiation. Evaporation is defined as free water evaporation, or the amount of evaporation from open/free water surfaces (i.e., the water is returned to the atmosphere from lakes, ponds, and watercourses). Potential evapotranspiration (PET) is the water loss that occurs from a vegetated natural surface if there is no deficiency of water in the soil for use by vegetation (Thornthwaite 1948). Actual evapotranspiration (AET) is the water loss that occurs from a vegetated natural surface considering the availability of water in the soil for use by vegetation. Estimated monthly and annual shallow lake evaporation, PET, and AET values are provided in Table 12, Table 13, and Table 14 respectively.

The mean annual shallow lake evaporation rate is estimated to be 673 mm, varying between 606 mm and 762 mm. Mean monthly evaporation rates vary between 0 mm in December to 138 mm in July. The 25th and 75th percentiles indicate that greatest variation in monthly evaporation occurs in July when evaporation is greatest, and lowest variation occurs in January and December when evaporation is lowest.

Table 12: Estimated Monthly and Annual Shallow Lake Evaporation Statistics for the Site (1974-2001)

Month	Shallow Lake Evaporation (mm)					
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile
January	0	1	4	0	0	1
February	1	7	12	4	7	10
March	24	32	43	29	32	34
April	52	66	79	59	67	72
May	86	105	140	96	102	115
June	95	122	155	110	121	132
July	110	138	173	123	136	153
August	80	115	137	107	113	130
September	37	61	80	54	60	70
October	18	22	28	20	21	23
November	0	4	8	1	4	6
December	0	0	3	0	0	1
Annual	**606**	**673**	**762**	**648**	**663**	**699**

The mean annual PET rate is estimated to be 863 mm, varying between 744 mm and 1022 mm. Mean monthly PET rates vary between 1 mm in December and January to 171 mm in July. The 25th and 75th percentiles indicate that greatest variation in monthly PET occurs in July when PET is greatest, and lowest variation occurs in January and December when PET is lowest.

Table 13: Estimated Monthly and Annual PET Statistics for the Site (1974-2001)

Month	Potential Evapotranspiration (mm)					
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile
January	0	1	5	0	0	2
February	1	7	11	4	7	10
March	24	41	59	34	42	45
April	68	92	112	83	93	102
May	103	134	178	120	131	149
June	113	150	195	125	155	174
July	124	171	240	151	166	191
August	84	151	199	135	152	174
September	54	89	117	71	89	108
October	17	24	40	20	23	26
November	0	4	9	1	4	6
December	0	1	4	0	0	1
Annual	**744**	**863**	**1022**	**815**	**856**	**925**

The mean annual AET rate is estimated to be 399 mm, varying between 319 mm and 449 mm. Mean monthly AET rates vary between 1 mm in December and January to 89 mm in July. The 25th and 75th percentiles indicate that greatest variation in monthly AET occurs in July when AET is greatest, and lowest variation occurs in January and December when AET is lowest. On an annual basis, AET at the Site is less than shallow lake evaporation and PET rates because AET is limited by the availability of water, particularly during the summer months when the air temperature is highest.

Table 14: Estimated Monthly and Annual AET Statistics for the Site (1974-2001)

Month	Actual Evapotranspiration (mm)					
	Minimum	Mean	Maximum	25th Percentile	50th Percentile	75th Percentile
January	0	1	5	0	0	2
February	1	7	11	4	7	9
March	15	18	25	17	18	19
April	16	31	47	26	30	35
May	42	64	84	60	63	68
June	48	80	98	75	80	86
July	61	89	105	83	89	99
August	51	63	78	57	63	69
September	10	23	35	18	22	29
October	11	17	22	16	17	18
November	0	4	9	1	4	6
December	0	1	4	0	0	1
Annual	**319**	**399**	**449**	**370**	**409**	**419**

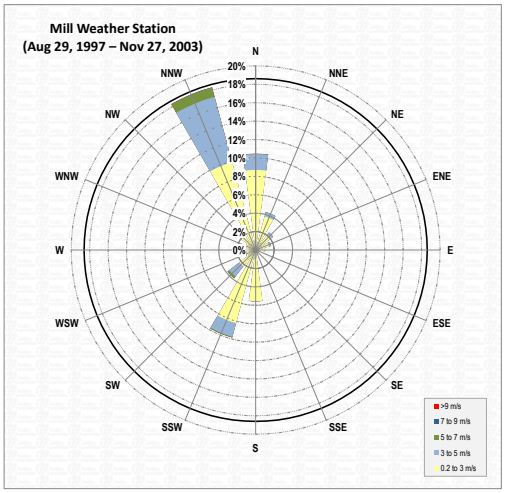
Wind Speed and Direction

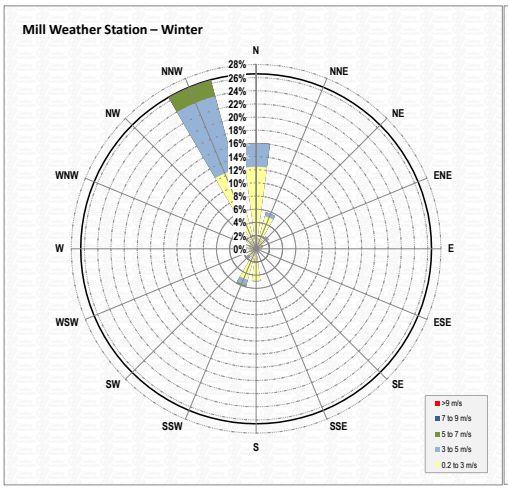
Hourly wind speed and direction data are available for the Site from 1997 to 2003, and daily wind speed data are available from 2019 to 2021; however, the data are not continuous. The hourly wind speed and direction data available from 1997 to 2003 were used to develop wind rose plots. A wind rose depicts the relative frequency of wind from a given direction on a 16-point compass. Each ring on the wind rose represents a frequency of 2% of the data period. The length of the shaded bars on each wind rose petal represents the frequency of wind recorded from a given direction within a defined wind speed range. A wind rose is provided for the period of August 1997 to November 2003, and seasonal wind roses are presented to display seasonal variability in wind patterns, where the seasons have been defined as follows:

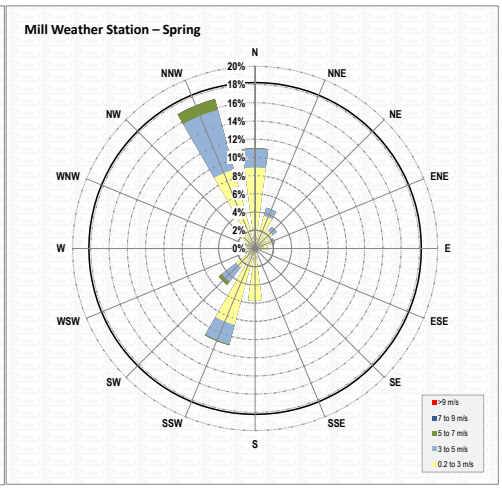
- Winter – December to February
- Spring – March to May
- Summer – June to August
- Autumn – September to November

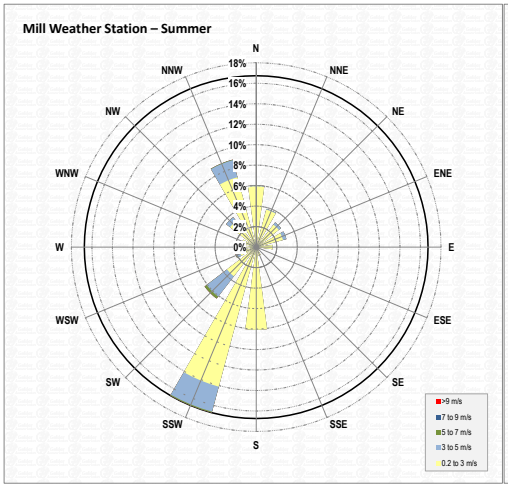
Daily wind data recorded from 2019 to 2021 from WS1 and WS2 were wind speed only, no direction. The period of record for WS2 in 2020 are incomplete and are not included in the analysis. The relative frequency (%) of the magnitude of the daily wind speed data recorded at WS1 for 2019 and 2021 were compared to the relative frequency (%) of wind speed magnitude of the data from 1997 to 2003.

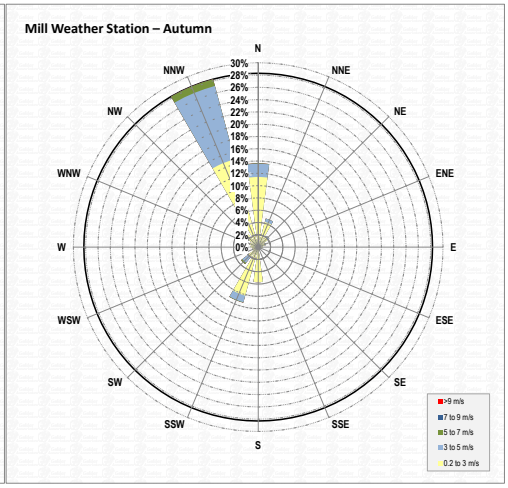
A wind rose plot for the Site depicting the relative frequency of mean hourly wind speed and direction, and the seasonal distribution, between August 29, 1997, and November 27, 2003, is shown in Figure 9.











Spring = March, April, May; Summer = June, July, August; Autumn = September, October, November; Winter = December, January, February.

Figure 9: MPMC Station Monitoring Period and Seasonal Wind Roses – August 29, 1997, to November 27, 2003

Winds measured at the Site typically blew from the north-northwest, north, and south-southwest directions, with minimal winds from the east and the west. The spring, autumn, and winter seasonal wind roses were consistent with the wind rose pattern for the entire monitoring period; however, during the summer months, the majority of winds were from the south-southwest. Similarly, wind speeds in spring, autumn, and winter were generally consistent with the wind rose for the entire monitoring period, while wind speeds in summer were generally lower.

Wind speed measured and seasonal distributions at the Site from 2019 to 2021 were consistent with the relative frequency of wind speed magnitudes and the seasonal distributions recorded between August 29, 1997, and November 27, 2003 (Table 15). It is noted that the data from 2019 and 2021 are daily wind speed rather than hourly wind speed and only the relative frequency (%) of wind speed magnitude was compared.

Table 15: Comparison of Relative Frequency of Wind Speed from Mill Weather Station and Weather Station 1 for the Site

Wind Speed (m/s)	Mill Weather Station August 29, 1997, to November 27, 2003[(a)]	Weather Station 1 January 1, 2019, to December 31, 2021[(b)]
calm	35%	28%
0.2 to 3 m/s	50%	56%
3 to 5 m/s	14%	13%
5 to 7 m/s	2%	3%
7 to 9 m/s	0%	0%
>9 m/s	0%	0%

(a) Recorded as hourly wind speed.

(b) Recorded as daily wind speed.

Snow Cover Properties

Snow cover data at the Site are available monthly from manual measurements from 1997 to 2022, recorded as snow-water-equivalent (SWE). Measurements, although not continuous, are typically recorded at the beginning and end of a month, with the latter being representative of the monthly SWE. Snow cover monthly statistics, reported as SWE, are presented in Table 16. At 50% exceedance, snow begins accumulating in November and achieves its maximum in March, reducing to 0 mm by the end of April. The 5th and 95th percentiles and standard deviation values demonstrate the variability in the amount of SWE at the Site, with March having the greatest variability from year to year.

Table 16: Snow Water Equivalent for the Site (1997-2021)

Month	Number of Measurements	Mean (mm)	Minimum (mm)	Percentile					Maximum (mm)	Standard Deviation (mm)
				5%	25%	50%	75%	95%		
January	22	147	76	88	120	139	164	327	339	56
February	22	182	99	104	131	193	222	338	344	61
March	22	185	0	6	97	198	257	403	411	108
April	21	33	0	0	0	0	81	177	177	58
November	22	17	0	0	0	9	37	72	72	25
December	22	102	32	50	77	101	122	193	196	44

3.2.2 Site Drainage and Surface Hydrology

The Mine is drained by three main watersheds: the Hazeltine Creek (30.2 km^2) at Quesnel Lake, the Edney Creek (87.4 km^2) at Quesnel Lake, and the Morehead Lake (62.7 km^2) watersheds (Figure 10). Figure 10 also shows the regional compliance hydrometric stations. The Hazeltine Creek watershed includes Polley Lake and conveys all water from Polley Lake, the east side of the Mine, and the area surrounding the TSF. The Morehead Creek watershed includes the Bootjack Lake catchment area (11.2 km^2). The watershed areas listed here exclude the mine, which covers part of the original watersheds.

Both the Hazeltine Creek and the Morehead Creek watersheds were significantly altered by historical (i.e., pre-Mount Polley Mine) water diversions. Bootjack Creek, a small remnant of which now flows into Polley Lake via a constructed diversion channel, historically conveyed water from Bootjack Lake to Hazeltine Creek. In 1913, flow from Bootjack Lake was reversed by miners (not associated with MPMC) damming the east end of Bootjack Lake and digging a new outlet westward to Morehead Creek. Around the same time, a water control structure was also built at the outlet of Polley Lake (Hazeltine Creek), and Hazeltine Creek water was diverted to Bullion Pit to support hydraulic placer mining. Flow from Polley Lake to Hazeltine Creek was restored with the abandonment of mining at Bullion Pit during World War II. However, the flow from Bootjack Lake to Hazeltine Creek was never restored.

Prior to the breach of the TSF, Edney Creek and Hazeltine Creek converged just prior to discharging into Quesnel Lake. The mouths of the two creeks were separated following the breach and interim remediation works. As of late summer, 2020, Edney Creek and Hazeltine Creek have been reconnected, with in-stream habitat features installed, as part of the conclusion of habitat construction works in the lower Hazeltine Creek and Edney Creek area.

An overview of Site hydrology, including site hydrometric station monitoring, is presented annually in MPMC's Annual Reclamation Report (MPMC 2023e). Section 4.8 and Appendix L of the 2023 Reclamation Report discusses site hydrology.



LEGEND

- MPMC HYDROMETRIC STATION
- ENVIRONMENT CANADA HYDROMETRIC STATIONS
- WATER CATCHMENT AREA
- CONTOUR (10m)
- ROAD
- WATERCOURSE
- WATERBODY

0 1.6 3.2

1:80,000 KILOMETRES

REFERENCES

1. CONTOURS, ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. WATER CATCHMENT AREAS INTERPOLATED BY GOLDER ASSOCIATES LTD.
3. PROJECT IMAGERY OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2023).
4. BASE IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
5. DATUM: NAD 1983 UTM ZONE 10N

CLIENT
MOUNT POLLEY MINING CORPORATION

PROJECT
WATER MANAGEMENT PLAN

TITLE
MAJOR DRAINAGES AND FLOW MONITORING STATIONS

CONSULTANT

wsp

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PREPARED	CDB
REVIEWED	GD
APPROVED	JM

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3.2.3 Pit Groundwater Hydrogeology

In 2016, Golder assessed groundwater flow for the following three open pits at the mine: Springer and Cariboo Pits, Wight Pit, and Boundary Pit. The analysis for each pit was described in a series of technical memoranda in Appendix B of the LTWMP (Attachments C, D, E, and F; Golder 2016g). Hydrogeological assessments for the pits were conducted as part of the LTWMP to provide estimates of seepage into and out of the pits.

WSP recently updated the hydrogeological pit model calibration for the Springer and Cariboo Pits (WSP 2024a) and revised the groundwater flow predictions for the ultimate Springer-Cariboo Pit configuration (Table 17). For the purpose of this report, predicted pit groundwater flows found in Table 18 and Table 19 (Wight Pit and Boundary Pit) remain valid for the current operations phase and are based on Golder 2016g.

Updates are currently underway for the Springer-Cariboo Pit, Wight Pit, and TSF hydrogeological models and updated seepage estimates are expected to be available by the close of 2025 for use in the site wide models for 2026 permit reporting.

Springer and Cariboo Pits

In 2024, the existing groundwater model built for closure conditions at the Springer-Cariboo pit (Golder 2016g) was updated to reflect changes in mine settings since 2016 including the pit configuration and water levels in pit lakes up to 2023 (WSP 2024a). Model calibration was refined based on hydrogeological data collected since 2016 in the mine monitoring wells within the groundwater model domain. Table 17 presents the predicted groundwater inflow and outflow rates from WSP (2024a) during flooding of Springer-Cariboo Pit for the Base Case predictions and for two sensitivity scenarios. These predictions consider only groundwater flow to the open pit for the simulated pit lake elevation, and do not include potential inputs from direct precipitation within the footprint of the pit and/or surface water run-off (if not diverted) from the pit walls and from the surrounding areas. These surface water inputs are incorporated outside of the hydrogeological model within the SWWBM.

Table 17: Predicted Groundwater Flows for the Ultimate Combined Springer-Cariboo Pit

Springer-Cariboo Pit Lake Elevation (masl)	Base Case		Upper Bound		Lower Bound	
	Groundwater Flow (m^3/d)		Groundwater Flow (m^3/d)		Groundwater Flow (m^3/d)	
	Into the Lake	Out of the Lake	Into the Lake	Out of the Lake	Into the Lake	Out of the Lake
760	640	-	1120	-	420	-
800	640	-	1120	-	420	-
850	640	-	1110	-	420	-
900	630	-	1090	-	410	-
940	620,	-	1080	-	410	-
960	610	-	1040	-	400	-
980	580	-	980	-	390	-
1000	520	-	850	-	360	-
1020	430	20	690	60	320	<10
1030	390	90	620	200	300	30
1040	360	200	560	440	280	80
1050	330	360	510	780	270	150

The 2024 model recalibration results indicated that when the Springer-Cariboo Pit is at the ultimate configuration and is fully dewatered, the groundwater inflow to the pit is between approximately 420 m^3/day and 1,120 m^3/d. When fully dewatered, the combined pit would act as strong groundwater sink that would reverse groundwater flow between Bootjack Lake and the pit such that the seepage from Bootjack Lake to the underlying bedrock would occur. As the pit lake level is raised, the groundwater seepage into the pit lake was predicted to gradually decrease to between approximately 270 m^3/day to 510 m^3/d, until once the assumed spillway elevation of 1,050 m is reached.

In addition, as the pit lake level increases between 1,020 m and 1,030 m elevation, seepage in the range of 20 m^3/d to 200 m^3/d from Springer-Cariboo Pit Lake into the subsurface was predicted to occur. This seepage was found to gradually increase when the pit lake reaches the assumed spillway elevation of 1,050 m (between 150 m^3/day and 780 m^3/d). At this elevation, the pit lake was predicted to act as a “flow-through” lake with groundwater recharge occurring from the uplands located northeast from the pit and recharge to groundwater occurring towards the southwest.

When compared to previous model predictions (Golder, 2016), updated average predicted inflows and outflows into and out of the pit lake are generally lower than previous estimates (between 10% and 45%). These differences are mainly due to the changes in hydraulic properties in the vicinity of the pit following model recalibration (i.e., reduction in hydraulic conductivity of the bedrock between 40 and 100 mbgs and changes to the brecciated bedrock) and to a lesser degree to the changes between the two simulated ultimate pits. While the updated ultimate pit is deeper and wider than the pit simulated in 2016, predicted flows are lower because of the reduced hydraulic conductivity of the units that are intersected by the ultimate pit.

Wight Pit

Hydrogeological modelling was carried out for the Wight Pit (Golder 2016g). The results from the hydrogeological model indicate that under steady-state conditions (Table 18), groundwater inflow to Wight Pit is projected to gradually decrease from 2,600 m^3/d at an elevation of 880 m to 600 m^3/d at an elevation of 926 m (Golder 2016g).

Table 18: Predicted Groundwater Flows for the Wight Pit

Wight Pit Lake Elevation (masl)	Groundwater Flow (m^3/d)	
	Into the Lake	Out of the Lake
Base Case		
880	2,600	0
900	2,500	0
910	2,100	0
920	800	0
926	600	500
Lower Bound		
926	400	300
Upper Bound		
926	700	800

Source: Golder 2016g.

masl = metres above sea level.

Boundary Pit

Boundary Pit is mainly unexcavated, and only a shallow pit sump exists at the western side of the anticipated pit area. At present, hydrogeological data specific to the Boundary Pit sump are not available. However, MPMC indicated that during mining seepage was not observed along the pit walls. This is considered reasonable due to the relatively shallow depth of this pit sump and depth to water table measured at monitoring wells that were installed near other mine facilities. It is thus considered likely that the water table was located near or below the floor of the Boundary Pit before mining at this location commenced.

Although seepage to the Boundary Pit from the surrounding rock mass is not expected, seepage out of this pit could occur due to water entering the pit via surface water runoff and direct precipitation. An estimate of these potential seepage rates out of the pit was made to provide input to the pit water balance and to characterize a potential seepage pathway originating from this pit (Golder 2016g).

Seepage rates out of the Boundary Pit have been estimated from a Darcy's Law calculation that considers changes in the dimensions of the seepage area as the pit is being flooded. The estimated seepage rate from the Boundary Pit when the pit lake level is 5 m above its base (1,073 m) is approximately 59 m^3/d, with a potential range between 35 and 177 m^3/d due to uncertainty in bedrock permeability (Table 19). Seepage outflow is estimated to decrease as the height of water column above the pit bottom decreases as shown in Table 19.

Table 19: Predicted Groundwater Outflows from the Boundary Pit

Boundary Pit Lake Elevation (masl)	Groundwater Outflow (m^3/d)		
	Lower Bound	Base Case	Upper Bound
1,068	2	3	10
1,069	6	10	29
1,070	12	20	61
1,071	16	26	79
1,072	32	53	159
1,073	35	59	177

Source: Golder 2016g.

masl = metres above sea level.

3.2.4 Seepage from the Tailings Storage Facility

WSP has modelled seepage from the TSF at 987m crest elevation assuming two seepage paths: captured seepage that reports through the TSF embankment drain system to the three TSF seepage collection ponds, and uncaptured seepage to the environment. Captured seepage reporting to collection ponds is modelled as S1 through S5 as seen on the water balance schematic for operations (Figure 15) and as estimated in Tables 20 through 22. Uncaptured seepage to the environment is modelled as S14 and is assumed at a constant flow rate.

The captured seepage flow assumptions (for the current water balance model) outlined in this section are based on modelling predictions of the raised TSF seepage drain system at the 987m crest and are assumed for all of the modelled operations period. This is a conservative approach, as the TSF is not currently at the ultimate 987m crest elevation, and current estimated TSF seepage should be below these modelled estimates for operations until the TSF is raised to 987m and the new seepage drain system is receiving inflow.

The TSF 987m embankment design includes a drainage system to accommodate the increase in the TSF water elevation (WSP 2023b). The new drain system will extend around the TSF and will capture water within the tailings above 970 m and convey it to the seepage collection system, downstream of the TSF embankment. WSP has estimated the water flows through the drains based on the distance between the TSF water pond and the TSF embankment (beach width of tailings). Estimation of flows have been made for each embankment:

- S1: South Embankment
- S2: Main Embankment
- S4: Corner 1 Embankment
- S5: Perimeter Embankment

Seepage flows from the TSF (S1 to S5) during operations were estimated using a two-dimensional numerical groundwater flow model to quantify anticipated seepage rates through the embankment and foundation. Seepage analyses were conducted for typical sections of the elevation of 987 m configuration of the South Embankment, Main Embankment, Perimeter Embankment, and Corner 1 Embankment under steady-state conditions. The analyses were conducted using GeoStudio 2021, developed by GEOSLOPE International Ltd. Seepage from the TSF has been defined to occur continuously without interruption in the SWWBM. Table 20 presents the estimated seepage flow rates through each embankment with dependency on the beach width.

Table 20: Seepage Flow Rates

Beach (m)	Seepage Flow Rate (L/s)			
	S1	S2	S4	S5
0	79	96	81	89
50	39	50	53	46
100	25	32	38	31
200	14	18	23	18
300	9	12	15	13

Note(s): Includes flows through upstream drains and embankment. All flows estimated for the 987 m raise.

The TSF contains both water and tailings. The term TSF water volume is used to describe the total amount of water within the TSF. The term TSF pond is also used, which describes the area of the TSF, mainly near the water surface elevation, where tailings are generally not placed and a water pond forms at the surface, typically with some water depth. The term TSF supernatant pond is also used and refers to the same pond. During operations, a pump barge is placed at the TSF pond to allow suction of TSF water for mill process use and placing the pump intake at the pond allows drawing water without drawing tailings. The location of the TSF pond depends on how tailings are placed within the TSF and the pond can be shifted around the TSF through tailings placement. Nearing closure, the pond will be shifted to the north end of the TSF (corner 1) to facilitate the closure spillway.

The progressive location of the TSF pond will depend on operational decisions during the deposition of tailings; thus, the change in beach widths have been assumed consistent for each embankment. Based on estimates of the TSF water volume and satellite imagery of the pond location since restart of operation in 2016, an estimation of embankment beach width has been made for different TSF water volume amounts. The estimates are provided in Table 21, which outline a conservative scenario, in terms of seepage flow quantities.

Table 21: Tailings Beach Width

TSF Water Volume (m^3)	Beach Width (m)			
	S1	S2	S4	S5
0	300	300	300	300
1,500,000	300	300	300	300
2,500,000	200	200	200	200
3,000,000	100	100	100	100
5,500,000	0	0	0	0

The water balance model uses both Table 20 and Table 21 presented above to estimate the beach width and consequently the seepage flow rates through the embankments during operations. For every time step the model calculates the TSF water volume and consequently the beach width, and finally the seepage flow rate.

Starting from four months into closure (August 1, 2031), the TSF water storage capacity reduces to 0.25 M-m^3 within two months due to the construction of the closure TSF spillway. This is estimated to increase the seepage flow rate on the perimeter embankment close to corner 1 compared to other TSF embankments, as the TSF pond will be pushed to that corner. For modelling purposes, it is considered that the seepage flow rate in Table 22 will be in effect 6 months after the end of the operation phase and throughout the closure and post-closure phases.

Table 22: Tailings Beach Width at Last Year of Operation and Closure

Flow Rate (L/s)			
S1	S2	S4	S5
70	0	0	0

Note: Values start 6 months after end of operation. Maximum capacity of TSF water volume is limited to 250,000 m^3.

Additionally, the water balance model includes an uncaptured seepage pathway from the TSF to the environment (S14), which represents a direct loss and is assumed at a constant rate. A constant seepage rate of 3.2 L/s has been estimated for S14 in the current water balance model (uncaptured TSF seepage). This value is considered a conservative estimate based on the results of three-dimensional groundwater flow modelling by Golder in 2016 (Golder 2016c) which estimated uncaptured TSF seepage to range of between 0.5 and 4 L/s with an average of 1.8 L/s for the ‘then planned’ dam raise to 970 m, and is supported by historical seepage assessments conducted by Knight Piésold in 1995 and 2005 which estimated uncaptured TSF seepage to range between 0.4 and 3.4 L/s, and by AMEC in 2014 which estimated a range between 0.5 and 4.0 L/s. The selected value of 3.2 L/s falls within the upper end of the range of historical estimates and is considered a reasonable representation for TSF 987 m water balance modelling purposes. This is because the TSF 987 m embankment design includes the discussed upstream drain system at elevation 970 m which is designed to minimize increases to the hydraulic gradient imposed on the embankment for raises to the TSF above elevation 970 m. As increases to the hydraulic gradient will be minimized to close to elevation 970 m by the drainage system, the previous estimate of the uncaptured seepage rate is considered reasonable for the TSF 987m seepage modelling predictions presented in this application.

An updated estimate for S14 is currently under development by WSP and is expected to be available by the end of 2025. This timeline is in alignment with the current EMA permit (September 02, 2025), in which Condition 4.2 requires update of the site-wide numerical groundwater model (including TSF uncaptured seepage assessment) by April 30, 2026.

3.3 Characterization of Existing Water Quality

The characterization of existing surface water quality in Quesnel Lake has been updated as part of this WMP and is described below. The characterization of other receiving environments (Bootjack Lake, Hazeltine Creek, and Polley Lake) have not been updated in this WMP but have been previously characterized in Golder 2016g and Golder 2020e. Only the Quesnel Lake characterization has been updated as part of this WMP, as it is the sole discharge location permitted in the existing EMA permit, expected to continue through operations. This single discharge location may continue through closure or may share discharge with other distributed locations.

The current EMA permit includes a new Condition 3.8 – Review of Discharge Alternatives, which will result in an updated assessment of potential receiving environments around the site that could receive distributed discharge of treated contact water, due to BC ENV before January 31, 2025. Results from this assessment will be incorporated into the WMP for the March 2026 issuance required under the M-200 permit.

Data from March 2015 to October 2024 collected in the West Basin of Quesnel Lake, east of the sill near Cariboo Island, were summarized. These data represent the background water quality of Quesnel Lake, generally flowing into the West Basin.

The following summary statistics were calculated for Quesnel Lake to represent existing conditions:

- Number of samples.
- Number and percentage of samples with values below the method detection limit (MDL).
- Minimum, median, arithmetic mean, 95th percentile, and maximum concentrations.

Minimum, maximum, and median values were calculated using absolute values; that is, when the summary statistic corresponded to a non-detect value in the dataset, the MDL was reported. For values reported as less than the MDL, the MDL was substituted for calculation of the mean and 95th percentile. A mean was not calculated for parameters with greater than 50% non-detect values. A median was only reported where a mean was not calculated. A 95th percentile was not calculated for parameters with less than 10 measurements or with greater than 95% non-detect values.

Existing conditions were defined as arithmetic mean concentrations or median where a mean was not calculated. Data were compared to applicable BC drinking water guidelines and BC 30-day WQGs (BC ENV 2020) protective of aquatic life; the maximum WQG was substituted where a 30-day WQG did not exist, as indicated in summary tables provided in Sections 3.3.1 through 3.3.4 in BC ENV 2025. WQGs calculated based on toxicity modifying factors (e.g., hardness, pH, chloride, dissolved organic carbon) were calculated based on corresponding toxicity modifying factor values (i.e., minimum and maximum statistics) described in the summary statistics for each waterbody.

BC WQGs protective of the most sensitive receiving environment use (generally aquatic life) were used for screening water quality.

The average residence time of Quesnel Lake is approximately 10 years but is estimated to be 90 days within the West Basin (Laval et al. 2008). Quesnel Lake is oligotrophic, with low primary productivity and total dissolved solids (TDS). The West Basin has vertical mixing typical of temperate lakes, with thermal stratification for most of the year, interrupted by brief turnover periods in the spring and the fall when vertical density gradients are lowest. The physical limnology of the West Basin is described more fully in Laval et al. 2008 and Tetra Tech EBA Inc. (Tetra Tech 2015).

Levels of total suspended solids (TSS), turbidity, and total metals previously elevated in the West Basin as a result of the TSF foundation failure remained below WQGs from 2015 to 2024 east of Cariboo Island. All mean constituent concentrations were below applicable BC WQGs in Quesnel Lake baseline water quality measured east of Cariboo Island from 2015 to 2024 (Table 23). Figures comparing existing turbidity, TSS, total phosphorus and dissolved copper concentrations to corresponding water quality guidelines are presented in Figure 11 through Figure 14, respectively.

Table 23: Summary of Water Quality Statistics for Quesnel Lake: Existing Conditions, East of Cariboo Island (2015 to 2024, from QUL-40A and QUL-120 Sampling Stations)

Parameter	Units	BC Drinking Water Quality Guidelines[a]		BC Water Quality Guidelines[b]		Quesnel Lake							
		Maximum	Notes	30-day Average	Notes	Number of Samples	Number of Samples <MDL	Percent of Samples <MDL	Minimum[s]	Median[s]	Mean[t]	95th[u], [v]	Maximum[s]
Physical Parameters													
pH (field)	pH units	-	-	6.5 – 9.0	A	199	0	0	6.4	7.7	7.4	8.3	8.9
Temperature (field)	°C	-	-	-	-	199	0	0	2.5	4.1	6.3	18	21
Conductivity (field)	µs/cm	-	-	-	-	199	0	0	21	111	115	142	202
Turbidity	NTU	+1 NTU from background	A	+2 NTU from background	A, (c)	191	0	0	0	0.29	0.68	1.6	48
Dissolved organic carbon	mg/L	-	-	-	-	238	0	0	1.1	1.8	2.1	2.4	13
Hardness (Dissolved)	mg/L	-	-	-	-	247	0	0	44	53	53	56	58
Total Dissolved Solids	mg/L	-	-	-	-	247	0	0	57	70	71	84	92
Total Suspended Solids	mg/L	-	-	+5 mg/L from background	A, (c)	247	206	83	<1.0	<1.1	1.9	<3.0	12
Major Ions													
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	247	0	0	39	50	49	52	54
Chloride	mg/L	250	A	150	A	247	222	90	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	mg/L	1.5	A	1.00 – 1.11	A, Max, (d)	247	0	0	0.025	0.034	0.034	0.038	0.045
Sulphate	mg/L	-	-	218	A, (e)	247	0	0	4.5	6.3	6.3	6.8	6.9
Nutrients													
Ammonia	mg/L (as N)	-	-	0.175	A, (f)	247	210	85	<0.005	<0.005	0.0051	0.0051	0.013
Nitrate	mg/L (as N)	10	A	3	A	247	0	0	0.014	0.14	0.13	0.15	0.15
Nitrite	mg/L (as N)	1	A	0.02	A, (g)	247	222	90	<0.001	<0.001	<0.001	<0.001	<0.001
Total Phosphorus	mg/L	0.01	A, lakes	0.005 – 0.015 in Lakes	A	239	95	40	<0.002	0.0021	0.0038	0.0062	0.098
Total Metals													
Aluminum	mg/L	-	-	5	A, WW, Max	247	0	0	0.0063	0.012	0.016	0.034	0.22
Antimony	mg/L	0.006	A	0.009	W	247	210	85	<0.0001	<0.0001	NC	<0.0001	0.00013
Arsenic	mg/L	0.01	A	0.005	A, Max	247	50	20	<0.0001	0.00011	0.00012	0.00015	0.00022
Barium	mg/L	-	-	1	W	247	0	0	0.0043	0.0052	0.0053	0.0059	0.0081
Beryllium	mg/L	-	-	0.00013	W	247	222	90	<0.0001	<0.0001	NC	<0.0001	<0.0001
Boron	mg/L	5	A	1.2	A	247	221	89	<0.01	<0.01	NC	<0.01	<0.01
Cadmium	mg/L	0.005	A	-	-	247	192	78	<0.000005	<0.000005	NC	0.0000057	<0.00001
Calcium	mg/L	-	-	See note	W, (h)	247	0	0	13	18	18	19	20
Chromium	mg/L	0.05	A	0.001	W, (i)	247	221	89	<0.0005	<0.0005	NC	<0.0005	0.00154
Cobalt	mg/L	0.001	A	0.004	A	247	221	89	<0.0001	<0.0001	NC	<0.0001	0.00017
Copper	mg/L	2	A	-	-	247	21.0	8.5	<0.0005	0.00066	0.00078	0.0012	0.0073
Iron	mg/L	-	-	1	A, Max	247	179	72	<0.03	<0.03	0.032	0.039	0.17
Lead	mg/L	0.005	A	0.0040 – 0.0050	A, (j)	246	138	56	<0.00005	<0.00005	0.00011	0.00035	0.0031
Lithium	mg/L	-	-	-	-	247	160	65	<0.0005	<0.001	0.001	0.0011	0.0016
Magnesium	mg/L	-	-	-	-	247	0	0	1.8	2.1	2.0	2.2	2.3
Manganese	mg/L	0.12	A	0.8 – 0.86	A, (k)	247	0	0	0.00012	0.001	0.0012	0.0023	0.0089

Table 23: Summary of Water Quality Statistics for Quesnel Lake: Existing Conditions, East of Cariboo Island (2015 to 2024, from QUL-40A and QUL-120 Sampling Stations)

Parameter	Units	BC Drinking Water Quality Guidelines[a]		BC Water Quality Guidelines[b]		Quesnel Lake							
		Maximum	Notes	30-day Average	Notes	Number of Samples	Number of Samples <MDL	Percent of Samples <MDL	Minimum[s]	Median[s]	Mean[t]	95th[u], [v]	Maximum[s]
Mercury	mg/L	0.001	A	0.00001	A, (l)	29.0	24	83	<0.000005	<0.000005	NC	<0.000005	<0.000005
Molybdenum	mg/L	0.088	A	7.6	A	247	0	0	0.00026	0.00034	0.00034	0.0004	0.00051
Total Metals (cont'd)													
Nickel	mg/L	0.08	A	0.025	W, (m)	247	216	87	<0.0005	<0.0005	NC	<0.0005	0.00103
Selenium	mg/L	0.01	A	0.002	A	247	10	4.0	0.000057	0.000098	0.00012	0.00016	<0.0005
Silicon	mg/L	-	-	-	-	247	0	0	0.82	1.7	1.7	2.0	2.1
Silver	mg/L	-	-	0.00005 – 0.0001	A, (n)	247	221	89	<0.00001	<0.00001	NC	<0.00001	0.000012
Sodium	mg/L	-	-	-	-	247	0	0	0.78	0.96	0.96	1.0	1.5
Strontium	mg/L	7	A	-	-	247	0	0	0.094	0.14	0.14	0.15	0.15
Thallium	mg/L	-	-	0.0008	W	247	222	90	<0.00001	<0.00001	NC	<0.00001	<0.00001
Tin	mg/L	-	-	-	-	247	220	89	<0.0001	<0.0001	NC	<0.0001	0.00023
Titanium	mg/L	-	-	-	-	247	221	89	<0.01	<0.01	NC	<0.01	0.011
Uranium	mg/L	0.02	A	0.0085	W	247	0	0	0.00012	0.00016	0.00016	0.00017	0.00018
Vanadium	mg/L	-	-	-	-	247	220	89	<0.0005	<0.0005	NC	<0.0005	0.001
Zinc	mg/L	3	A	-	-	247	219	89	<0.003	<0.003	NC	<0.003	0.0057
Dissolved Metals													
Aluminum	mg/L	-	-	0.041 - 0.05	A, (o)	247	0	0	0.0037	0.0059	0.0066	0.011	0.02
Antimony	mg/L	0.006	A	-	-	247	222	90	<0.0001	<0.0001	NC	<0.0001	<0.0001
Arsenic	mg/L	0.01	A	-	-	247	157	64	<0.0001	<0.0001	0.0001	0.00013	0.00018
Barium	mg/L	-	-	-	-	247	0	0	0.0046	0.0051	0.0051	0.0056	0.0065
Beryllium	mg/L	-	-	-	-	247	222	90	<0.0001	<0.0001	NC	<0.001	<0.001
Boron	mg/L	5	A	-	-	247	222	90	<0.01	<0.01	NC	<0.01	<0.01
Cadmium	mg/L	0.005	A	0.00011 – 0.00014	A, (p)	247	219	89	<0.000005	<0.000005	NC	0.0000059	<0.00001
Calcium	mg/L	-	-	-	-	247	0	0	15	18	18	19	20
Chromium	mg/L	0.05	A	-	-	247	221	89	<0.0005	<0.0005	NC	<0.0005	0.00057
Cobalt	mg/L	0.001	A	-	-	247	222	90	<0.0001	<0.0001	NC	<0.0001	<0.0001
Copper	mg/L	2	A	0.00020 – 0.0021	A, (q)	247	54	22	<0.0005	0.00059	0.00064	0.00094	0.002
Iron	mg/L	-	-	0.35	A, Max	247	222	90	<0.03	<0.03	NC	<0.03	<0.03
Lead	mg/L	0.005	A	-	-	242	125	52	<0.00005	<0.00005	0.0001	0.00028	0.00071
Lithium	mg/L	-	-	-	-	247	192	78	0.00069	<0.001	NC	<0.001	0.0013
Magnesium	mg/L	-	-	-	-	247	0	0	1.8	2.0	2.0	2.1	2.3
Manganese	mg/L	0.12	A	-	-	247	14	5.7	0.000086	0.00022	0.00031	0.001	0.0028
Mercury	mg/L	0.001	A	-	-	10	10	100	<0.000005	<0.000005	NC	<0.000005	<0.000005
Molybdenum	mg/L	0.088	A	-	-	247	0	0	0.00026	0.00033	0.00033	0.00038	0.00045
Nickel	mg/L	0.08	A	-	-	247	218	88	<0.0005	<0.0005	NC	<0.0005	0.0012
Potassium	mg/L	-	-	-	-	247	0	0	0.43	0.49	0.49	0.53	0.62

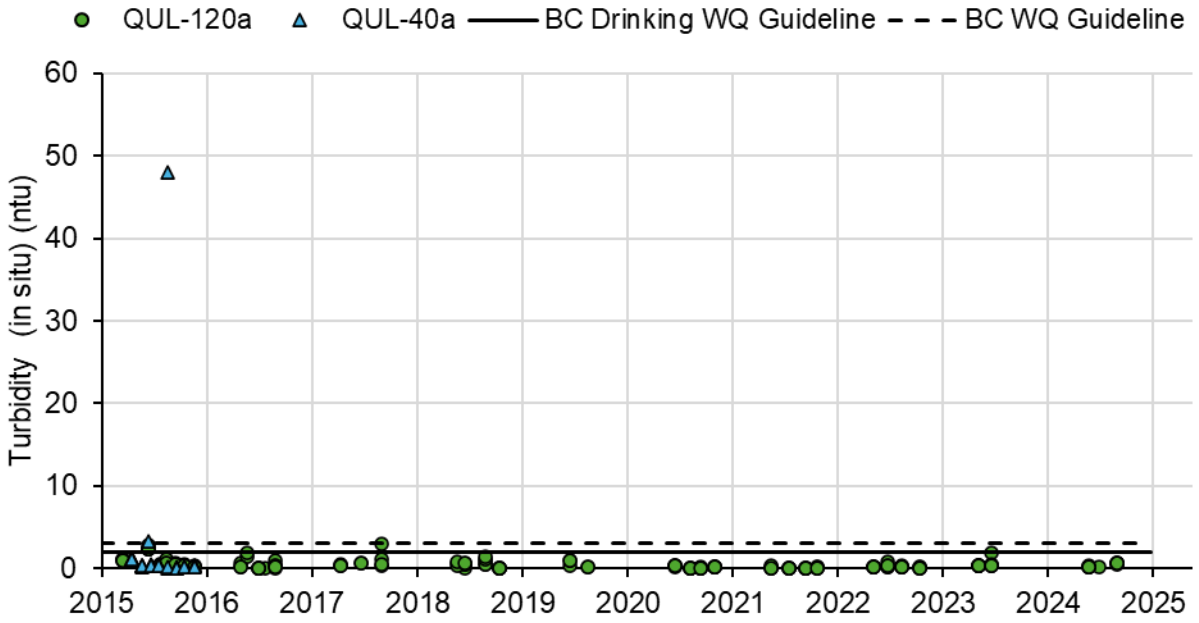
Table 23: Summary of Water Quality Statistics for Quesnel Lake: Existing Conditions, East of Cariboo Island (2015 to 2024, from QUL-40A and QUL-120 Sampling Stations)

Parameter	Units	BC Drinking Water Quality Guidelines[a]		BC Water Quality Guidelines[b]		Quesnel Lake							
		Maximum	Notes	30-day Average	Notes	Number of Samples	Number of Samples <MDL	Percent of Samples <MDL	Minimum[s]	Median[s]	Mean[t]	95th[u], [v]	Maximum[s]
Selenium	mg/L	0.01	A	-	-	247	10	4.0	0.00005	0.00009	0.00011	0.00015	<0.0005
Silicon	mg/L	-	-	-	-	247	0	0	0.76	1.7	1.7	1.9	2.0
Silver	mg/L	-	-	-	-	247	222	90	<0.00001	<0.00001	NC	<0.00001	<0.00001
Sodium	mg/L	-	-	-	-	247	0	0	0.82	0.95	0.95	1.0	1.2
Dissolved Metals (cont'd)													
Strontium	mg/L	7	A	-	-	247	0	0	0.1	0.14	0.13	0.15	0.15
Thallium	mg/L	-	-	-	-	247	222	90	<0.00001	<0.00001	NC	<0.00001	<0.00001
Tin	mg/L	-	-	-	-	247	220	89	<0.0001	<0.0001	NC	<0.0001	0.00013
Titanium	mg/L	-	-	-	-	247	222	90	<0.01	<0.01	NC	<0.01	<0.01
Uranium	mg/L	0.02	A	-	-	247	0	0	0.00012	0.00016	0.00016	0.00017	0.00018
Vanadium	mg/L	-	-	-	-	247	222	90	<0.0005	<0.0005	NC	<0.0005	0.001
Zinc	mg/L	3	A	0.0075	A, (r)	246	216	88	<0.003	<0.003	NC	<0.003	0.0081

(a) BC WQ guideline for the protection of drinking water, available at https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines.
(b) BC Water Quality Guidelines (BC WQG). Fresh Water Aquatic Life 30-day Guidelines used, except where noted (e.g., molybdenum, total aluminum). Maximum (Max) guidelines substituted where 30-d guidelines do not exist.
(c) For guideline comparison, Quesnel Lake background turbidity is assumed equal to 1 NTU and background TSS is equal to the MDL of 3.0 mg/L.
(d) Hardness dependent fluoride guideline: BC Max WQG (mg/L) = (-51.73+(92.57log10(hardness))*0.01), 0.4 at hardness 10 mg/L.
(e) Hardness dependent sulphate guideline: BC 30-d WQG (mg/L) = 128 at hardness <30 mg/L, 218 at hardness 31-75 mg/L, 309 at hardness 76-180 mg/L, 429 at hardness 181-250 mg/L, determined based on-site water at hardness >250 mg/L.
(f) pH and temperature dependent ammonia guideline: values selected from Table 4 in BC WQG based on maximum temperature and pH.
(g) Chloride (Cl) dependent nitrite guideline: BC 30-d WQG (mg/L) = 0.02 at Cl <2 mg/L, 0.04 at Cl 2-4 mg/L, 0.06 at Cl 4-6 mg/L, 0.08 at Cl 6-8 mg/L, 0.10 at Cl 8-10 mg/L, 0.20 at Cl >10 mg/L.
(h) up to 4 – highly sensitive to acid inputs; 4 to 8 – moderately sensitive; over 8 – low sensitivity. Refer to alkalinity, the more restrictive of calcium or alkalinity applies.
(i) Max guideline is for hexavalent chromium.
(j) Hardness dependent lead guideline: BC 30-d WQG (mg/L) = (3.31 + exp(1.273*ln(hardness) - 4.704)) / 1000 at hardness >8 mg/L.
(k) Hardness dependent manganese guideline: BC 30-d WQG (mg/L) = 0.0044*hardness+0.605.
(l) Mercury BC 30-d WQG (mg/L) = 0.0001/(MeHg/THg), where MeHg is mass (or concentration) of methyl mercury and THg is total mass (or concentration) of mercury in a given water volume; assumed = 0.00001 at 1% MeHg.
(m) Hardness dependent nickel guideline: BC 30-d WQG (mg/L) = 0.025 at hardness <60 mg/L, (exp(0.76*ln(hardness)+1.06))/1000 at hardness <180 mg/L, 0.15 at hardness >180 mg/L.
(n) Hardness dependent silver guideline: BC 30-d WQG (mg/L) = 0.00005 at hardness ≤100 mg/L, 0.0015 at hardness >100 mg/L.
(o) pH dependent dissolved aluminum guideline: BC 30-d WQG (mg/L) = 0.05 at pH ≥6.5, exp(1.6-3.327*(median pH)+0.402*(median pH2)) at pH <6.5.
(p) Hardness dependent dissolved cadmium guideline: BC 30-d WQG (mg/L) = (exp(0.736*ln(hardness)-4.943))/1000.
(q) pH, dissolved organic carbon, and hardness dependent copper guideline was calculated using the BC copper biotic ligand model. BC 30-d WQG range calculated using minimum and maximum pH (6.4 – 8.9), dissolved organic carbon (1.3 to 13 mg/L), and hardness (44 – 58 mg/L) values.
(r) Hardness dependent zinc guideline: BC 30-d WQG (mg/L) = (7.5+0.75(hardness-90))/1000.
(s) Minimum, maximum, and median were calculated using absolute values; that is, when the summary statistic corresponded to a non-detect (ND) value in the dataset, the MDL was reported.
(t) Mean was not calculated for parameters with greater than 50% non-detect values. A median was reported where a mean was not calculated.
(u) 95th percentile was not calculated for parameters with less than 10 samples.
(v) 95th percentile was not calculated for parameters with greater than 95% non-detect values.

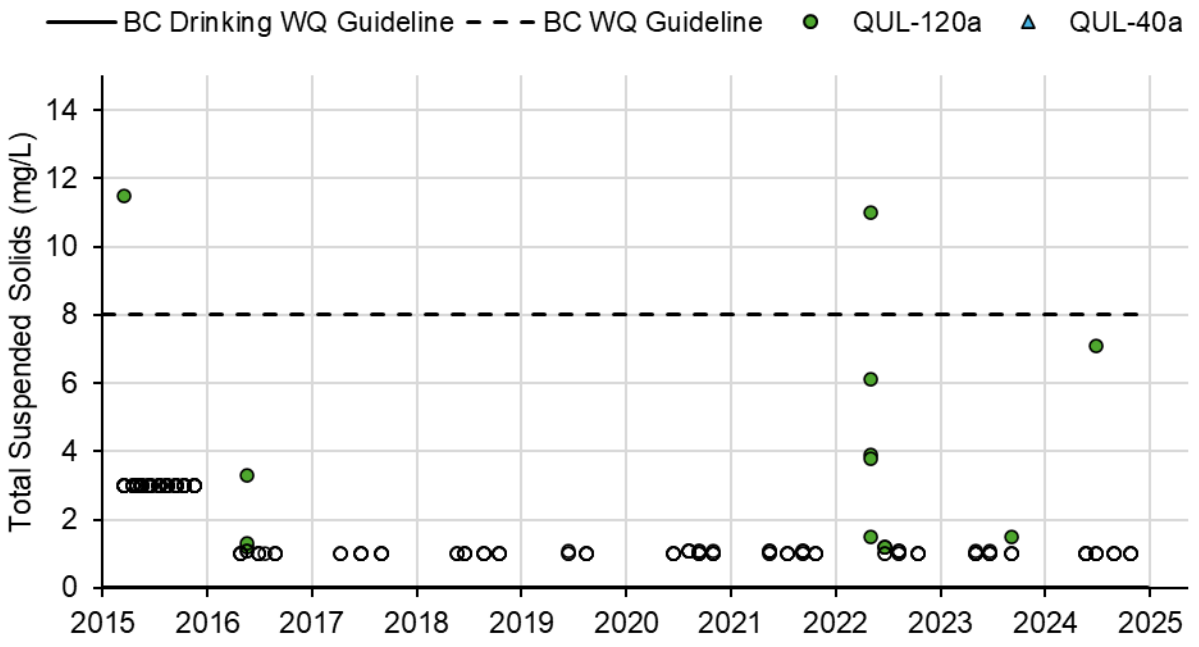
Underlined value = exceeds maximum BC Drinking Water Quality Guidelines.
Shaded value = exceeds 30-day average BC Water Quality Guidelines.

A = approved guideline; W = working guideline; Max = maximum guideline used; Min = Minimum concentration requirement based on life stage; WW = wildlife water supply guidelines; NC = not calculated; "<" = reported value is less than method detection limit (MDL).



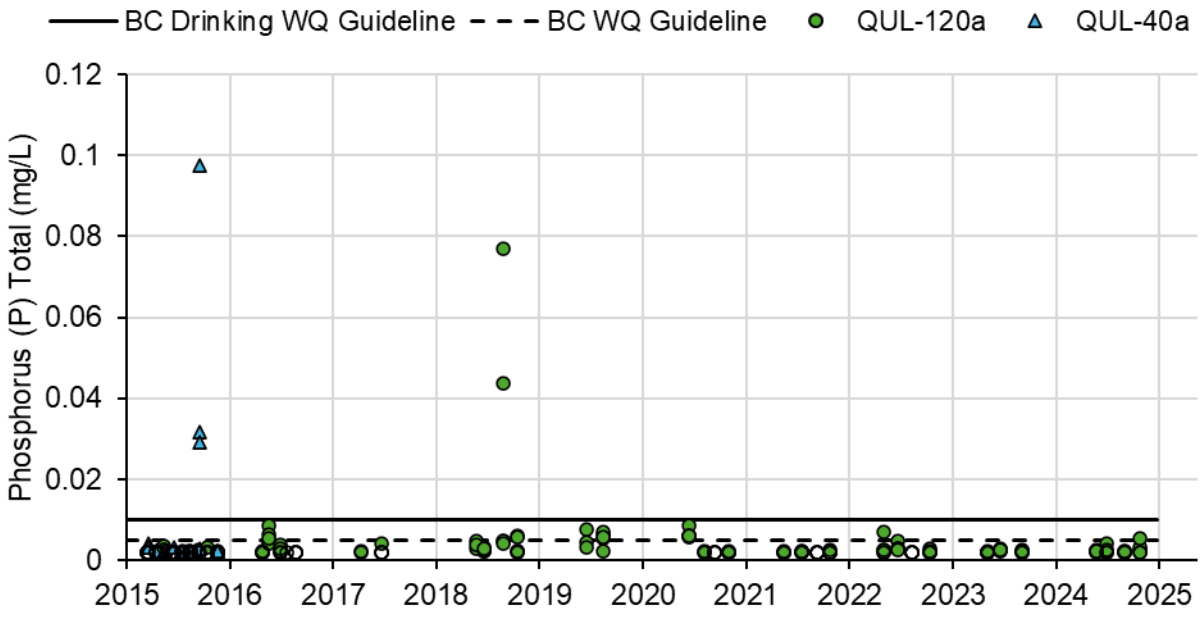
Note: Unfilled data points represent samples below detection limits.

Figure 11: Monitored Turbidity at QUL-40a and QUL-120a in Quesnel Lake, 2015 to 2024



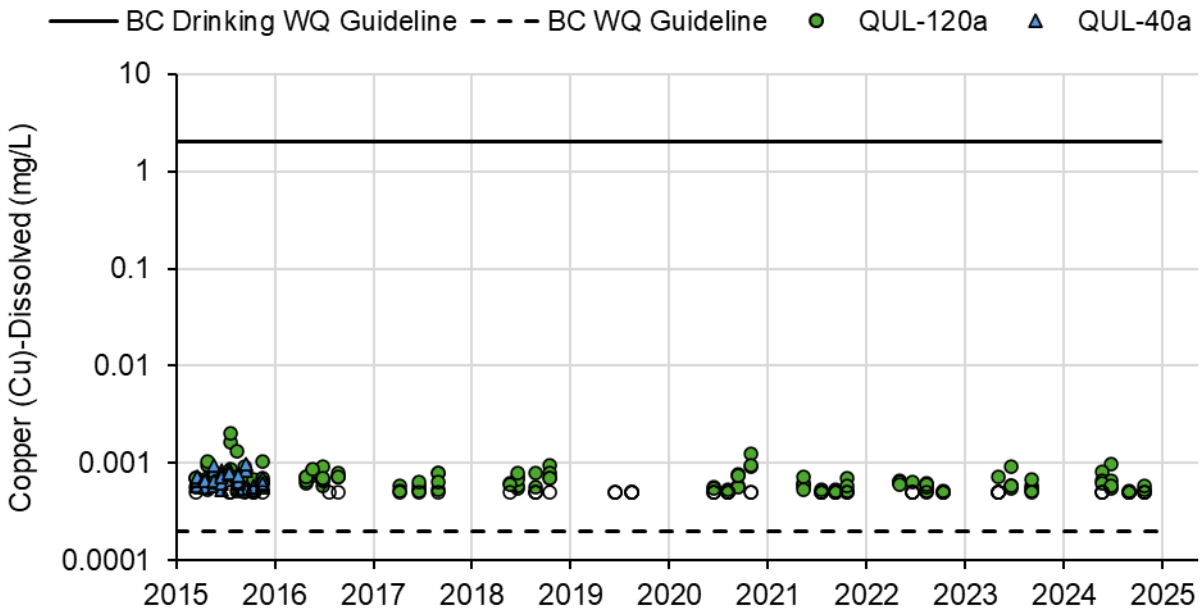
Note: Unfilled data points represent samples below detection limits.

Figure 12: Monitored Total Suspended Solids at QUL-40a and QUL-120a in Quesnel Lake, 2015 to 2024



Note: Unfilled data points represent samples below detection limits.

Figure 13: Monitored Total Phosphorus at QUL-40a and QUL-120a in Quesnel Lake, 2015 to 2024



Note: Unfilled data points represent samples below detection limits. The y-axis is presented using a logarithmic scale (base = 10).

Figure 14: Monitored Dissolved Copper at QUL-40a and QUL-120a in Quesnel Lake, 2015 to 2024

4.0 SITE WATER MANAGEMENT

4.1 Water Management Summary

A network of channels, ponds, and pumping systems is operated by MPMC for managing surface water at the mine. Contact (mine-affected) and non-contact water (non-mine-affected) systems are managed with the objective of avoiding the mixing of these waters.

The non-contact water system includes channels to divert runoff from undisturbed catchments away from mine infrastructure. Contact water from within the mine site is actively managed using on-site water management infrastructure and either used for the mill processes, temporarily stored on-site in the TSF or Wight Pit, or directed to the Water Treatment Plant (WTP) for subsequent treated water discharge through a pipeline to Quesnel Lake.

Gravity drainage generally flows from north to south across the site. On the eastern Polley Lake side of the Mine, contact water drains southeast towards Polley Lake and is collected mainly within Long Ditch, which flows south towards the CCS. On the western Bootjack Lake side of the Mine, contact water drains southwest towards Bootjack Lake and is collected mainly within West Ditch, which flows south into SERDS Ditch towards the CCS. Contact water at the CCS can either be transferred to Wight Pit or to the TSF for storage or directed to the PETBP for treatment and discharge.

The mine normally has a positive water balance, with discharge required during mine operations to prevent year-on-year accumulation of water on-site. The only currently permitted discharge of treated contact water from site occurs through the existing WTP and the Quesnel Lake pipe and diffusers. Water management during operations will continue per the current water management infrastructure. The existing WTP (Actiflo patented high-rate ballasted coagulation and flocculation and clarification process) is considered the Best Achievable Technology (BAT, BC ENV 2015) for treatment and discharge through assumed future operations (Golder 2015b).

The treatment flow rate of the existing WTP varies between approximately 0.21 m^3/s and 0.31 m^3/s, pending operator control of the plant and influent conditions. The allowable maximum discharge volume from site is currently 29,000 m^3/day (10.59 M-m^3/year, average of 0.33 m^3/s), as per EMA Permit 11678.

The mine's water management plan assumes minimal storage of contact water on-site, although during freshet (April through June) and extreme storm events, the volume of mine water runoff will exceed the discharge and treatment capacity, and temporary retention will be necessary to store contact water prior to treatment and discharge. Temporary water accumulation will occur in the TSF, Wight Pit, or in other available pit volume(s) if required. Temporary stored water will be discharged to the environment through the WTP following the freshet period or the storm event.

As the mine moves into closure and post-closure, the objectives of water management include returning the impacted land to pre-mining land functions. As the mine is constructed across a watershed divide, it is desired that during the post-closure period, drainages will be distributed back to their natural watersheds (i.e., to Bootjack Lake, Polley Lake, and Hazeltine Creek), provided that this can be achieved in an environmentally appropriate and permittable manner. MPMC has been proceeding with a program of evaluating and developing passive, semi-passive, and active water treatment technologies for their possible use during mine closure to support the goal of distributing discharge back into the pre-mining configuration using low-impact technologies. Two treatment options are considered the BAT for treatment during closure and post-closure: Option A – distributed passive/semi-passive treatment systems (applied to select sources), and Option B – pit-lake treatment followed by the centralized Actiflo plant (Golder 2016h). Option B is the current assumption for water treatment during closure/post-closure, but MPMC has also been progressing technology evaluations to support Option A.

This water management plan provides an overview on expected water quantity and quality required for treatment during both operations and closure/post-closure and provides an update on treatment technology development considered for closure/post-closure (Section 4.6).

4.2 Description of Source Inventory

Flow and water quality parameter inputs to the site water management tools, specifically the SWWBM and the SWWQM, are derived from a combination of measured data sources and assumed values based on established modelling practices and site knowledge. The primary objective of these water management tools is to predict the chemistry of water; in particular, the concentrations of constituents that have been identified in PE-11678 and how the loading behaves as water flows through disturbed and undisturbed landforms and constructed conveyance structures (e.g., ditches, pipelines, channels). The amount of loading (constituent concentrations) in contact water is generally influenced by the geochemistry of the source material (i.e., waste rock, ore) and the quantity of water. Non-contact water is not influenced by mine operations.

For the purposes of advancing the development of these water management tools, contact water flows can be classified as follows:

- **Waste rock contact water**—sourced primarily from waste dumps and ore stockpiles distributed throughout the mine.
- **Pit wall runoff**—sourced from the containment walls of excavated voids (i.e., pit shells).
- **Tailings Storage Facility**—sourced from the seepage collection system of the TSF.
- **Other**—site-wide sources for disturbed and undisturbed runoff and groundwater inflows.

As part of this WMP and water management framework, a source inventory (Table 24) has been compiled that identifies areas of the mine that generate mine-contact water. The inventory is intended to be a living database and may need to be updated as the mine layout changes over time or as the mine transition into closure becomes more defined. The source inventory is composed of the following data:

- Modelled or measured water quality data (i.e., station names, station UTM co-ordinates, number of samples, date range of samples).
- Modelled or measured flow (i.e., availability of flow records and a qualitative measure of how well the source is modelled in the SWWBM).

The water quality data from the source inventory is further defined and expanded upon in Section 4.4, where the water quality data are used to calibrate the SWWQM and provide context to the key findings from the model simulation results.

Table 24: Source Inventory

	Description	Water Quality			Data Source Coordinates	Water Quantity			
		Data Source[a]	Number of WQ Samples[b]	Period of Record (inclusive)	UTM Zone 10 (X/Y)[c]	Measured Flow Data	Period of Record (inclusive)	Number of Flow Records	Modelled Flows Available (Y = YES, N = NO; P = PARTIAL)[d]
Waste Rock Contact Water	Boundary Pit Waste Rock Seepage and Runoff	Boundary Dump SEEPS[e]	79	2013–2024	591906/5825223	No Data	-	-	P
	Wight Pit Waste Rock Seepage and Runoff	JCP[f]	73	2014–2024	593634/5823889	Spot Flow Data	2013–2020	73	P
	NAG Waste Rock Seepage and Runoff (including ore stockpiles)	SERDS SEEPS[g]	547	2013–2024	594452 / 5820998	Spot Flow Data (SERDS Ditch)	2014–2019 [n] 2021-2024 [o]	28 [n] 21,710 [o]	P
	Temporary NW PAG Stockpile Seepage and Runoff	PAG Dump SEEPS	151	2013–2024	590736/5823923	No Data	-	-	P
	Ore Stockpile Runoff	SERDS SEEPS	547	2013–2024	594452 / 5820998	Spot Flow Data (SERDS Ditch)	2014–2019 [n] 2021-2024 [o]	28 [n] 21,710 [o]	P
Pit Wall Runoff	Boundary Pit Wall Runoff	BP[h]	20	2016–2024	591784/5825446	No Data	-	-	Y
	Wight Pit Wall Runoff	E10[h]	137	2016–2024	592872/5825309	No Data	-	-	Y
	Cariboo Pit Wall Runoff	E8[h]	64	2016–2024	592128/5823173	No Data	-	-	Y
	Springer Pit Wall Runoff	E11[h]	58	2016–2024	591703/5823328	No Data	-	-	Y
Tailings Storage Facility	TSF Pumped Draindown	E5[i]	141	2014–2024	NA	No Data	-	-	P
	TSF Process Water	E1/E1a[j]	243	2011–2024	594480/5819669	No Data	-	-	Y
	TSF Seepage – Saturated	E1/E1a[j]	243	2011–2024	594480/5819669	No Data	-	-	P
	TSF Seepage – Unsaturated	E1/E1a[j]	243	2011–2024	594480/5819669	No Data	-	-	P
	TSF Beach Runoff	E1/E1a[j]	243	2011–2024	594480/5819669	No Data	-	-	Y
Other	Disturbed Runoff	W5[k]	312	2014–2024	593125/5822868	No Data	-	-	Y
	Undisturbed Runoff	W8[l]	220	2006–2024	597020/5817600	No Data	-	-	Y
	Groundwater Inflow	GW12/GW15[m]	346	2013–2024	594170/5822279	No Data	-	-	P

(a) Boundary Dump SEEPS, SERDS SEEPS, and PAG Dump SEEPS contain multiple sampling points in the vicinity of the prescribed area.
(b) Samples collected before the period of record are excluded.
(c) UTM Zone 10 X and Y coordinates are approximate and represent the general location of the sampling point. Certain areas have multiple sampling points in the vicinity of the prescribed area.
(d) “Partial” designation indicates that the SWWBM only captures selected elements of the source category. Flows are not calibrated due to a lack of adequate flow records at preferred calibration points.
(e) Seepage stations beside the waste rock piles near Boundary Pit.
(f) Located east of the start of the Long Ditch in a clearing.
(g) Seepage stations located between the Northeast Zone Dump, the SERDS and the SERDS Ditch.
(h) Water quality inputs assigned to pit wall runoff were based on SRK source terms for wall rock lithologies and proportions instead of source terms calculated from pit water monitoring data.
(i) Located in the main embankment seepage collection pond.
(j) Water quality assigned from model predictions of the TSF instead of source terms calculated from pit water monitoring data.
(k) Located in Bootjack Creek above Hazeltine Creek.
(l) Located in the Northeast Edney Creek Tributary.
(m) GW12 sample stations located in the Springer Pit Well and NW of the Temporary PAG Dump. GW15 sample stations located the South and North Springer Pit Wells.
(n) Flows sampled over the corresponding period of record.
(o) Flow measured at 15-minute intervals.

Source: Holmes 2020, pers. comms.; Ivens 2020, pers. comms.

WQ = Water Quality; SEEPS = Seepage; JCP = Joe’s Creek Pipe; NAG = Non-potentially Acid Generating; NW = Northwest; SERDS = Southeast Rock Disposal Site; PAG = Potentially Acid Generating; TSF = Tailings Storage Facility; NA = Not Available; MTD = Main Toe Drain; GW = Groundwater; SWWBM = site-wide water balance model.

4.3 Water Balance

This section describes the SWWBM, including discussion of calibration to observed data, implementation of updates to reflect the Springer Expansion LOM Plan and TSF 987 m proposed crest lift, and simulation results. The SWWBM represents a key water management tool that is used to confirm whether existing and proposed site Water Management Plans are adequate for supporting the permit application associated with the proposed TSF lift.

4.3.1 Water Balance Model

An update to the existing SWWBM was carried out using GoldSim™ (Version 15.0). The SWWBM was originally developed for the LTWMP to support the effects predictions in the LTWMP for the mine and has since been calibrated on an annual basis (refer to WSP 2025b for the 2024 annual calibration). WSP incorporated the Springer Expansion LOM Plan (MPMC 2023b) for the implementation of future operations scenario in the SWWBM.

The updated SWWBM simulates the site water circuitry (the logic driving water transfers, discharges, and flows on-site) under the assumed future operations scenario. The model is built to predict inflows and outflows to major storage locations and conveyance structures on-site. The model accounts for operational, closure, and post-closure phases, estimates contact water volumes and retention needs and supports water treatment and discharge planning. The SWWBM water quantity projections are then fed into the SWWQM to generate predictions on water quality parameter concentrations at selected locations of interest.

4.3.1.1 General Assumptions and Key Input Parameters

General assumptions applied to this model update are as follows:

- There is no seepage from the ponds or sumps other than the TSF and major pits (i.e., all ponds and sumps are assumed to be lined, or seepage is assumed to be negligible).
- Direct precipitation, evaporation, and seepage loss from ditches are assumed to be negligible.
- Precipitation occurs as snow from December to February and as rain or a mixture of rain and snow in all other months.
- Snowpack is represented by the cumulative precipitation depths over the months of December, January, and February, spanning a period of three months.
- Snowmelt occurs in the months of March, April, and May as a percentage of the maximum snowpack at the end of February (5% in March, 90% in April, and 5% in May).
- The closure and post-closure phases are included in the SWWBM, and the flow logic and model wiring for these phases are based on the 2022 Reclamation and Closure Plan (RCP) (Golder 2022a).
- At the start of closure, the combined Springer-Cariboo pit is allowed to fill and is no longer actively dewatered, reducing the total contact water requiring annual treatment. All other catchment contact water is centrally collected and treated at the WTP prior to discharge.
- At the start of post-closure, multiple catchments are considered remediated and no longer generating contact water and are assumed to directly discharge to the environment. Only TSF contact water and TSF seepage is treated at the WTP prior to discharge.

The detailed methodology, assumptions, and inputs used in the SWWBM are presented in the Mine Water Balance Model Report in Appendix A. The following Appendix A sections provide a comprehensive breakdown of the model components:

- Section 4.5.1: Climate inputs
- Section 4.5.2: Hydrology inputs
- Section 4.5.3: Groundwater inputs
- Section 4.5.4: Storage Capacities
- Section 4.5.5: Mine Plan
- Section 4.5.6: TSF Pond Volumes

4.3.1.2 Model Scope and Flow Diagram

The scope and structure of the SWWBM is outlined in the conceptual flow diagram for forecasted future operations in Figure 15. The flow diagram illustrates the water circuitry at the Mine, including operational storage, conveyance, and discharge of water. The water management infrastructure modelled within the SWWBM is summarized in Table 25. The flow types that are programmed into the SWWBM are outlined in Table 26.

From closure and progressively to post-closure, certain Site areas will be reclaimed, therefore reducing the annual volume of contact water. Pumping rates for the Site will be reduced at the end of the closure period, as certain areas are assumed reclaimed. Closure and post-closure flow diagrams are shown in Figure 16 and Figure 17, respectively.

Table 25: Water Management Infrastructure

Major Ditches	Sumps and Minor Ponds	Major Ponds and Storage Facilities
▪ Long Ditch ▪ SERDS Ditch (lower portion of West Ditch)	▪ South Embankment Seepage Pond ▪ Main Embankment Seepage Pond ▪ Central Collection Sump ▪ Bootjack Creek Sump ▪ Mill Site Sump ▪ Mine Drainage Creek Sump ▪ NW Sump ▪ 9K Sump ▪ Boundary Pit ▪ SERDS Sump ▪ Upper and Lower Long Ditch Sumps ▪ TSF Booster Sump ▪ NEZ Sump ▪ NEZ Booster Sumps	▪ TSF ▪ Combined Springer-Cariboo Pit ▪ Wight Pit ▪ Perimeter Embankment Till Borrow Pond

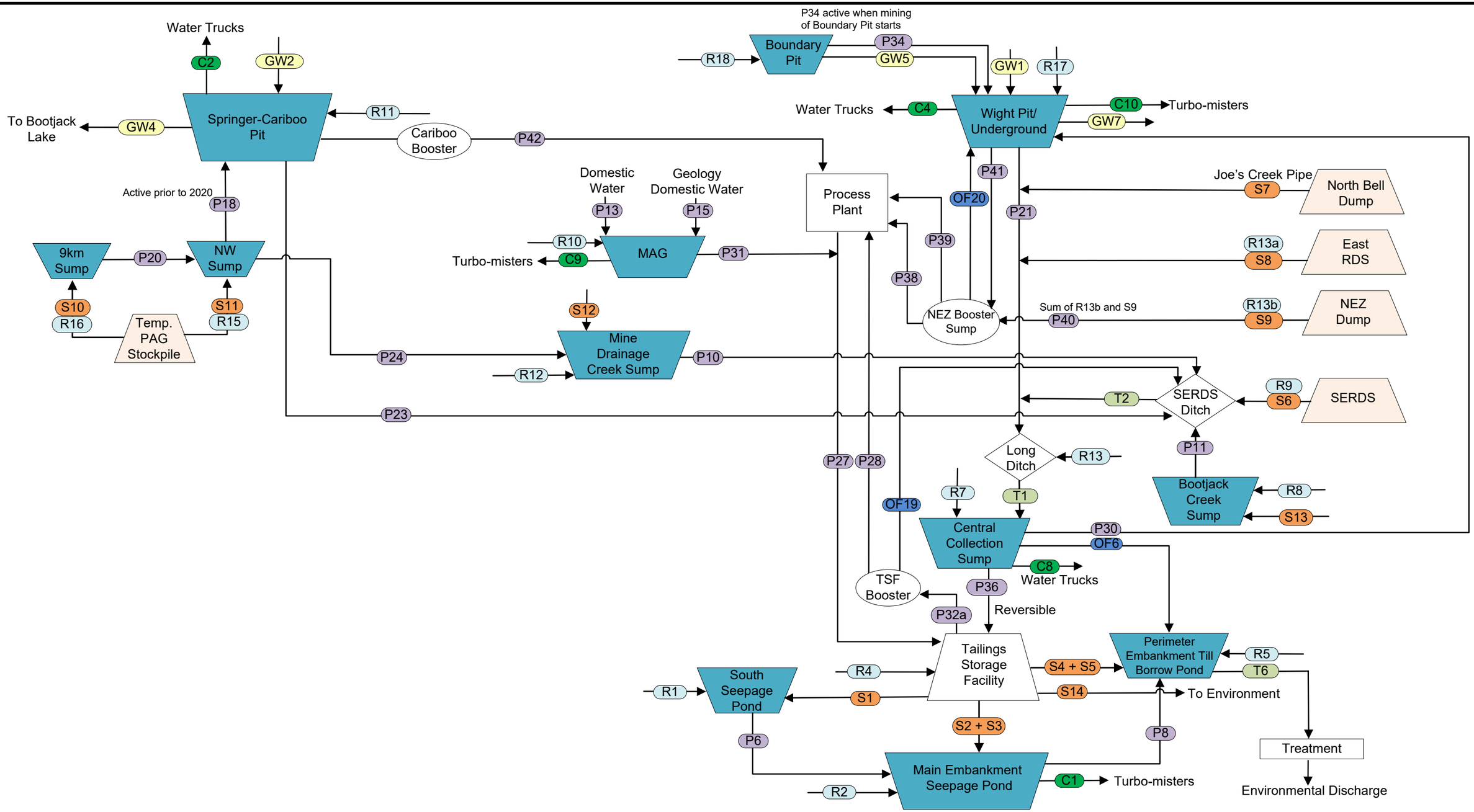
Source: WSP 2025d.

NEZ=Northeast Zone; NW=Northwest; SERDS=Southeast Rock Disposal Site.

Table 26: Types of Flows Represented in the SWWBM

Site Inflows	Site Outflows or Transfers
▪ Direct precipitation ▪ Runoff ▪ Seepage (includes baseflows)	▪ Water consumption flows (turbo-misters, and water trucks) ▪ Water treatment discharge ▪ permanent, unrecoverable storage in tailings (interstitial water) ▪ Open water evaporation ▪ Pumped flows between facilities ▪ Transfer flows (gravity flows between facilities) ▪ Groundwater flows

Source: WSP 2025d.



Runoff (R)
Seepage Flow (S)
Water consumption (C)
Pumped Flows (P)
Groundwater Flows (GW)
Overflow (OF)
Transfer Flows (T)

Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

wsp

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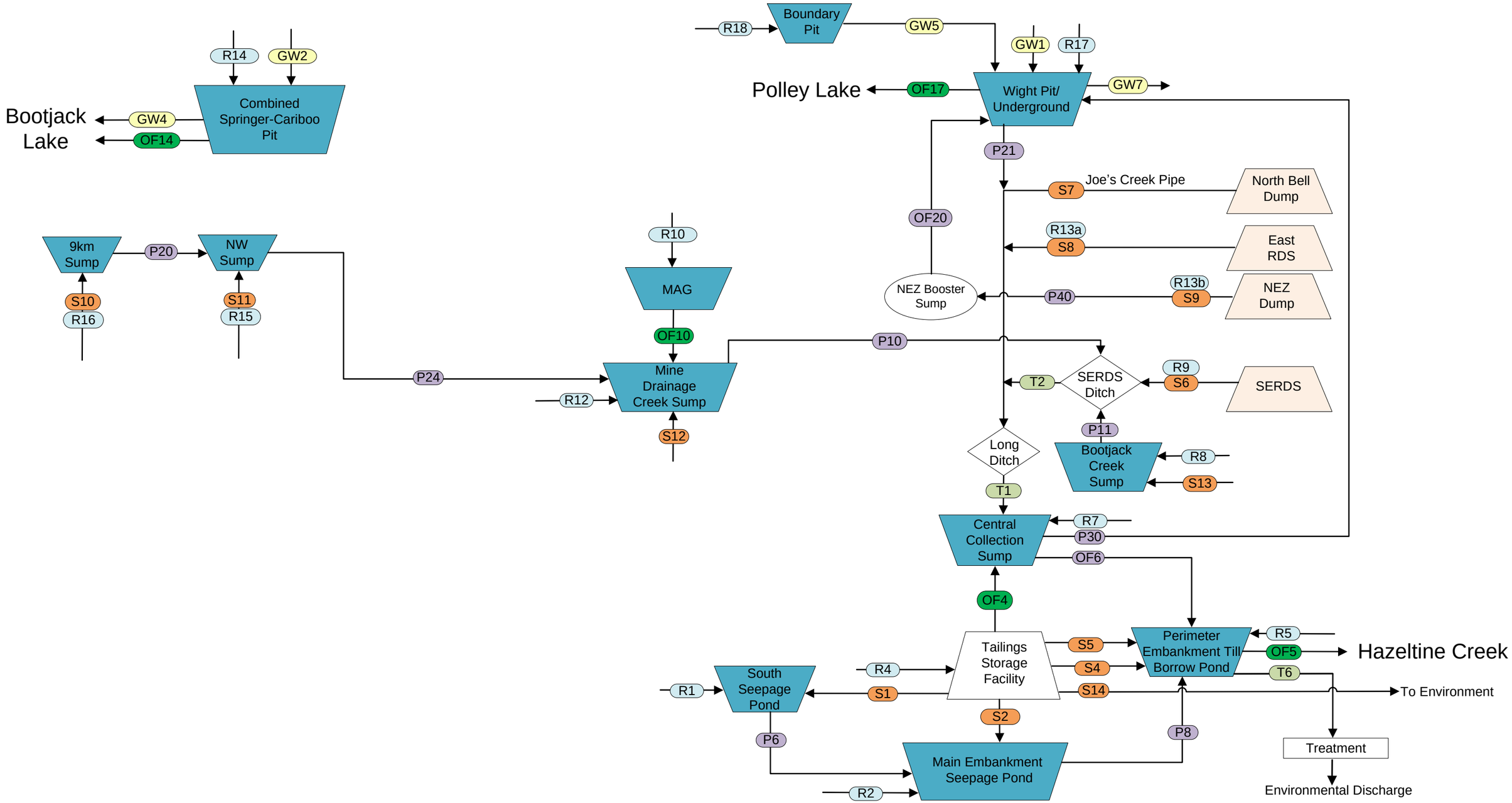
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DATE: 28 AUGUST 2025

CHECKED: TS
DATE: 28 AUGUST 2025

SCALE: Not to Scale
PROJECT No: CA0047730.8440/31191

TITLE: **Site Wide Water Balance Operational Phase Flow Diagram**

FIGURE No: 15
REV No: 0



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

wsp

CLIENT: Mount Polley Mining Corporation

DRAWN: SC
DATE: 28 AUGUST 2025

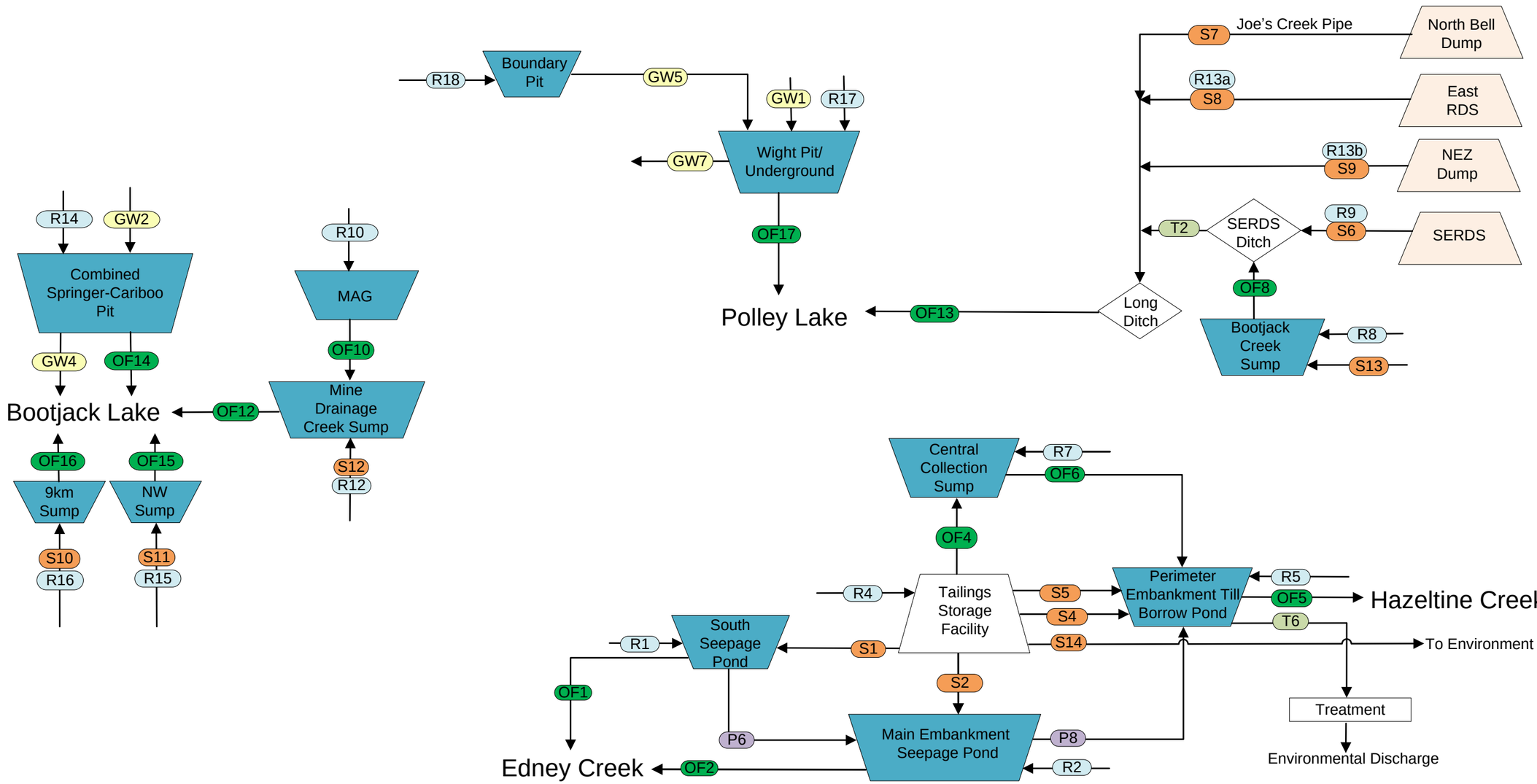
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DATE: 28 AUGUST 2025

SCALE: Not to Scale
PROJECT No: CA0047730.8440/31191

TITLE

Site Wide Water Balance
Closure Phase Flow Diagram

FIGURE No: 16
REV No: 0



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

CLIENT: Mount Polley Mining Corporation

DRAWN: SC
DATE: 28 AUGUST 2025
CHECKED: TS
DATE: 28 AUGUST 2025
SCALE: Not to Scale
PROJECT No: CA0047730.8440/31191

TITLE

Site Wide Water Balance
Post-Closure Phase Flow Diagram

FIGURE No: 17
REV No: 0

4.3.1.3 Catchment Areas

Catchment areas for each storage element were defined in the model to enable the simulation of runoff. The modelled catchments areas for operations and closure are shown in Table 31 and illustrated in Figure 18.

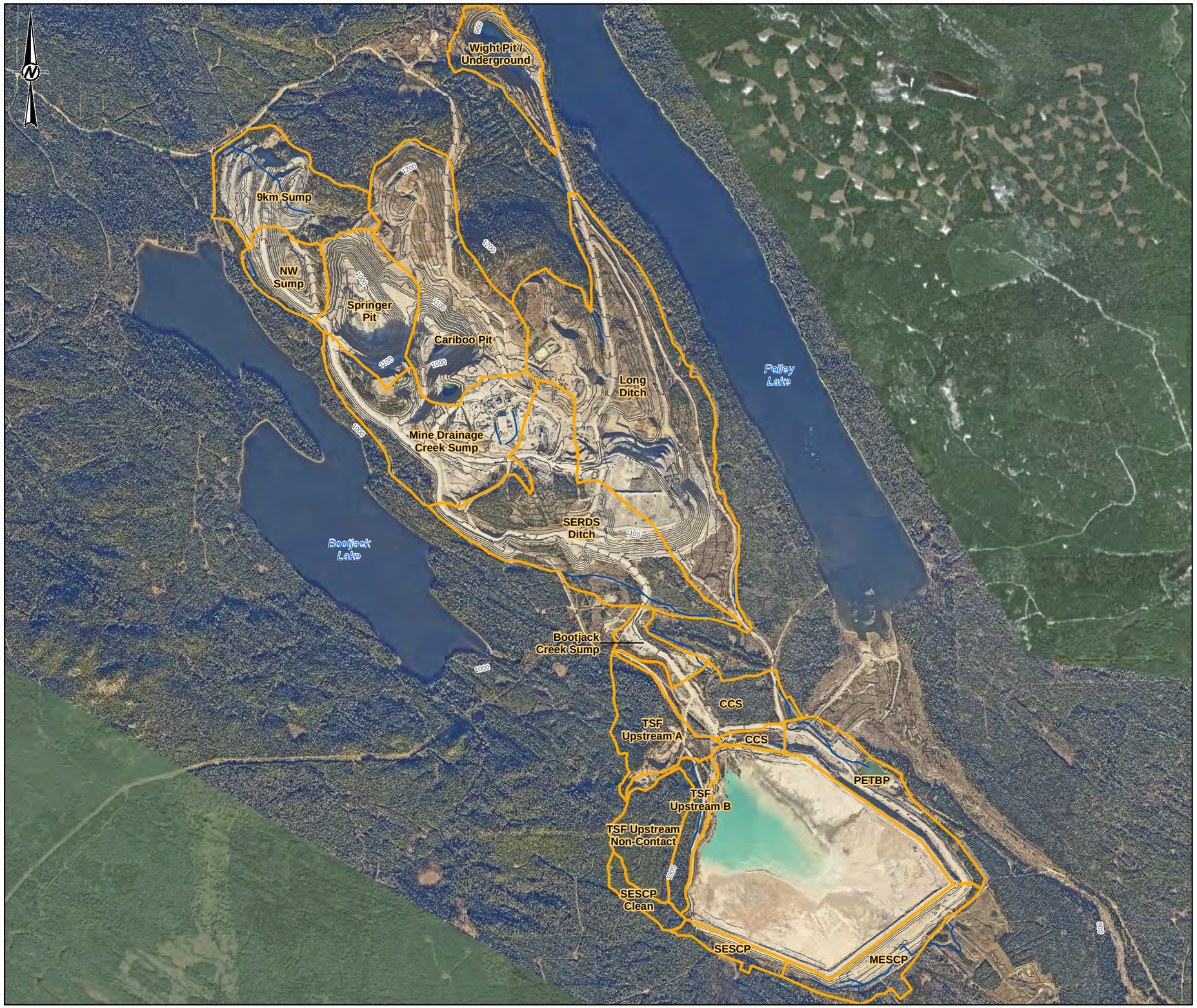
Table 27: Current Catchment Areas for SWWBM Storage/Conveyance Elements

Storage or Conveyance Element	Total Reporting Area (m^2)		
	Operations[(a)]	Operations[(b)]	Closure
South Embankment Seepage Pond	238,971	234,673	234,673
Main Embankment Seepage Pond	411,218	494,830	494,830
TSF Upstream Catchment (External)	1,066,326	951,910	951,910
TSF Impoundment Catchment (Internal – current)	2,382,476	2,511,150	2,511,150
Perimeter Embankment Till Borrow Pond (PETBP)	516,967	633,750	633,750
Central Collection Sump (CCS)	499,160	510,713	510,713
Bootjack Creek Sump	175,259	175,259	175,259
SERDS Ditch	1,538,407	1,538,407	1,538,407
Mill Site Sump	1,628	1,628	1,628
Mine Drainage Creek Sump	1,116,583	1,116,583	768,219
Long Ditch	2,495,465	2,495,465	2,495,465
Combined Springer – Cariboo Pit	1,981,274	1,981,274	2,329,638
NW Sump	330,391	330,391	330,391
9K Sump	745,648	745,648	745,648
Wight Pit	414,151	414,151	414,151
Boundary Pit	33,029	33,029	33,029
Total Reporting Area	**13,946,953**	**14,168,861**	**14,168,861**

(a) Based on the TSF 974m configuration for TSF catchments.

(b) Based on the TSF 987m configuration for TSF catchments.

Source: Golder 2016a and updates in this SWWBM.



LEGEND

- WATER CATCHMENT AREA
- WATER COLLECTION DITCH
- CONTOUR (10m)

0 600 1,200

1:30,000 METRES

REFERENCES

1. WATER CATCHMENT AREAS INTERPOLATED BY WSP (2025).
2. CONTOURS OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2019).
3. PROJECT IMAGERY OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2023).
4. BASE IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.
5. TSF UPSTREAM CATCHMENTS ARE SUBJECT TO CHANGE AS THE TSF EMBANKMENTS ARE RAISED TO THE ULTIMATE CREST ELEVATION OF 987 M. ANNUAL WATER BALANCE MODEL REVISIONS WILL ACCOUNT FOR THESE CHANGING CATCHMENTS TO BEST ESTIMATE CURRENT OPERATING CONDITIONS.
6. DATUM: NAD 1983 UTM ZONE 10N

CLIENT
MOUNT POLLEY MINING CORPORATION

PROJECT
WATER MANAGEMENT PLAN

TITLE
WATER CATCHMENT AREAS

CONSULTANT

wsp

YYYY-MM-DD	2025-10-31
DESIGNED	SC
PREPARED	CDB
REVIEWED	GD
APPROVED	JM

PROJECT NO.	PHASE	REV.	FIGURE
CA0047730.8440	31100A/31191	0	**18**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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4.3.1.4 Climate Inputs

The climate datasets are derived from local and site-based climate stations as described in Section 3.2.1. The climate inputs used in the SWWBM are described in more details in Section 4.5.1 of the SWWBM report in Appendix A.

4.3.1.5 Hydrology Inputs

The processes and inputs that define the SWWBM's hydrology are described in more details in Section 4.5.2 of the Mine Water Balance Model Report (Appendix A).

4.3.2 Water Balance Calibration

Models are representations of systems, and as a result, accuracy will vary. Models are used to provide an indication of a system and how the system behaves under certain conditions. Calibration and validation exercises are used as an indicator of how well the model replicates conditions during the calibration period and provide the basis for future projections assuming that past behavior is an indicator of future behavior. The level of accuracy in model calibrations is dependent on the availability and quality of historical data and whether the logic for transferring or storing water is representative of actual conditions. If there are significant changes to the system that is being modelled, then those assumptions should be validated through additional model calibration as more monitoring data become available.

4.3.2.1 Calibration Period

The calibration period is from January 1, 2017, to December 31, 2024. An 8-year period was selected to capture variable climatic, operational, and hydrological conditions that have been experienced on-site.

4.3.2.2 Tailings Storage Facility Water Volume

The TSF represents one of the largest designated water storage facilities at the mine. The large volume capacity of the facility, coupled with the availability of water level and survey data, and the TSF's role in the production mill reclaim water system, means the structure is a key indicator of large water volume changes on-site, and with that, a good location for conducting a calibration check that is representative of the entire mine. A calibration check was carried out for the TSF water volume. Measured TSF water levels and operational water transfer data formed the primary inputs (e.g., water transfers to the Springer or Cariboo pits, production mill process flows, and water transfer to and from the PETBP). In addition, a global water balance check was performed to check that the difference between total water inflows and total water outflows was equal to the change in site storage.

Initial model simulation runs during the 2016 calibration, without any adjustments, revealed poor agreement for selected periods. To account for these differences, general seasonal runoff coefficients (July to February) were assigned a 30% increase (scalar factor applied to the runoff coefficients for the applicable period) to represent higher antecedent moisture conditions during March to June if the previous month accumulated more than 50 mm of precipitation depth. In addition, general runoff coefficients were applied to what was defined as dry period in the LTWMP. Climate records obtained from a nearby ECCC station (Spokin Lake 4E; 1097646) appeared to support the hypothesis that rain-on-snow events, occurring for short and discrete periods, would have contributed to higher runoff conditions. These runoff coefficient assumptions have remained in the model since the 2016 calibration and have resulted in the annual TSF volume correlation shown in Figure 19.

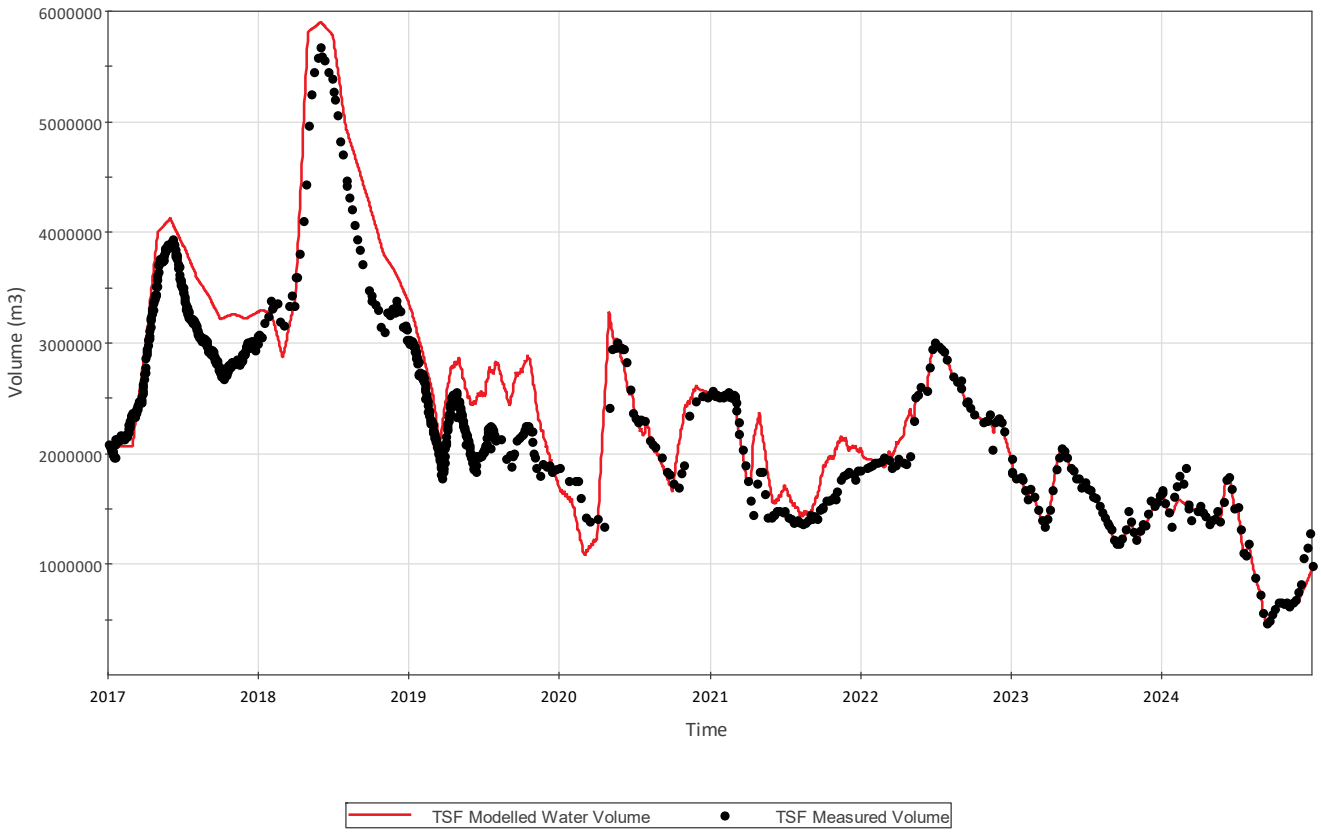


Figure 19: TSF Free Water Volume Calibration from January 1, 2017, to December 31, 2024

As illustrated in Figure 19, the TSF modelled water volumes appear to demonstrate good agreement between modelled and inferred water volumes (water level measurements converted to a volume using interpolated stage-storage curves), with modelled volumes consistently tracking inflection points (change from accumulation to depletion or vice-versa). There are select periods where the calibrated model is over-estimating or under-estimating the inferred volumes.

Additional calibration information was also assessed for Wight Pit as a main storage element for the 2024 SWWBM calibration (WSP 2025b).

Remaining differences between modelled and inferred values may have several explanations:

- Variability in runoff coefficient throughout the year.
- Uncertainties in the climate data, e.g.:
  - Data gaps exist from on-site climate station data collection (evaporation, precipitation) and data infill assumptions are made.
  - Snowpack surveys can miss intermittent snowmelt if conducted infrequently and the use of composite datasets may over or under-estimate actual conditions.
- Uncertainties in the TSF bathymetric survey (e.g., the transition between exposed tailings surface [i.e., beach] and free water can be complex).

- Uncertainties associated with the tie-in of the October 30, 2023, TSF storage curve with the July 15, 2024, TSF storage curve.
- Potential inaccuracies in water level measurements and recorded actual flow transfers on Site.
- Potential inaccuracies and/or missing WTP discharge data.
- Potential differences between modelled water transfer rates and actual transfers on Site.
- Potential inaccuracies regarding the inflows and outflows of groundwater to the pits, particularly the Wight Pit.

The modelled results from the SWWBM calibration reasonably approximate long-term site conditions and trends, particularly at the TSF, supporting its suitability for water management planning, subject to further assessment and calibration as recommended.

4.3.3 Tailings Access Road & Wrap-Around Road

Two new road facilities are anticipated for the site between the SERDS and TSF areas of the site which will impact site water management. The Tailings Access Road (TAR) and the Wrap-Around Road (WAR) are both shown with proposed contours for the facilities in Figure 20. Two designs are shown for the TAR, the proposed design for current operations TAR (V3), and the LOM design for the proposed ultimate operations TAR (LOM). The extents of the current operations proposed TAR and WAR are also indicated on Figure 5, where the nearby site water management infrastructure can be identified.

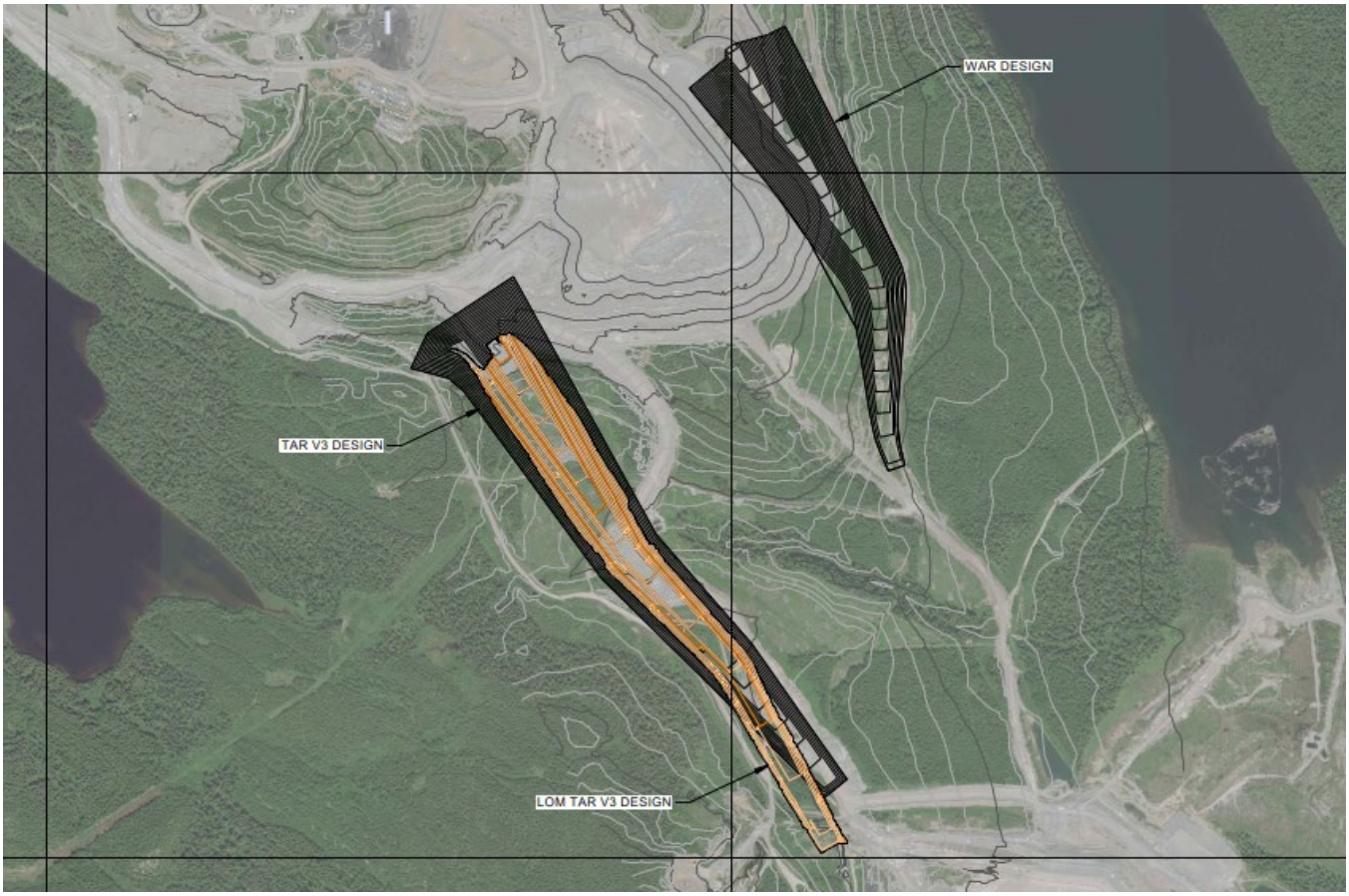


Figure 20: Contour Designs for Tailings Access Road (TAR) and Wrap-Around Road (WAR)

For the WAR, the eastern extents of the road will be constructed along Long Ditch and will not impact the conveyance in that channel. The SERDS ditch connection to Long Ditch is south of the proposed WAR and will not be impacted by the road. Contact water collected from the WAR will continue to report to Long Ditch, as was the case of the WAR catchment area prior to the new road design.

For the TAR, some existing pipelines can be seen within the proposed TAR extents in Figure 5, and these pipelines will be relocated to the western extent of the TAR to remain accessible. Near the north end of the TAR, the SERDS ditch crosses under the road through buried culverts and the general routing of the SERDS ditch is not impacted. Contact water will be collected along the bottom toe of the eastern and western slopes of the TAR and will drain to the same catchments as prior to the new road design. At the north end of the TAR, contact water will drain to SERDS ditch. Contact water collected at the centre area of the TAR will drain to Bootjack Creek sump, and contact water collected at the south area of the TAR will drain to the CCS. Water management infrastructure details at the south end of the TAR, where TAR contact water channels connect to TSF contact water channels, is shown in the water management infrastructure design package submitted with the TSF 987m crest permit application.

The addition of the TAR and WAR does not impact the SWWBM, as the model elements are at catchment scale and not individual channel/ditch scale and the contact water generated in TAR and WAR catchment areas is still routed to the same catchment collection points after road construction. As the roads are constructed, annual

SWWBM updates will be implemented to account for the actual changes in catchment area ground conditions as the road surface and NAG rock portion of the catchment will increase.

4.3.4 Water Balance Results

The updated SWWBM results are intended to inform the water quality assessment for this WMP. The primary use of the water quantity and quality assessments are to predict whether the discharge water quality from the mine during operations will meet the permit-required parameter concentrations and discharge quantities and to estimate and anticipate water treatment requirements into the future. This section provides an overview of the key results of the SWWBM. Full detailed SWWBM results can be found in Appendix A.

Quantity of Discharge

Throughout the entire planned future operations and closure period to July 31, 2041, the maximum treatment capacity of the WTP in the model is assumed to be 25,000 m^3/day (0.29 m^3/s, 9.15 M-m^3/year). Excess water beyond this discharge rate is temporarily stored within the Wight Pit and the TSF until it can be treated and discharged. In some cases, overflow from the PETBP in extreme event is also simulated and those volumes are included in the reported annual treatment volumes so that they are accounted for in the predicted annual treatment requirement. Centralized collection and treatment of contact water is assumed during operations, closure, and post-closure. The Mine's current discharge permit authorizes a maximum daily discharge volume of 29,000 m^3/day, as per EMA Permit 11678.

In year 2041, the assumed treatment capacity of the WTP in the model remains at 25,000 m^3/day (0.29 m^3/s). However, annual contact water requiring treatment is reduced over the post-closure phase as site areas are remediated and some catchments no longer generate contact water, as shown in Figure 17. The annual contact water treated discharge volume declines further in year 2051 when the South Embankment Seepage Pond and Main Embankment Seepage Pond catchments are considered remediated, commencing 10 years after the post-closure phase. At the end of the operations phase, contact water requiring treatment increases in 2031, as milling is assumed to terminate in 2031 and the demand for milling process water also terminates.

Predicted annual contact water volumes requiring treatment, including simulated overflow volumes from the PETBP, from operations to post-closure are presented in Table 28.

Table 28: WTP Annual Volume Requiring Treatment and Simulated PETBP Overflows (M-m³)

Year	Annual Volume Requiring Treatment at WTP (M-m³)		
	50th Percentile	90th Percentile	99.5th Percentile
2025	5.05	6.11	7.76
2026	3.20	4.32	5.73
2027	3.31	4.45	5.98
2028	3.32	4.52	6.07
2029	3.31	4.43	6.01
2030	3.40	4.60	6.26
2031 (a)	4.60	5.71	6.62
2032	5.28	6.16	7.56
2033	5.09	6.03	7.42
2034	5.08	5.97	7.31
2035	4.88	5.75	7.11
2036	4.50	5.30	6.30
2041 (b)	3.53	3.99	4.49
2046	1.56	1.94	2.64
2051	1.11	1.39	1.96
2071	0.22	0.42	0.96
2091	0.22	0.41	1.07
2111	0.22	0.40	1.00
2131	0.22	0.42	1.03
2165	0.22	0.40	0.97

(a) Closure starts on August 1, 2031.

(b) Post-closure starts on August 1, 2041.

Tailings Storage Facility

Temporary detention of water in the TSF is expected to manage the runoff volumes generated during freshet (typically April to June). The inflows during freshet will exceed treatment capacity, and may also exceed transfer capacity to Wight Pit, and detention volume is required in the TSF to prevent uncontrolled release.

The TSF is available to store excess freshet water until four months after the start of closure. At that time, the TSF pond will decrease its volume to 0.25 M-m³, the assumed maximum TSF water volume at closure. To create the reduced TSF pond, a closure spillway will be constructed at the north abutment (Corner 5) of the TSF.

During closure and post-closure, the TSF catchment is modelled to discharge annually via the spillway, and the TSF water volume will vary seasonally, limited by the spillway invert, to a maximum of approximately 0.25 M-m³. As from Figure 21, the water volume fluctuation follows a consistent pattern during both closure and post-closure periods, with minimum values occurring in winter and reaching maximum capacity during freshet (0.25 M-m³).

Figure 21 shows the water volume in the TSF throughout future operations and into closure until 10 years after post-closure. The TSF water volume pattern shown for the 2041-2051 post-closure period TSF volume trend is continued for the remaining 80 years of post-closure (until 2131). Table 35 shows tabulated minimum, average, and maximum bounds for the three percentile trends shown in Figure 21.For most percentile results, the TSF pond volume can be maintained at the 0.75 M-m³ target throughout the year; however, in some scenarios above the 95th percentile, additional storage in the TSF is predicted, up to 2.15 M-m³ pond water volume.

Table 29: TSF Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	736,063	736,063	743,022
	Average	749,194	749,205	1,033,212
	Maximum	750,000	750,000	2,149,922
Closure	Minimum	0	0	0
	Average	30,597	78,769	158,240
	Maximum [a]	233,616	257,209	257,209
Post-closure	Minimum	0	0	0
	Average	23,700	66,224	145,931
	Maximum	176,718	257,209	257,209

(a) These values are representative of the closure period after the transitional phase from operations.

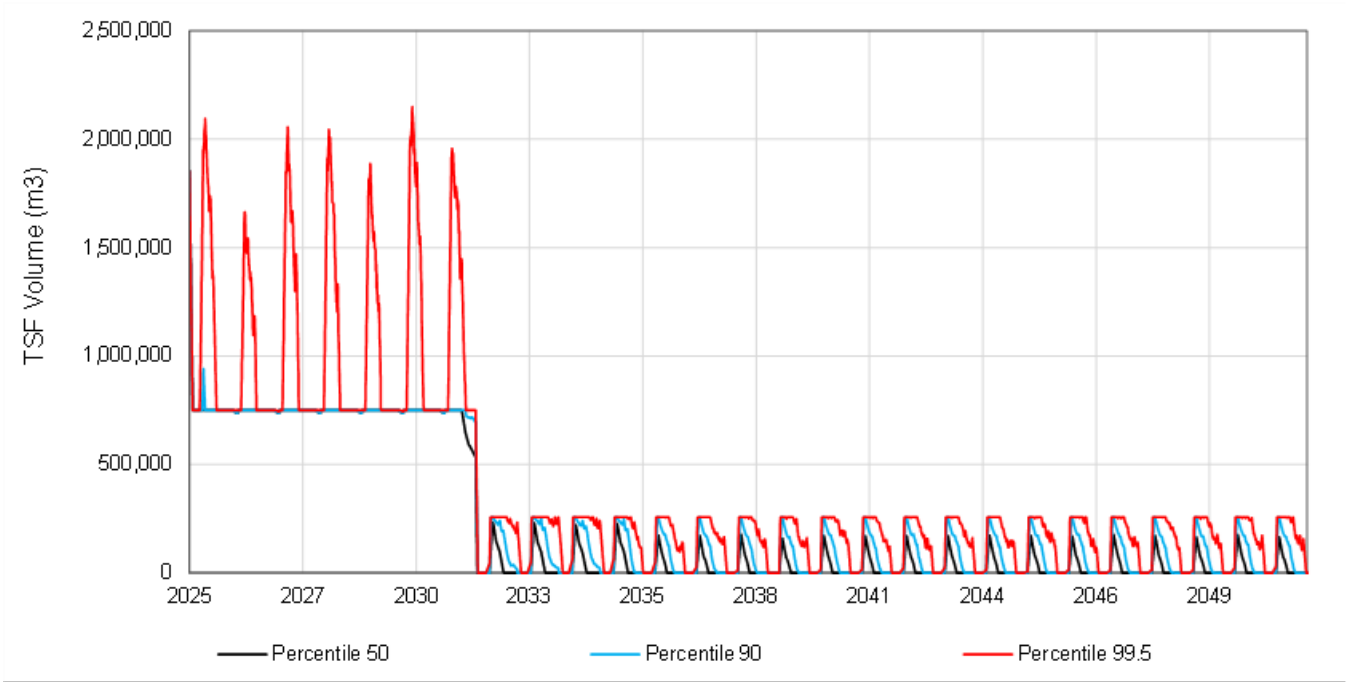


Figure 21: TSF Water Volume During Operations to 10 Years After Post-closure

Combined Springer-Cariboo Pit

Springer Pit and Cariboo Pit were modelled as a single combined pit. A result comparison between different percentiles for predicted combined Springer-Cariboo Pit volume during operations, closure and post-closure is provided in Figure 22. The simulations were run from an initial storage volume of 0 m^3, as Springer-Cariboo Pit will be actively dewatered during operations, then allowed to fill at closure.

During operations, no water is stored in the Springer–Cariboo Pit for the 50th percentile scenario, while volumes reach approximately 62,000 m³ and 663,000 m³ for the 90th and 99.5th percentiles, respectively. These volumes reflect temporary retention, when inflows exceed available pit dewatering transfer capacity.

At closure, Potentially Acid Generating (PAG) waste rock will be stacked uniformly to an elevation of 964 m in the base of the Springer-Cariboo Pit at the end of the operations phase, for a total volume of 37 M-m^3. Results of the simulations indicate that water levels within the pit will cover the PAG material placed in pit by approximately 2040 (99.5th percentile), 2041 (90th percentile), and 2042 (50th percentile).

The pit will then fill up to its overflow volume of 72.4 M-m³, at which point water would begin to discharge. Under the 50th percentile results, the Springer-Cariboo Pit lake is estimated to start overflowing in 2152, while under the 90th percentile it is estimated to start overflowing in 2148, and in 2143 under the 99.5th percentile.

Table 30: Springer-Cariboo Pit Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	0	0	0
	Average	0	140	30,529
	Maximum	0	61,978	663,068

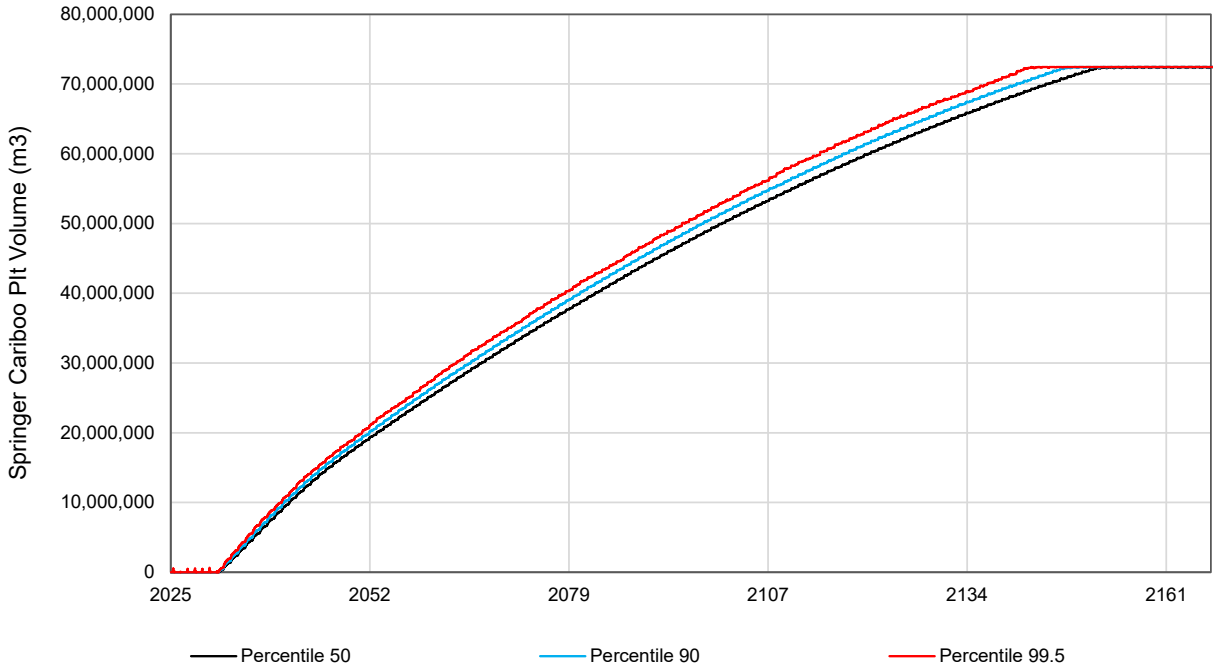


Figure 22: Springer-Cariboo Pit Water Volume from Closure

The Springer-Cariboo Pit is modelled to fill to its maximum volume during post-closure. Following that time, additional volume collected in the combined pit will overflow from the pit's spillway and is assumed to direct discharge to the receiving environment in the SWWBM. Water quality and water treatment is further discussed in Section 4.6.1.

Table 31 shows the modelled average annual overflow volume from the combined Springer-Cariboo Pit, once the pit fills and begins overflow via an engineering discharge or the assumed spillway.

Table 31: Combined Springer-Cariboo Pit Annual Overflow (m^3)

Phase	Combined Springer-Cariboo Pit Annual Average Overflow (m^3)		
	50th Percentile	90th percentile	99.5th percentile
Post-Closure	307,356	533,658	923,540

Wight Pit

During operations, temporary detention of water in the Wight Pit will be necessary to manage the runoff volumes generated during freshet. The water volume in Wight Pit is expected to increase during each freshet season and will be removed as soon as there is available capacity for treatment in the WTP.

The TSF pond will be reduced to 0.25 M-m^3 within two months into the closure phase, after which Wight Pit will still be used to store excess contact water. During post-closure, Wight Pit will no longer be used for freshet storage and will be allowed to fill. Wight Pit is projected to start overflowing in 2044 under the 50th and 90th percentile results, and in 2043 under the 99.5th percentile results. Overflow from Wight Pit during post-closure is assumed as direct environmental discharge to Polley Lake and the water quality implications of this assumption are discussed in the water treatment section of this WMP. Estimated volumes stored in Wight Pit from operations to 10 years after post-closure are presented in Table 32 and Figure 23 and the average annual post-closure overflow volumes are shown in Table 33.

Table 32: Wight Pit Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	1,351,273	1,466,804	1,528,049
	Average	1,918,290	2,188,512	2,562,768
	Maximum	2,784,487	3,235,582	3,283,925

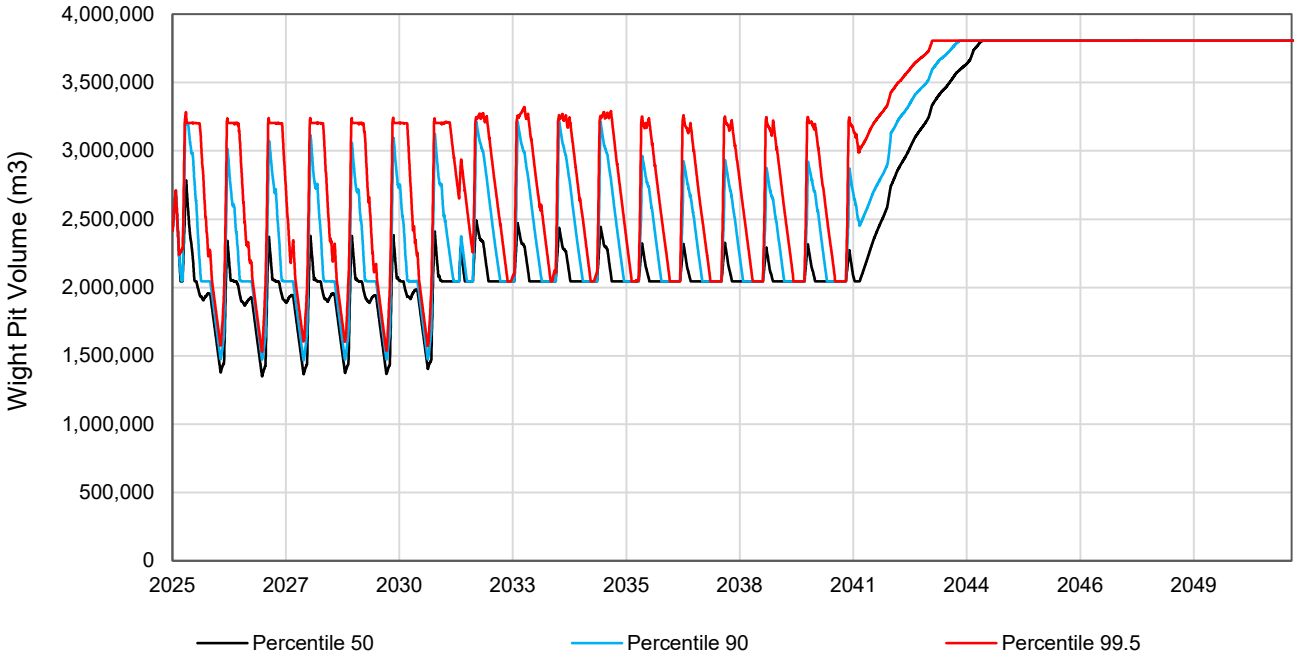


Figure 23: Wight Pit Water Volume During Operations to 10 Years After Post-closure

Table 33: Wight Pit Annual Average Overflow (m^3)

Phase	Wight Pit Annual Average Overflow (m^3)		
	50th Percentile	90th percentile	99.5th percentile
Post-closure	320,998	369,090	440,144

See discussion in Sections above regarding relative volumes of the TSF and Wight Pit.

4.3.5 Water Balance Model Summary

The SWWBM was updated to support the Permit Amendment Application for the TSF raise to 987m. The SWWBM assumes a mine operational phase aligned with the Springer Expansion LOM plan and incorporates closure and post-closure water management assumptions aligned with the 2022 Reclamation and Closure Plan. The SWWBM supports water management planning and the assessment of water quality and associated water treatment and discharge options.

The model was run from January 1, 2025, to July 31, 2131, and included the following LOM phases:

- operational phase extending from January 1, 2025, to July 31, 2031.
- closure phase extending from August 1, 2031, to July 31, 2041.
- post-closure phase commencing on August 1, 2041, and extending to July 31, 2131 (100 years including closure). The simulation was extended to end of 2168, in order to include the overflow from the Springer-Cariboo Pit after closure.

The model was run stochastically for 2000 realizations to present 50th, 90th, and 99.5th percentile model results. The results for the modelling during the operational phase are presented as follows:

- The average annual treated discharge for the 50th percentile is approximately 3.8 M-m^3 between 2025 and 2031, while the milling process water demand exists.
- The maximum annual treated discharge for the 99.5th percentile, including overflows, is 7.76 M-m^3 in 2025.
- The maximum TSF pond volume during the operational phase is approximately 2.2 M-m^3 for the 99.5th percentile, and 0.75 M-m³ for the 50th percentile results.
- During the operational phase, the Springer-Cariboo Pit is usually maintained empty, except for the 90th and 99.5th percentiles with maximum volumes of 0.06 and 0.7 M-m^3, respectively.
- There are occasional predicted overflows from the PETBP during the operational phase (for percentiles >= 98%), with an annual maximum of 0.46 M-m^3 in 2025 (99.5th percentile).

The conclusions for the modelling during closure and post-closure phases are as follows:

- The average annual treated discharge for the 50th percentile result is approximately 4.8 M-m^3 during closure and 0.35 M-m^3 during post-closure. Springer-Cariboo catchment is no longer contributing contact water to the annual treatment total, and the mill is no longer consuming contact water annually.
- The TSF pond volume will vary seasonally, limited by the spillway invert, to a maximum of approximately 0.25 M-m^3.
- The Springer-Cariboo Pit Lake will not overflow within the post-closure period (100 years), as the overflow period is estimated to start between 2143 and 2152, with an average annual 50th percentile overflow volume of approximately 0.3 M-m^3.
- PAG material placed in the Springer-Cariboo Pit is estimated to be inundated and covered by the pit lake between 2040 and 2042.
- During closure, temporary storage will occur in the PETBP during the freshet under each of the climate conditions simulated. During closure and post-closure phases, the PETBP does not have sufficient storage capacity to prevent overflow during freshet for the 99.5th percentile condition and future transfer systems at closure should consider appropriate design flows.
- The Wight Pit is expected to initiate spilling between 2043 and 2044, with an average annual 50th percentile overflow volume of approximately 0.3 M-m^3.

The LOM SWWBM is designed to reflect current conditions and support the current permitting requirements. Its assumptions, inputs, and structure are not intended to account for or evaluate future potential changes to site configuration not yet under permit application. Assessment of such scenarios will be part of future updates.

4.4 Water Quality

The Site Wide Water Quality Model Report (SWWQM), developed in GoldSim for the LTWMP (Appendix D; Golder 2016g) and linked to the SWWBM, was updated as part of this WMP. The complete description of the model setup, inputs, assumptions, calibration and model results are presented in the TSF raise to 987 m water quality model report (Appendix B).

The objectives of the SWWQM are as follows:

- Hindcast concentrations of constituents in the influent to the WTP (i.e., water quality in the PETBP) and at other Mine facilities (i.e., CCS, Springer Pit, Cariboo Pit, 9K Sump, NW Sump, Mine Drainage Creek Sump, Bootjack Creek Sump, South Embankment Seepage Collection Pond, Main Embankment Seepage Collection Pond, TSF supernatant pond, and seepage from all ore stockpiles) for the calibration period.
- Forecast concentrations of constituents during operations, closure and post-closure as part of the permit application for the TSF raise to 987m crest elevation.

The model simulation included four time periods:

- **Calibration** (January 1, 2017, to December 31, 2024) – the calibration period includes operations (January 1, 2017, to May 1, 2019), care and maintenance of the Mine site (May 2, 2019, to October 31, 2021) and the beginning of resumed operations (November 1, 2021). During the calibration period, water in the Perimeter Embankment Till Borrow Pond (PETBP) is treated at the water treatment plant (WTP) and discharged to Quesnel Lake.
- **Future Operations** (January 1, 2025, to July 31, 2031) – the resumed operations period when, similar to the calibration period, water in the PETBP is treated at the WTP and discharged to Quesnel Lake.
- **Closure** (August 1, 2031, to July 31, 2041) – a ten-year active closure period is assumed, during which potentially acid generating (PAG) stockpile material from the Temporary Northwest (NW) PAG stockpile is deposited into the Springer-Cariboo Pit and other facilities are reclaimed. The closure phase will include reclamation activities as identified in the WMP. The WTP is assumed to be in operation through all of the closure period. Details on the closure and post-closure management of mine facilities are provided in the SWWBM Report (Appendix A).
- **Post-closure** (August 1, 2041, to July 31, 2131) – this period includes filling of pits, discharge, and establishment of steady-state conditions for the drainage from mine facilities. Results are presented for two periods within post-closure:
  - Early post-closure (August 1, 2041, to July 31, 2051) – Represents the first ten years of post-closure during which drainage from Mine facilities is assumed to progressively return to undisturbed water quality. The WTP is assumed to be in operation during this period.
  - Long-term post-closure (August 1, 2051, to July 31, 2131) – this time period has been selected to represent steady-state conditions after all closure and post-closure changes have taken place. The need for treatment during long-term post-closure will be confirmed as MPMC approaches this phase and may be achieved through centralized or distributed treatment, using passive or semi-passive treatment systems if feasible.

Uncertainty exists regarding the exact timing of these transitions. The time periods are intended to show, at a conceptual level, the difference in site drainage quality as the site progresses through the post-closure period; it is not intended to imply that the transitions will occur on precisely those dates.

4.4.1 Constituents in the Model

The constituents in the SWWQM include physical parameters, major ions, nutrients, and dissolved metals and metalloids (Table 34). The dissolved fractions of metals and metalloids are used in all mixing calculations in the model. The total concentrations of metals and metalloids are calculated by adding particulate fractions to the dissolved concentrations as described in the Particulate Addition and Total Metals section that follows the table.

Table 34: Constituents in the Site-wide Water Quality Model

Category	Constituent
Physical parameters	Total dissolved solids (calculated), hardness (calculated).
Major ions	Calcium, chloride, fluoride, magnesium, potassium, sodium, sulphate.
Nutrients	Nitrate, nitrite, total ammonia, total phosphorus.
Dissolved metals and metalloids	Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, zinc.

Particulate Addition and Total Metals

The process of calculating particulate fractions of constituents and total metals and metalloids concentrations was described in Appendix D of the LTWMP (Golder 2016g). Predictions of total metals and metalloids were calculated by adding empirical particulate fractions to the predicted dissolved metals and metalloids concentrations. Particulate fractions were calculated for two periods:

1) **Operations and Closure:** Monitoring data in the SERDS Ditch and Long Ditch between 2008 and 2024 were used to establish the empirical particulate metal concentrations during operations and closure because these facilities are expected to contribute the majority of particulate load to site flows. The model assumes that total suspended solids (TSS) will be settled to 15 mg/L during operations and closure (i.e., the maximum permitted discharge concentration) before being discharged.

2) **Post-closure:** Monitoring data from Edney Creek was used to establish the empirical particulate metal concentrations because data from this location is considered representative of undisturbed (i.e., reclaimed) surface runoff. The model assumes that TSS will be settled to 3 mg/L (i.e., the 95th percentile of TSS from monitoring data at Edney Creek from 2016 to 2022).

4.4.2 Model Set-up

The model simulated concentrations on a daily time step from January 2017 to December 2024 (calibration period), January 2025 to July 2031 (operations) and from August 2031 to July 2131 (closure and post-closure). Probabilistic climate and water quality inputs were used to run the model stochastically for 2000 simulations:

- **Climate Inputs:** The SWWQM was run with probabilistic monthly climate inputs during operations, closure and post-closure as described in Section 4.3.1.5. Monthly precipitation data in the Mount Polley Mine Climate Baseline Update (Golder 2022a) were fitted to a log-normal probability distribution. The calibration period used historical climate data for the climate inputs.

- **Water Quality Inputs:** For each realization, a unique concentration for each parameter was selected based on randomly sampled values from within a statistical probability distribution function that was derived from each input.

To interpret the results, median and 95th percentile concentrations were calculated for each Mine facility. To put the results in context, a 95th percentile prediction indicates the maximum concentration that is likely to be reached over the duration of the simulation, with a 95% likelihood that concentrations will be at or below that concentration (it does not suggest that concentrations will exceed this value 5% of the time).

4.4.3 Model Inputs

Water quality inputs in the SWWQM were derived from site monitoring data. A summary of the water quality inputs assigned to each flow in the SWWQM is presented in Table 35 and described below.

Site Water Quality Monitoring Data

Site water quality monitoring data from 2006 to 2024 (depending on the input) were used to develop water quality inputs in the SWWQM. For each constituent, water quality inputs were represented in the model by probability distribution functions. The same standardized process described in the LTWMP (Appendix D, Golder 2016g) was used to fit probability distribution functions to the monitoring data. A summary of the distributions selected, maximum, 95th percentile, and mean values used for each constituent, and number of samples for each water quality input are presented in in the SWWQM Report (Appendix B).

Geochemical Source Terms

Water quality inputs derived from geochemical source terms developed by SRK Consulting Canada were applied to the SWWQM as an additional scenario in the 2016 LTWMP (Golder 2016). Updates to these geochemical source terms were completed by SRK consulting in 2023 (SRK 2023) and were recently updated again in April 2025 (SRK 2025). WSP recently completed a model sensitivity using the geochemical source terms developed by SRK and the water quality model from the 2023 WMP (WSP 2025f). Results from that sensitivity indicate that some metals, including copper, may have divergence in their long-term concentration trend compared to the results presented in this report. The 2026 WMP will include a summary of the 2025 SRK geochemical source term SWWQM results and treatment impacts. Although preliminary, this WMP for the TSF raise to 987 m does discuss some predicted long-term pit water quality trends using the 2023 SRK geochemical source terms, as well as potential treatment mitigations (Section 4.6 of this WMP).

Table 35: Summary of Water Quality Inputs

Category	Description	Model Input		
		Calibration Period and Operations	Closure	Post-closure
Rock Disposal Site Contact Water	RDS Runoff to Boundary Pit	Boundary Dump Seep station water quality data (n = 79, June 2013 – November 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	RDS Seepage to Boundary Pit	Boundary Dump Seep station water quality data (n = 79, June 2013 – July 2024)		
	RDS Runoff to Wight Pit	Joe's Creek Pipe station (from North Bell Dump) water quality (n = 73, August 2014 to November 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	RDS Seepage to Wight Pit	Joe's Creek Pipe station (from North Bell Dump) water quality (n = 73, August 2014 to November 2024)		
	NAG Waste Rock Runoff	East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep water quality (n = 547, May 2013 to December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	NAG Waste Rock Seepage	East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep station water quality (n = 547, May 2013 to August 2023)		
	NEZ Waste Rock Runoff	East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep water quality (n = 547, May 2013 to December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	NEZ Waste Rock Seepage	East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep station water quality (n = 547, May 2013 to August 2023)		
	Temporary NW PAG Stockpile Runoff	PAG Dump Seep station water quality (n = 151, May 2013 – December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Temporary NW PAG Stockpile Seepage	PAG Dump Seep station water quality (n = 151, May 2013 – December 2024)	NAG Waste Rock: East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep station water quality (n = 547, May 2013 to August 2023)	
Pit Wall Runoff	Boundary Pit Wall Runoff	Boundary Pit station water quality (n = 20, February 2016 - November 2024)		
	Wight Pit Wall Runoff	Wight Pit (Station E10) water quality (n =137, February 2016 - December 2024)		
	Springer Pit Wall Runoff	Springer Pit (Station E11) water quality (n = 58, January 2016 - November 2024)		
	C2 and WX Pit Wall Runoff	Springer Pit (Station E11) water quality (n = 58, January 2016 - November 2024)		
	Cariboo Pit Wall Runoff	Cariboo Pit (Station E8) water quality (n = 64, June 2016 - November 2024)		
Tailings Storage Facility	TSF Beach, Impoundment, and Embankment Runoff	TSF supernatant (Station E1a) water quality (n = 243, May 2011 to December 2024)		Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Unsaturated TSF Seepage	TSF Main Embankment Seepage Collection Pond (Station E5) water quality (n = 141, January 2006 - November 2024)		
	Saturated TSF Seepage	Predicted concentration in the TSF		
Other	Haul Road Runoff	NAG Waste Rock: East Rock Disposal Site station, Northeast Zone Dump station, SERDS Seep station water quality (n = 547, May 2013 to December 2024)		Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Disturbed Runoff	W4 and W5 site monitored data (n = 312, January 2014 to December 2024)		
	Undisturbed Runoff	W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)		
	Groundwater Inflow to Springer-Cariboo Pit	GW12-1/2, GW15-1/2 site monitored data (n = 346, January 2016 to December 2024)		

NW Sump = Northwest Sump; MDCS = Mine Drainage Creek Sump; SESCP = South Embankment Seepage Collection Pond; MESCP = Main Embankment Seepage Collection Pond; PETBP = Perimeter Embankment Till Borrow Pond; PAG = potentially acid-generating; NAG = Non-potentially acid-generating; RDS = Rock Disposal Site; TSF = Tailings Storage Facility; SERDS = Southeast Rock Disposal Site.

4.4.4 Model Assumptions

The key assumptions that have been made in the SWWQM are:

- The input water qualities used in the SWWQM are representative of their respective input sources and will continue to be representative over the modelled timeframe. Water quality data for model inputs were selected from available lab testing and field monitoring, augmented by professional judgement where necessary.
- Concentrations of parameters from monitoring data that were lower than the analytical detection limit were set equal to half the detection limit.
- Concentrations of parameters in direct precipitation onto the water surface of water management facilities were assumed to be zero. No mass was removed or added to modelled systems through evaporation or direct precipitation. These processes affected water quantity only and did not affect mass of modelled parameters in the system.
- All open pits, ponds, and sumps are fully mixed systems. No stratification is considered over the modelled timeframe. All inputs are mixed with existing water volumes to calculate concentrations of parameters.
- All parameters are assumed to behave conservatively. That is, they are assumed to not settle, precipitate, sorb, degrade, or undergo any other process that would reduce concentrations. This assumption is likely to have negligible effects on major ion predictions but may lead to over-estimation of some nutrients and metals.
- All PAG waste rock will be disposed sub-aqueously in the Springer-Cariboo Pit at closure to mitigate onset of acid generation. Acid generation is not expected to occur prior to subaqueous disposal, and disposal in the Springer-Cariboo Pit Lake will prevent acid onset in the future by limiting oxidation in the waste rock. Geochemical characterization studies estimate the time to the onset of acid generation varies between decades and 100 years (MPMC 2022a).
- The combined Springer-Cariboo Pit is assumed to be empty at the start of closure.
- Rock disposal sites (RDS) are assumed to be reclaimed in post-closure. Following revegetation, the runoff from these facilities is assumed to return to undisturbed runoff quality over the course of ten years.
- Diffusive flux from the submerged PAG waste rock into the Springer-Cariboo Pit Lake water was not modelled.
- Accumulation and flushing of oxidation products from weathered PAG material prior to subaqueous disposal was not modelled.
- Ice formation and melting were not considered in pits, ponds, and ditches that retain water.

4.4.5 Model Calibration

The SWWQM was set up to hindcast concentrations from January 1, 2017, to December 31, 2024, at seven locations:

- Springer Pit
- Cariboo Pit
- Wight Pit

- CCS
- PETBP
- TSF
- NW Sump

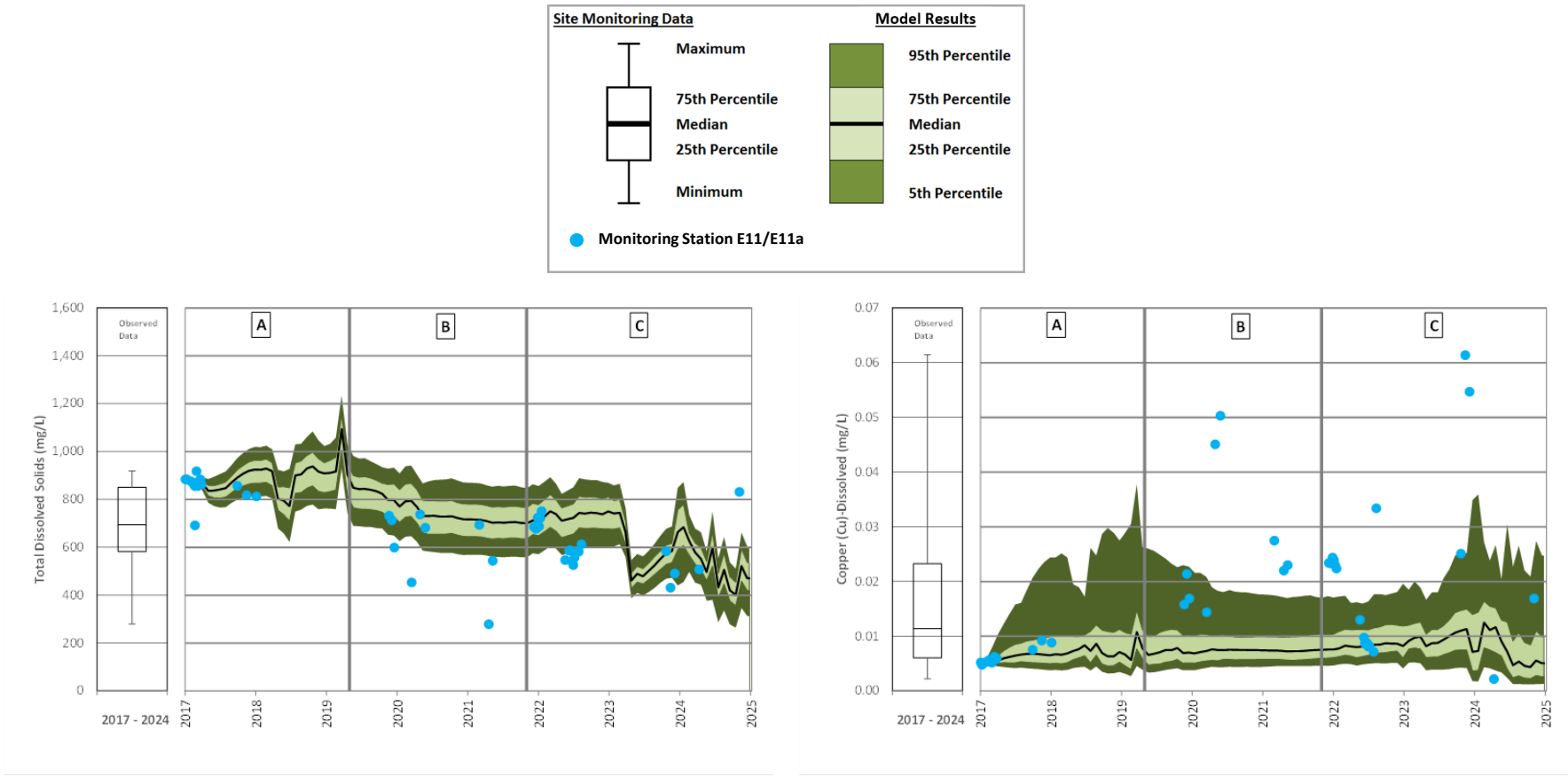
Where discrepancies between model results and monitoring data existed, the model was adjusted to better reflect monitoring data. The same adjustments, made during calibration of the SWWQM in the 2020 Water Management Plan (Golder 2020) and during the calibration of the SWWQM in the 2023 Water Management Plan (WSP 2024c), were maintained in this update to achieve calibration with monitoring data:

- Adjusting the proportion of Wight Pit runoff and groundwater inflows that are assigned a waste rock contact water input based on storage of waste rock in the pit.
- Adjusting the proportion of runoff from waste rock that is assigned an undisturbed water quality input.
- In the TSF, applying calibration factors greater than 1.0 to improve the model calibration for chloride, fluoride, potassium, sodium, nitrite, dissolved antimony, dissolved arsenic, dissolved barium, dissolved lithium, dissolved molybdenum, and dissolved vanadium. These calibration factors are applied during periods when tailings are deposited to the TSF.

Calibration Results

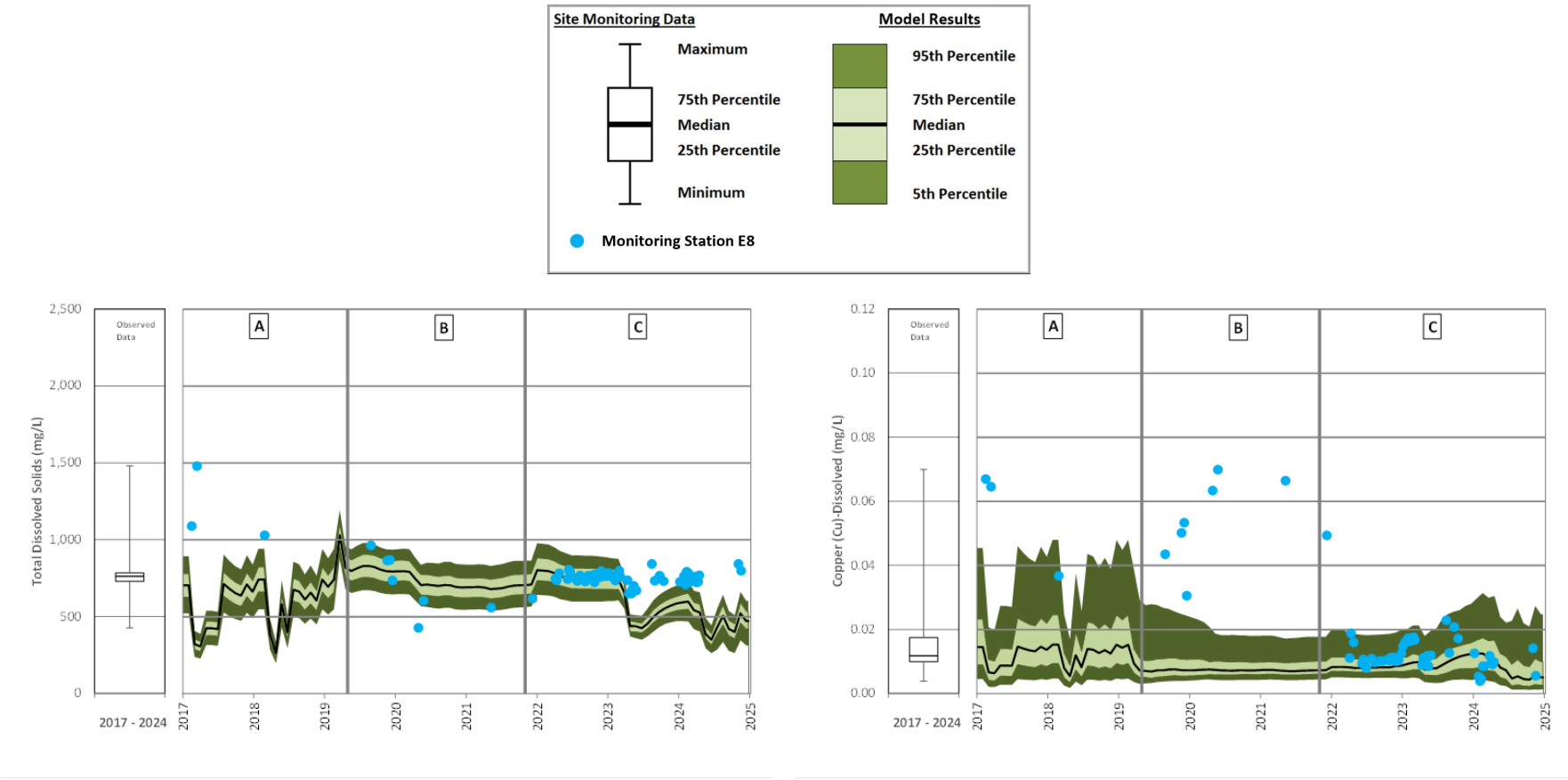
Model calibration results are shown compared to monitoring data for total dissolved solids and dissolved copper in Figure 24 through Figure 30. Model calibration results for all parameters and locations are provided in the SWWQM Report (Appendix B). Monitoring data were generally between the projected 5th and 95th percentile model calibration results for all parameters during the calibration period with the following exceptions:

- Several parameters (e.g., dissolved copper) were underpredicted during periods in 2018, 2020 and 2021. The source of the increased concentrations in the monitoring data for these parameters is thought to be due to the discharge of leachate to the TSF from the onsite test heap leach facility (Golder 2022f). These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process.
- Several parameters (e.g., total dissolved solids) were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for these parameters is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.



A = Operations; B = Care and Maintenance; C = Resumed Operations.

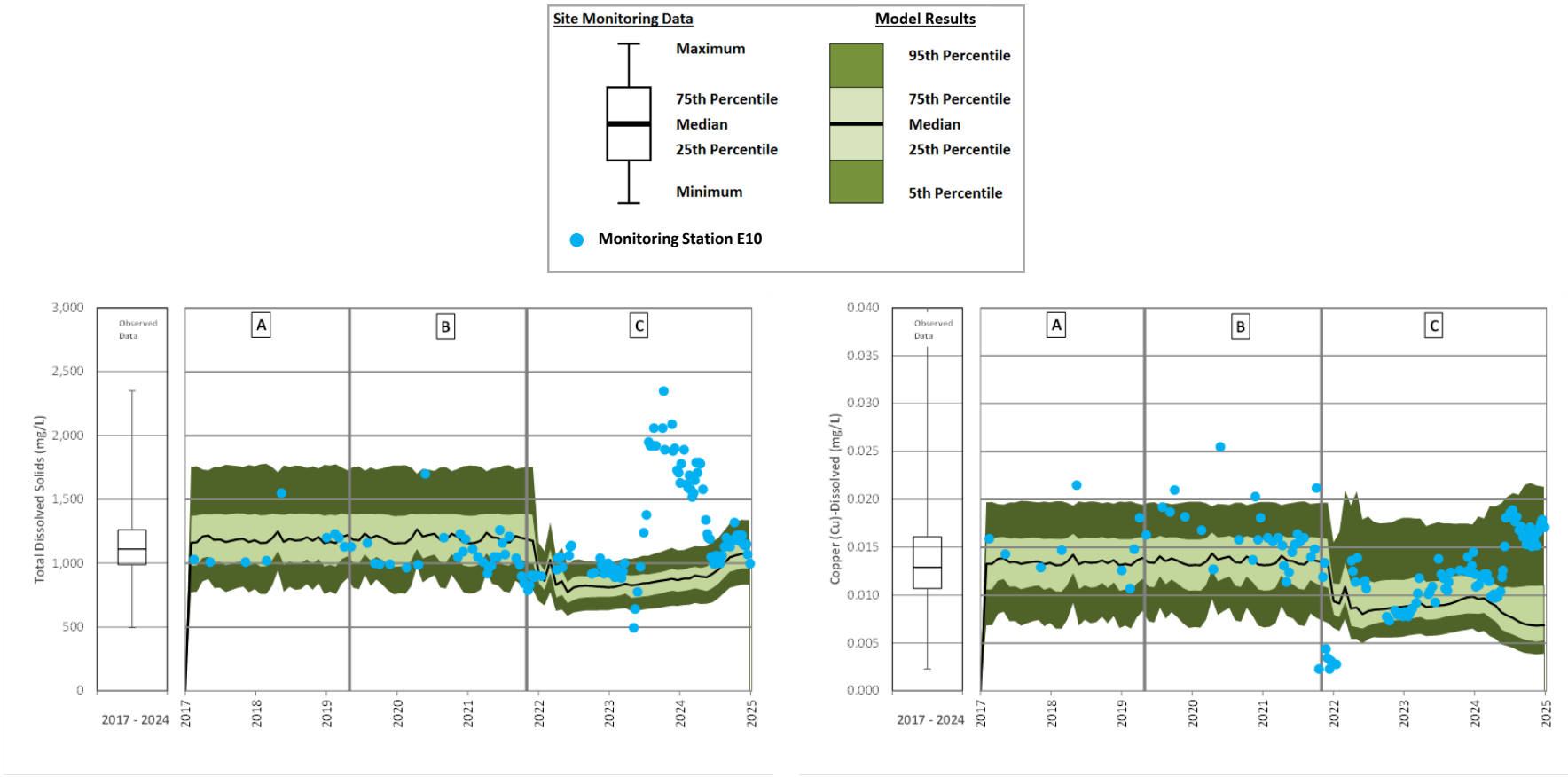
Figure 24: Springer Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Note(s): Cariboo Pit is a flow-through system from the beginning of the model simulation to March 2019, which results in a variability in predicted concentrations. After March 2019, Cariboo Pit stores water, which reduces the range in predicted concentrations. The source of increased copper concentrations in 2019, 2020 and 2021 monitoring data is due to the discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to Cariboo Pit). These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022a).

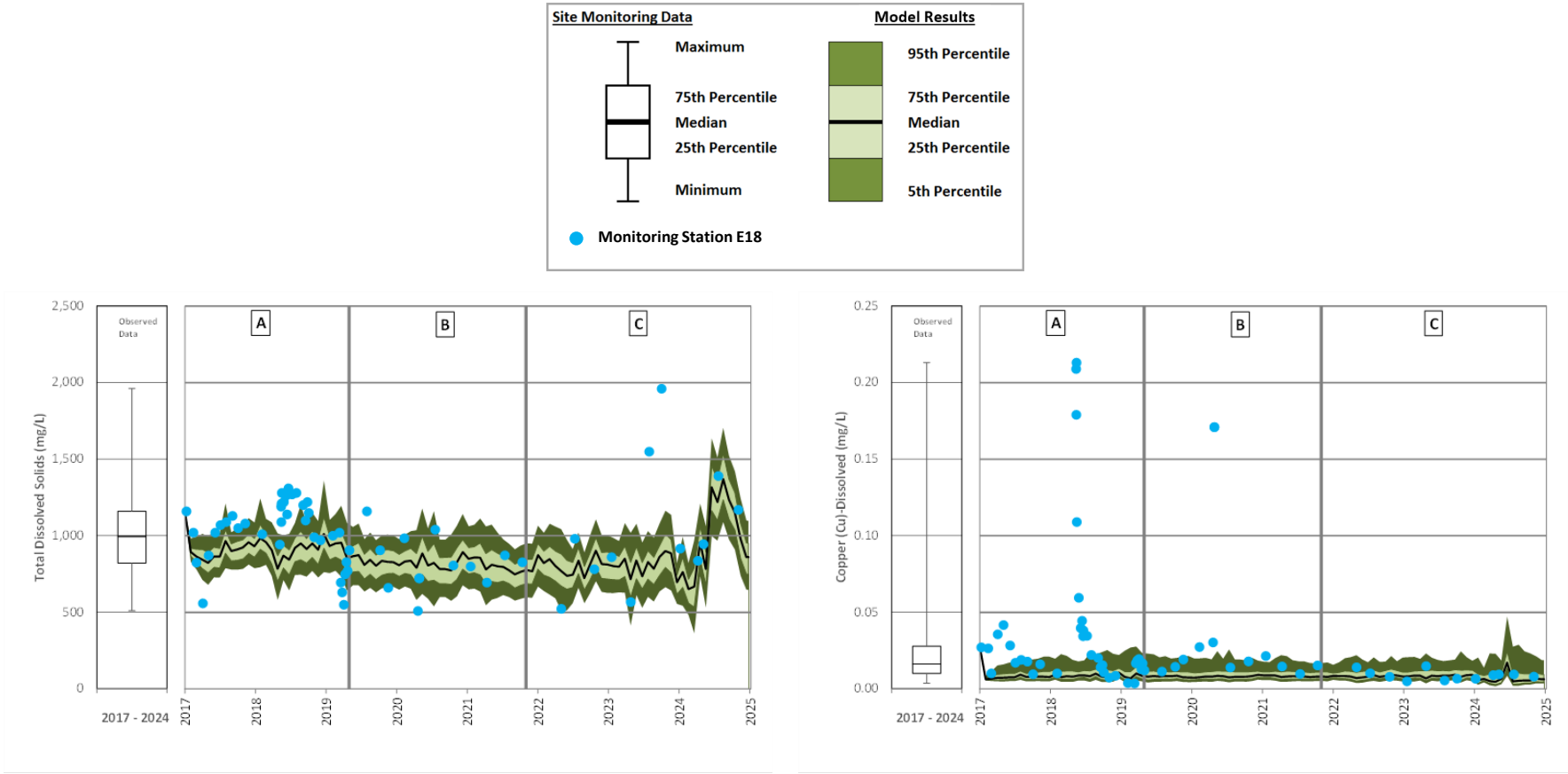
Figure 25: Cariboo Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Note(s): Total dissolved solids were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for total dissolved solids is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

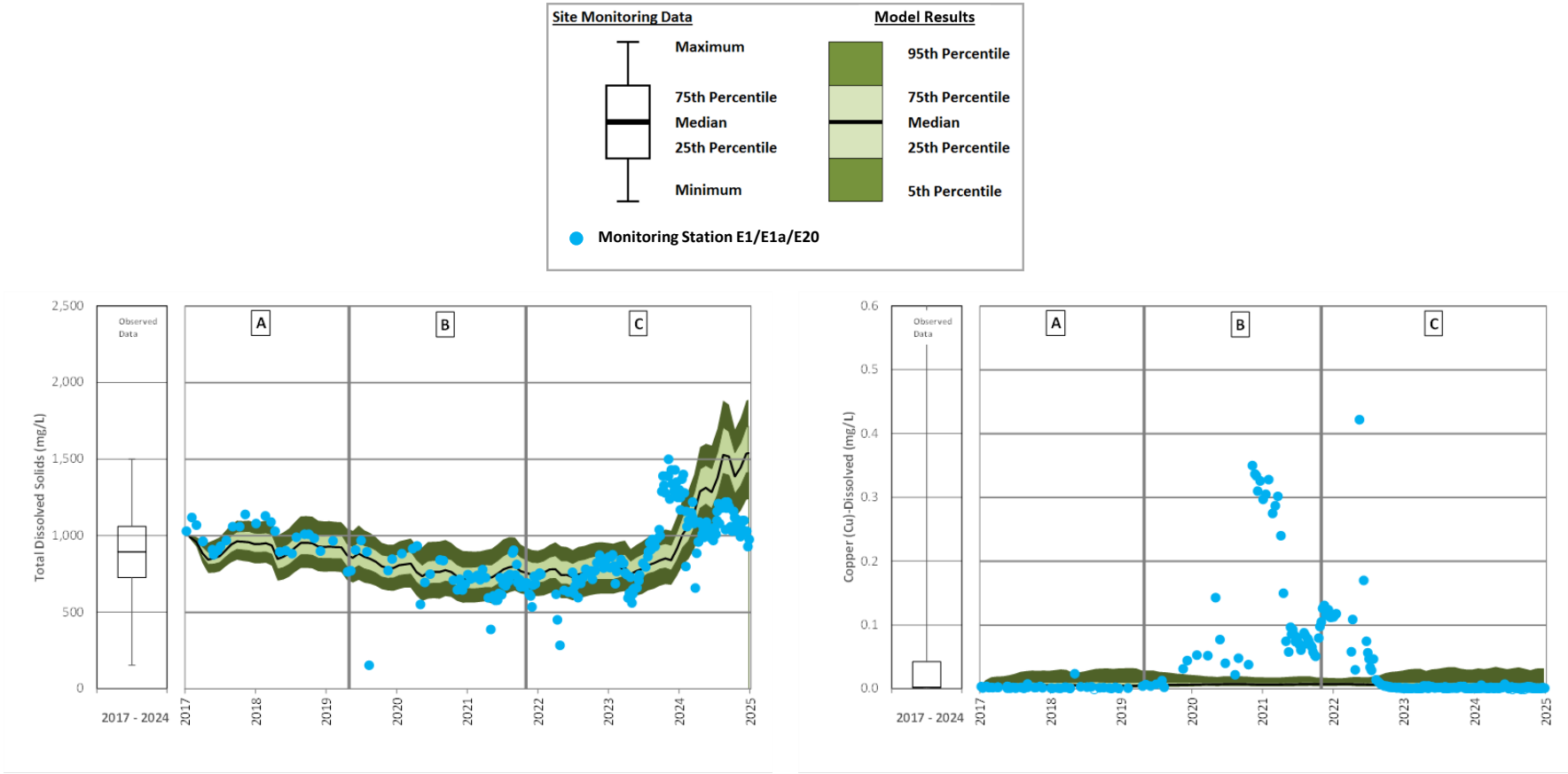
Figure 26: Wight Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Note(s): The source of increased dissolved copper concentrations in the Central Collection Sump 2018 monitoring data is due to discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to the CCS. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022a).

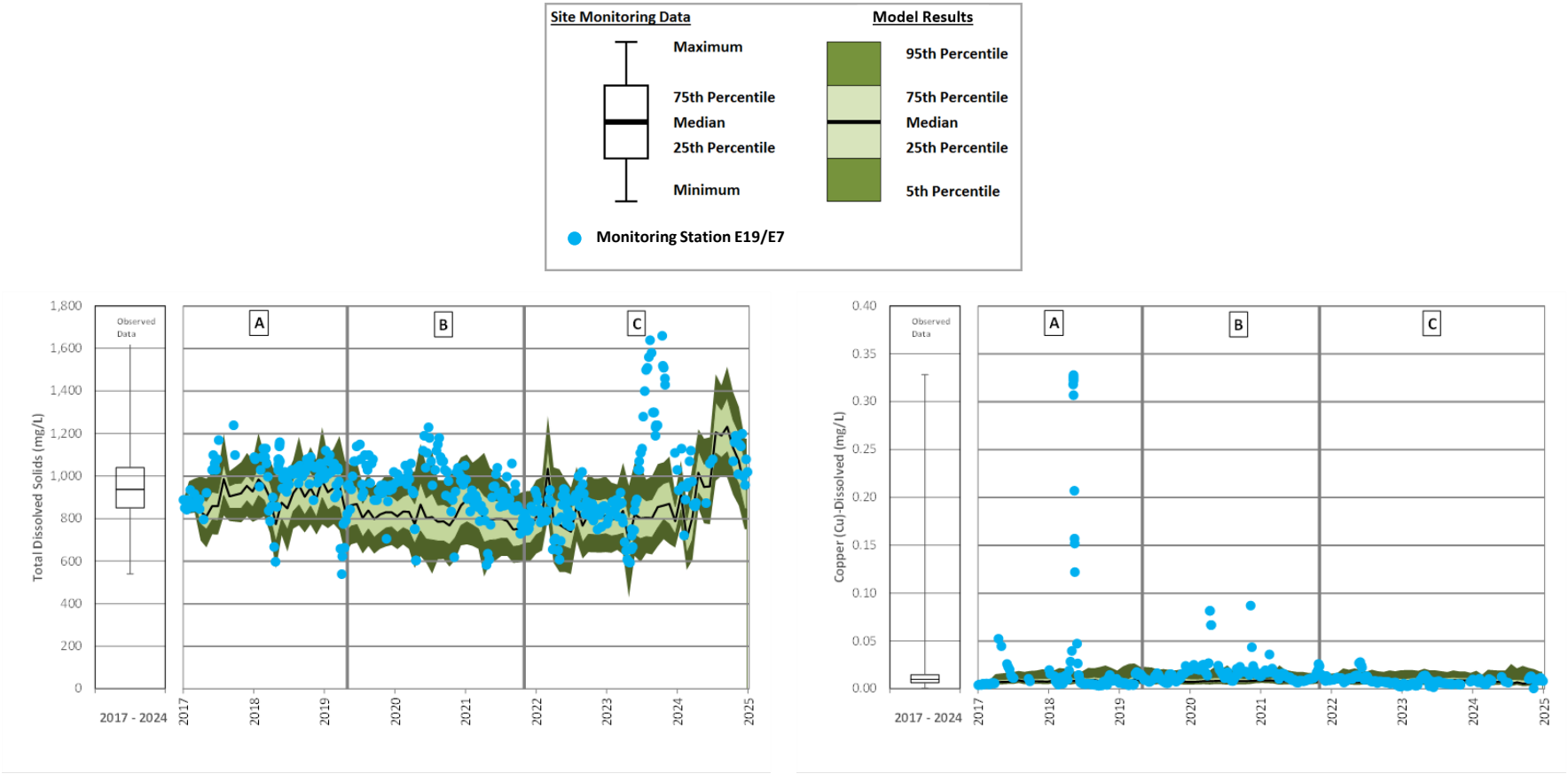
Figure 27: Central Collection Sump Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Note(s): The source of increased copper concentrations in 2018 and from 2020 to 2022 in the monitoring data of the Tailings Storage Facility (TSF) is due to the discharge of leachate to the TSF from the onsite test heap leach facility. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022a).

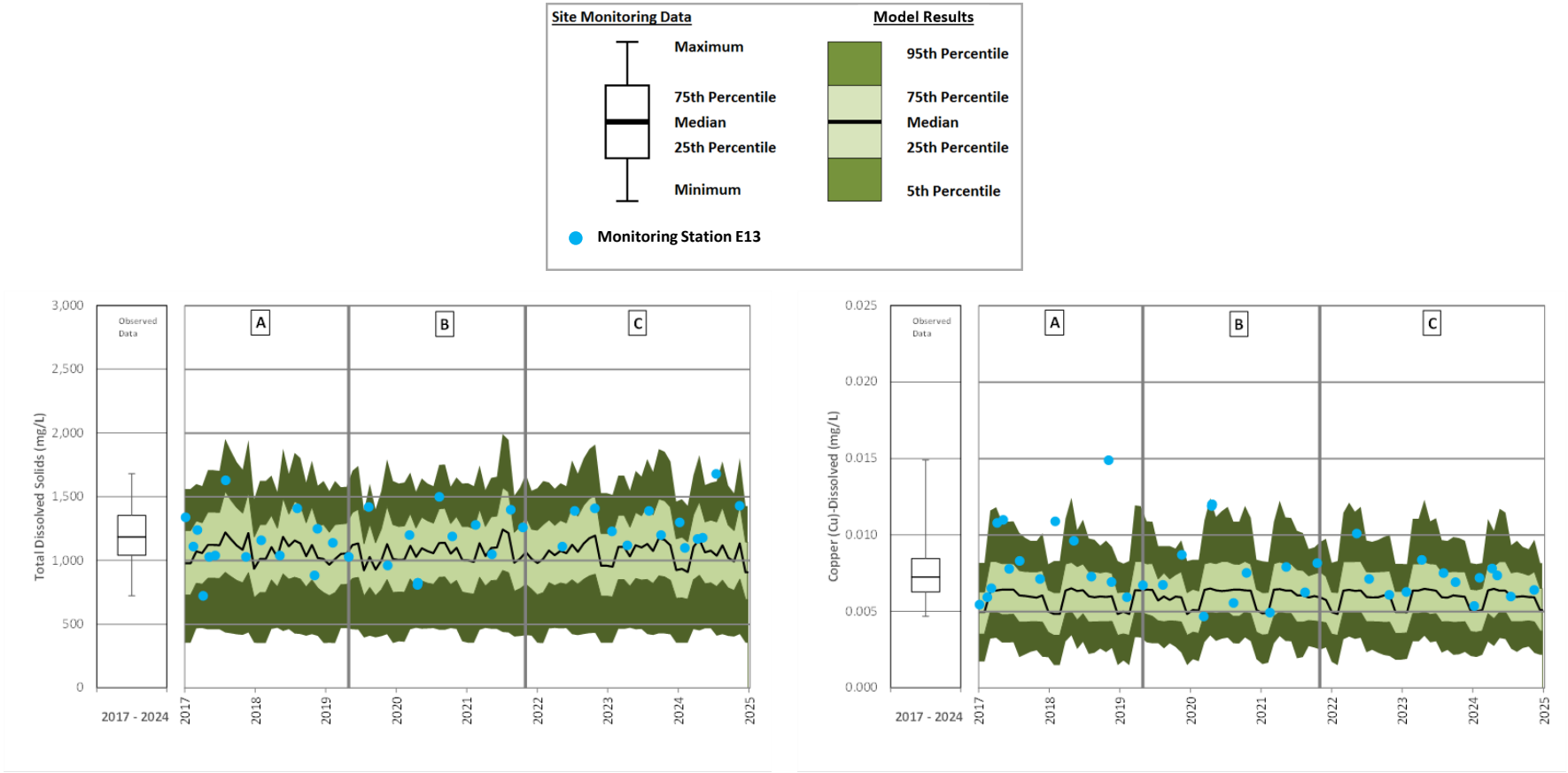
Figure 28: Tailings Storage Facility Supernatant Pond – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Note(s): The source of increased dissolved copper concentrations in the Perimeter Embankment Till Borrow Pond 2018 monitoring data is due to discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to the PETBP. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022a). Total dissolved solids were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for total dissolved solids is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure 29: Perimeter Embankment Till Borrow Pond – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations.

Figure 30: Northwest Sump – Total Dissolved Solids and Dissolved Copper

4.4.6 Model Simulation

After the model calibration was completed, model simulations were performed for the following periods:

- Operations (January 1, 2025, to July 31, 2031)
- Closure (August 1, 2031, to July 31, 2041)
- Post-closure (August 1, 2041, to July 31, 2131)

For most parameters, peak concentrations of parameters occur in operations or closure. Concentrations decrease during closure and post closure as Site areas are reclaimed. Runoff inflows from reclaimed areas are assigned the undisturbed runoff water quality input. Some parameters (for example, dissolved aluminum and dissolved chromium) increase in concentration from operations to closure and post-closure because the statistical distributions assigned to undisturbed runoff water quality have higher concentrations than the statistical distributions assigned to the contact areas of the Site (disturbed runoff areas, TSF beach runoff areas, NAG waste rock areas and PAG waste rock areas).

The following sections present time series of predicted concentrations of several key parameters (copper and selenium) for the PETBP, the Springer-Cariboo Pit Sump, Wight Pit and Long Ditch (which receives contact water from the SERDS). Maximum of median and 95th percentile predicted concentrations are presented for all modelled parameters in these locations. Time series and maximum concentrations for all modelled parameters and locations are presented in the SWWQM report (Appendix B).

4.4.6.1 Perimeter Embankment Till Borrow Pond

During operations, closure and post-closure, the PETBP is the assumed influent water to the WTP, which discharges to Quesnel Lake. Maximum of the daily median and maximum of the daily 95th percentile concentrations in the PETBP are presented in Table 36. Time series for predicted copper and selenium concentrations in the PETBP are presented in Figure 31.

In general, concentrations in the PETBP are predicted to remain relatively consistent during operations until the end of pumping from the mill processing plant in 2031. This consistency is due to the assumption that the entire surface areas of the RDS are accounted for at the beginning of the model simulation. Therefore, the runoff and seepage assumptions for the RDS do not change. Changes in predicted concentrations in the PETBP are due to:

- Variable flows from the CCS and MESCP to the PETBP.
- Changes in tailings beach area. Runoff from the tailings beach area flows into the TSF. Seepage from the TSF reaches the PETBP.
- Surface runoff at the mine site causes fluctuations in concentrations depending on the proportions of the catchment areas flowing into the facilities (e.g., RDS areas, disturbed areas, undisturbed areas). Parameter concentrations reach steady-state during the winter months because surface runoff is low.

Discharge from the PETBP, through the WTP, and to Quesnel Lake, will continue through closure and post-closure until remediation or treatment allows local discharge to Hazeltine Creek (pre-mining catchment discharge). During closure, the PETBP receives contact water from the entire Site except from Springer-Cariboo pit (which is allowed to fill during closure). During post-closure, the PETBP receives overflow and seepage from the TSF, pumped flows from the SESCP and MESCP, as well as runoff from catchment areas of the PETBP, TSF, and CCS. At long-term post-closure (2051), the SESCP and MESCP catchments are considered non-contact water and the PETBP only receives gravity overflow and seepage from the TSF, as well as runoff from the catchment areas of the PETBP, TSF, and CCS. PETBP water treatment requirements are assumed to continue into closure and post-closure until permitted otherwise.

Predicted concentrations in the PETBP change from operations to closure and into early post-closure because of the staggered reclamation of areas which are then assigned an undisturbed water quality once the areas are reclaimed. As more areas are reclaimed on the mine site, undisturbed runoff water quality is assigned to more inflows to the PETBP. In closure and post-closure, concentrations in the PETBP follow two patterns:

1) Decrease from operations because the statistical distributions assigned to undisturbed runoff water quality have lower concentrations than the statistical distributions assigned to the TSF beach runoff and the NAG waste rock runoff quality (e.g., sulphate, nitrate and dissolved copper).

2) Increase from operations because the statistical distributions assigned to undisturbed runoff water quality have higher concentrations than the statistical distributions assigned to the TSF beach runoff and the NAG waste rock runoff quality (e.g., total phosphorus, dissolved chromium and dissolved iron).

Predicted concentrations in the PETBP reach a steady state approximately 10 years after the start of post-closure (long term post-closure) when all mine site areas have been reclaimed.

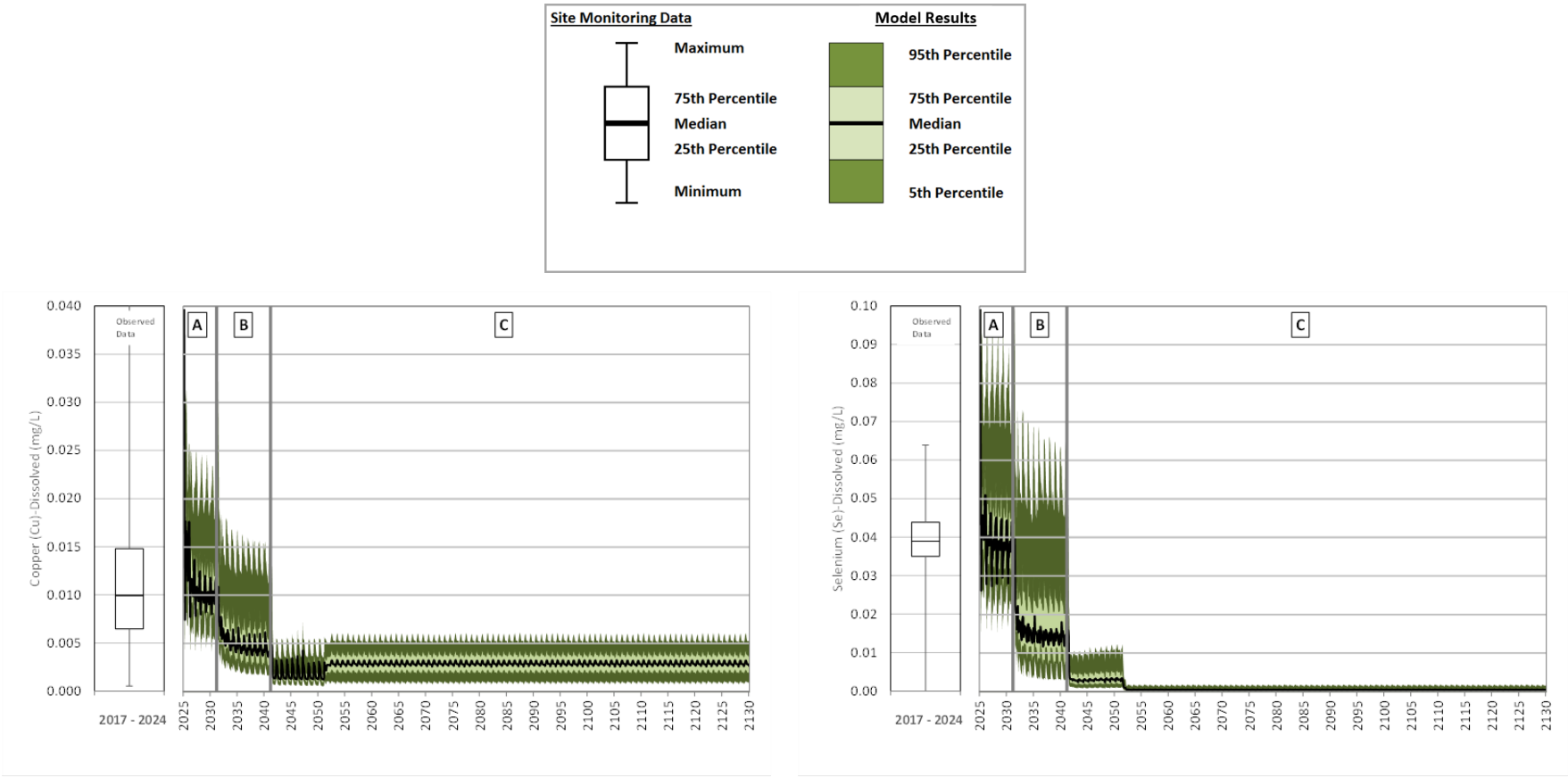
Table 36: Predicted Maximum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[a]	mg $CaCO_3$/L	695	859	517	686	294	457	184	287
Total Dissolved Solids	mg/L	1056	1360	776	1025	460	810	301	442
Major Ions									
Calcium	mg/L	219	269	161	214	90	142	51	76
Chloride	mg/L	18	22	6.1	9.9	6.6	10	6.0	9.4
Fluoride	mg/L	0.65	0.7	0.3	0.43	0.22	0.37	0.2	0.3
Magnesium	mg/L	36	45	28	37	16	25	14	24
Potassium	mg/L	9.8	14	4.3	7.0	3.6	4.8	3.2	4.5
Sodium	mg/L	58	76	26	38	23	31	21	29
Sulphate	mg/L	589	751	424	568	233	447	124	175
Nutrients									
Ammonia	mg/L (as N)	0.068	0.12	0.022	0.1	0.01	0.045	0.0091	0.04
Nitrate	mg/L (as N)	4.5	16	2.1	7.8	0.85	3.1	0.51	2.3
Nitrite	mg/L (as N)	0.079	0.11	0.027	0.056	0.0049	0.038	0.0039	0.034
Total Phosphorus	mg/L	0.018	0.03	0.015	0.028	0.017	0.024	0.026	0.038
Total Metals									
Aluminum	mg/L	0.48	0.54	0.48	0.55	0.056	0.23	0.086	0.41
Antimony	mg/L	0.0022	0.0025	0.00064	0.0011	0.00013	0.00025	0.000094	0.00018
Arsenic	mg/L	0.0036	0.0037	0.0015	0.0025	0.00085	0.0014	0.001	0.0019
Barium	mg/L	0.047	0.07	0.031	0.049	0.021	0.036	0.018	0.028
Beryllium	mg/L	0.000072	0.00009	0.000059	0.000062	0.000037	0.000046	0.000032	0.000035
Boron	mg/L	0.14	0.21	0.13	0.25	0.063	0.12	0.039	0.056
Cadmium	mg/L	0.00018	0.00039	0.0001	0.00028	0.000026	0.000077	0.000019	0.000067
Chromium	mg/L	0.00073	0.0009	0.00071	0.00094	0.00061	0.0012	0.00095	0.0019
Cobalt	mg/L	0.00065	0.001	0.00045	0.00092	0.000096	0.00038	0.000083	0.00026
Copper	mg/L	0.025	0.17	0.015	0.17	0.0046	0.013	0.0037	0.0077
Iron	mg/L	0.49	0.53	0.49	0.57	0.099	0.38	0.15	0.63
Lead	mg/L	0.00016	0.00016	0.00014	0.00015	0.000028	0.00011	0.000034	0.00014
Lithium	mg/L	0.013	0.016	0.0051	0.0086	0.0023	0.0072	0.0019	0.0031
Manganese	mg/L	0.17	0.4	0.084	0.34	0.07	0.19	0.062	0.15
Mercury	mg/L	0.0000054	0.000007	0.0000046	0.0000048	0.0000051	0.0000052	0.0000057	0.0000063
Molybdenum	mg/L	0.24	0.28	0.24	0.56	0.16	0.28	0.085	0.23
Nickel	mg/L	0.0013	0.0022	0.0012	0.002	0.00062	0.0013	0.0010	0.0022
Selenium	mg/L	0.051	0.1	0.023	0.08	0.014	0.035	0.0031	0.011
Silver	mg/L	0.0000092	0.000018	0.0000045	0.000017	0.000004	0.000019	0.0000037	0.000027
Strontium	mg/L	3.9	5.9	2.4	4.1	0.89	1.6	0.56	0.95
Thallium	mg/L	0.0000089	0.000016	0.0000063	0.000012	0.0000056	0.0000063	0.0000057	0.0000063

Table 36: Predicted Maximum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Tin	mg/L	0.000065	0.00014	0.000037	0.00011	0.000031	0.000042	0.000026	0.000029
Titanium	mg/L	0.025	0.026	0.022	0.024	0.0027	0.0034	0.002	0.0031
Uranium	mg/L	0.0025	0.0036	0.0015	0.0024	0.00094	0.0015	0.00065	0.0013
Vanadium	mg/L	0.003	0.0034	0.0019	0.0025	0.0007	0.0012	0.00081	0.0016
Zinc	mg/L	0.013	0.032	0.01	0.024	0.0018	0.0051	0.0015	0.0047
Dissolved Metals									
Aluminum	mg/L	0.03	0.086	0.023	0.10	0.023	0.1	0.053	0.28
Antimony	mg/L	0.0022	0.0023	0.00062	0.00097	0.00013	0.00025	0.000094	0.00018
Arsenic	mg/L	0.0033	0.0035	0.0013	0.0022	0.0008	0.0013	0.00096	0.0017
Barium	mg/L	0.045	0.06	0.029	0.041	0.02	0.034	0.017	0.026
Beryllium	mg/L	0.000072	0.00009	0.000059	0.000062	0.000037	0.000046	0.000032	0.000035
Boron	mg/L	0.14	0.18	0.13	0.22	0.063	0.11	0.039	0.054
Cadmium	mg/L	0.00018	0.00035	0.000098	0.00024	0.000025	0.000069	0.000017	0.00006
Chromium	mg/L	0.00033	0.00048	0.00031	0.00054	0.00049	0.00072	0.00083	0.0013
Cobalt	mg/L	0.00036	0.00075	0.00016	0.00063	0.000096	0.00026	0.000083	0.00014
Copper	mg/L	0.018	0.026	0.0078	0.019	0.0043	0.011	0.0033	0.0061
Iron	mg/L	0.036	0.08	0.037	0.12	0.047	0.16	0.095	0.41
Lead	mg/L	0.000042	0.000051	0.000026	0.000041	0.000028	0.000047	0.000034	0.000075
Lithium	mg/L	0.013	0.015	0.0049	0.0077	0.0023	0.0071	0.0019	0.003
Manganese	mg/L	0.15	0.38	0.063	0.32	0.066	0.17	0.058	0.13
Mercury	mg/L	0.0000054	0.000007	0.0000046	0.0000048	0.0000051	0.0000052	0.0000057	0.0000063
Molybdenum	mg/L	0.24	0.27	0.24	0.55	0.16	0.28	0.085	0.23
Nickel	mg/L	0.00073	0.0017	0.00063	0.0014	0.00054	0.00093	0.00092	0.0019
Selenium	mg/L	0.051	0.1	0.023	0.073	0.014	0.035	0.0031	0.011
Silicon	mg/L	6.7	8	6.4	7.9	5.2	6.5	6.8	9.6
Silver	mg/L	0.0000092	0.000011	0.0000045	0.0000093	0.000004	0.000011	0.0000037	0.00002
Strontium	mg/L	3.9	5.5	2.4	3.7	0.89	1.6	0.56	0.93
Thallium	mg/L	0.0000089	0.000014	0.0000063	0.000011	0.0000056	0.0000063	0.0000057	0.0000063
Tin	mg/L	0.000065	0.00007	0.000037	0.000042	0.000031	0.000042	0.000026	0.000029
Titanium	mg/L	0.0059	0.007	0.0035	0.005	0.0027	0.0034	0.002	0.0031
Uranium	mg/L	0.0025	0.0033	0.0015	0.0021	0.00094	0.0015	0.00065	0.0013
Vanadium	mg/L	0.0018	0.0022	0.00069	0.0013	0.00052	0.0007	0.00064	0.0011
Zinc	mg/L	0.011	0.03	0.0077	0.021	0.0018	0.0051	0.0015	0.0047

(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure.

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 31: Predicted Dissolved Copper and Dissolved Selenium Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

4.4.6.2 Springer-Cariboo Pit

At closure, the PAG material from the Temporary NW PAG Stockpile will be placed in the Springer-Cariboo Pit, and a pit lake will form. The pit will fill passively with groundwater and surface runoff from the pit catchment area. The groundwater inflow to the pit is assumed to flow into the stored PAG material in closure and post-closure. The surface runoff includes runoff and seepage from North Bell RDS and the haul roads. These facilities will be reclaimed during closure. Under the 50th percentile results, the pit lake is estimated to start overflowing in 2153, while under the 90th percentile it is estimated to start overflowing in 2148, and in 2144 under the 99.5th percentile. Overflow from the pit is assumed to discharge to Bootjack Lake.

Maximum of the daily median and maximum of the daily 95th percentile concentrations in the PETBP are presented in Table 37. Time series for predicted copper and selenium concentrations in the PETBP are presented in Figure 32. It is anticipated that particulate metals such as aluminum and copper will be lower in pit lake waters compared to model predictions, as has been observed in operational monitoring (Golder 2016b).

Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake. For most parameters, predicted peak concentrations in the Springer-Cariboo Pit occur during operations, and then decrease as areas are reclaimed. Predicted water quality reaches steady state near the end of post-closure, when the pit lake begins to overflow.

Iron is the only parameter with predicted maximum concentrations greater in post-closure than closure. This is due to higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to the NAG waste rock and disturbed area water qualities. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to a greater proportion of the total inflows to the Springer-Cariboo pit.

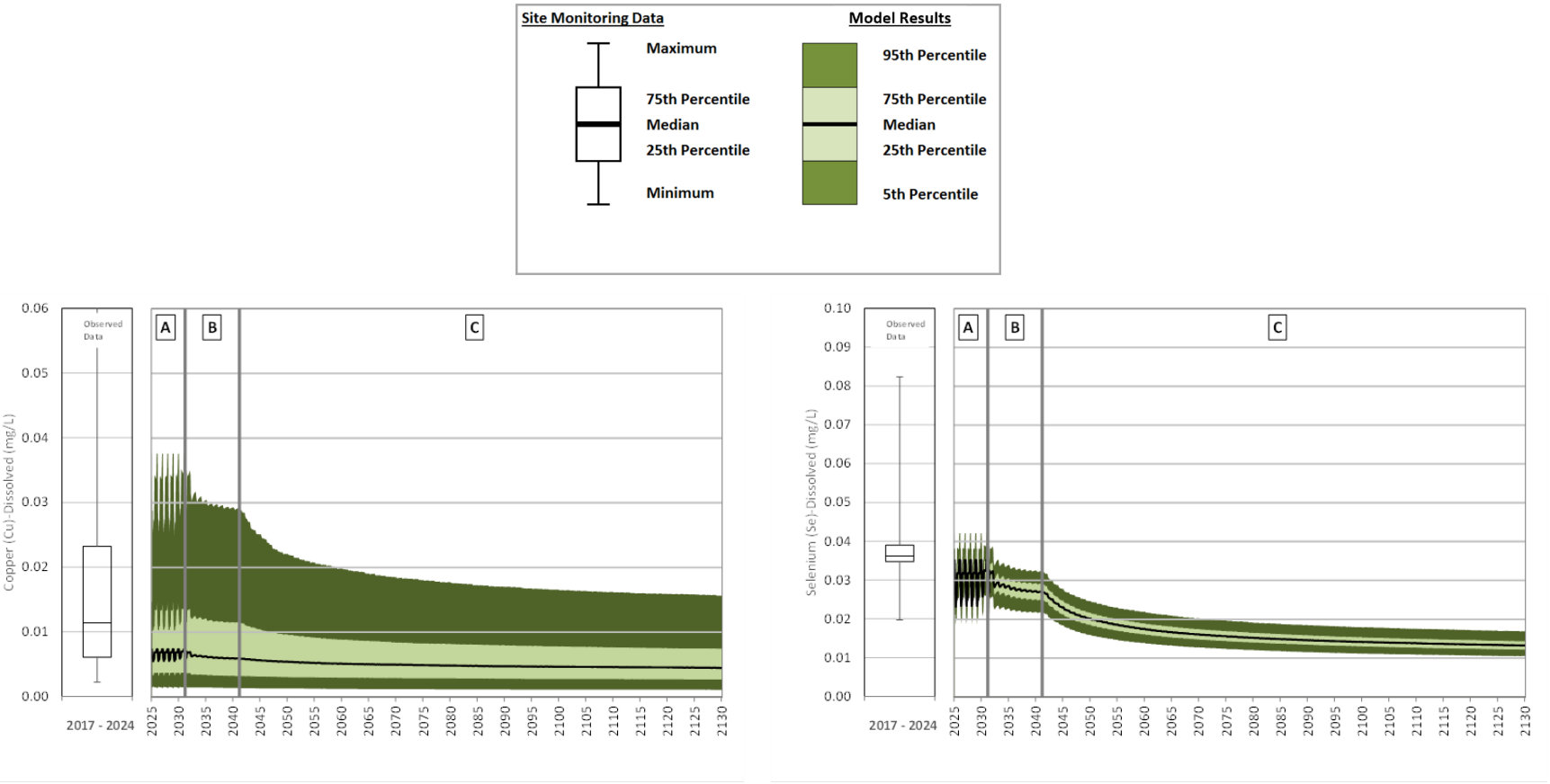
Table 37: Summary of Predicted Water Quality in Springer-Cariboo Pit

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	418	527	389	490	327	412	257	359
Total Dissolved Solids	mg/L	723	911	672	843	561	706	441	570
Major Ions									
Calcium	mg/L	128	159	119	148	100	125	79	111
Chloride	mg/L	8.3	14	7.7	13	6.4	11	4.7	7.9
Fluoride	mg/L	0.46	0.63	0.42	0.58	0.35	0.48	0.26	0.36
Magnesium	mg/L	24	32	22	29	19	24	15	20
Potassium	mg/L	8.9	17	8.2	16	6.8	13	5.0	9.3
Sodium	mg/L	42	60	39	55	32	46	24	34
Sulphate	mg/L	422	541	388	499	323	414	239	313
Nutrients									
Ammonia	mg/L (as N)	0.053	0.26	0.048	0.24	0.04	0.19	0.03	0.14
Nitrate	mg/L (as N)	6.1	9.9	5.6	9.2	4.6	7.6	3.3	5.4
Nitrite	mg/L (as N)	0.047	0.088	0.043	0.081	0.036	0.067	0.026	0.048
Total Phosphorus	mg/L	0.011	0.035	0.011	0.032	0.0097	0.027	0.0094	0.023
Total Metals									
Aluminum	mg/L	0.46	0.49	0.46	0.48	0.044	0.16	0.043	0.16
Antimony	mg/L	0.018	0.019	0.0012	0.0017	0.00096	0.0013	0.00069	0.00094
Arsenic	mg/L	0.033	0.034	0.0016	0.0026	0.0011	0.002	0.00088	0.0016
Barium	mg/L	0.051	0.083	0.047	0.077	0.038	0.059	0.031	0.046
Beryllium	mg/L	0.00005	0.00005	0.000047	0.000049	0.000041	0.000041	0.000039	0.00004
Boron	mg/L	0.14	0.2	0.13	0.19	0.1	0.13	0.079	0.1
Cadmium	mg/L	0.000022	0.00013	0.00002	0.00012	0.000017	0.000071	0.000014	0.000054
Chromium	mg/L	0.00065	0.00068	0.00063	0.00066	0.00032	0.00077	0.00031	0.00076
Cobalt	mg/L	0.00041	0.00061	0.0004	0.00059	0.000091	0.00036	0.000073	0.00031
Copper	mg/L	0.015	0.19	0.014	0.18	0.0063	0.031	0.0058	0.023
Iron	mg/L	0.47	0.48	0.47	0.48	0.066	0.24	0.067	0.25
Lead	mg/L	0.00014	0.00014	0.00014	0.00014	0.00002	0.000088	0.000017	0.000087
Lithium	mg/L	0.011	0.018	0.01	0.016	0.0083	0.013	0.006	0.0093
Manganese	mg/L	0.053	0.081	0.051	0.076	0.029	0.069	0.023	0.058
Mercury	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Molybdenum	mg/L	0.51	0.56	0.15	0.2	0.12	0.16	0.09	0.12
Nickel	mg/L	0.001	0.0014	0.001	0.0014	0.00048	0.001	0.00043	0.00094
Selenium	mg/L	0.036	0.049	0.033	0.045	0.027	0.032	0.02	0.024
Silver	mg/L	0.00001	0.000017	0.0000093	0.000017	0.0000078	0.000016	0.0000062	0.000015
Strontium	mg/L	1.8	3.1	1.6	2.9	1.4	2.1	1.0	1.6
Thallium	mg/L	0.000005	0.0000067	0.0000047	0.0000065	0.0000041	0.0000042	0.000004	0.0000041
Tin	mg/L	0.00005	0.00012	0.000046	0.00012	0.000038	0.000039	0.000029	0.00003

Table 37: Summary of Predicted Water Quality in Springer-Cariboo Pit

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Total Metals (cont'd)									
Titanium	mg/L	0.022	0.037	0.022	0.036	0.0027	0.014	0.002	0.0099
Uranium	mg/L	0.0018	0.0028	0.0016	0.0026	0.0013	0.0019	0.001	0.0015
Vanadium	mg/L	0.0025	0.0043	0.0024	0.0041	0.0012	0.0029	0.001	0.0023
Zinc	mg/L	0.0042	0.006	0.0042	0.0051	0.0014	0.0022	0.0013	0.0019
Dissolved Metals									
Aluminum	mg/L	0.011	0.036	0.011	0.027	0.011	0.025	0.01	0.024
Antimony	mg/L	0.018	0.019	0.0012	0.0016	0.00096	0.0013	0.00069	0.00094
Arsenic	mg/L	0.033	0.034	0.0013	0.0023	0.0011	0.0019	0.00083	0.0014
Barium	mg/L	0.049	0.074	0.045	0.068	0.038	0.057	0.03	0.044
Beryllium	mg/L	0.00005	0.00005	0.000047	0.000049	0.000041	0.000041	0.000039	0.00004
Boron	mg/L	0.14	0.17	0.13	0.16	0.1	0.13	0.079	0.1
Cadmium	mg/L	0.000019	0.000083	0.000018	0.000076	0.000015	0.000063	0.000012	0.000046
Chromium	mg/L	0.00025	0.00028	0.00023	0.00026	0.0002	0.00025	0.00019	0.00024
Cobalt	mg/L	0.00012	0.00032	0.00011	0.0003	0.000091	0.00025	0.000073	0.00019
Copper	mg/L	0.0074	0.038	0.007	0.035	0.0059	0.029	0.0054	0.022
Iron	mg/L	0.015	0.034	0.014	0.025	0.014	0.023	0.015	0.032
Lead	mg/L	0.000025	0.000025	0.000023	0.000025	0.00002	0.000022	0.000017	0.000022
Lithium	mg/L	0.011	0.017	0.01	0.015	0.0083	0.013	0.006	0.0092
Manganese	mg/L	0.032	0.06	0.03	0.055	0.025	0.046	0.019	0.035
Mercury	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Molybdenum	mg/L	0.51	0.55	0.15	0.19	0.12	0.16	0.09	0.12
Nickel	mg/L	0.0005	0.00088	0.00047	0.00083	0.0004	0.0007	0.00035	0.00061
Selenium	mg/L	0.035	0.042	0.033	0.039	0.027	0.032	0.02	0.024
Silicon	mg/L	5.4	7.6	4.4	6.4	3.8	5.5	3.7	5.2
Silver	mg/L	0.00001	0.00001	0.0000093	0.0000097	0.0000078	0.0000085	0.0000062	0.0000081
Strontium	mg/L	1.8	2.8	1.6	2.5	1.4	2.1	1.0	1.5
Thallium	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Tin	mg/L	0.00005	0.00005	0.000046	0.000047	0.000038	0.000039	0.000029	0.00003
Titanium	mg/L	0.0036	0.018	0.0033	0.017	0.0027	0.014	0.002	0.0099
Uranium	mg/L	0.0017	0.0025	0.0016	0.0023	0.0013	0.0019	0.0010	0.0014
Vanadium	mg/L	0.0013	0.0031	0.0012	0.0029	0.001	0.0024	0.00086	0.0018
Zinc	mg/L	0.0016	0.0034	0.0015	0.0025	0.0014	0.0022	0.0013	0.0019

(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure.

Note: The change in concentrations during closure and post-closure is caused by reclamation of mine site areas and the filling of the combined Springer-Cariboo Pit.

Figure 32: Predicted Dissolved Copper and Dissolved Selenium Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure

4.4.6.3 Wight Pit

Four months into the closure phase, the TSF pond will be reduced to 0.25 M-m^3 within two months, after which Wight Pit will still be used to store excess water. During post-closure, Wight Pit will no longer be used for freshet storage and will be allowed to fill. Wight Pit is projected to start overflowing in 2045 under the 50th and 90th percentile results, and in 2044 under the 99.5th percentile results. Overflow from Wight Pit during post-closure is assumed as direct environmental discharge to Polley Lake. Reclamation of the disturbed areas and haul roads is assumed to occur during closure. Runoff water quality from these facilities is predicted to return to undisturbed water quality.

Maximum of the daily median and maximum of the daily 95th percentile concentrations in Wight Pit are presented in Table 38. Time series for predicted copper and selenium concentrations in the Wight Pit are presented in Figure 33.

Predicted concentrations of key parameters in Wight Pit are generally stable 10 years after the start of post-closure. Concentrations of key parameters decrease through early post-closure after the pit has filled and is flushed with runoff from reclaimed disturbed areas and haul roads in the Wight Pit catchment area.

Some parameters are predicted to have increasing concentrations before reaching a steady-state in post-closure (for example, dissolved copper). The increase in concentration for these parameters is caused by either:

a) Higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to NAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more inflows into Wight Pit.

b) Increased proportions of the total inflows to Wight Pit from pit wall runoff that is assigned the Wight Pit wall runoff during post-closure.

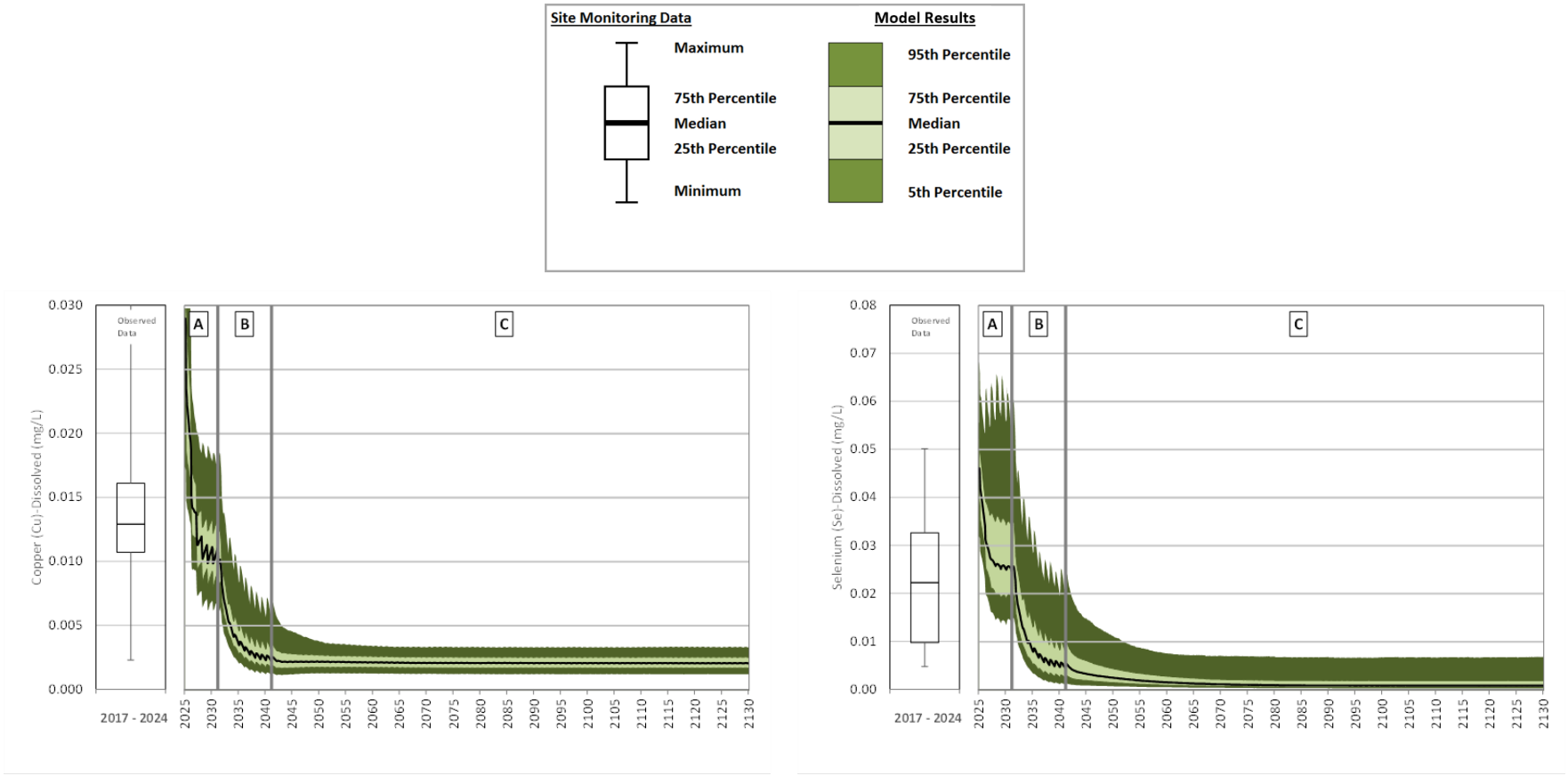
Table 38: Summary of Predicted Water Quality in Wight Pit

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	691	872	579	765	213	374	171	335
Total Dissolved Solids	mg/L	1048	1319	890	1155	312	484	246	406
Major Ions									
Calcium	mg/L	222	284	184	246	67	108	55	96
Chloride	mg/L	9.0	10	4.0	11	2.1	11	1.9	11
Fluoride	mg/L	0.59	0.73	0.39	0.54	0.23	0.37	0.22	0.35
Magnesium	mg/L	33	40	29	36	11	25	8.2	23
Potassium	mg/L	4.5	5.2	3.0	4.4	0.85	1.8	0.65	1.3
Sodium	mg/L	31	35	24	31	18	31	17	30
Sulphate	mg/L	588	778	502	665	141	230	96	179
Nutrients									
Ammonia	mg/L (as N)	0.04	0.061	0.016	0.046	0.0046	0.033	0.0031	0.031
Nitrate	mg/L (as N)	4.9	11	2.7	9.7	0.45	2.8	0.21	1.2
Nitrite	mg/L (as N)	0.028	0.035	0.014	0.026	0.0027	0.017	0.0011	0.015
Total Phosphorus	mg/L	0.021	0.025	0.014	0.029	0.015	0.029	0.014	0.028
Total Metals									
Aluminum	mg/L	0.5	0.52	0.47	0.5	0.042	0.17	0.042	0.16
Antimony	mg/L	0.00089	0.0011	0.0008	0.0011	0.00011	0.00022	0.000084	0.00016
Arsenic	mg/L	0.0017	0.0019	0.0021	0.0038	0.0019	0.0037	0.0019	0.0037
Barium	mg/L	0.041	0.053	0.033	0.058	0.019	0.051	0.018	0.051
Beryllium	mg/L	0.000072	0.000077	0.000072	0.000078	0.000051	0.000052	0.000053	0.000054
Boron	mg/L	0.18	0.28	0.2	0.38	0.19	0.36	0.19	0.35
Cadmium	mg/L	0.00021	0.00053	0.00014	0.0004	0.000014	0.000047	0.000011	0.000029
Chromium	mg/L	0.00072	0.00077	0.00064	0.0010	0.00032	0.0012	0.00033	0.0012
Cobalt	mg/L	0.00077	0.0011	0.00051	0.00089	0.000048	0.0004	0.000042	0.00036
Copper	mg/L	0.028	0.18	0.017	0.17	0.0029	0.0083	0.0026	0.0053
Iron	mg/L	0.49	0.53	0.48	0.61	0.072	0.38	0.072	0.38
Lead	mg/L	0.00016	0.00017	0.00014	0.00015	0.000024	0.000094	0.000024	0.000094
Lithium	mg/L	0.0085	0.011	0.0061	0.0088	0.0028	0.0043	0.0026	0.0041
Manganese	mg/L	0.22	0.4	0.1	0.31	0.027	0.31	0.022	0.28
Mercury	mg/L	0.0000047	0.0000047	0.0000046	0.0000048	0.0000032	0.0000034	0.0000033	0.0000034
Molybdenum	mg/L	0.14	0.17	0.12	0.16	0.038	0.058	0.03	0.048
Nickel	mg/L	0.0014	0.002	0.0012	0.0019	0.00051	0.0012	0.00049	0.0012
Selenium	mg/L	0.039	0.072	0.026	0.065	0.0052	0.024	0.0023	0.01
Silver	mg/L	0.000011	0.000019	0.0000049	0.000014	0.0000046	0.000013	0.0000046	0.000014
Strontium	mg/L	4.3	7.3	3.2	5.8	0.45	0.86	0.28	0.63
Thallium	mg/L	0.0000098	0.000021	0.0000078	0.000016	0.000005	0.0000051	0.0000051	0.0000052
Tin	mg/L	0.000064	0.00014	0.00004	0.00011	0.000025	0.000042	0.000024	0.000041

Table 38: Summary of Predicted Water Quality in Wight Pit

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Total Metals (cont'd)									
Titanium	mg/L	0.025	0.026	0.023	0.024	0.0041	0.0044	0.0039	0.0041
Uranium	mg/L	0.0024	0.0039	0.002	0.0032	0.00044	0.0011	0.00037	0.0011
Vanadium	mg/L	0.0027	0.0029	0.0019	0.0031	0.00066	0.0024	0.00065	0.0024
Zinc	mg/L	0.017	0.05	0.014	0.035	0.003	0.007	0.003	0.0072
Dissolved Metals									
Aluminum	mg/L	0.051	0.063	0.013	0.045	0.0094	0.034	0.0086	0.031
Antimony	mg/L	0.00087	0.00099	0.00078	0.00094	0.00011	0.00022	0.000084	0.00016
Arsenic	mg/L	0.0015	0.0016	0.0018	0.0035	0.0019	0.0036	0.0019	0.0035
Barium	mg/L	0.039	0.045	0.031	0.049	0.019	0.049	0.017	0.049
Beryllium	mg/L	0.000072	0.000077	0.000072	0.000078	0.000051	0.000052	0.000053	0.000054
Boron	mg/L	0.18	0.25	0.19	0.35	0.19	0.36	0.19	0.35
Cadmium	mg/L	0.00021	0.00048	0.00014	0.00035	0.000013	0.000039	0.0000095	0.000021
Chromium	mg/L	0.00033	0.00038	0.00024	0.0006	0.0002	0.00064	0.00021	0.00066
Cobalt	mg/L	0.00048	0.00079	0.00022	0.0006	0.000048	0.00028	0.000042	0.00024
Copper	mg/L	0.021	0.034	0.01	0.019	0.0025	0.0067	0.0022	0.0037
Iron	mg/L	0.04	0.076	0.025	0.16	0.02	0.16	0.02	0.17
Lead	mg/L	0.00005	0.000055	0.000024	0.000031	0.000024	0.000029	0.000024	0.000029
Lithium	mg/L	0.0083	0.0097	0.0059	0.0079	0.0028	0.0041	0.0026	0.0039
Manganese	mg/L	0.2	0.38	0.082	0.29	0.023	0.28	0.018	0.25
Mercury	mg/L	0.0000047	0.0000047	0.0000046	0.0000048	0.0000032	0.0000034	0.0000033	0.0000034
Molybdenum	mg/L	0.14	0.16	0.12	0.15	0.038	0.058	0.03	0.048
Nickel	mg/L	0.00085	0.0015	0.00065	0.0013	0.00043	0.0009	0.00041	0.00084
Selenium	mg/L	0.039	0.066	0.025	0.059	0.0052	0.024	0.0023	0.01
Silicon	mg/L	7.5	8.2	7.1	9.5	7.3	9.5	7.4	9.6
Silver	mg/L	0.000011	0.000012	0.0000049	0.0000068	0.0000046	0.000006	0.0000046	0.0000062
Strontium	mg/L	4.3	6.9	3.2	5.4	0.44	0.84	0.27	0.61
Thallium	mg/L	0.0000098	0.000019	0.0000078	0.000015	0.000005	0.0000051	0.0000051	0.0000052
Tin	mg/L	0.000064	0.000073	0.00004	0.000042	0.000025	0.000042	0.000024	0.000041
Titanium	mg/L	0.0057	0.007	0.004	0.0054	0.0041	0.0044	0.0039	0.0041
Uranium	mg/L	0.0024	0.0036	0.002	0.0029	0.00044	0.0011	0.00037	0.0011
Vanadium	mg/L	0.0015	0.0017	0.00067	0.0019	0.00048	0.0019	0.00047	0.0019
Zinc	mg/L	0.015	0.047	0.011	0.033	0.003	0.007	0.003	0.0072

(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure.

Note(s): The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 33: Predicted Dissolved Copper and Dissolved Selenium Concentrations in the Wight Pit – Operations, Closure and Post-closure

4.4.6.4 Long Ditch

In closure, the Long Ditch continues to receive flow from the SERDS Ditch and overflow from Bootjack Creek Sump (via SERDS Ditch). Discharge from the Long Ditch will be directed to the CCS (and eventually the PETBP and treatment) during operations and closure and assumed directed to Polley Lake in post-closure. The combined catchment area for the Long Ditch, the SERDS Ditch, and Bootjack Creek includes the SERDS RDS, NEZ RDS, and East RDS along with haul roads, disturbed areas, and undisturbed catchment area. Tailings co-disposal to the SERDS location will include a soil cover during closure that will remediate runoff from the tailings deposition area which runs off into SERDS Ditch. However, seepage water quality from the SERDS tailings is assumed to remain unchanged through closure and post-closure. The proportion of seepage assigned tailings water quality is calculated based on the total proportions of tailings relative to waste rock deposited (4.7% tailings and 95.3% waste rock; Appendix B).

Maximum of the daily median and maximum of the daily 95th percentile concentrations in Long Ditch are presented in Table 39. Time series for predicted copper and selenium concentrations in the Long Ditch are presented in Figure 34.

Peak concentrations in the Long Ditch are predicted to occur during operations, representing runoff and seepage from un-reclaimed RDS areas within the combined catchment area for the Long Ditch, the SERDS Ditch, and Bootjack Creek (Appendix B). These facilities are reclaimed throughout closure, at which point runoff is assigned undisturbed water quality. Most parameter concentrations in the Long Ditch are predicted to decrease through closure, reaching steady state conditions 10 years after the start of post-closure.

Seasonal peak concentrations in winter are driven by seepage from the RDS area within the watershed which is assigned the NAG water quality in perpetuity. During winter months, when precipitation occurs as snowfall, RDS seepage represents a higher proportion of the total flow to the Long Ditch and causes concentrations to peak.

Some parameters are predicted to have higher concentrations in post-closure than closure. These parameters have higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to NAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more inflows into Bootjack Creek Sump, SERDS Ditch, and Long Ditch which causes concentrations of some parameters, such as aluminum, to increase.

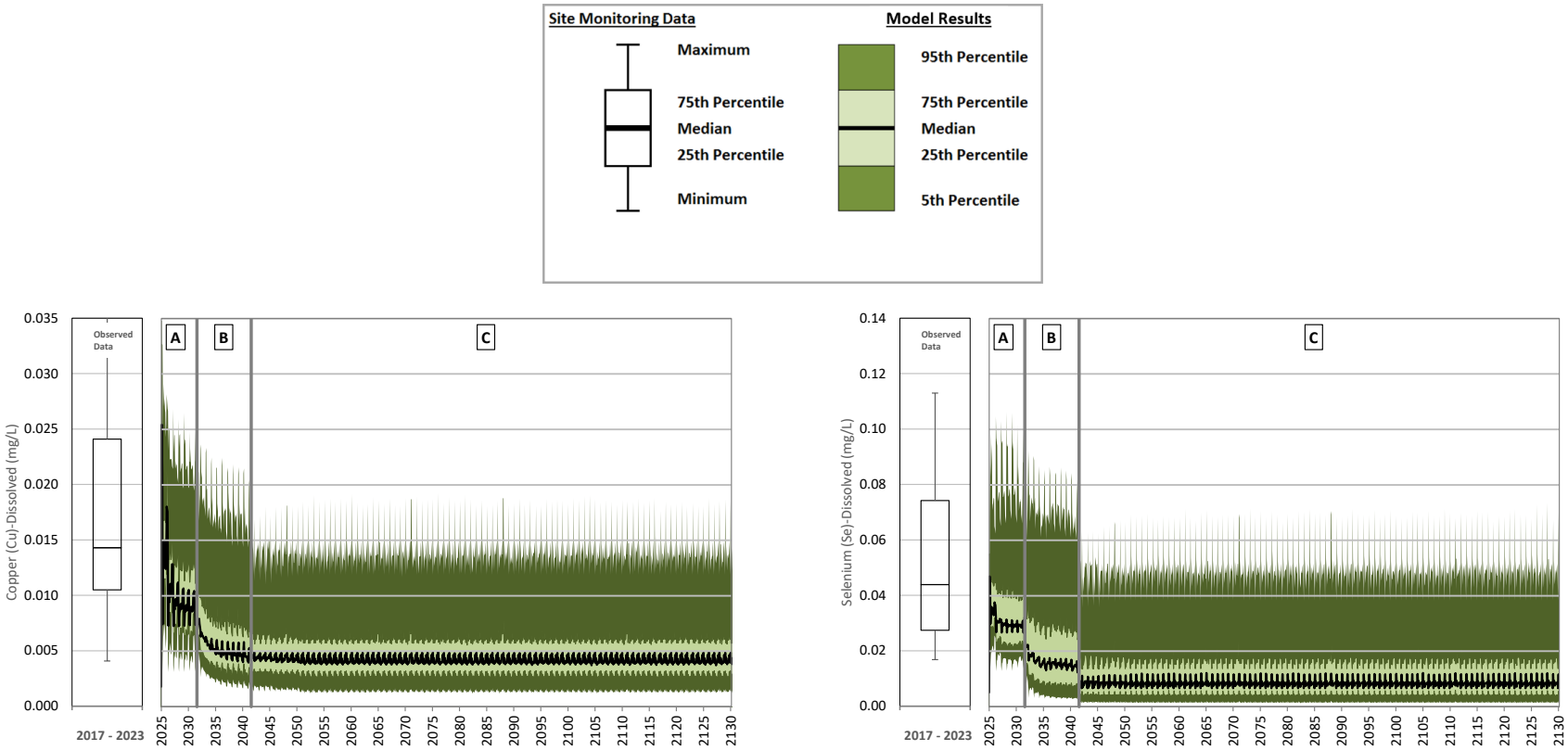
Table 39: Summary of Predicted Water Quality in Long Ditch

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	681	848	533	739	336	497	342	509
Total Dissolved Solids	mg/L	1034	1261	790	1108	491	747	499	753
Major Ions									
Calcium	mg/L	218	268	165	229	95	141	97	146
Chloride	mg/L	7.3	11	3.3	7.6	2.8	8.9	2.8	8.9
Fluoride	mg/L	0.52	0.65	0.31	0.43	0.13	0.27	0.13	0.27
Magnesium	mg/L	34	44	29	41	24	35	24	35
Potassium	mg/L	4.1	8.0	2.3	3.7	1.3	1.8	1.3	1.8
Sodium	mg/L	29	43	20	25	9.6	14	9.7	14
Sulphate	mg/L	582	733	426	606	212	350	216	353
Nutrients									
Ammonia	mg/L (as N)	0.034	0.09	0.012	0.031	0.004	0.012	0.0041	0.012
Nitrate	mg/L (as N)	4.9	18	1.8	12	0.43	4.6	0.44	4.8
Nitrite	mg/L (as N)	0.024	0.057	0.0099	0.02	0.00059	0.0031	0.00059	0.0031
Total Phosphorus	mg/L	0.019	0.029	0.016	0.029	0.025	0.037	0.025	0.037
Total Metals									
Aluminum	mg/L	0.49	0.51	0.48	0.55	0.077	0.38	0.077	0.38
Antimony	mg/L	0.0029	0.004	0.00056	0.00082	0.000078	0.00021	0.000079	0.00022
Arsenic	mg/L	0.0052	0.0071	0.0015	0.0025	0.00097	0.0018	0.00097	0.0018
Barium	mg/L	0.04	0.058	0.029	0.049	0.017	0.025	0.017	0.025
Beryllium	mg/L	0.000067	0.000071	0.00006	0.000064	0.000032	0.000034	0.000032	0.000034
Boron	mg/L	0.16	0.25	0.13	0.25	0.029	0.044	0.029	0.044
Cadmium	mg/L	0.00018	0.00043	0.0001	0.00029	0.000026	0.00012	0.000026	0.00013
Chromium	mg/L	0.00069	0.00078	0.0007	0.0009	0.00089	0.0018	0.00089	0.0018
Cobalt	mg/L	0.0007	0.0012	0.00046	0.0011	0.000073	0.00073	0.000073	0.00076
Copper	mg/L	0.025	0.18	0.015	0.17	0.0053	0.02	0.0053	0.021
Iron	mg/L	0.49	0.52	0.49	0.58	0.14	0.6	0.14	0.6
Lead	mg/L	0.00016	0.00016	0.00014	0.00015	0.000035	0.00014	0.000035	0.00014
Lithium	mg/L	0.0078	0.011	0.0047	0.0071	0.0014	0.0037	0.0015	0.0037
Manganese	mg/L	0.19	0.46	0.085	0.41	0.019	0.32	0.019	0.33
Mercury	mg/L	0.0000046	0.0000053	0.0000047	0.000005	0.0000056	0.0000056	0.0000056	0.0000056
Molybdenum	mg/L	0.16	0.2	0.094	0.14	0.035	0.066	0.035	0.067
Nickel	mg/L	0.0013	0.0024	0.0012	0.0022	0.0011	0.0024	0.0011	0.0024
Selenium	mg/L	0.038	0.11	0.024	0.099	0.012	0.07	0.012	0.074
Silver	mg/L	0.0000092	0.000017	0.0000045	0.000015	0.0000038	0.000026	0.0000038	0.000026
Strontium	mg/L	3.8	6.1	2.5	4.2	1.0	1.8	1.0	1.9
Thallium	mg/L	0.0000088	0.000017	0.0000064	0.000012	0.0000056	0.0000056	0.0000056	0.0000056
Tin	mg/L	0.000058	0.00013	0.000036	0.00011	0.000032	0.000034	0.000032	0.000034

Table 39: Summary of Predicted Water Quality in Long Ditch

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - July 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Total Metals (cont'd)									
Titanium	mg/L	0.024	0.027	0.022	0.024	0.0029	0.0049	0.0029	0.0049
Uranium	mg/L	0.0022	0.0034	0.0016	0.0025	0.00092	0.0016	0.00092	0.0016
Vanadium	mg/L	0.0024	0.0027	0.0018	0.0025	0.00078	0.0015	0.00078	0.0015
Zinc	mg/L	0.015	0.039	0.011	0.025	0.0022	0.0058	0.0017	0.0058
Dissolved Metals									
Aluminum	mg/L	0.037	0.058	0.025	0.1	0.044	0.25	0.044	0.25
Antimony	mg/L	0.0029	0.0038	0.00054	0.00068	0.000078	0.00021	0.000079	0.00022
Arsenic	mg/L	0.005	0.0068	0.0013	0.0023	0.00092	0.0016	0.00092	0.0016
Barium	mg/L	0.038	0.05	0.027	0.041	0.016	0.023	0.017	0.023
Beryllium	mg/L	0.000067	0.000071	0.00006	0.000064	0.000032	0.000034	0.000032	0.000034
Boron	mg/L	0.16	0.22	0.13	0.22	0.029	0.042	0.029	0.042
Cadmium	mg/L	0.00018	0.00038	0.0001	0.00024	0.000024	0.00012	0.000024	0.00012
Chromium	mg/L	0.00029	0.00039	0.0003	0.0005	0.00077	0.0012	0.00077	0.0012
Cobalt	mg/L	0.00041	0.00088	0.00017	0.00078	0.000073	0.00061	0.000073	0.00064
Copper	mg/L	0.018	0.028	0.008	0.024	0.0049	0.019	0.005	0.019
Iron	mg/L	0.035	0.073	0.041	0.13	0.084	0.38	0.084	0.38
Lead	mg/L	0.000042	0.000047	0.000026	0.000039	0.000035	0.000074	0.000035	0.000074
Lithium	mg/L	0.0076	0.01	0.0045	0.0061	0.0014	0.0035	0.0015	0.0036
Manganese	mg/L	0.17	0.44	0.064	0.39	0.015	0.3	0.015	0.31
Mercury	mg/L	0.0000046	0.0000053	0.0000047	0.000005	0.0000056	0.0000056	0.0000056	0.0000056
Molybdenum	mg/L	0.16	0.19	0.094	0.13	0.035	0.065	0.035	0.067
Nickel	mg/L	0.00078	0.0018	0.00065	0.0017	0.00099	0.002	0.00099	0.002
Selenium	mg/L	0.038	0.11	0.024	0.093	0.012	0.07	0.012	0.074
Silicon	mg/L	7.0	7.6	6.4	7.9	6.7	9.1	6.7	9.1
Silver	mg/L	0.0000092	0.00001	0.0000045	0.0000081	0.0000038	0.000018	0.0000038	0.000018
Strontium	mg/L	3.8	5.8	2.5	3.9	1.0	1.8	1.0	1.8
Thallium	mg/L	0.0000088	0.000016	0.0000064	0.000011	0.0000056	0.0000056	0.0000056	0.0000056
Tin	mg/L	0.000058	0.000064	0.000036	0.000041	0.000032	0.000034	0.000032	0.000034
Titanium	mg/L	0.0053	0.0077	0.0035	0.0053	0.0029	0.0049	0.0029	0.0049
Uranium	mg/L	0.0022	0.0031	0.0015	0.0022	0.00091	0.0015	0.00092	0.0016
Vanadium	mg/L	0.0012	0.0016	0.00057	0.0013	0.00061	0.0010	0.00061	0.0010
Zinc	mg/L	0.012	0.037	0.008	0.022	0.0022	0.0058	0.0017	0.0058

(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure.

Note(s): The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 34: Predicted Dissolved Copper and Dissolved Selenium Concentrations in the Long Ditch – Operations, Closure and Post-closure

4.5 Description of Discharge Options Inventory

4.5.1 Restoration of Watercourses

There are few ecologically productive watercourses that have been changed as a result of mining activity. Hazeltine Creek and a lower portion of Edney Creek were changed extensively as a result of the August 2014 foundational failure and resulting TSF breach. The restoration of those watercourses began to take place as soon as safe access was possible following that breach. Historical changes to the natural drainage patterns occurred well before the Mount Polley Mine was developed. Bootjack Creek drainage and Hazeltine Creek drainages were modified to support hydraulic placer mining.

The primary driver behind watercourse restoration at Mount Polley is aquatic productivity / productive capacity of aquatic habitats, rather than the use of a watercourse as a discharge conveyance system[1]. However, some amount of flows within Hazeltine Creek could potentially augment the amount of habitat available, particularly during seasonally dry periods (e.g., August). Currently, the weir at the confluence of Hazeltine Creek and Polley Lake is being used to mute the peak flows and to provide flow nourishment to Hazeltine Creek during dry periods.

Other streams affected by mine development include Bootjack Creek and Mine Drainage Creek. MPMC has determined that Bootjack Creek cannot maintain its current alignment while still functioning as fish habitat. Impacts to Bootjack Creek will be addressed through the development of offset habitat in accordance with Fisheries and Oceans Canada's fish habitat policy. Mine Drainage Creek is currently captured as contact water in Mine Drainage Creek sump and pumped to the West Ditch for management and treatment. However, rainbow trout spawning was recorded previously in the lower reach of the creek (~25 m upstream of Bootjack Lake), and restoration of this watercourse could be considered as part of future closure planning.

Should additional drainages need to be constructed at closure, they will be constructed with the objective of developing those watercourses as aquatic habitats where feasible. Feasibility evaluations will include the stream gradient, access and connectivity to other habitats, habitat enhancement objectives, stream bed characteristics (i.e., the stream bed must be capable of maintaining surface water) and the cost to construct as a habitat. Where it is not feasible to construct a drainage feature as an aquatic habitat, hydraulic engineering design principles (Chow 1959) will be used to provide drainage features that are built to sustain themselves without maintenance following closure. The details of such drainages will be identified as closure designs are developed in advance of the mine going into closure.

4.5.2 Watercourses Available to Receive Discharge

Over 2015 and 2016, Golder assessed the capacity of the following receiving environments around the Mine to receive treated effluent discharge (Golder 2015a, Golder 2016b, Appendix G of the LTWMP – Golder 2016g):

- Polly Lake outlet
- Hazeltine Creek at the mouth
- Bootjack Lake outlet
- Edney Creek at the mouth
- Quesnel River at Likely

[1] Note: Prior to Hazeltine Creek being made accessible to fish, it was temporarily used to convey treated water flows to Quesnel Lake while the current pipeline and diffuser were being constructed.

Based on the far-field volumetric dilution values for the mean seven-day low flow condition, concentrations of constituents in the treated effluent discharge were calculated such that concentrations at the potential effluent discharge locations would meet WQGs. The concentrations of constituents in the treated effluent discharge to meet WQGs were compared to monitoring data at station HAD-3 to determine if additional water treatment would be required.

Based on median concentrations from monitoring data, additional water treatment would be required to meet WQGs for several constituents (sulphate, nitrate, nitrite, dissolved aluminum, dissolved copper, and total selenium) if considering discharge to the receiving environments listed above.

In Golder (2016g), two potential discharge locations were presented for long-term discharge at the mine in operations:

- Pipeline to Quesnel River
- Pipeline to Quesnel Lake

Based on the hydrologic and chemical assimilative capacities of potential receiving environments, a pipeline to Quesnel Lake was ranked to provide the best assimilative capacity for discharge from the Mount Polley Mine during operations. A pipeline from the WTP to Quesnel Lake was constructed, including submerged diffuser at the pipeline terminus, to convey treated mine contact water to this selected receiving environment. This discharge location remains as the single permitted discharge location for the mine, which is anticipated to continue through operations and is assumed as the base case discharge location into closure/post-closure. A detailed description of this receiving environment assessment and results are provided in the 2020 Water Management Plan (Golder 2020e) and not duplicated here.

Another review of discharge alternatives has been stipulated as a new permit condition in the 2025 EMA Permit 11678, with a summary report due to regulators by January 31, 2026. The review must evaluate discharge alternatives for direct discharge of treated mine water on and around the mine site for all mine phases and must consider passive and semi-passive water treatment options, as well as physical, chemical, and biological characteristics of potential receiving environments. Results from this review will be incorporated into the next revision of this WMP in March 2026 when the WMP is due under the M-200 annual permit requirement.

4.6 Water Treatment

This section provides details regarding water treatment for the Mine to identify the water treatment flow rate and water quality requirements for operations and closure/post-closure. This section discusses the current treatment system's performance in meeting existing permit requirements during operations, the predicted requirements for water treatment in the future for closure, and also provides updates on the progression of water treatment technology development for closure.

4.6.1 Water Treatment Requirements

The flows and associated influent water quality that require treatment during operations and closure/post-closure are predicted by the SWWBM and SWWQM and described in this section. Results are used to predict treatment requirements for operations and closure, assumed met by either the current treatment system or future potential water treatment technologies. The existing water quality requirements in the EMA Permit 11678 for WTP discharge are assumed to be valid for the remainder of operations and are used in comparison with predicted contact water quality to assess treatment requirements for specific constituents. EMA Permit 11678 water quality

requirements are also assumed for closure/post-closure permit requirements, as they reflect the only currently permitted discharge; however, it is acknowledged that closure phase permit requirements may differ, notably if distributed discharge is directed to other watercourses than Quesnel Lake.

Flow Rate

Operations

The treatment flow rate capacity of the existing WTP varies between approximately 0.21 m^3/s and 0.31 m^3/s, pending operator control of the plant and varying influent conditions. The allowable maximum daily discharge volume from site is currently 29,000 m^3/day (0.34 m^3/s), as per EMA Permit 11678.

The SWWBM has assumed a maximum WTP treatment capacity of 0.29 m^3/s (25,000 m^3/d, or 9.13 M-m^3 annually) for modelling purposes and this flow rate results in sufficient predicted treatment capacity for the site to manage annual contact water volume during operations from 2025 to 2031 (WSP 2025d). The SWWBM has predicted that, for all stochastic results, the maximum of the 90th percentile annual required treated water discharge from Site is 6.11 M-m^3 during operations, which results in a treatment flow rate of 0.19 m^3/s. Given these volume predictions and the modelled WTP capacity, the treatment capacity of the existing WTP has been assumed sufficient for the remainder of the LOM operations phase.

Closure and Post-closure

For the combined closure and post-closure phases, the SWWBM was again used to predict annual required treatment volumes for the period of 2031 to 2131. For the closure period of 2031 to 2041, results showed an annual maximum treatment volume of approximately 6.16 M-m^3 for 90th percentile climate conditions, which results in a treatment flow rate of 0.20 m^3/s. For the closure period, annual treated water is similar to the operations phase, as most site catchments are not assumed remediated until post-closure and are still generating contact water in the SWWBM. The Springer-Cariboo Pit catchment no longer contributes volume to the annual treatment requirement during closure, but the mill is also no longer consuming annual process water.

For the post-closure period of 2041 to 2131, results showed an annual maximum treatment volume of approximately 3.99 M-m^3 for 90th percentile climate conditions, which results in a treatment flow rate of 0.13 m^3/s. After 2051, the SWWBM predicts the maximum of the 90th percentile of the annual water treatment volume to reduce to 0.43 M-m^3 after some of the final TSF catchments are remediated, which results in a treatment flow rate of 0.04 m^3/s. These maximum annual 90th percentile treated water requirements are assumed as the required WTP flow rates in closure and post-closure.

The combined Springer-Cariboo Pit and Wight Pit are both modelled to become pit lakes during post-closure and are assumed to fill and overflow directly to the environment without treatment. Overflow is predicted to occur in 2044 for Wight Pit (90th and 50th percentile predictions) and between 2148 and 2152 for Springer-Cariboo pit (90th and 50th percentile predictions, respectively). Annual overflow volume predictions from these pits are 0.37 M-m^3 for Wight Pit and 0.55 M-m^3 for Springer-Cariboo Pit (maximum of the 90th percentile results). Water quality and treatment requirements for pit overflow water is discussed in the closure/post-closure water quality section. If overflow from both pits is assumed included in the required annual treatment volume for the site in post-closure, then the annual treatment requirement would increase from 0.43 M-m^3/year to 1.35 M-m^3/year.

Water Quality and Targets

Operations

The SWWQM was used to predict water quality at the PETBP during operations (the current influent source to the WTP). Table 40 provides a list of constituents of interest determined following review of modelled water quality

predictions during operations (Appendix B). Table 40 compares the current EMA Permit 11678 WTP discharge limits with the predicted 95th percentile parameter concentrations in the PETBP.

Table 40: Predicted Water Quality Concentrations and Permit Limits for Treatment During Operations

Parameter	Unit	EMA Permit 11678 WTP Discharge Limit	PETBP – Maximum of 95th Percentile Predicted Concentrations
Major Ions			
Total Sulphate	mg/L	1,100	751
Nutrients			
Total Ammonia	mg/L (as N)	1.30	0.12
Total Nitrate	mg/L (as N)	34	16
Total Phosphorus	mg/L	0.09	0.03
Total Metals			
Arsenic	mg/L	0.028	0.004
Chromium	mg/L	0.004	0.001
Copper	mg/L	0.033	**0.173**
Iron	mg/L	1.00	0.53
Manganese	mg/L	3.4	0.40
Molybdenum	mg/L	0.36	0.28
Selenium	mg/L	0.075	**0.102**
Zinc	mg/L	0.059	0.032
Dissolved Metals			
Cadmium	mg/L	0.00034	**0.00035**
Copper	mg/L	No EMA Permit Limit	0.026

Note(s): **Bold and underlined** values exceed permitted discharge limits. These EMA Permit 11678 discharge limits apply to the effluent of the WTP, and not to the PETBP (WTP influent). PETBP water quality predictions are shown to demonstrate the requirement for treatment of a water quality parameter. The SWWBM was developed to predict water quality conservatively; where uncertainty exists in the model inputs, the inputs are selected such that under-prediction would be minimized. Thus, over-prediction is generally expected.

Table 40 shows that total copper, total selenium, and dissolved cadmium are predicted to require treatment during operations. Total Suspended Solids (TSS), not listed in Table 40, is also required for treatment during operations. The predictions shown in the table are the maximum of the 95th percentile concentration predictions, and these parameters are not normally seen at these concentrations in monitoring data. The maximum of the median percentile concentration predictions for total copper, total selenium and dissolved cadmium are 0.025 mg/L, 0.051 mg/L, and 0.00018 mg/L, respectively, which are all below permit limit.

The existing WTP has been shown to effectively treat TSS for historical operating conditions (discussed in more detail in Golder 2022b). WTP influent and effluent quality were assessed over six years between 2016 and 2021, showing effluent TSS consistently below permit limit (Golder 2022b).

The existing WTP has been able to effectively treat total copper for the majority of historic operating conditions, as demonstrated in Figure 35, which shows total copper concentration in the WTP influent and effluent over the period of 2016 through 2024. Also shown in the figure is the total copper EMA permit limit for the WTP effluent (0.033 mg/L). The SWWQM predicted maximum of the 95th percentile concentration for total copper of 0.173 mg/L in the WTP influent shown in Table 40, which is a conservative prediction based on infrequent outlying historic copper concentrations and the average WTP influent total copper illustrated in Figure 35 over 2023 and 2024 is

significantly lower at a value of 0.013 mg/L. Figure 35 shows that the existing WTP is able to maintain WTP effluent total copper below the permit limit with only occasional occurrences of total copper above the permit limit. These occurrences are managed by halting WTP discharge and temporary contact water recirculation until copper concentration is below permit limit. This process is managed through MPMC's Trigger Response Plan, which is presented in MPMC's Annual Discharge Plan (ADP).

There is one instance of high historic total copper that is not seen on Figure 35 due to the axis limits in the figure. In May 2018, specific conditions occurred on-site to produce a WTP influent total copper concentration maximum of 0.933 mg/L. The Trigger Response Plan was initiated for this occurrence to manage the high copper instance. This particular event is an outlier occurrence and is further discussed in Appendix B when discussing total copper model predictions.

The EMA Permit also includes a Numeric Performance Metric (NPM) for WTP effluent total copper at a target value of 0.012 mg/L (annual average). The existing WTP is generally able to meet this NPM target, and the annual average of total copper in the WTP effluent during 2022 and 2023 and 2024 (based on available monitoring data) was 0.012 mg/L, 0.010 mg/L, and 0.013 mg/L, respectively.

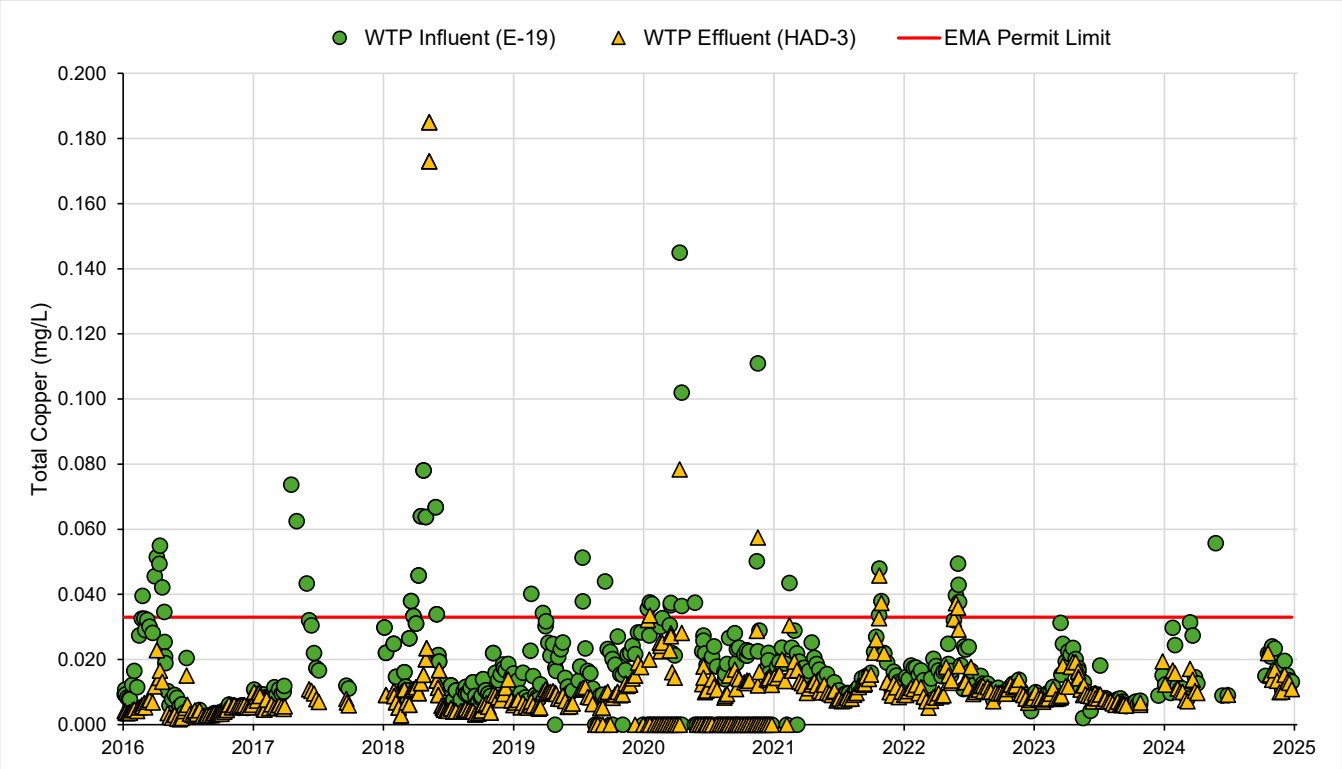


Figure 35: Historical Total Copper in WTP Influent and WTP Effluent from 2016 through 2023

Total selenium is predicted to require treatment during operations, as shown by the 95th percentile PETBP concentration shown in Table 40. Monitoring data has shown actual total selenium in the PETBP consistently below the permit limit (Golder 2022b), with actual monitoring data maximums all below permit level (0.063 mg/L, 0.051 mg/L, and 0.055 mg/L for 2022, 2023, and 2024, respectively). The water treatment system during operations has not required selenium treatment and it is not anticipated to require selenium treatment for the

remainder of operations. The Selenium Management Plan (SeMP, Golder 2016i) lists in-pit treatment along with biological treatment as two of the measures that may be employed to mitigate selenium if required.

Table 40 shows that dissolved cadmium is predicted to require treatment during operations. This modelled 0.35 µg/L concentration is a conservative estimate from the model, and monitoring data from existing operation does not show dissolved cadmium in concentrations requiring treatment. The existing WTP does not target dissolved cadmium as a constituent of concern (COC), but similar to other metals, total cadmium is partially removed through TSS removal at the WTP.

An update to the WTP Trigger Response Plan has been stipulated as a new permit condition in the 2025 EMA Permit 11678, with the updated plan due to regulators by February 28, 2026. The plan will be removed from MPMC's ADP and presented in a stand-alone document. The plan will be expanded to include all water quality parameters limited within the EMA permit, as well as turbidity, and will include defined trigger levels for each parameter as well as a response plan for WTP shutdown or suspension and a plan for resumption of the WTP and discharge.

Closure and Post-closure

The SWWQM was used to predict water quality at the PETBP during closure/post-closure. Central site contact water collection to the PETBP may not be the final post-closure water treatment configuration (particularly if distributed treatment and discharge can be permitted), but collection to this location has been assumed as the closure base case as it represents the currently permitted system configuration and is one of the two BAT options identified for closure. Table 41 provides a list of constituents of interest and the maximum of the 95th percentile predicted concentrations in the PETBP during closure and post-closure. Table 41 also compares predicted PETBP water quality to MPMC's current EMA Permit 11678 WTP discharge limits. These WTP discharge limits are being compared to closure/post-closure water quality predictions as they represent the currently permitted treatment requirements. Distributed treatment during closure/post-closure may discharge to different receiving environments with different discharge limits than the existing EMA Permit, but the current limits have been assumed for closure/post-closure for the purposes of this Water Management Plan.

Table 41: Predicted Water Quality Concentrations at Perimeter Embankment Till Borrow Pond During Closure/Post-closure

Parameter	Unit	EMA Permit 11678 WTP Discharge Limit	PETBP – Maximum of 95th Percentile Predicted Concentrations – Closure	PETBP – Maximum of 95th Percentile Predicted Concentrations – Post-closure
Major Ions				
Total Sulphate	mg/L	1,100	568	447
Nutrients				
Total Ammonia	mg/L (as N)	1.30	0.10	0.04
Total Nitrate	mg/L (as N)	34	8	3
Total Phosphorus	mg/L	0.09	0.03	0.04
Total Metals				
Arsenic	mg/L	0.028	0.002	0.002
Chromium	mg/L	0.004	0.001	0.002
Copper	mg/L	0.033	**0.167**	0.013
Iron	mg/L	1.00	0.57	0.63
Manganese	mg/L	3.40	0.34	0.19
Molybdenum	mg/L	0.36	**0.57**	0.28
Selenium	mg/L	0.075	**0.080**	0.035
Zinc	mg/L	0.059	0.024	0.005
Dissolved Metals				

Table 41: Predicted Water Quality Concentrations at Perimeter Embankment Till Borrow Pond During Closure/Post-closure

Parameter	Unit	EMA Permit 11678 WTP Discharge Limit	PETBP – Maximum of 95th Percentile Predicted Concentrations – Closure	PETBP – Maximum of 95th Percentile Predicted Concentrations – Post-closure
Cadmium	mg/L	0.00034	0.00024	0.00007

Note(s): **Bold and underlined** values exceed permitted discharge limits. These EMA Permit 11678 discharge limits apply to the effluent of the WTP, and not to the PETBP (WTP influent). PETBP water quality predictions are shown to demonstrate the requirement for treatment of a water quality parameter. The SWWBM was developed to predict water quality conservatively; where uncertainty exists in the model inputs, the inputs are selected such that under-prediction would be minimized. Thus, over-prediction is generally expected.

Table 41 shows that total copper, total molybdenum, total selenium are predicted to require treatment during closure. TSS, not listed in Table 41, is also required for treatment during closure/post-closure.

The assumed BAT treatment system during closure/post-closure is pit-lake treatment (for selenium treatment if required) followed by the centralized Actiflo plant (existing WTP), with the possibility of distributed passive/semi-passive treatment if systems are environmentally appropriate and permittable. TSS treatment is assumed to be required through closure and post-closure and will be achieved with the Actiflo plant. Total copper treatment is predicted to be required through closure and will be achieved with a combination of the Actiflo plant (total copper removal through TSS removal), and future dissolved copper precipitation aids if required (such as trimercapto-striazine trisodium salt [TMT]). Total molybdenum treatment has not been required during operations and is not anticipated to require treatment during closure/post-closure.

Total selenium is considered a potential COC during closure and post-closure, though not predicted to require treatment. Existing monitoring data has consistently shown total selenium in Site contact water to be below discharge limits. If required, the assumed method of selenium treatment is semi-passive pit-lake pre-treatment for dissolved selenium (active dosing of carbon source to pit-lake), followed by treatment by the Actiflo plant for TSS and particulate selenium removal. MPMC has also been progressing the development of multiple passive and semi-passive closure treatment technologies that target selenium in order to potentially reduce the complexity and operating footprint of long-term treatment system during post-closure.

At mine closure, three major zones are in long-term contact with waste rock: the combined Springer-Cariboo Pit, Wight Pit, and the SERDS which drains into Long Ditch. Table 42 provides a list of constituents of interest and the maximum of the 95th percentile predicted concentrations in the Springer-Cariboo Pit, Wight Pit, and Long Ditch during closure and post-closure. Predicted parameters are shown post-2041 for Wight Pit and Long Ditch, the period in closure they have been assumed to discharge directly to environment in the SWWBM. Predicted parameters are shown post-2051 for Springer-Cariboo, as this pit is predicted to overflow long into post-closure. These specific catchments are of interest during closure, as drainage from them could be separated from the TSF catchments (that collect in the PETBP) for consideration for distributed discharge.

Table 42: Predicted Water Quality Concentrations at Springer-Cariboo Pit, Wight Pit, and Long Ditch During Closure/Post-closure

Parameter	Unit	Springer-Cariboo Pit – Maximum of 95th Percentile Predicted Concentrations – Long Term Post-Closure	Wight Pit – Maximum of 95th Percentile Predicted Concentrations – Early Post-Closure	Long Ditch – Maximum of 95th Percentile Predicted Concentrations – Early Post-Closure
Major Ions				
Total Sulphate	mg/L	313	230	350
Nutrients				
Total Ammonia	mg/L (as N)	0.14	0.03	0.01
Total Nitrate	mg/L (as N)	5	3	5

Table 42: Predicted Water Quality Concentrations at Springer-Cariboo Pit, Wight Pit, and Long Ditch During Closure/Post-closure

Parameter	Unit	Springer-Cariboo Pit – Maximum of 95th Percentile Predicted Concentrations – Long Term Post-Closure	Wight Pit – Maximum of 95th Percentile Predicted Concentrations – Early Post-Closure	Long Ditch – Maximum of 95th Percentile Predicted Concentrations – Early Post-Closure
Total Phosphorus	mg/L	0.02	0.03	0.04
Total Metals				
Arsenic	mg/L	0.002	0.004	0.002
Chromium	mg/L	0.001	0.001	0.002
Copper	mg/L	0.023	0.008	0.020
Iron	mg/L	0.25	0.38	0.60
Manganese	mg/L	0.06	0.31	0.32
Molybdenum	mg/L	0.12	0.06	0.07
Selenium	mg/L	0.024	0.024	0.070
Zinc	mg/L	0.002	0.007	0.006
Dissolved Metals				
Cadmium	mg/L	0.00005	0.00004	0.00012

Note: The SWWBM was developed to predict water quality conservatively; where uncertainty exists in the model inputs, the inputs are selected such that under-prediction would be minimized. Thus, over-prediction is generally expected.

The SWWQM results presented in this WMP reflect model source terms developed using historical monitoring data collected at the Site since 2017. Modelling with geochemical based source terms can help assess future water quality trends that might develop over the long-term into post-closure due to changing geochemistry of materials at the Site. WSP carried out modelling using geochemical source terms provided by SRK (SRK 2023) in support of regulator questions on the Springer Expansion permit application. Results are provided in WSP 2025f and indicate that some metals, including copper, may have predicted divergence in their long-term concentration trend compared to the results presented here. WSP 2025f indicates that this trend may occur for some metals in Springer-Cariboo pit, where pit wall runoff forms a notable portion of the influent volume. Further assessment of long term water quality trends and mitigations will continue as the Mine approaches closure. SRK has updated geochemical source terms in 2025, and the March 2026 update of this WMP will present detailed modelling results using geochemical source terms updated in 2025.

Direct discharge of the Table 42 catchments to the environment during post-closure is assumed in the SWWBM, but this will not occur until appropriate permit limits are established and when actual water quality near post-closure is confirmed. COC concentrations in these drainages will be monitored through operations and closure, particularly for copper and selenium. If copper treatment is required during post-closure for these drainage sources, then centralized or distributed dissolved copper pre-treatment and/or TSS clarification could be employed to reduce total copper to below established limits. Other technologies being considered for closure may also address copper reduction. If selenium treatment is required during post-closure, then centralized pit-lake or distributed passive/semi-passive treatment could be employed to reduce total selenium to below established limits.

Details on modelled water quality concentrations for all parameters and mine phases at various site locations (in addition to the locations discussed here) can be found in Appendix B.

4.6.2 Water Treatment Technology Development

Good engineering practice typically requires a project to follow a standardized engineering design process for the selection and progressive refinement of the final project concept. A project progresses from a pre-concept phase for the identification of multiple treatment options, through concept, pre-feasibility, and feasibility phases to project execution. Generally, the engineering studies performed for each of these project phases are supported by test work that progresses from proof-of-concept and detailed bench-scale testing to pilot-scale and demonstration-scale test work. Some of the treatment technologies tested may not progress to the next stage of development. For example, a treatment technology may be eliminated if its treatment capacity is insufficient to treat the forecast volumes. This framework takes a staged approach, such that input assumptions, design, and cost for the total system can be refined as each stage is completed and the information that the plan relies on becomes more certain. This allows input assumptions to be less conservative as they become more accurate with accumulated knowledge. Additional details regarding this project development framework and how it aligns with the BC Ministry of Environment and Climate Change Strategy's BAT policy is provided in Golder 2020e.

A generic model for such a project development framework is provided in Figure 36. This framework also approximates the sequence of steps outlined in BC ENV's BAT policy (BC ENV 2015).

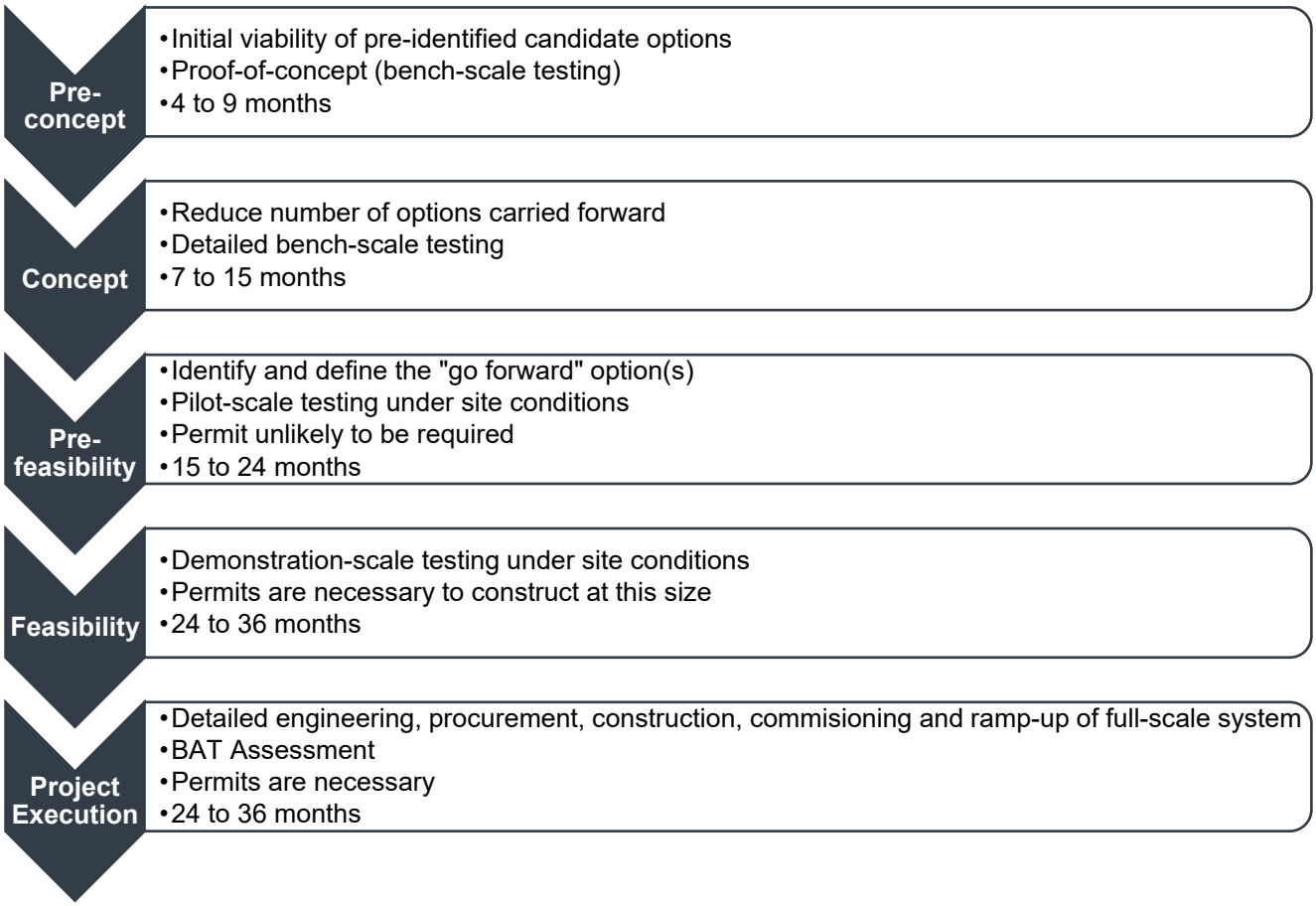


Figure 36: Project Development Framework

MPMC has been progressing and evaluating multiple technologies under this project development framework to support the treatment of identified COCs and to support potential decentralized treatment and discharge during closure/post-closure. Various studies and trials have been completed to support these efforts as an important component of water management planning and closure refinement. An inventory of treatment technologies and a summary of their development is presented in Table 43.

This Water Management Plan assumes that the reader is familiar with the technologies presented in Table 43; this document only provides updates on work completed by MPMC since circa 2017 to support the development of these technologies. Detailed descriptions of these technologies and associated process flow schematics can be found in Golder 2020e.

Future work may occur for any technology still under consideration that has not achieved full-scale implementation. Permitting (*Mines Act* and *Environmental Management Act*) to support technology development, although not specifically listed in Table 43, is assumed to be required before all onsite pilot-scale, demonstration-scale, and full-scale execution phases.

The Province of British Columbia has established technical guidance regarding the assessment and level of technology readiness for emerging mine water treatment technologies (Technology Readiness Assessment, Interim Technical Guidance, August 2022). Technology readiness is defined in nine Technology Readiness Levels (TRL), ranging from TRL-1 (basic principles of the process are known) to TRL-9 (proven technology through successful operational deployment). If an emerging technology is proposed in a permit application as a mitigation for project impacts, the technology must be demonstrated to be at a TRL suitable for the sought permit. Permit application(s) for closure will consider this TRL guidance.

Table 43: Treatment Technology Inventory and Stage of Development

Technology/ Stage of Development	Targeted COCs	Proof-of-Concept Bench-Scale Testing	Detailed Bench-Scale Testing	Pilot-Scale Testing	Demo-Scale Testing	Full-Scale Execution	Work Completed
Actiflo	TSS, total metals						Bench and full-scale testing. Flocculant Management Plan.
TMT Treatment	Dissolved copper						Bench and full-scale testing. Toxicity evaluation.
NaHS	Dissolved copper						Bench, pilot and demo-scale trials by MPMC.
Pit-Lake Treatment	Selenium, nitrate						Preliminary concept design and proof-of-concept bench-scale testing. Pilot-scale testing workplan.
Saturated Rock Fill (SRF)	Selenium, nitrate						Concept design, proof-of-concept bench-scale testing, detailed bench-scale testing workplan, long-term substrate leach testing. Wight Pit SRF assessments. Geotechnical material testing and settlement assessment.
Packed Bed Reactor (PBR)	Selenium, nitrate						Concept design, proof-of-concept bench-scale testing, and detailed bench scale testing workplan.
Biochemical Reactor (BCR)	Selenium, nitrate						Concept design and proof-of-concept bench-scale testing.
Submerged Sand Reactor (SSR)	Selenium, nitrate						Screening analysis.
Constructed Wetland Treatment (CWT)	Selenium, nitrate						Concept design, bench-scale testing, and on-site pilot scale testing (by others).

Implemented Under Consideration Eliminated/Paused

Actiflo

Actiflo, the tradename of a technology supplied by Veolia, is the technology currently in use as the Site's WTP and is considered the BAT for TSS removal during operations and closure/post-closure. The main targeted COC of this technology is TSS, with total metals removal also occurring via TSS removal (including copper). The technology is a high-rate ballasted coagulation and flocculation and clarification process. Polyaluminum chloride (PAC) is dosed into the influent water, which neutralizes surface charges on suspended particles and aids with constituent precipitation. Polymer is then added to the water with microsand, which rapidly forms large heavy flocs. The heavy flocs settle by gravity through the lamella type clarifier. Treated water decants from the downstream surface of the clarifier, and the floc/microsand mixture at the bottom of the clarifier is recycled through a hydrocyclone where the majority of the microsand is recycled to the beginning of the process, and the sludge stream is wasted, then discharged to the TSF. The Actiflo technology is currently implemented at full-scale on-site.

Concept design, bench-scale, and full-scale testing have been completed for the Actiflo technology, including assessment and optimization of PAC and various chelating agent dosages (including TMT) to assist copper precipitation and removal (Golder 2016k, Golder 2017a, Golder 2018a, Golder 2019a, Golder 2019b, Golder 2020f). A Flocculant Management Plan for the Actiflo WTP was developed (WSP 2023d) to address EMA permit requirements, which describes the Actiflo process and associated flocculant use in detail, including PAC, polymer, and microsand. Golder 2022b also provides a detailed summary of recent WTP performance regarding TSS, total copper, and total selenium removal.

Actiflo treatment is currently operating as the core component of the treatment system during operations and is currently assumed as a base case component of treatment during closure/post-closure.

TMT Treatment

TMT is a chelating agent that aids with dissolved copper precipitation. TMT can be added to WTP influent water to enhance copper treatment by precipitating dissolved copper, which then can be gravity settled through clarification. TMT addition relies on sufficient reaction time with influent water prior to treatment, and sufficient settling time during clarification to make effective contributions to dissolved copper removal. The main targeted COC of this technology for MPMC is dissolved copper.

Bench-scale test work undertaken showed that TMT is able to effectively precipitate dissolved copper (Golder 2016k, Golder 2017a, Golder 2018a) and the full-scale trials completed showed that the existing Actiflo treatment system was able to remove the copper bound with TMT to below the permit limit (Golder 2019a, Golder 2019b, Golder 2020f). Full-scale trials also showed that copper removal to lower concentrations (total copper <0.012 mg/L) was challenging for Actiflo with TMT treatment, not due to limitations in dissolved copper precipitation but due to limitations in Actiflo TSS removal to low concentrations. TMT was effective in precipitating dissolved copper, but the Actiflo system was not effective in subsequently removing the precipitate to result in low effluent copper concentrations. The toxicity of TMT has also been evaluated and showed that its use would not result in an acutely lethal effluent (Golder 2018b).

TMT treatment is still being considered as a potential precipitation aid targeting dissolved copper.

Pit-Lake Treatment

Pit-lake treatment targeting COCs of selenium and nitrate is a semi-passive in-situ technology that requires nutrient and carbon source dosing to create conditions for biological treatment within the pit-lake.

A conceptual assessment of full-scale pit-lake selenium treatment was completed (Golder 2017b) and the technology was deemed a cost-effective approach to managing selenium and was recommended for further bench and pilot-scale testing. Proof-of-concept bench-scale testing for pit-lake selenium treatment was also completed and showed effective removal of selenium and nitrate, with further pilot-scale testing recommended (Golder 2019c). A pilot-scale study for pit-lake treatment was designed for Cariboo Pit in 2020 (Golder 2020d), but mine operational changes have resulted in the draining of both Springer and Cariboo pits and pit-lake treatment trials are no longer currently feasible at these locations.

Pit-lake treatment targeting selenium and nitrate is still being considered for full-scale implementation and is an identified BAT treatment technology during closure/post-closure if required. Discussion is ongoing between MPMC and WSP regarding the potential for a limited-duration pit-lake treatment trial in Wight Pit following freshet, while the pit stores freshet contact water and prior to required discharge from the pit. Due to site water management requirements, Wight Pit water volume is reduced every year following freshet to provide available storage capacity for the following year's freshet and the duration of stored water in the pit is on the order of months.

Saturated Rock Fill (SRF)

SRF treatment is a fixed-film anaerobic system targeting the treatment of selenium and nitrate and ideally utilizes a mined open pit as a bioreactor operated in a horizontal flow configuration.

A concept study for SRF treatment was completed (Golder 2020g) and SRF was recommended for further bench-scale and pilot-scale testing. Proof-of-concept bench-scale testing for SRF was also completed (Golder 2021), which showed effective removal of selenium and nitrate, but also indicated metal leaching. Detailed bench-scale testing and waste rock SRF substrate metal leach testing was recommended following completion of the proof-of-concept work. Bench-scale leach testing using anticipated SRF substrate waste rock from site was completed (Golder 2022c), which monitored leached metals over a long-term test period of 52 weeks. Results showed that metal leaching from site waste rock varies over time and differs between metals and must be considered during the start-up phase of SRF implementation (and may lead to additional required polishing treatment steps downstream of the SRF). Detailed bench-scale testing for SRF has been proposed and a test plan has been submitted to MPMC (Golder 2022d).

In 2024, geotechnical material testing was undertaken for site waste rock that could be used as reactor substrate (in either a SRF or PBR reactor). The geotechnical laboratory results were used in a desktop geotechnical settlement assessment of a waste rock bed to estimate porosity that will inform possible SRF/PBR hydraulic retention time and overall reactor sizing (WSP 2024b). Some geochemical characterization has occurred through the SRF long-term leaching test, which gave indication of leaching potential of media substrate when exposed to SRF operating conditions (anaerobic with low oxidation-reduction potential) over longer periods.

The next phase of development for the SRF technology is detailed bench scale testing to establish the system parameters for subsequent pilot scale test work (target hydraulic retention time for desired nitrate and selenium reduction and target carbon/phosphorus dosing rates). Detailed bench testing involves expanding the tested treatment process beyond just the SRF reactor, adding in aeration and settling steps downstream of the reactor for managing residual nutrients and suspended solids in the SRF reactor effluent. The processes will also be tested in two parallel treatment trains (each with reactor, aeration, and settling) to evaluate reproducibility of the results.

SRF treatment is still being evaluated for full-scale implementation and is currently considered a technology option for semi-passive treatment of selenium and nitrate during closure/post-closure if required.

Packed Bed Reactor (PBR)

PBR treatment is another fixed-film anaerobic system targeting the treatment of selenium and nitrate. PBR treatment differs from SRF treatment through the use of a vertical flow (top to bottom) reactor.

Proof-of-concept bench-scale testing was completed (Golder 2019d) and PBR treatment was shown to be effective in reducing selenium and nitrate. Further detailed bench-scale and pilot-scale testing was recommended following completion of the initial testing. Detailed bench-scale testing for PBR has been proposed and a test plan has been submitted to MPMC (Golder 2022e). The 2024 geotechnical material testing and subsequent geotechnical settlement assessment (WSP 2024b) is also applicable to the PBR treatment technology, as waste rock reactor construction for SRF vs PBR is similar.

The next phase of development for the PBR technology is also detailed bench scale testing, with the proposed test plan being similar to the proposed SRF detailed bench scale test (expanded treatment train beyond just the PBR reactor with two parallel trains).

PBR treatment is still being evaluated for full-scale implementation and is currently considered a technology option for semi-passive distributed treatment of selenium and nitrate during closure/post-closure if required.

Biochemical Reactor (BCR)

BCR treatment is another fixed-film anaerobic treatment technology that consists of a lined pond filled with a submerged organic substrate media mix. The main targeted COCs of this technology are selenium and nitrate. BCR treatment is passive and does not involve continuous dosing of a carbon source to the media bed.

Proof-of-concept bench-scale testing was completed (Golder 2019d) and BCR treatment was shown to be effective in reducing selenium and nitrate, but redox sensitive metals were present in the BCR effluent.

Upon review of the BCR technology in comparison to other passive and semi-passive technologies, MPMC decided to not proceed with further development of this technology (MPMC 2021) for the following reasons:

- Limited lifespan of BCR passive treatment systems based on the availability of a carbon source that is encapsulated in the system during construction – this needs to be replaced periodically at significant cost.
- Emission of elevated levels of biochemical oxygen demand (BOD) from the system during commissioning and start-up of operation that exceed standards for discharge to the environment.
- Persistent emission of phosphorus from the BCR during operation that will likely exceed plausible standards for discharge to the environment.

BCR treatment is no longer being developed as a passive treatment technology option during closure/post-closure.

Submerged Sand Reactor (SSR)

SSR is similar to other anaerobic reactor technologies, with the use of the existing tailings as media for the bioreactor. The main targeted COCs of this technology are selenium and nitrate.

A concept study was completed for SSR (Golder 2020g), as well as proof-of-concept bench-scale testing (Golder 2019d). Use of MPMC tailings as SSR bioreactor media or use of the site's TSF as an in-situ SSR was not recommended for further investigation. Bench-scale testing resulting in metal release in the reactor effluent when using site tailings as the reactor media. The concept study also concluded that further investigation of SSR

was not warranted, based on a review of literature, an evaluation of historical water quality monitoring data, and an evaluation of the feasibility of utilizing the TSF from a hydrogeological and permitting perspective.

SSR treatment is no longer being developed as a treatment technology option during closure/post-closure.

Constructed Wetland Treatment (CWT)

MPMC retained Ensero Solutions Inc. (Ensero), formerly known as Contango Strategies Ltd., to conduct a detailed assessment and evaluation of the feasibility of a CWT system for passive/semi-passive treatment during closure/post-closure. The main targeted COCs of this technology are selenium and nitrate.

Pilot-scale design, sizing, and testing for CWT was completed by Ensero (Ensero 2020), and the technology demonstrated successful results for treatment of targeted COCs; however other passive/semi-passive technologies have indicated improved treatment capability in comparison.

To result in comparable treatment capability with other technologies targeting selenium and nitrate, the required size of a CWT facility would be prohibitively large. MPMC have decided to not proceed with further development of this technology due to the comparative advantages of competing technologies. CWT treatment is no longer being developed as a treatment technology option during closure/post-closure.

5.0 WATER MANAGEMENT PLAN REVISION TRIGGERS

Operational events (i.e., triggers) that may result in updates to the WMP are listed in Table 44 as part of the revision process. These triggers cover changes to the mine plan or changes to site catchments or the TSF that would likely have a material impact on how water is conveyed, stored, and treated at the mine. When one of the operational events occur, it is expected that an update will be required to the WMP to address changes to the water management approach. Triggers and proposed timelines for a WMP update are included in Table 44.

The need for changes to water treatment will be evaluated for each operational trigger. If it is determined that an operational trigger requires a change to the water treatment approach, the required engineering design process will be followed for the selection and progressive refinement of options as described in Figure 36.

Table 44: Water Management Plan: Revision Process for Potential Future Updates to Water Management Plan

Revision Trigger	Applicable Regulatory Body and Permit	WMP Update	Anticipated WMP Update Submission (revision trigger + X months)	Additional Notes
Mine plan update: a change to the permitted mine plan or implementation schedule that results in modifications to the water management systems.	MCM; M-200 EMA; PE-11678	Full update	10 months	Update to water balance (including water quality model) and implementation schedule. Updates to groundwater/hydrogeological models may be required.
Tailings Storage Facility: a change to the permitted configuration (i.e., dam crest elevation, water storage volume, or tailings volumes) of the TSF that impacts water storage and discharge requirements.	MCM; M-200 EMA; PE-11678	Full update	6 months	Update to water balance (including water quality model) and implementation schedule. Updates to groundwater/hydrogeological models may be required.
Catchment areas: change in the site footprint of more than 10% increase or decrease in runoff volume attributed to changes in the permitted and modified mine areas.	MCM; M-200 EMA; PE-11678	Partial update	3 months	Update will be composed of a calibration and sensitivity exercise on the existing water balance (including water quality model). Updates to groundwater/hydrogeological models may be required.
Requirement to update WMP by the Engineer of Record or the Independent Engineering Review Panel.	MCM; HSRC	Level of update depends on requirement of Engineer of Record or Independent Engineering Review Panel	6 months	To be determined; however, it may include an update to water balance (including water quality model) and implementation schedule. Updates to groundwater/hydrogeological models may be required.
Requirement to update the WMP by the Statutory Decision Maker of MCM or BC ENV.	MCM; M-200 EMA; PE-11678	Level of update depends on requirement of statutory decision maker	6-10 months	To be determined; however, it may include an update to water balance (including water quality model) and implementation schedule. Updates to groundwater/hydrogeological models may be required.

WMP = Water Management Plan; TSF = Tailings Storage Facility; EMA = *Environmental Management Act*; MCM = Ministry of Mining and Critical Minerals; HSRC = Health, Safety and Reclamation Code for Mines in British Columbia; BC ENV = British Columbia Ministry of Environment and Parks.

6.0 CLOSURE

The reader is referred to the Study Limitations section, which precedes the text and forms an integral part of this report.

We trust the above meets your present requirements. If you have any questions or comments, please contact the undersigned.

Signature Page

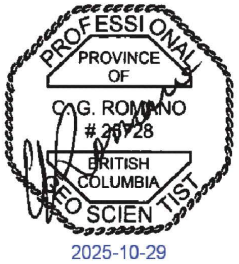
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APPENDIX A

Site-wide Water Balance Model (SWWBM)

REPORT

Mount Polley Mine Water Balance Model

TSF Raise to 987m Permit Amendment Application

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APPENDICES

APPENDIX A
SWWBM TSF Raise to 987 m Permit Amendment Application Inputs

APPENDIX B
Flow Diagrams and 2025 Water Management Infrastructure

APPENDIX C
SWWBM TSF Raise to 987m Permit Amendment Application Results

1.0 INTRODUCTION

Mount Polley Mining Corporation (MPMC) is submitting a Permit Amendment Application for the Tailings Storage Facility Raise to 987 m. The Site Wide Water Balance Model (SWWBM) presented in this report is essential to support the Water Management Plan required to support this Application and for compliance with MPMC's M-200 *Mines Act* permit. It should be noted that the specific operation, closure, and post-closure dates in this report have been assumed for the purpose of modelling. There are many factors that exist that can alter these dates, such as changes to the mine production schedule and mine plan, new exploration, and care and maintenance periods. Thus, these time frames should not be considered static.

The SWWBM was originally developed for the Technical Assessment Report (TAR) to support the effects predictions in the Mount Polley Mine Long Term Water Management Plan (Golder 2016a) for the Mount Polley Mine (the Mine) and has since been calibrated on an annual basis (refer to WSP 2025a for the latest 2024 annual calibration). This report presents the SWWBM based on the Springer Expansion Life-of-Mine (LOM) Plan informed by MPMC (MPMC 2022), with a TSF crest elevation of 987 m. Water management strategies during closure are aligned with the 2022 Reclamation and Closure Plan. The next update to the Reclamation and Closure Plan will occur in 2027 as per requirements in the BC HSRC.

The water management approach applied in this study is intended to provide a SWWBM in support of the permit application for the Tailings Storage Facility crest raise to 987 m.

The work presented in this report is as follows:

- A summary of the physical setting at the Site (Section 2.0).
- An overview of the climate and hydrology at the Site (Section 3.0).
- A description of the SWWBM, including inputs and assumptions (Section 4.0).
- A presentation of SWWBM results, including operational, closure, post-closure phases (Section 5.0).
- Tabular inputs of the SWWBM (APPENDIX A).
- Flow Diagrams and 2025 Water Management Infrastructure Drawing (APPENDIX B).
- SWWBM results for the entire modelled duration (APPENDIX C).

This report has been prepared in accordance with the "Study Limitations," which are presented at the beginning of the report. The reader's attention is specifically drawn to this information for reference during use of this report.

2.0 BACKGROUND

2.1 General Information

Mount Polley Mine is a copper and gold mine operated by MPMC, a subsidiary of Imperial Metals Corporation. The Mine is located approximately 56 km northeast of Williams Lake, British Columbia (BC), and is located between Polley Lake and Bootjack Lake. Within the area of the Mine, the plateau has somewhat higher relief, with the Mine rising approximately 300 metres (m) above the surrounding terrain. Topographically, the Site area consists of north–south trending ridges of moderate elevation and relief. Local elevations range from 922 metres above sea level (masl) at Polley Lake to 1,266 masl at the top of Polley Mountain with an average elevation of 1,038 masl. The total surface area of the Site is 17.8 square kilometers (km^2).

3.0 CLIMATE AND HYDROLOGY

3.1 Climate

In 2022, the climate baseline data was updated for the Mine. The climate of the Mine was characterized in the Baseline Climate Update Report (Golder 2022b) using historical measurements from local climate stations, supported by data obtained from five nearby regional Environment and Climate Change Canada (ECCC) climate stations. During the winter, snowpack is measured at four snow course sites at a minimum frequency of once per month, with more frequent measurements typically being taken during the melt phase. Detailed climate information can be viewed in Golder 2022b. The climate inputs for the SWWBM are presented in Section 4.5.1.

3.2 Site Drainage and Surface Hydrology

A network of ditches, sumps, and pumping systems are operated by MPMC to manage surface water at the Mine. The current water management infrastructure of Mount Polley is presented in the MPMC Water Management Infrastructure Drawing provided in APPENDIX B. Surface water is separated between contact (mine affected) and non-contact (non mine affected) sources of runoff. The two water sources can be characterized as follows:

- Contact water: water that may have come into direct contact with mining and milling activities. This water generally requires treatment before release to the environment.
- Non-contact water: runoff originating from areas unaltered by mining activity that does not contact mining areas. It is typically diverted to the maximum extent practicable and allowed to discharge directly to the receiving environment.

The objective of current water management practices is to minimize the mixing of contact and non-contact surface water sources whenever possible. These contact and non-contact water flows originate from direct precipitation, runoff, and snowmelt from catchments. Contact water is mainly collected along two ditches running north to south along the Site: West Ditch and Long Ditch. A block flow diagram provides a conceptual overview of the sumps and their respective connections across the Mine area presented in Figure 1.

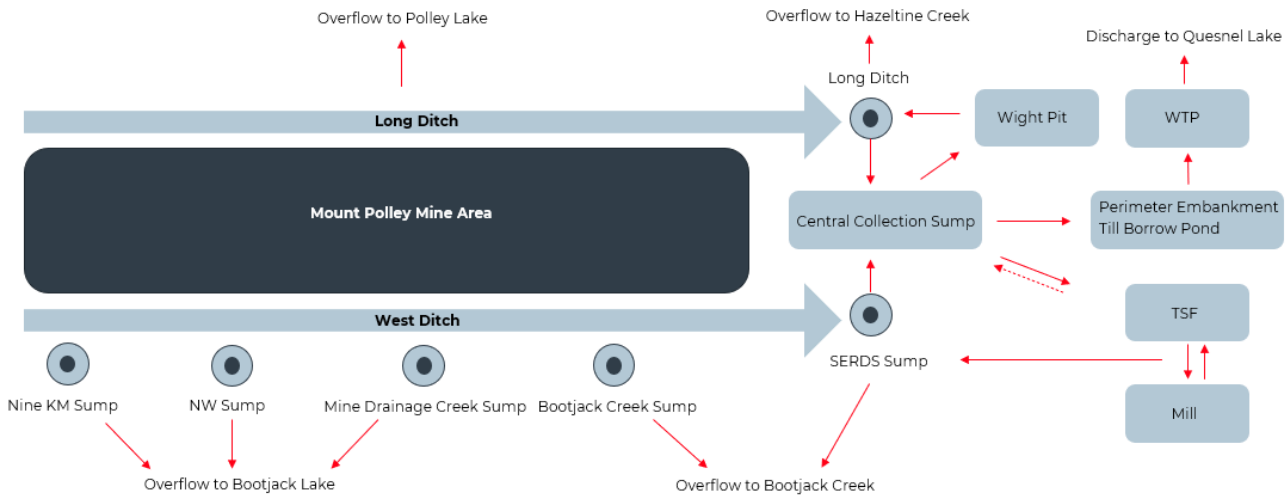


Figure 1: Conceptual Flow Diagram of Mount Polley Mine Contact Water Management Infrastructure

The West Ditch system collects contact water starting from the west side of the Site, progressing from the Nine KM Sump to the SERDS Sump. Components of the West Ditch system include various sumps, ditches, and pumping systems.

Similarly, the Long Ditch system manages contact water from the east side of the Site, extending from below the site access road to the Central Collection Sump. This system also comprises various sumps, ditches, and pumping systems.

Contact water is centrally collected at the Central Collection Sump (CCS) and either transferred to Wight Pit for temporary storage, to the Perimeter Embankment Till Borrow Pond (PETBP) for treatment, or to the TSF to maintain target water levels for mill operations. From the PETBP, contact water is transferred to treatment and discharge to Quesnel Lake.

3.3 Pit Groundwater Hydrogeology

In 2016, Golder assessed groundwater flow for the following three open pits at the mine: Springer and Cariboo Pits, Wight Pit, and Boundary Pit. The analysis for each pit was described in a series of technical memoranda in Appendix B of the TAR (Attachments C, D, E, and F; Golder 2016a). Hydrogeological assessments for the pits were conducted as part of the TAR to provide estimates of seepage into and out of the pits.

WSP recently updated the hydrogeological pit model calibration for the Springer and Cariboo Pits (WSP 2024a) and revised the groundwater flow predictions for the ultimate Springer-Cariboo Pit configuration Groundwater inputs for the SWWBM are presented in Section 4.5.3.

Updates to the hydrogeological models for Springer Pit, Cariboo Pit, Wight Pit, and the TSF are in progress and updated pit and TSF groundwater parameters are expected by the close of 2025 for use in the annual SWWBM update required by March 2026.

3.4 Tailings Storage Facility

Updated estimations of seepage flow rates have been developed for each embankment as part of the TSF embankment crest at elevation 987 m design and are provided in Section 4.5.7.6.

4.0 SITE WIDE WATER BALANCE MODEL

An update to the existing SWWBM was carried out using GoldSim™ (Version 15.0). This section presents SWWBM software, model objectives, general assumptions, processes, and inputs.

4.1 Model Software

GoldSim allows dynamic and complex water quantity interactions to be represented through a visual and highly modular framework. All input parameters and functions are defined by the user and are built as individual objects or elements linked together by mathematical expressions. GoldSim is widely used for mine water quantity studies and provides the following capabilities:

- Deterministic and probabilistic simulations can be run within the model, which allows statistics and probabilities to be assigned to the model outputs.
- Simulation periods can be varied within the same model.
- The model framework can be easily adjusted to account for evolving conditions on a mine site, which allows the model to be used as an operational planning tool.
- Water quantity and water quality modules can be directly linked within the model, which allows both modules to be updated simultaneously; this is particularly useful when evaluating a range of scenarios (e.g., alternative water management strategies).

4.2 Model Objectives

This SWWBM was updated to include the future operational phase, in line with the assumed Springer Expansion LOM plan for the 987 m TSF Raise. Water management assumptions during closure are aligned with the 2022 Reclamation and Closure Plan (RCP). The next update to the RCP will occur in 2027 as per requirements in the BC HSRC.

This SWWBM for the 987 m TSF Raise has the following objectives:

- Include a future operational phase that will extend from January 1, 2025, to July 31, 2031.
- Include a closure phase extending from August 1, 2031, to July 31, 2041.
- Include a post-closure phase commencing on July 1, 2041, and extending to July 31, 2131 (100 years including closure). The simulation was extended to end of 2168, in order to include the overflow from the Springer-Cariboo Pit after closure.
- Estimate the quantity of contact water collected on-site per the climate conditions.
- Estimate water retention requirements in major storage locations at site such as the TSF and pits.
- Estimate the quantity of contact water requiring treatment.
- Enable assessment of future operations water quality and associated water treatment and/or discharge options.
- Provide a model that can be linked to a water quality module that assesses site water quality during forecasted future operations.

4.3 Assumptions and Key Input Parameter Values

General assumptions applied to this model are as follows:

- There is no seepage from the ponds or sumps other than the TSF and major pits (i.e., all ponds and sumps are assumed to be lined, or seepage is assumed to be negligible).
- Direct precipitation, evaporation, and seepage loss from ditches are assumed to be negligible.
- Precipitation occurs as snow from December to February and as rain or a mixture of rain and snow in all other months.
- Snowpack is represented by the cumulative precipitation depths over the months of December, January, and February, spanning a period of three months.
- Snowmelt occurs in the months of March, April, and May as a percentage of the maximum snowpack at the end of February (5% in March, 90% in April, and 5% in May).
- The closure and post-closure phases are included in the SWWBM, and the flow logic and model wiring for these phases are based on the 2022 RCP, described in the Water Balance appendix to the RCP (Golder 2022a). Flow diagrams for closure and post-closure phases are also presented in APPENDIX B.
- At the start of closure, the combined Springer-Cariboo pit is allowed to fill and is no longer actively dewatered, reducing the total contact water requiring annual treatment. All other catchment contact water is centrally collected and treated at the WTP prior to discharge.
- At the start of post-closure, multiple catchments are considered remediated and no longer generating contact water and are assumed to directly discharge to the environment. Only TSF contact water and TSF seepage is treated at the WTP prior to discharge.

Key input parameter values and assumptions for the operational phase simulations are presented in Table 1.

Table 1: Key Input Parameter Values and Assumptions

Parameter	Value	Reference
TSF crest elevation during operations	987 m	WSP 2023c
Initial TSF pond water level	966.84 m	TSF Weekly Report (MPMC 2024a)
Initial Springer-Cariboo Pit water level	N/A	TSF Weekly Report (MPMC 2024a)
Initial Wight Pit water level	911.38	TSF Weekly Report (MPMC 2024a)
Tailings stored in Springer-Cariboo Pit	0 M-m^3	TSF Weekly Report (MPMC 2024a)
Water Treatment Plant (WTP) treatment capacity	25,000 m^3/d	Provided by MPMC (MPMC 2023b)

4.4 Model Domain

A description of the model flows is provided in APPENDIX A. The domain and structure of the SWWBM is outlined in the conceptual flow diagrams for the forecasted operational, closure and post-closure phases in APPENDIX B. The flow diagrams illustrate the assumed water circuit system at the Site during operations, closure, and post-closure, including the storage and conveyance of water. The water management infrastructure within the SWWBM for the operational phase is summarized in Table 2 and flow types are outlined in Table 3.

From closure and progressively to post-closure, certain Site areas will be reclaimed, and run-off will become non-contact water, therefore reducing the annual volume of contact water. Pumping rates for the Site will be reduced at the end of the closure period, as certain areas are assumed reclaimed. The progression of flow routes and discharges to the environment are shown on the flow diagrams presented in APPENDIX B.

Table 2: Water Management Infrastructure during Operations

Major Ditches	Sumps and Minor Ponds	Major Ponds and Storage Facilities
▪ Long Ditch ▪ SERDS Ditch (lower portion of West Ditch)	▪ South Embankment Seepage Pond ▪ Main Embankment Seepage Pond ▪ Central Collection Sump ▪ Bootjack Creek Sump ▪ MAG sump ▪ Mine Drainage Creek Sump ▪ NW Sump ▪ 9K Sump ▪ Boundary Pit ▪ TSF Booster Sump ▪ NEZ Booster Sumps	▪ TSF ▪ Combined Springer-Cariboo Pit ▪ Wight Pit ▪ Perimeter Embankment Till Borrow Pond

SERDS=Southeast Rock Disposal Site; TSF = Tailings Storage Facility.

Table 3: Types of Flows Represented in the SWWBM

Site Inflows	Site Outflows or Transfers
▪ Direct precipitation ▪ Runoff ▪ Seepage (includes baseflows)	▪ Water consumption flows (turbo-misters, and water trucks) ▪ Water treatment discharge ▪ permanent, unrecoverable storage in tailings (interstitial water) ▪ Open water evaporation ▪ Pumped flows between facilities ▪ Transfer flows (gravity flows between facilities) ▪ Groundwater flows

4.5 Model Inputs

4.5.1 Climate Inputs

The following sections describe the climate inputs used in the SWWBM. The climate datasets are derived from local site-based and regional long-term ECCC climate stations as described in Golder (2022b).

4.5.1.1 Precipitation

The SWWBM was run with probabilistic monthly climate inputs for this assessment. To simulate stochastic conditions, monthly precipitation data were fitted to a normal distribution. A normal distribution is a type of probability distribution (a mathematical representation of the relative likelihood of an uncertain variable having specific values). All distribution types use a set of arguments to specify the relative likelihood for each possible value. The arguments for normal distribution are the dataset's mean and standard deviation. The mean and standard deviation for the monthly precipitation values were determined. The standard deviations were adjusted using a standard z-table, so that the annual mean of the stochastically generated results agreed with the mean of the historical data. The mean and standard deviation for the monthly precipitation values are shown in Table 4. The model is run using a daily time step, which represents better variation between months such as the water volume in the TSF or the pits.

Table 4 shows a summary of the precipitation depths generated by the stochastic generator.

Table 4: Stochastic Climate Generator Log-Normal Distribution Input Arguments

Month	Mean of the Monthly Precipitation Depths (mm)	Standard Deviation of the Monthly Precipitation Depths (mm)
January	49.4	30.9
February	35.8	24.2
March	29.7	13.9
April	44.7	43.6
May	49.9	20.2
June	70.8	32.9
July	63.6	55.1
August	50.6	31.2
September	52.3	30.1
October	58.1	27.9
November	49.8	28.9
December	57.6	32.7

The derived monthly means and standard deviations of the precipitation values, defined in the model as stochastic elements, were used to generate random values based on the normal distribution of the dataset. The stochastic generator was set to perform 2000 realizations to create a sample size that was sufficiently large to account for a range of conceivable monthly climatic precipitation scenarios for the study period. The results of these 2000 realizations were compiled to generate probability distributions that yield percentile values.

Table 5 shows a summary of the precipitation depths generated by the stochastic generator.

Table 5: Stochastic Generated Precipitation

Month	Monthly Average Precipitation (mm)[a]			
	Mean	50%	90%	99.50%
January	49.4	41.9	87.5	183.0
February	35.9	29.7	65.3	145.2
March	29.6	26.9	47.4	84.2
April	44.7	32.1	91.3	264.6
May	49.9	46.2	76.1	126.3
June	70.9	64.2	113.4	201.1
July	63.7	48.2	125.6	333.3
August	50.5	43.0	89.0	184.3
September	52.3	45.4	89.9	178.7
October	58.1	52.5	93.8	170.4
November	49.8	43.0	86.0	172.8
December	57.7	50.2	98.9	196.3
Annual Total	**612.4**	**523.3**	**1064.1**	**2240.2**

(a) Average during the modelling period (2025 to 2131).

4.5.1.2 Evaporation

The median annual shallow lake evaporation rate is estimated to be 663 mm. Monthly evaporation rates vary between 0 mm in December to 136 mm in July. Estimated median monthly and annual shallow lake evaporation from 1974 to 2001 are presented in Table 6.

Table 6: Median Monthly and Annual Shallow Lake Evaporation Statistics for the Site (1974-2001)

Month	Median Shallow Lake Evaporation (mm)
January	0
February	7
March	32
April	67
May	102
June	121
July	136
August	113
September	60
October	21
November	4
December	0
Annual	**663**

4.5.1.3 Climate Change

An ensemble of monthly temperature and precipitation projections were obtained from ClimateBC consisting of 8 Global Climate Models (UBC 2022) and two emissions scenarios (SSP2-4.5 and SSP5-8.5) covering mid to high emissions from the Sixth Intergovernmental Panel on Climate Change Assessment Report (IPCC 2021). A stochastic approach (outside the GoldSim model) was used to extend these projections from year 2100 to 2200 by resampling monthly data from 2071-2100 and relating projected changes in temperature and precipitation climate variables to a set of extended greenhouse gas concentration pathways beyond year 2100 (van Vuuren et al. 2011). The range of projected temperature and precipitation values for each month was summarized across the ensemble of climate models and emissions scenarios using a range of values. The mean, and the upper bound, have been included in the SWWBM to analyze the effects of climate change. Lake evaporation, snow accumulation and snowmelt were calculated in the same way as for the average scenario.

4.5.2 Hydrology Inputs

The following sections describe the hydrologic processes and inputs used in the SWWBM.

4.5.2.1 Runoff Parameters

Runoff in the SWWBM is estimated using seasonal runoff coefficients. Runoff coefficients represent the proportion of rainfall that reports as runoff or seepage, accounting for losses due to evaporation, storage, and infiltration. Adjustment during the calibration process resulted in a 30% increase of the general runoff coefficients in cases where the monthly precipitation exceeds 50 mm (Golder 2020). The runoff coefficients account for the following two seasonal climate periods:

- **General (July to February)** – mid-range coefficients to reflect soil moisture contents for intermittent runoff events.
- **Freshet (March to June)** – highest runoff coefficients to represent expected higher soil moisture content, and therefore greater runoff.

The seasonal runoff coefficients defined for the catchment types considered in the SWWBM are presented in Table 7. Runoff coefficients are adjusted, if deemed reasonable, during the annual SWWBM calibration to align estimated runoff volumes with Site monitoring data.

Table 7: Seasonal Runoff Coefficients

Catchment Type	General	Freshet
Exposed tailings	0.6	0.9
Disturbed areas	0.3	0.9
Rock disposal site areas	0.1	0.6
Open pits	0.75	0.9
Undisturbed catchments	0.4	0.42
Haul roads and access roads	0.15	0.9
Mill site area	0.1	0.1

Source: Golder 2020.

4.5.2.2 Catchment Areas

Catchment areas for each storage element were defined in the model to enable the simulation of runoff. The catchment/reporting areas were updated in this SWWBM to reflect the operations and closure phases. The updated catchments are shown in Table 8. Subdivision of catchments areas by land type are presented in Table A-1 in APPENDIX A.

Table 8: Current Catchment Areas for SWWBM Storage/Conveyance Elements

Storage or Conveyance Element	Total Reporting Area (m^2)		
	Operations[(a)]	Operations[(b)]	Closure
South Embankment Seepage Pond	238,971	234,673	234,673
Main Embankment Seepage Pond	411,218	494,830	494,830
TSF Upstream Catchment (External)	1,066,326	951,910	951,910
TSF Impoundment Catchment (Internal – current)	2,382,476	2,511,150	2,511,150
Perimeter Embankment Till Borrow Pond (PETBP)	516,967	633,750	633,750
Central Collection Sump (CCS)	499,160	510,713	510,713
Bootjack Creek Sump	175,259	175,259	175,259
SERDS Ditch	1,538,407	1,538,407	1,538,407
Mill Site Sump	1,628	1,628	1,628
Mine Drainage Creek Sump	1,116,583	1,116,583	768,219
Long Ditch	2,495,465	2,495,465	2,495,465
Combined Springer – Cariboo Pit	1,981,274	1,981,274	2,329,638
NW Sump	330,391	330,391	330,391
9K Sump	745,648	745,648	745,648
Wight Pit	414,151	414,151	414,151
Boundary Pit	33,029	33,029	33,029
Total Reporting Area	**13,946,953**	**14,168,861**	**14,168,861**

Source: WSP 2025a and updates in this SWWBM.

(a) Based on the TSF 974m configuration for TSF catchments.

(b) Based on the TSF 987m configuration for TSF catchments.

After finishing operations, some mining features become remediated during closure and become non-contact water during post-closure. This is modelled by changing the land types, from disturbed to not disturbed areas. The land types define the runoff coefficients (Table 7) and the water quality, which is analyzed in the Water Quality Report (WSP 2025b). The model logic to convert the land types it is as follows (all timeframes are from start of closure on August 1, 2031 – assumed for the purpose of modelling):

- Roads:
  - 14% of total road area switch to disturbed at year 3.
  - 21% of total road area (additional 7%) switch to disturbed at year 4.

    - Negligible amount of road surface is fully reclaimed (no undisturbed road area ever).
- Dump areas transition to disturbed at the following rate:
    - Closure + year 1 = 22%.
    - Closure + year 2 = 37%.
    - Closure + year 3 = 61%.
    - Closure + year 4 = 100%.
- Mill site
    - Areas switch to disturbed at year 2.
- All Disturbed areas, not including unreclaimed roads, will transition to undisturbed at the following schedule:
    - year 5 = 25%.
    - year 10 = 50%.
    - year 15 = 75%.
    - year 20 = 100%.

After this time all areas will be undisturbed except Pit areas and unreclaimed roads.

4.5.3 Groundwater Inputs

Groundwater flow has been assessed for the following open pits at the mine: Springer-Cariboo Pit, Wight Pit, and Boundary Pit. Groundwater flows with dependency on the water level of the pits are presented in Appendix B of the TAR (Attachments C, D, E, and F; Golder 2016a) and repeated in APPENDIX A of this report.

Additionally, the groundwater flow predictions for the ultimate Springer-Cariboo Pit configuration Groundwater input have been revised and updated (WSP 2024a).

4.5.4 Storage Capacities

Free water volumes in storage ponds, sumps, and the TSF depend on a balance between their inflows and outflows. The stage (elevation) can be directly correlated to a specific storage volume using bathymetric and topographic data. These relationships are referred to as stage-storage curves.

Dynamic storage facilities such as the TSF, where tailings deposition changes the available storage, require regular survey updates to confirm whether existing stage storage curves are appropriate for projecting free water volumes. Stage-storage curves for the TSF up to a crest elevation of 987 m were developed from the 2023 TSF survey. These curves were obtained from preliminary tailings deposition modelling carried out in support of the design of the 987 m TSF.

The stage-storage curves projected up to a crest elevation of 987 m constitute a 2-D element that considers the tailings tonnage. These curves will interpolate according to the dry tailings volume across the Springer Expansion LOM schedule. The stage-storage curves up to a crest elevation of 987 m crest in this report are provided in APPENDIX A. The tailings tonnage from the tailings deposition model incorporated the actual tailings deposited from June 2022 until the end of 2023. Starting in 2024, it is based on the mine plan provided in MPMC 2022.

Stage-storage curves were available for the following major storage elements and are provided in APPENDIX A:

- Springer-Cariboo Pit (July 23, 2024, stage-storage curve with 72.4 M-ton (37 M-m^3) of PAG backfilled and without PAG backfilled).
- TSF (August 25, 2023, bathymetric survey, projected to 974 m and 987 m stage-storage curves [WSP 2024c]).
- Wight Pit (stage-storage curve received on September 6, 2024).

The estimated volume capacities for the facilities listed above and other storage locations are presented in Table 9.

Table 9: Maximum Capacities for Major Storage Facilities

Major Storage Facility	Estimated Capacity (M-m^3)
Combined Springer-Cariboo Pit final mine-out[(a)]	101.2
Combined Springer-Cariboo Pit after PAG rock infilling	72.4
TSF Pond – 987 m crest elevation design	5.4[(b)]
Wight Pit (operations)	3.5
Wight Pit (closure)	3.8
PETBP	Before 2027: 0.17 Starting 2027: 0.14

(a) Before PAG rock infilling.
(b) Capacity at the final stage of the TSF, when tailings deposition ends.

When the embankment reaches an elevation of 987 m, the TSF pond will be pushed towards the north abutment. The TSF will be available to store freshet water until four months after the start of the closure phase in order to capture the last freshet period during the operations phase. Commencing December 1, 2031, TSF volume will be progressively reduced to 0.25 M-m^3 over the course of two months due to construction of the closure spillway.

4.5.5 Mine Plan

The mine plan for the Springer Expansion was updated in the SWWBM and assumed a milling operational end date of March 2031. Tonnage of dry tailings during the project is provided in Table 10 (MPMC 2022).

Table 10: Mine Plan (Annual Totals)

Year	Dry Tailings (tons)
2025	7,300,000
2026	7,300,000
2027	7,300,000
2028	7,300,000
2029	7,300,000
2030	7,300,000
2031[(a)]	3,738,350

(a) Mine plan ends on July 31, 2031.

4.5.6 TSF Pond Volumes

Temporary detention of water in the TSF is necessary to manage large site runoff volumes that can be generated during freshet and to provide water for operations; however, a fundamental basis of the water management plan is to not accumulate water on-site year over year (including within the TSF) by treating and discharging water.

According to the WMP, the TSF should meet with the following Quantitative Performance Objectives (QPO) (WSP 2025e):

- Maintain a maximum contact water volume of 0.75 M-m^3 in the TSF prior to freshet.
- After the required period for temporarily storing high freshet inflow, return the TSF contact water storage volume to below 1.5 M-m^3.

To meet these objectives, the target operational water volume for the TSF is set at 0.75 M-m^3. The water balance model activates and deactivates pumping flows based on this target. Under normal conditions, the water volume should remain close to 0.75 Mm^3, occasionally dropping to no less than 0.6 M-m^3. The water volume is expected to rise during freshet and will be drained as soon as there is sufficient available treatment capacity to restore it to the target value.

Additionally, to help prevent the TSF pond from dropping below its target volume and ensure sufficient water is available to supply the Mill when needed, a buffer of 1.5 M-m^3 is maintained above the minimum level in the Wight Pit.

TSF volume conditions in the model are presented in Table 11.

Table 11: TSF Pond Volume Values

Condition	TSF Pond Volume (M-m^3)
Target volume	0.75
Maximum after freshet and until freeze-up	1.5

Note: M-m^3 = 1 × 10^6 m^3.

4.5.7 Flow Derivation and Logic

This section describes the model logic for pumped flows, seepage (from the TSF), groundwater inflows and outflows, consumption, and transfer flows.

In general, the model localizes the outflows of the TSF and pits and ponds, based on demand priorities using modeling elements known as "allocators." When water is present in storage, the allocator calculates evaporation as the first priority, followed by all pumping flows depending on the configured priorities. The maximum pumping capacity is utilized when water is available. If the total outflow is restricted, a lower or zero pumping rate is applied.

4.5.7.1 Pumped Flows

The most relevant transfer rates, including rates between TSF, Pits and PETBP, have been informed or confirmed by MPMC (MPMC 2023b, MPMC 2025a, MPMC 2025b, WSP 2025f). Maximum pumping rates for the operational, closure, and post-closure phases (2025 to 2131) are shown in APPENDIX A.

Pumping rates for transfers from the CCS to Wight Pit (P30) and from the CCS to the TSF (P36) were set at pipeline capacity, as confirmed by MPMC (2025b).

4.5.7.2 CCS Pumping Logic

As of 2025, contact water is pumped directly to the TSF (P36) from the CCS. This connection is used to fill the TSF pond and maintain the target level. If inflows to the CCS are greater than the WTP discharge and the Wight Pit transfer capacities, all excess water is sent to the TSF up to the maximum transfer rate.

4.5.7.3 PETBP Pumping Logic

Starting in 2025, the Perimeter Embankment Till Borrow Pond (PETBP) no longer pumps water directly to the Tailings Storage Facility (TSF). The inflows to the PETBP are treated and discharged through the WTP. With the updated configuration, pumping to the TSF is now routed from the CCS rather than the PETBP. When inflows to the PETBP exceed the available WTP capacity, the CCS to TSF pump is activated to help manage excess volumes.

The current maximum capacity of the PETBP is 170,000 m^3 and will decrease to 138,000 m^3 starting in 2027. The PETBP is planned to be shifted east during the TSF 987 m buttress construction and is planned to be reduced in size.

4.5.7.4 Mill Process Flows

The mill process water requirements are based on 2.0 m^3/t of tailings. Interstitial water sequestered in the deposited tailings is based on 1.35 t/m^3 of tailings deposited.

4.5.7.5 Consumption Flows

Consumption flows are system losses attributed to the operation of dust suppression equipment. Consumption flows were estimated by MPMC staff for operations (MPMC 2023b) and are modelled according to the following logic:

- Turbo-misters operate from May to September.
- Water trucks withdraw water at variable rates from May to September.

Consumption flow rates are presented in APPENDIX A.

4.5.7.6 Tailings Storage Facility Flows

The upstream drain system will capture water within the tailings above 970 m and convey it to the seepage collection system, downstream of the TSF embankment. WSP has estimated the water flows (WSP 2024b) through the upstream drains for the 987m crest TSF based on the distance between the pond and the embankment (beach width).

Estimation of flows have been made for each embankment:

- S1: South Embankment
- S2: Main Embankment
- S4: Corner 1 Embankment
- S5: Perimeter Embankment

Seepage flows from the TSF (S1 to S5) during operations were estimated using a two-dimensional numerical groundwater flow model to quantify anticipate seepage rates through the embankment and foundation. Seepage analyses for typical sections of the elevation of 987 m configuration of the South Embankment, Main Embankment, Perimeter Embankment, and Corner 1 Embankment under steady-state conditions. The analyses were conducted using GeoStudio 2021, developed by GEOSLOPE International Ltd. Seepage from the TSF has been defined to occur continuously without interruption in the SWWBM (WSP 2024b). Table 12 presents the estimated seepage flow rates through each embankment and upstream drain with dependency on the beach width.

Table 12: Seepage Flow Rates

Beach (m)	Flow Rate (L/s)			
	S1	S2	S4	S5
0	79	96	81	89
50	39	50	53	46
100	25	32	38	31
200	14	18	23	18
300	9	12	15	13

Note: Includes flows through upstream drains and embankment. All flows estimated for the 987 m raise.

The progressive location of the TSF pond will depend on operational decisions during the deposition of tailings; thus, the change in beach widths have been assumed consistent for each embankment. Based on estimates of the TSF pond volume and satellite imagery of the pond location since restart of operation in 2016, an estimation of embankment beach width has been made for different pond sizes. The estimates of beach widths and associated pond volumes are provided in Table 13.

Table 13: Tailings Beach Width

TSF Pond Volume (m^3)	Beach Width (m)			
	S1	S2	S4	S5
0	300	300	300	300
1,500,000	300	300	300	300
2,500,000	200	200	200	200
3,000,000	100	100	100	100
5,500,000	0	0	0	0

The model uses both Table 12 and Table 13 presented above to calculate the beach width and consequently the seepage flow rates through the embankments during operations. For every time step the model calculates the TSF volume and consequently the beach width, and finally the seepage flow rate.

Starting from four months into closure (August 1, 2031), the TSF pond reduces its volume to 0.25 M-m^3 within two months due to the construction of the closure TSF spillway. This is estimated to increase in the seepage flow rate on the perimeter embankment close to corner 1, as the TSF pond will be pushed to that corner. For modelling purposes, it is considered that the seepage flow rate in Table 14 will be in effect 6 months after the end of the operation phase and throughout the post-closure phase.

Table 14: Tailings Beach Width Starting 6 Months into Closure

Flow Rate (L/s)			
S1	**S2**	**S4**	**S5**
70	0	0	0

Note: Values start 6 months after end of operation. Maximum capacity of TSF pond is limited to 0.25 M-m³.

Additionally, the water balance model includes an uncaptured seepage pathway from the TSF to the environment (S14), which represents a direct loss.

A constant seepage rate of 3.2 L/s has been assumed for S14 in the current water balance model. This value is based on historical seepage assessments conducted by Knight Piésold in 1995 and 2005, which estimated uncaptured TSF seepage to range between 0.4 and 3.4 L/s, and by AMEC in 2014, which estimated a range of 0.5 to 4.0 L/s. The selected value of 3.2 L/s falls within these historical ranges and is considered a reasonable representation for modeling purposes.

The existing groundwater models (WSP 2024b) were constructed for each facility (Springer Pit and TSF) and do not represent a single site-wide groundwater model for the mine site. However, collectively, these models are considered to reasonably represent site conditions.

5.0 WATER BALANCE RESULTS

The following sections present major model results for the operational and closure phases, and partial results for post-closure phase. Full extension of post-closure results are presented in APPENDIX C.

5.1 WTP Treatment Capacity

Throughout the entire planned future operations and closure periods to July 31, 2041, the maximum treatment capacity of the WTP in the model is assumed to be 25,000 m^3/day (0.29 m^3/s, 9.15 M-m^3/year). Excess water beyond this discharge rate is temporarily stored within the Wight Pit and the TSF until it can be treated and discharged. In some cases, overflow from the PETBP (for extreme probabilistic simulations results) is simulated and those volumes are included in the reported annual treatment volumes so that they are accounted for in the predicted annual treatment requirement. Centralized collection and treatment of contact water is assumed during operations, closure, and post-closure. The Mine's current discharge permit authorizes an annual discharge volume of 10.59 M-m^3, as per EMA Permit 11678 (December 2022).

At the end of the operations phase, contact water requiring treatment increases in 2031, as milling is assumed to terminate in 2031 and the demand for milling process water also terminates.

In year 2041, the assumed treatment capacity of the WTP in the model remains at 25,000 m^3/day (0.29 m^3/s). However, annual contact water requiring treatment is significantly reduced over the post-closure phase as site areas are remediated and some runoff is considered non-contact water, as shown in the flow diagram Figure B-3 provided in APPENDIX B. The annual contact water treated discharge volume declines further in year 2051 when the South Embankment Seepage Pond and Main Embankment Seepage Pond catchments are assumed remediated, commencing 10 years after the post-closure phase.

Estimated annual contact water volumes requiring treatment from operations to post-closure (including simulated overflow volumes from the PETBP) are presented in Table 15.

Table 15: WTP Annual Volume Requiring Treatment and Simulated PETBP Overflows (M-m^3)

Year	Annual Volume Requiring Treatment at WTP (M-m^3)		
	50th Percentile	90th percentile	99.5th percentile
2025	5.05	6.11	7.76
2026	3.20	4.32	5.73
2027	3.31	4.45	5.98
2028	3.32	4.52	6.07
2029	3.31	4.43	6.01
2030	3.40	4.60	6.26
2031 (a)	4.60	5.71	6.62
2032	5.28	6.16	7.56
2033	5.09	6.03	7.42
2034	5.08	5.97	7.31
2035	4.88	5.75	7.11
2036	4.50	5.30	6.30
2041(b)	3.53	3.99	4.49
2046	1.56	1.94	2.64
2051	1.11	1.39	1.96
2071	0.22	0.42	0.96
2091	0.22	0.41	1.07
2111	0.22	0.40	1.00

Table 15: WTP Annual Volume Requiring Treatment and Simulated PETBP Overflows (M-m^3)

Year	Annual Volume Requiring Treatment at WTP (M-m^3)		
	50th Percentile	90th percentile	99.5th percentile
2131	0.22	0.42	1.03
2165	0.22	0.40	0.97

(a) Closure starts on July 1, 2031.

(b) Post-closure starts on July 1, 2041.

5.2 Tailings Storage Facility

Temporary detention of water will be necessary to manage the large runoff volumes generated during freshet (typically April to June). The inflows during freshet will exceed treatment capacity, and detention volume is required to prevent uncontrolled release and to equalize the flow for treatment.

The TSF is available to store excess freshet water until four months after the start of closure. At that time, the TSF pond will decrease its volume to 0.25 M-m³, the maximum allowable volume at closure. To create the reduced TSF pond, a closure spillway will be constructed at the north abutment (Corner 5) of the TSF. Water will discharge from the TSF to the CCS and then flow to the PETBP for treatment prior to discharge.

During closure and post-closure, the TSF pond is modelled to discharge annually via the spillway, and the TSF pond volume will vary seasonally, limited by the spillway invert, to a maximum of approximately 0.25 M-m^3. As from Figure 2, the volume fluctuation follows a consistent pattern during both closure and post-closure periods, with minimum values occurring in winter and reaching maximum capacity during freshet (0.25 M-m³).

Figure 2 shows the water volume in the TSF throughout future operations and into closure until 10 years after post-closure. The TSF volume pattern shown for the 2041-2051 post-closure period is continued for the remaining 80 years of post-closure (until 2131). Table 16 shows tabulated minimum, average, and maximum bounds for the three percentile trends shown in Figure 2. For most percentile results, the TSF pond volume can be maintained at the 0.75 M-m^3 target throughout the year; however, in some scenarios above the 95th percentile, additional storage in the TSF is predicted, up to 2.15 M-m^3 pond water volume.

Table 16: TSF Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	736,063	736,063	743,022
	Average	749,194	749,205	1,033,212
	Maximum	750,000	750,000	2,149,922
Closure [(a)]	Minimum	0	0	0
	Average	30,597	78,769	158,240
	Maximum	233,616	257,209	257,209
Post-Closure	Minimum	0	0	0
	Average	23,700	66,224	145,931
	Maximum	176,718	257,209	257,209

(a) These values are representative of the closure period after the transitional phase from operations.

(b) These values represent conditions after the end of the 2025 freshet, which has already occurred at the time of this report.

(c) During the operational phase, the TSF is not used for water storage except when other facilities (i.e., Wight Pit or water treatment plant) capacity is exceeded. This exceedance is reflected in the 99.5th percentile results.

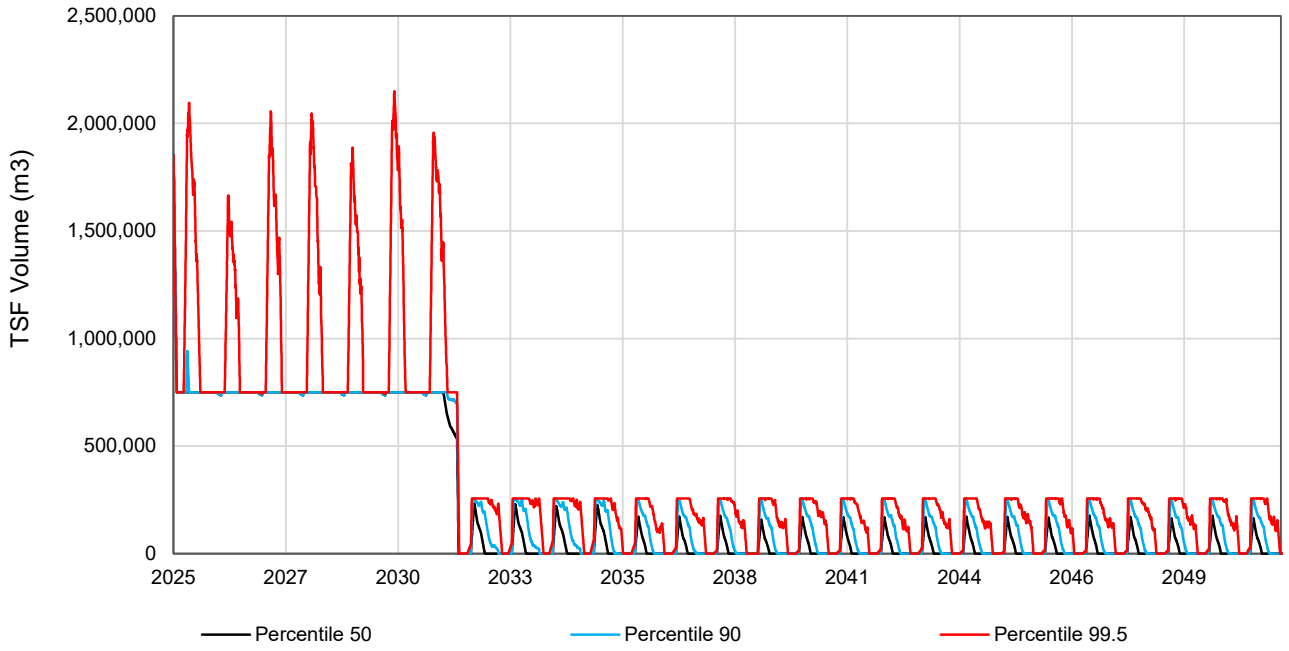


Figure 2: TSF Water Volume from Operations to 10 Years after Post-Closure

5.3 Combined Springer-Cariboo Pit

Springer Pit and Cariboo Pit were modelled as a single pit. A result comparison between different percentiles for Combined Springer-Cariboo Pit volume and pit lake elevation during operations, closure and post-closure are provided in Figure 3 and Figure 4. The simulations were run from an initial storage volume of 0 m^3, as Springer- Cariboo Pit will be actively dewatered during operations, then allowed to fill at closure.

During operations, no water is stored in the Springer–Cariboo Pit for the 50th percentile scenario, while volumes reach approximately 62,000 m^3 and 663,000 m^3 for the 90th and 99.5th percentiles, respectively. These volumes reflect temporary retention, when inflows exceed available treatment capacity in the WTP and transfer to Wight Pit.

At closure, Potentially Acid Generating (PAG) waste rock will be stacked uniformly to an elevation of 964 m in the base of the Springer-Cariboo Pit, for a total volume of 37 M-m^3. The void space within the PAG material is estimated to contain approximately 9.4 M-m^3 of water. Results of the simulations indicate that water levels within the pit will cover the PAG material placed in pit by approximately 2039 (99.5th percentile), 2040 (90th percentile), and late 2040 (50th percentile).

The pit will then fill up to its overflow volume of 72.4 Mm^3 (including the void space within the PAG material), at which point water would begin to discharge. Under the 50th percentile results, the Springer-Cariboo Pit lake is estimated to start overflowing in 2152, while under the 90th percentile it is estimated to start overflowing in 2148, and in 2143 under the 99.5th percentile.

Table 17: Springer-Cariboo Pit Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	0	0	0
	Average	0	140	30,529
	Maximum	0	61,978	663,068

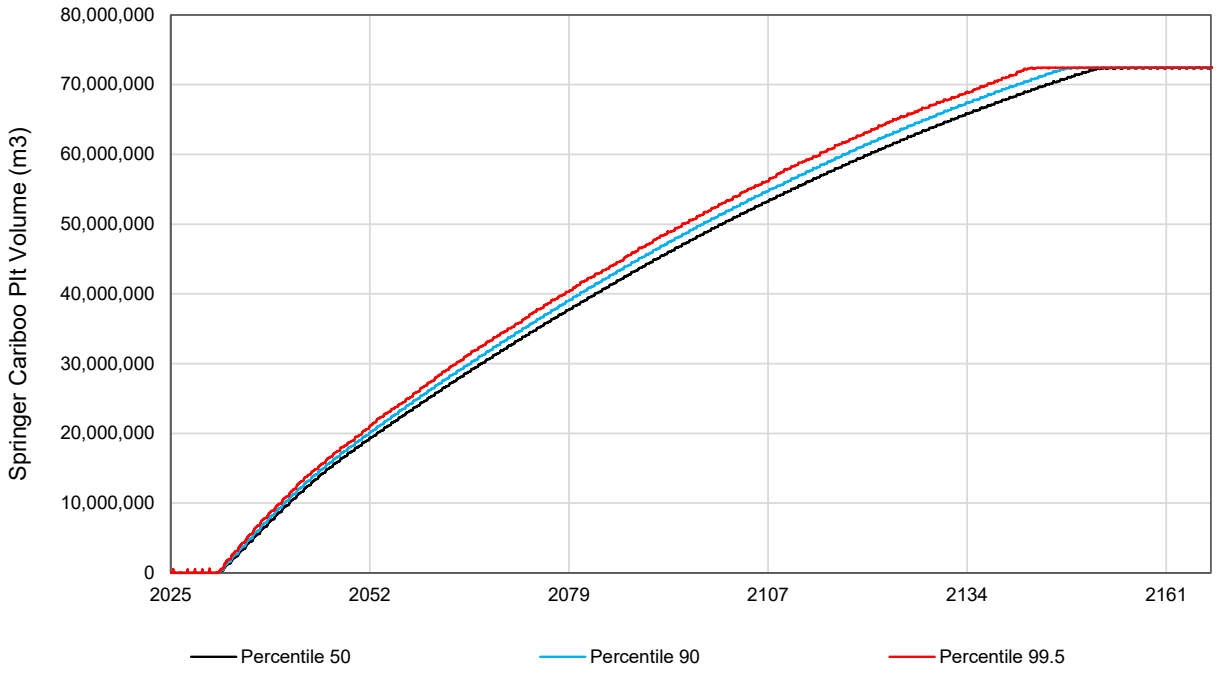


Figure 3: Springer-Cariboo Pit Water Volume from Operations to Year 2168

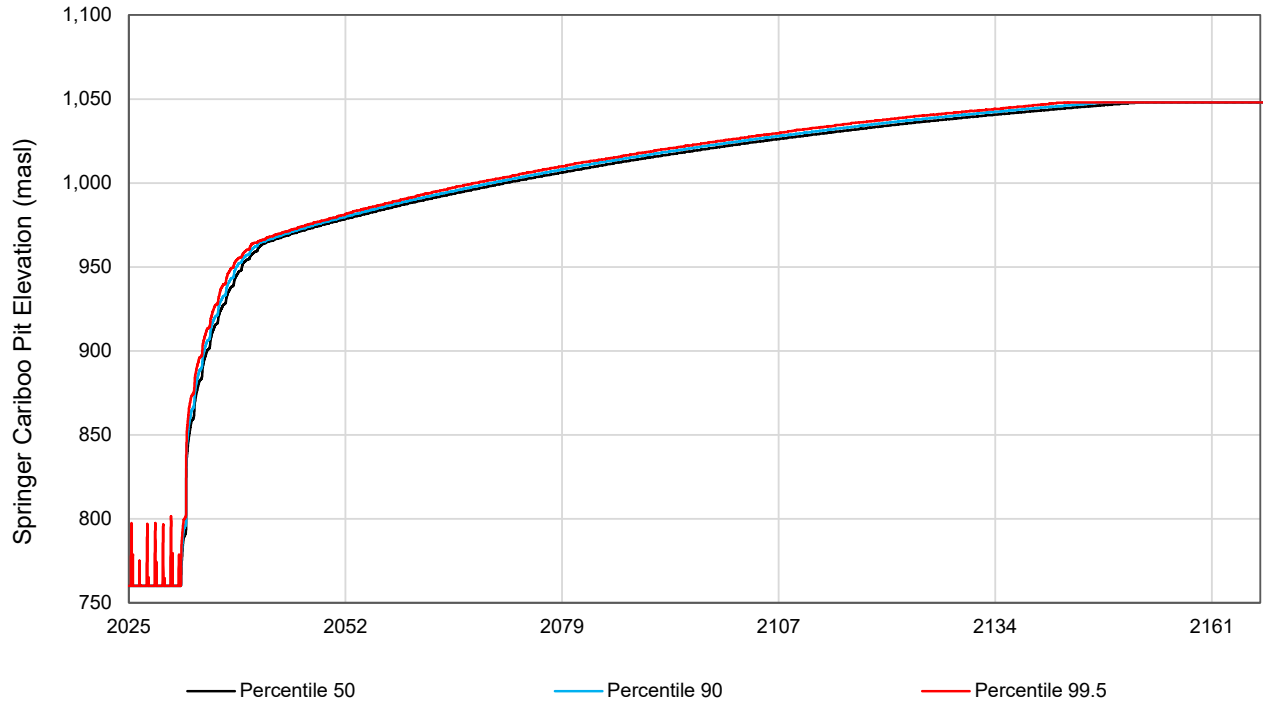


Figure 4: Springer-Cariboo Pit Lake Elevation from Operations to Year 2168

The Springer-Cariboo Pit is modelled to fill to its maximum volume during post-closure. Following that time, additional volume collected in the combined pit will overflow from the pit's spillway and is assumed in the SWWBM to direct discharge to the receiving environment. Water quality and water treatment discussion is included within the TSF Raise to 987m Permit Amendment Application Water Management Plan (WSP 2025d) regarding this assumption of direct environmental discharge of pit lake overflow during post-closure.

Table 18 shows the modelled average annual overflow volume from the Springer-Cariboo Pit.

Table 18: Springer-Cariboo Pit Annual Overflow (m^3)

Phase	Springer-Cariboo Pit Annual Average Overflow (m^3)		
	50th Percentile	90th percentile	99.5th percentile
Post-Closure	307,356	533,658	923,540

5.4 Perimeter Embankment Till Borrow Pond (PETBP)

With the updated configuration, when inflows to the PETBP exceed the available WTP capacity, the CCS to TSF pump is activated to help manage excess volumes. In spite of this, the model simulates overflows from the PETBP under the 99.5th percentile.

The SWWBM predicts that the PETBP will have sufficient capacity to prevent overflow for the 50th and 90th percentiles during operations, and for the 50th percentile during closure. It is assumed that sufficient storage or transfer capacity will be implemented during extreme conditions to prevent any unwanted overflow of contact water requiring treatment during the operational and closure phase. The volumes listed in Table 19 are included in the total annual volumes required for treatment shown in Table 15.

During closure and post-closure, less storage is available in the overall water management system. The PETBP reaches higher maximum volumes during freshet periods and does not have the capacity to prevent overflow for the 90th and the 99.5th percentile results (as shown in PETBP overflow volumes listed in Table 20).

Estimated storage volumes in the Perimeter Embankment Till Borrow Pond (PETBP) from operations to 10 years after post-closure are presented in Figure 5, with minimum, average, and maximum bounds of those trends shown in Table 19.

Table 19: PETBP Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	29,315	29,315	29,315
	Average	36,619	38,786	67,344
	Maximum	62,011	136,006	169,417
Closure	Minimum	29,315	29,315	29,315
	Average	29,315	33,185	59,759
	Maximum	29,315	105,541	138,358
Post-Closure	Minimum	29,315	29,315	29,315
	Average	29,315	29,383	37,141
	Maximum	29,315	41,505	138,358

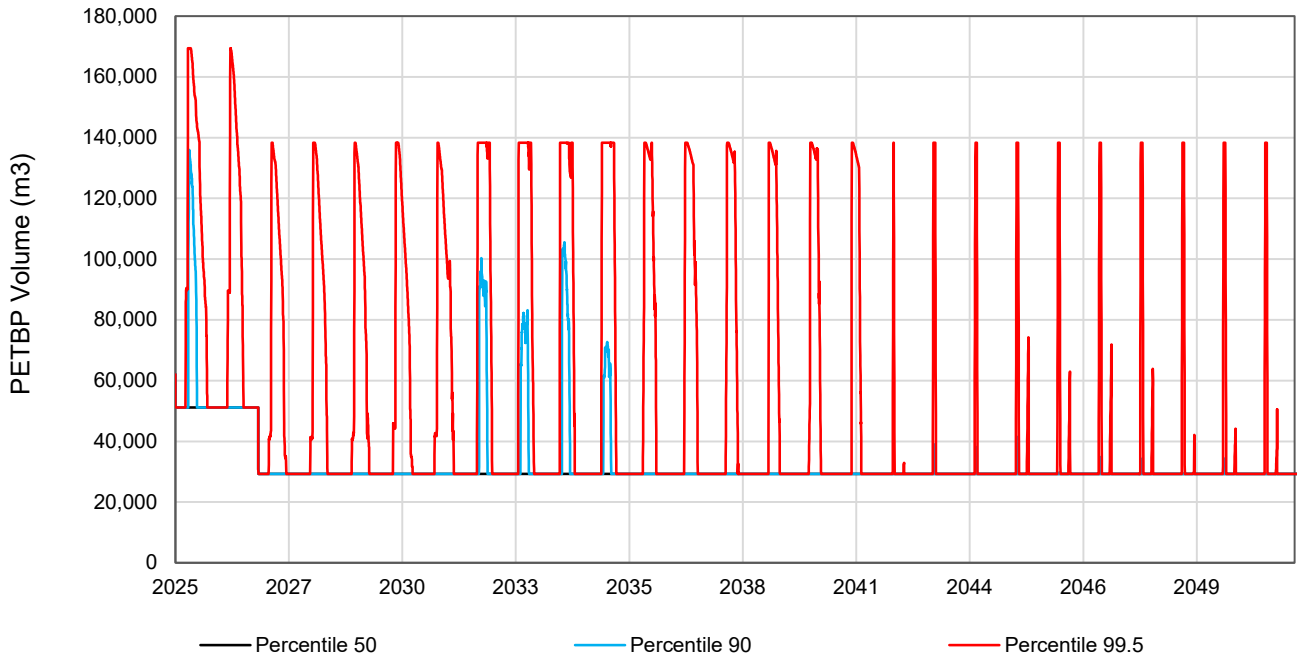


Figure 5: PETBP Water Volume in Pond during Operations to 10 Years after Post-Closure

Table 20: Annual PETBP Overflow Volume for Treatment (m^3)

Year	Annual Overflow Volume at PETBP (m^3)		
	50th Percentile	90th percentile	99.5th percentile
2025	0	0	463,384
2026	0	0	72,328
2027	0	0	136,773
2028	0	0	139,684
2029	0	0	101,182
2030	0	0	116,272
2031 (a)	0	0	96,576
2032	0	31,738	832,598
2033	0	16,360	1,285,584
2034	0	24,953	1,012,256
2035	0	0	941,263
2041 (b)	0	0	302,535
2046	0	0	258,029
2051	0	0	234,548
2056	0	0	133,640
2076	0	0	37,472
2096	0	0	81,539

Table 20: Annual PETBP Overflow Volume for Treatment (m^3)

Year	Annual Overflow Volume at PETBP (m^3)		
	50th Percentile	90th percentile	99.5th percentile
2116	0	0	47,439
2131	0	0	114,766
2168	0	0	153,488

(a) Closure starts on July 1, 2031.

(b) Post-closure starts on July 1, 2041.

5.5 Wight Pit

During operations, temporary detention of water in the Wight Pit will be necessary to manage the runoff volumes generated during freshet. The water volume in Wight Pit is expected to increase during each freshet season and will be removed as soon as there is available capacity for treatment in the WTP.

The TSF pond will be reduced to 0.25 M-m^3 within two months into the closure phase, after which Wight Pit will still be used to store excess water. During post-closure, Wight Pit will no longer be used for freshet storage and will be allowed to fill. Wight Pit is projected to start overflowing in 2044 under the 50th and 90th percentile results, and in 2043 under the 99.5th percentile results. Overflow from Wight Pit during post-closure is assumed as direct environmental discharge to Polley Lake and the water quality implications of this assumption are discussed within the TSF Raise to 987m Permit Amendment Application Water Management Plan (WSP 2025d). Estimated volumes stored in Wight Pit from operations to 10 years after post-closure are presented in Figure 6 and the average annual post-closure overflow volumes are shown in Table 22.

Table 21: Wight Pit Water Volume (m^3)

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	1,351,273	1,466,804	1,528,049
	Average	1,918,290	2,188,512	2,562,768
	Maximum	2,784,487	3,235,582	3,283,925

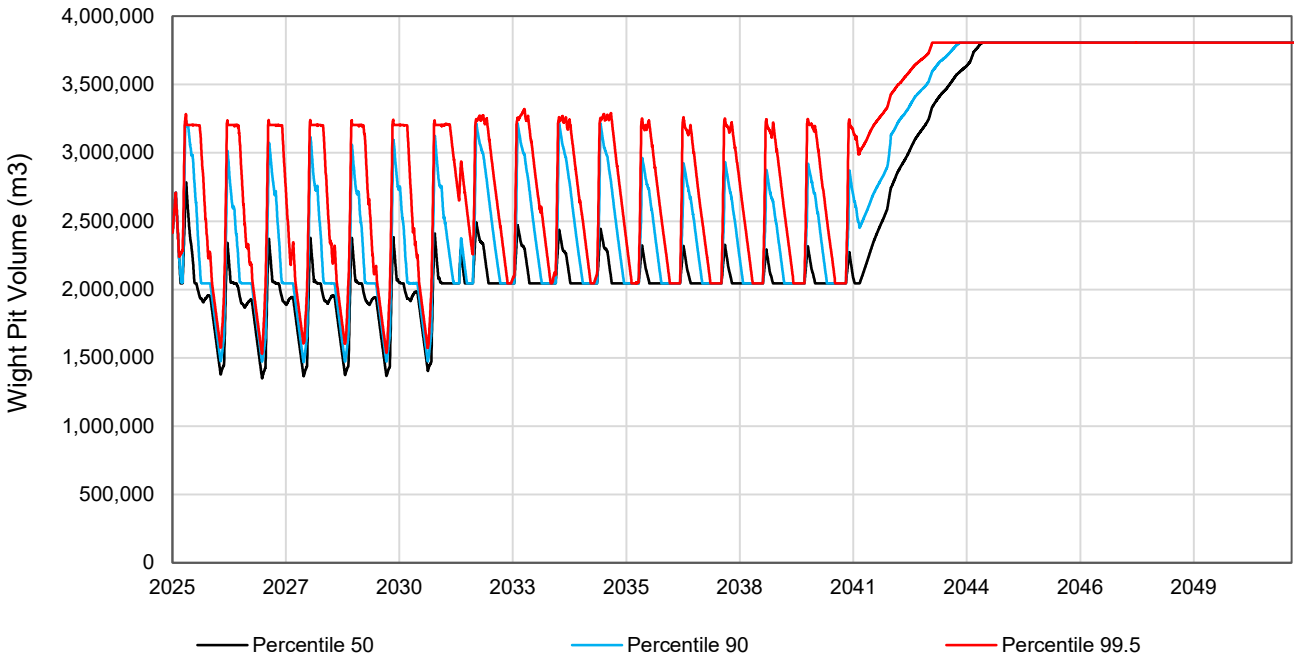


Figure 6: Wight Pit Water Volume from Operations to 10 Years after Post-Closure

Table 22: Wight Pit Annual Average Overflow (m^3)

Phase	Wight Pit Annual Average Overflow (m^3)		
	50th Percentile	90th percentile	99.5th percentile
Post-Closure	320,998	369,090	440,144

5.6 Sensitivity Analysis

A sensitivity analysis was conducted to evaluate the impact of avoiding overflows from the PETBP, by increasing the modelled CCS to TSF pumping capacity beyond currently installed capacity. The objective of this analysis was to assess the ability of the TSF to maintain operational pond volumes under this configuration, particularly during freshet.

Under the 50th and 90th percentile scenarios, TSF pond volumes remained constant at 0.75 M-m^3 throughout the operational phase. Under the 99.5th percentile scenario, the TSF pond volume reached a maximum of 2.24 M-m^3 (as shown in Table 23 and Figure 7) compared to the maximum TSF water volume of 2.15 M-m^3 predicted assuming only installed transfer capacity between CCS and TSF.

Table 23: TSF Water Volume (m^3) – Sensitivity Analysis

Phase	Bound	50th Percentile	90th Percentile	99.5th Percentile
Operations	Minimum	750,000	750,000	750,000
	Average	750,000	750,000	1,032,308
	Maximum	750,000	750,000	2,237,274
Closure [(a)]	Minimum	0	0	0
	Average	30,597	78,769	158,240
	Maximum	233,616	257,209	257,209
Post-Closure	Minimum	0	0	0
	Average	23,700	66,224	145,931
	Maximum	176,718	257,209	257,209

(a) These values are representative of the closure period after the transitional phase from operations.

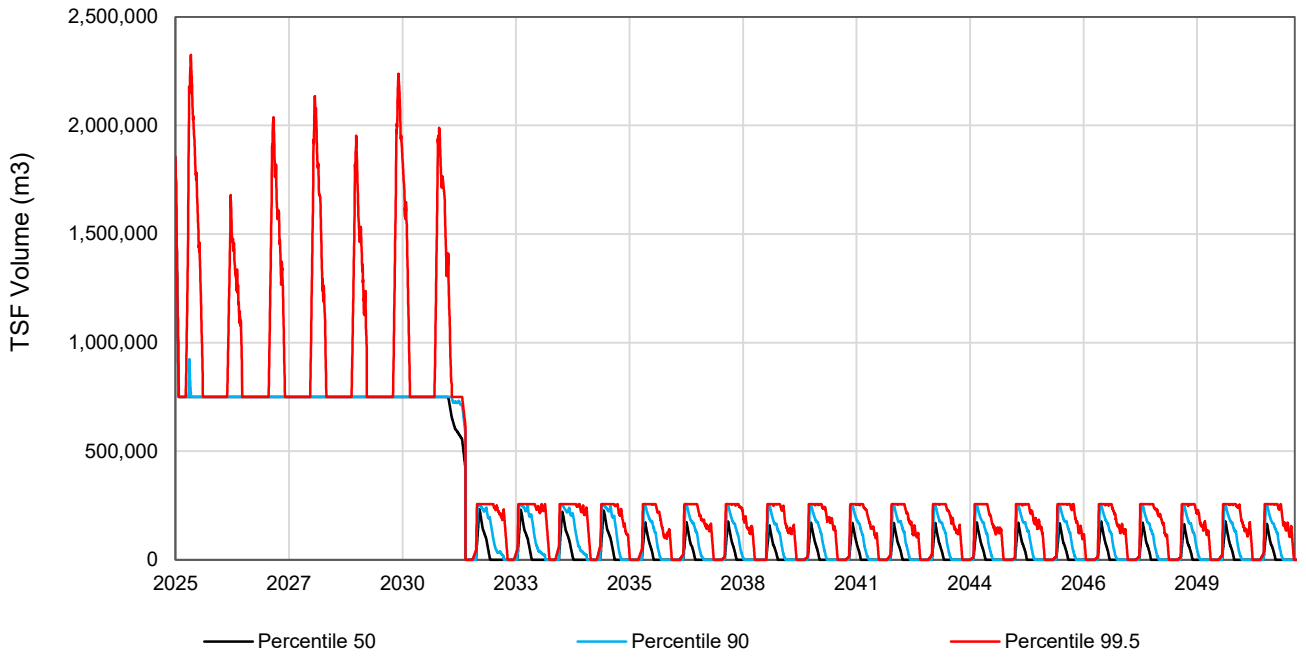


Figure 7: TSF Water Volume from Operations to 10 Years after Post-Closure – Sensitivity Analysis

6.0 SUMMARY

The SWWBM was updated to support the Pemit Amendment Application for the TSF raise to 987m. The SWWBM assumes a mine operational phase aligned with the Springer Expansion LOM plan and incorporates closure and post-closure water management strategies aligned with the 2022 RCP. The SWWBM supports water management planning and the assessment of water quality and associated water treatment and discharge options.

The model was run from January 1, 2025, to July 31, 2131, and included the following LOM phases:

- operational phase extending from January 1, 2025, to July 31, 2031
- closure phase extending from April 1, 2031, to July 31, 2041
- post-closure phase commencing on August 1, 2041, and extending to July 31, 2131 (100 years including closure). The simulation was extended to end of 2168, in order to include the overflow from the Springer- Cariboo Pit after closure

The model was run stochastically for 2000 realizations to present 50th, 90th, and 99.5th percentile model results. The results for modelling during the operational phase are presented as follows:

- The average annual treated discharge for the 50th percentile is approximately 3.8 M-m^3 between 2025 and 2031, while the milling process water demand exists.
- The maximum annual treated discharge for the 99.5th percentile, including overflows, is 7.76 M-m^3 in 2025.
- The maximum TSF pond volume during the operational phase is approximately 2.2 M-m^3 for the 99.5th percentile, and 0.75 M-m^3 for the 50th percentile results.
- During the operational phase, the Springer-Cariboo Pit is usually maintained empty, except for the 90th and 99.5th percentiles with maximum volumes of 0.06 and 0.7 M-m^3 ,respectively.
- There are occasional overflows from the PETBP during the operational phase (for percentiles >= 98%), with an annual maximum of 0.46 M-m^3 in 2025 (99.5th percentile).

The conclusions for the modelling during closure and post-closure phases are as follows:

- The average annual treated discharge for the 50th percentile result is approximately 4.8 M-m^3 during closure and 0.35 M-m^3 during post-closure.
- The TSF pond volume will vary seasonally, limited by the spillway invert, to a maximum of approximately 0.25 M-m^3.
- The Springer-Cariboo Pit Lake will not overflow within the post-closure period (100 years), as the overflow period is estimated to start between 2143 and 2152, with an average annual 50th percentile overflow volume of approximately 0.3 M-m^3.
- PAG material placed in the Springer-Cariboo Pit is estimated to be inundated and covered by the pit lake between 2040 and 2042.

- During closure, temporary storage will occur in the PETBP during the freshet under each of the climate conditions simulated. During closure and post-closure phases, the PETBP does not have sufficient storage capacity to prevent overflow during freshet for the 99.5th percentile condition and future transfer systems at closure should consider appropriate design flows.
- The Wight Pit is expected to initiate spilling between 2043 and 2044, with an average annual 50th percentile overflow volume of approximately 0.32 M-m^3.

7.0 CLOSING

This report summarizes the SWWBM to support the water management information requirements for the permit application for the Tailings Storage Facility crest raise to 987 m.

We trust that this report satisfies your current requirements. Please contact the undersigned should you have any questions.

The reader is referred to the Study Limitations section, which precedes the text and forms an integral part of this report.

WSP Canada Inc.



PERMIT TO PRACTICE #1000200
Engineers & Geoscientists BC



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https://wsponline.sharepoint.com/sites/gld-10023g/2025 deliverables1/ca0047730.8440 deliverables/002_issued/035-r-31191- water balance model - 987m design/rev1/ca0047730.8440-035-r-rev1-31191-water balance model report 29aug_25.docx

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APPENDIX A

SWWBM TSF Raise to 987 m Permit Amendment Application Inputs

A1.0 CATCHMENT AREAS BY LAND TYPE

Table A-1: Catchment Areas by Land Type (Start of Closure)

Catchment	Land Types (m^2)							
	Waste Rock	Haul Roads	Mill Site Area	Disturbed Area	Undisturbed Area	Pit Walls	Maximum Pond Area	Total Catchment
South Seepage Pond	125,107	0	0	0	109,566	0	0	234,673
Main Embankment Seepage Pond	298,516	0	0	158,768	0	0	37,546	494,830
TSF Upstream Catchment (External)	0	68,339	0	63,800	819,771	0	0	951,910
Perimeter Embankment Till Borrow Pond (PETBP)	100,535	96,348	0	302,500	65,060	0	69,307	633,750
Central Collection Sump (CCS)	0	67,918	0	194,121	226,851	0	21,823	510,713
Bootjack Creek Sump	0	103,986	0	70,143	0	0	1,130	175,259
SERDS Ditch	401,235	165,456	273,919	313,879	383,918	0	0	1,538,407
Mill Site Sump	0	0	0	0	0	0	1,628	1,628
Mine Drainage Creek Sump	88,826	137,335	314,166	115,633	111,134	0	1,125	768,219
Nez Dump	199,116	261,421	0	238,416	202,646	0	0	901,599
North Bell Dump	0	0	0	0	0	0	0	0
East RDS	693,392	0	0	900,474	0	0	0	1,593,866
Combined Springer - Cariboo Pit	922,698	0	129,436	156,100	0	1,121,404	0	2,329,638
NW Sump	205,919	63,800	0	60,441	0	0	231	330,391
9K Sump	497,228	0	0	60,735	187,285	0	400	745,648
Wight Pit	162,022	0	0	106,465	0	145,664	0	414,151
Boundary Pit	3,511	0	0	0	10,286	9,616	9,616	33,029

Note: TSF-Tailing Storage Facility; PETBP-Perimeter Till Borrow Pond; CCS-Central Collection Sump.

A2.0 FLOW INVENTORY

A description of the model flows is provided in Table A-2. Direct precipitation, runoff and environmental discharge flows are numbered according to their associated elements and are therefore not described herein.

Table A-2: Description of Flows for Operational Phase

Flow Process	Component	Flow Label
Hydrology	Precipitation	N/A[(a)]
	Evaporation	N/A[(a)]
	Runoff	All flows labelled R[(b)]
Consumption	Turbo-misters	C1, C9, C10
	Water Truck Usage	C2, C4, C8
Seepage (from Tailings Storage Facility)	South Seepage Pond Inflow	S1
	Perimeter Embankment Till Borrow Pond (PETBP)	S4, S5
	Main Embankment Seepage Pond	S2, S3
	Seepage to Environment	S14
Seepage (from Other Facilities)	SERDS Dump to SERDS Ditch	S6
	North Bell Dump to Long Ditch	S7
	East RDS to Long Ditch	S8
	NEZ Dump to NEZ Booster Sump	S9
	To 9KM Sump	S10
	To NW Sump	S11
	To Mine Drainage Creek Sump	S12
	To Bootjack Creek Sump	S13
Groundwater Flows	Wight Pit Groundwater Inflow	GW1
	Springer – Cariboo Pit Groundwater Inflow	GW2
	Springer – Cariboo Pit Groundwater Outflow	GW4
	Boundary Pit to Wight Pit	GW5
	Wight Pit Groundwater Outflow	GW7
Transfers	Long Ditch to Central Collection Sump (CCS)	T1
	SERDS Ditch to Long Ditch	T2
	CCS to PETBP	T3 (OF6)
	PETBP to Water Treatment Plant (WTP)	T6
Pumped Flows – Wight Pit	CCS to Wight Pit	P30
	Boundary Pit to Wight Pit	P34
	Wight Pit to Long Ditch	P21
Pumped Flows – Springer-Cariboo Pit	NW Sump to Springer Pit	P18
	Springer – Cariboo Pit to SERDS Ditch	P23

Table A-2: Description of Flows for Operational Phase

Flow Process	Component	Flow Label
Pumped Flows – Process Plant	Process flow from TSF Booster	P28
	Process return to TSF	P27
	NEZ Booster Sump to Process Plant	P38
	NEZ Booster Sump to Process Plant	P39
	Cariboo Booster to Process Plant	P42
Pumped Flows – Sumps	PETBP to TSF	P5
	South Seepage Pond to Main Embankment Seepage Pond	P6
	Main Embankment Seepage Pond to PETBP	P8
	Mine Drainage Creek Sump to SERDS Ditch	P10
	Bootjack Creek Sump to SERDS Ditch	P11
	Mill Domestic Water to Mill Site Sump	P13
	Geology Domestic Water Effluent to Mill Site Sump	P15
	9KM Sump to NW Sump	P20
	NW Sump to Mine Drainage Creek Sump	P24
	MAG Sump to TSF	P31
	TSF to TSF Booster	P32a
	CCS to TSF	P36
	NEZ Dump to NEZ Booster Sump	P40
	Wight Pit to NEZ Booster Sump	P41
	NEZ Booster Sump to Wight Pit	OF20
	TSF Booster to SERDS Ditch	OF19

Source: Springer Pit Expansion LOM SWWBM Flow Diagram (Appendix B).

(a) Evaporation and direct precipitation flows not shown on flow diagram.

(b) No flows were assigned specifically for snowmelt. Instead, snowpack was accumulated in the model and snowmelt was included in the runoff flows.

A3.0 FLOW RATES

A3.1 Pumped Flows

Maximum pumping rates have been provided or confirmed by MPMC (MPMC 2023b, MPMC 2025a, MPMC 2025b, WSP 2025f).

Maximum pumping rates for operational flows are shown in Table A-3, and maximum pumping rates for closure flows are shown in Table A-4. It should be noted that any pumped flows shown in Table A-3, but not shown in Table A-4, are assumed to be decommissioned with zero transfer capacity.

Table A-3: Maximum Pumping Rates for Operational Flows

Flow ID	From	To	Flow Rate (m^3/day)	Reference
P5	PETBP	TSF	Deactivated as of 2025	MPMC 2025b

Table A-3: Maximum Pumping Rates for Operational Flows

Flow ID	From	To	Flow Rate (m^3/day)	Reference
P6	South Seepage Pond	Main Embankment Seepage Pond	8,640	WSP 2025f
P8	Main Embankment Seepage Pond	PETBP	8,640	MPMC 2023b
P10	Mine Drainage Creek Sump	SERDS Ditch	36,000	MPMC 2025b
P11	Bootjack Creek Sump	SERDS Ditch	8,640	WSP 2025f
P13[a]	Mill Domestic Water	Mill Site Sump	545	WSP 2025f
P15[a]	Geology Domestic Water	Mill Site Sump	2.5	WSP 2025f
P20	9KM Sump	NW Sump	13,633	WSP 2025f
P21	Wight Pit	PETBP	8,712	MPMC 2023b
P23	Springer-Cariboo Pit	SERDS Ditch	43,200	WSP 2025f
P24	NW Sump	Mine Drainage Creek Sump	20,000	WSP 2025f
P27	Mill	TSF	N/A[c]	WSP 2025f
P28	TSF	Mill	80,000	MPCM 2025a
P30[b]	CCS	Wight Pit	55,200 during freshet / 28,800 rest of the year	MPMC 2025b
P31	Mill Site Sump	TSF	8,640	WSP 2025f
P32a	TSF	TSF booster	80,000	MPMC 2025b
P34[d]	Boundary Pit	Wight Pit	4,000	WSP 2025f
P36[b]	CCS	TSF	20,000	MPMC 2025b
P38	NEZ Booster Sump	Process Plant	8,200	MPMC 2025a
P39	NEZ Booster Sump	Process Plant	8,200	MPMC 2025a
P40	NEZ Dump	NEZ Booster Sump	Sum of S9 and R13b[e]	N/A
P41	Wight Pit	NEZ Booster Sump	9,000	MPMC 2025a
P42	Cariboo Booster	Process Plant	4,000[f]	MPMC 2024a
OF19	TSF Booster	SERDS Ditch	80,000	MPMC 2025a
OF20	NEZ Booster Sump	Wight Pit/ Underground	N/A[g]	MPMC 2025a

(a) Based on measured flow rates (WSP 2025f).

(b) Pumping capacity assumed as pipeline capacity.

(c) No maximum pumping rate applied. These are defined based on the process flow requirements from the Mill, where P27 is defined as process water (including interstitial water) in addition to tailings solids, and P28 is defined as process water demand.

(d) P34 active when mining of Boundary Pit starts in 2026.

(e) No maximum pumping rate applied. Defined as the sum of seepage flow from the NEZ Dump (S9) and Long Ditch runoff (R13b) after August 2022.

(f) No flow applied in the SWWBM, as this line is considered as contingency (MPMC 2025a).

(g) No maximum pumping rate applied, as all overflows from NEZ Booster Sump are assumed to be pumped to Wight Pit.

Table A-4: Maximum Pumping Rates for Closure Flows

Flow ID	From	To	Flow Rate (m^3/day)	Reference
P6	South Seepage Pond	Main Embankment Seepage Pond	8,640	WSP 2025f
P8	Main Embankment Seepage Pond	PETBP	8,640	MPMC 2023b
P10	Mine Drainage Creek Sump	SERDS Ditch	8,640	WSP 2025f
P11	Bootjack Creek Sump	SERDS Ditch	8,640	WSP 2025f
P20	9KM Sump	NW Sump	8,640	WSP 2025f
P21	Wight Pit	Long Ditch	8,712	MPMC 2023b
P24	NW Sump	Mine Drainage Creek Sump	8,640	WSP 2025f
P30	CCS	Wight Pit	55,200 during freshet / 28,800 rest of the year	Confirmed in this SWWBM

A3.2 Consumption Flows

The flow parameters for the turbomisters are shown in Table A-5 and Table A-6.

Table A-5: Operational Hours per Day for Turbomisters

Flow ID	From	Hours per Day				
		May	June	July	August	September
C1	Main Embankment Seepage Collection Pond	10	10	10	10	10
C10	Wight Pit	10	10	10	10	10

Table A-6: Operational Flow Rates for Turbomisters

Flow ID	From	Evaporation Rates (m^3/hr)	
		May and June	July to September
C1	Main Embankment Seepage Collection Pond	5.5	12.7
C10	Wight Pit	5.5	12.7

The flow parameters for water trucks are shown in Table A-7 and Table A-8 below.

Table A-7: Operational Days per Month for Water Trucks

Flow ID	From	Days per Month					
		May	June	July	August	September	October
C4	Wight Pit	10	5	20	20	15	10
C8	CCS	4.5	19	12.6	21.5	10.6	0

Table A-8: Operational Flow Rates for Water Trucks

Flow ID	From	Flow Rates (m^3/day)
C4	Wight Pit	818
C8	CCS	818

A3.3 Transfer Flows

The flow rates for the transfer flows were defined in the model as described in Table A-9.

Table A-9: Transfer Flows

Flow ID	From	To	Flow Definition/Rates
T1	Long Ditch	Central Collection Sump	Flow rates determined by runoff and baseflow from the Long Ditch catchment.
T2	SERDS Ditch	Central Collection Sump	Flow rates determined by runoff and baseflow from the SERDS ditch catchment.
T3 (OF6)	Central Collection Sump	PETBP	Modelled as the overflow rate from the CCS.
T6[(a)]	PETBP	Water Treatment Plant	Maximum capacity 25,000 m^3/day during operations until post-closure.

(a) Provided by Maximum pumping rates provided by MPMC (MPMC 2023b).

A3.4 Groundwater inputs

Combined Springer- Cariboo Pit

Springer – Cariboo Pit is modelled as one single pit starting July 1, 2024. A model recalibration was conducted to refine predictions of long-term groundwater seepage from the combined Springer and Cariboo pits (WSP 2024a), applicable to closure and post-closure. As the pit lake level increases between 1,020 masl and 1,030 masl, seepage in the range of 20 to 90 m^3/d from the Springer Pit Lake into the subsurface was predicted to occur (Table A-10). Seepage was found to gradually increase to approximately 360 m^3/d when the pit lake reaches the spillway at 1,050 masl.

Table A-10: Springer-Cariboo Pit Predicted Groundwater Flows

Pit Lake Elevation (masl)	Groundwater Flow (m^3/d)	
	Into the Pit	Out of the Pit
760	640	0
800	640	0
850	640	0
900	630	0
940	620	0
960	610	0
980	580	0
1000	520	0
1020	430	20
1030	390	90
1040	360	200
1050	330	360

Wight Pit

Groundwater inflow to the Wight Pit is projected to gradually decrease from 2,600 m^3/d at of 804 masl, to 600 m^3/d at 935 masl (Golder 2015). Table A-11 shows the predicted groundwater flows for Wight Pit.

Table A-11: Wight Pit Predicted Groundwater Flows

Pit Lake Elevation (masl)	Groundwater Flow (m^3/d)	
	Into the Pit	Out of the Pit
804	2,600	0
880	2,600	0
900	2,500	0
910	2,100	0
920	800	0
926	600	500
930	600	500
935	600	500

Boundary Pit

MPMC reported that seepage was not observed along the pit walls during mining. However, seepage out of the pit could still occur due to water entering via surface water runoff and direct precipitation. Potential seepage rates out of the pit were estimated to incorporate them into the pit water balance and to characterize a possible seepage pathway originating from this pit (Golder 2016c).

Seepage rates out of the Boundary Pit were estimated from a Darcy's Law calculation that considers changes in the dimensions of the seepage area as the pit is being flooded. The estimated seepage rate from the Boundary Pit when the pit lake surface level is 5 m above its base (1,072 masl) is approximately 59 m^3/d, with a potential range between 35 m^3/d and 177 m^3/d due to uncertainty in bedrock permeability. Seepage outflow is estimated to decrease as the height of water column above the pit bottom decreases as shown in Table A-12.

Table A-12: Boundary Pit Predicted Groundwater Flows

Pit Lake Elevation (masl)	Groundwater Outflow (m^3/d)
1067	3
1068	10
1069	20
1070	26
1071	53
1072	59
1073	59

A4.0 STORAGE CHARACTERIZATION

Table A-13 to Table A-16 show the stage-storage curves for the following facilities:

- Combined Springer-Cariboo Pit
- Tailings Storage Facility
- Wight Pit

Table A-13: Combined Springer-Cariboo Pit Stage-storage Curve

Elevation (masl)	Storage (m^3)	
	Before PAG Rock Infilling (Operations)	After PAG Rock Infilling (Closure)
760	0	0
772	52,175	12,798
784	200,606	49,205
796	459,810	112,784
808	890,768	218,490
820	1,496,323	367,023
832	2,414,562	592,251
844	3,552,097	871,269
856	5,013,380	1,229,697
868	6,838,626	1,677,399
880	9,069,495	2,224,593
892	11,645,404	2,856,420
904	14,776,004	3,624,303

Table A-13: Combined Springer-Cariboo Pit Stage-storage Curve

Elevation (masl)	Storage (m^3)	
	Before PAG Rock Infilling (Operations)	After PAG Rock Infilling (Closure)
916	18,397,826	4,512,674
928	22,767,172	5,584,401
940	27,659,946	6,784,515
952	33,312,580	8,171,010
964	39,530,169	10,705,325
976	46,478,495	17,653,652
988	53,851,922	25,027,079
1000	62,021,604	33,196,761
1012	70,732,281	41,907,438
1024	80,272,136	51,447,293
1036	90,365,031	61,540,188
1048	101,243,121	72,418,278

Table A-14: TSF Stage-storage Curves

Elevation (masl)	Storage (m^3)		
	2023 Survey	Projected 974m TSF Crest	Projected 987m TSF Crest
960.5	0	-	0
961	19,673	-	0
962	186,690	-	0
963	502,565	-	0
964	1,021,319	-	0
965	2,482,105	-	0
966	4,478,653	-	0
967	6,567,990	-	0
968	8,688,744	178,487	0
969	10,835,147	478,694	0
970	11,706,012	907,496	0
971	11,706,012	1,476,285	0
972	11,706,012	2,430,441	0
973	11,706,012	4,196,111	0
974	11,706,012	6,428,105	0
975	11,706,012	6,428,105	0
976	11,706,012	6,428,105	0
977	11,706,012	6,428,105	0
978	11,706,012	6,428,105	0
979	11,706,012	6,428,105	0
980	11,706,012	6,428,105	0

Table A-14: TSF Stage-storage Curves

Elevation (masl)	Storage (m^3)		
	2023 Survey	Projected 974m TSF Crest	Projected 987m TSF Crest
981	11,706,012	6,428,105	273
982	11,706,012	6,428,105	67,347
983	11,706,012	6,428,105	323,880
984	11,706,012	6,428,105	890,494
985	11,706,012	6,428,105	1,912,234
986	11,706,012	6,428,105	3,505,768
987	11,706,012	6,428,105	5,467,962

Table A-15: Wight Pit Stage-storage Curve

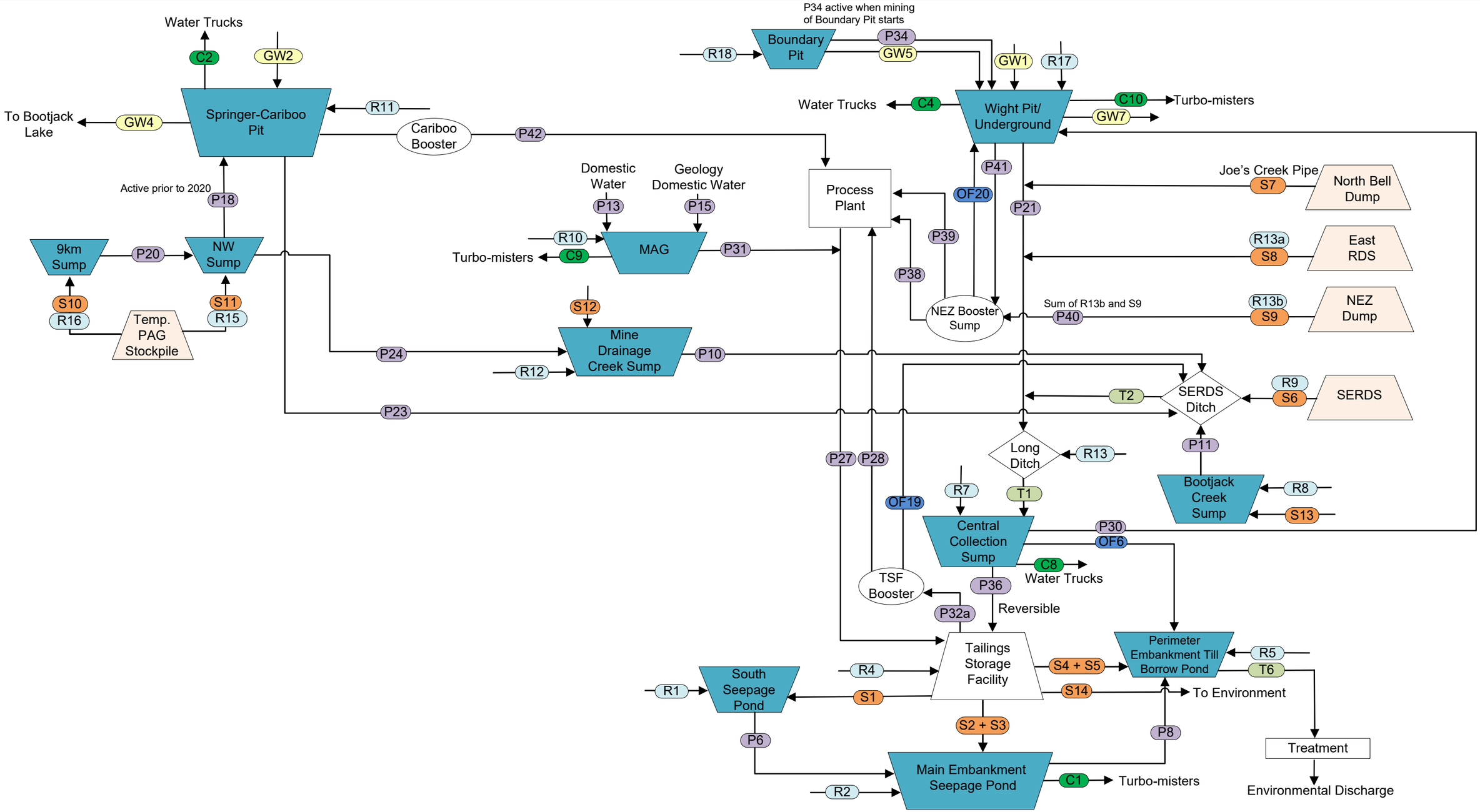
Elevation (masl)	Storage (m^3
804	5
805	52
810	3,298
815	8,214
820	14,432
825	22,943
830	34,877
835	57,119
840	84,200
845	122,450
850	167,739
855	223,463
860	289,415
865	363,840
870	449,748
875	545,566
880	697,138
885	884,221
890	1,100,515
895	1,349,194
900	1,630,730
905	1,966,867
910	2,336,384
915	2,854,018
920	3,499,065

Table A-16: Maximum Capacities for Storage Facilities

Storage Facility	Estimated Capacity (m^3)
South Embankment Seepage Pond	315
Main Embankment Seepage Pond	86,146
PETBP	Before 2027: 170,000 Starting 2027: 138,300
CCS	50,989
Bootjack Creek Sump	1,420
MAG Sump	2,106
Mine Drainage Creek Sump	1,420
NW Sump	200
9K Sump	330
Boundary Pit	14,468
NEZ Booster Sump	500
TSF Booster Sump	0

APPENDIX B

Flow Diagrams and 2025 Water Management Infrastructure

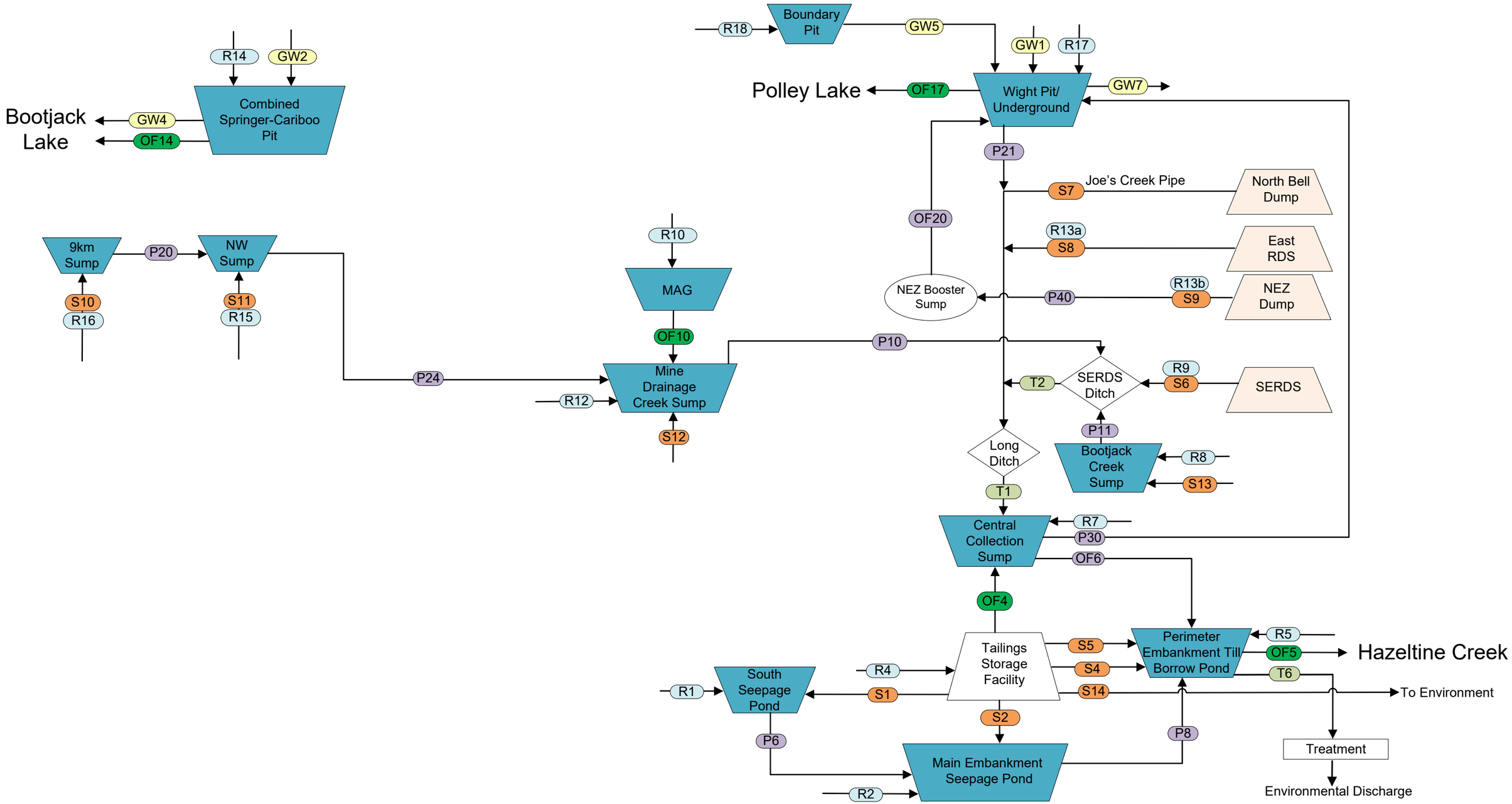


Runoff (R)
Seepage Flow (S)
Water consumption (C)
Pumped Flows (P)
Groundwater Flows (GW)
Overflow (OF)
Transfer Flows (T)

Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

CLIENT	Mount Polley Mining Corporation	TITLE	**Site Wide Water Balance Operational Phase Flow Diagram**
DRAWN SC	DATE 28 Aug 2025		
CHECKED TS	DATE 28 Aug 2025		
SCALE Not to Scale	PROJECT No CA0047730.8440/31191	FIGURE No B-1	REV No 1



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

wsp

CLIENT: Mount Polley Mining Corporation

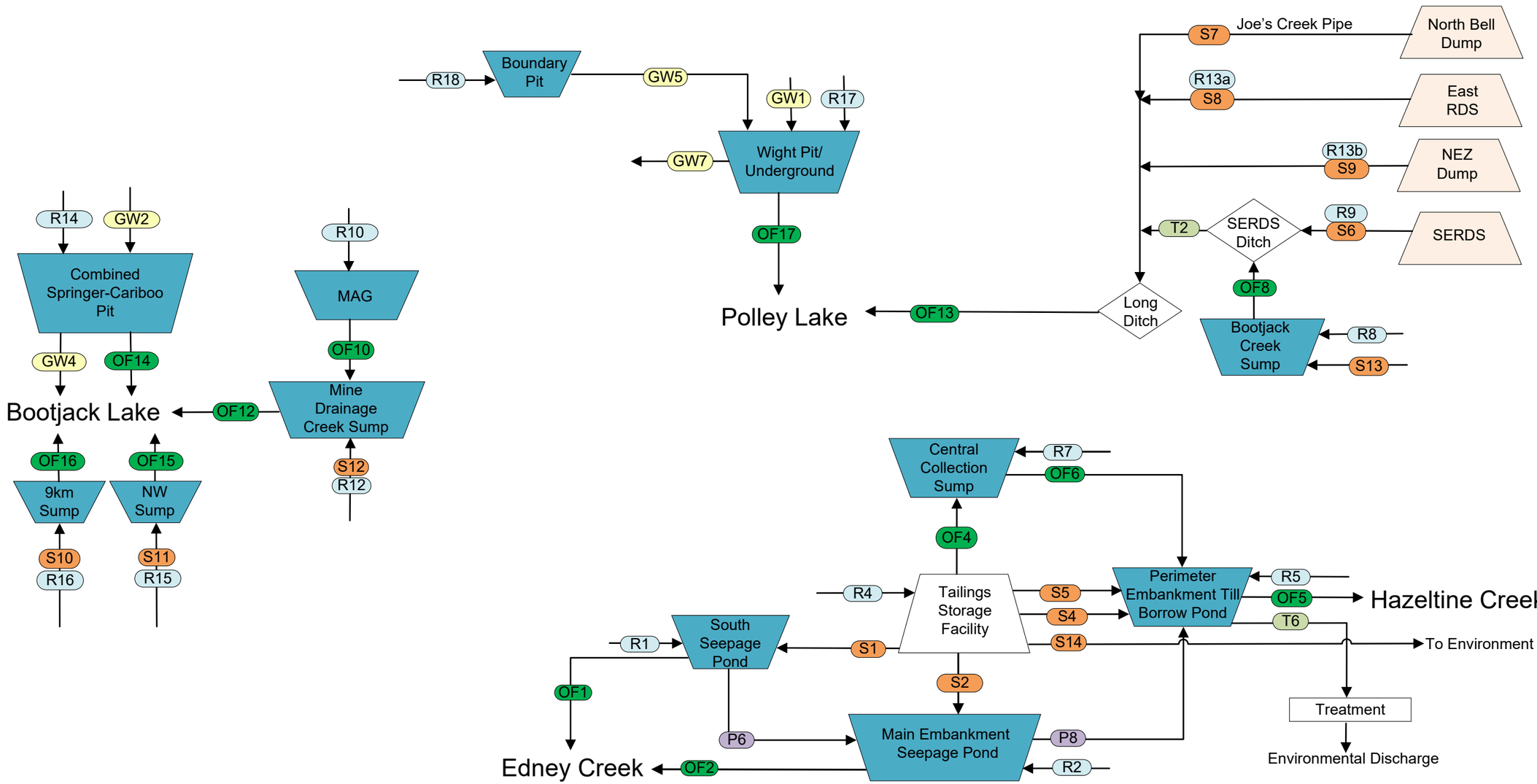
DRAWN: SC
DATE: 28 AUG 2025

CHECKED: TS
DATE: 28 AUG 2025

SCALE: Not to Scale
PROJECT No: CA0047730.8440/31191
FIGURE No: B-2
REV No: 1

TITLE

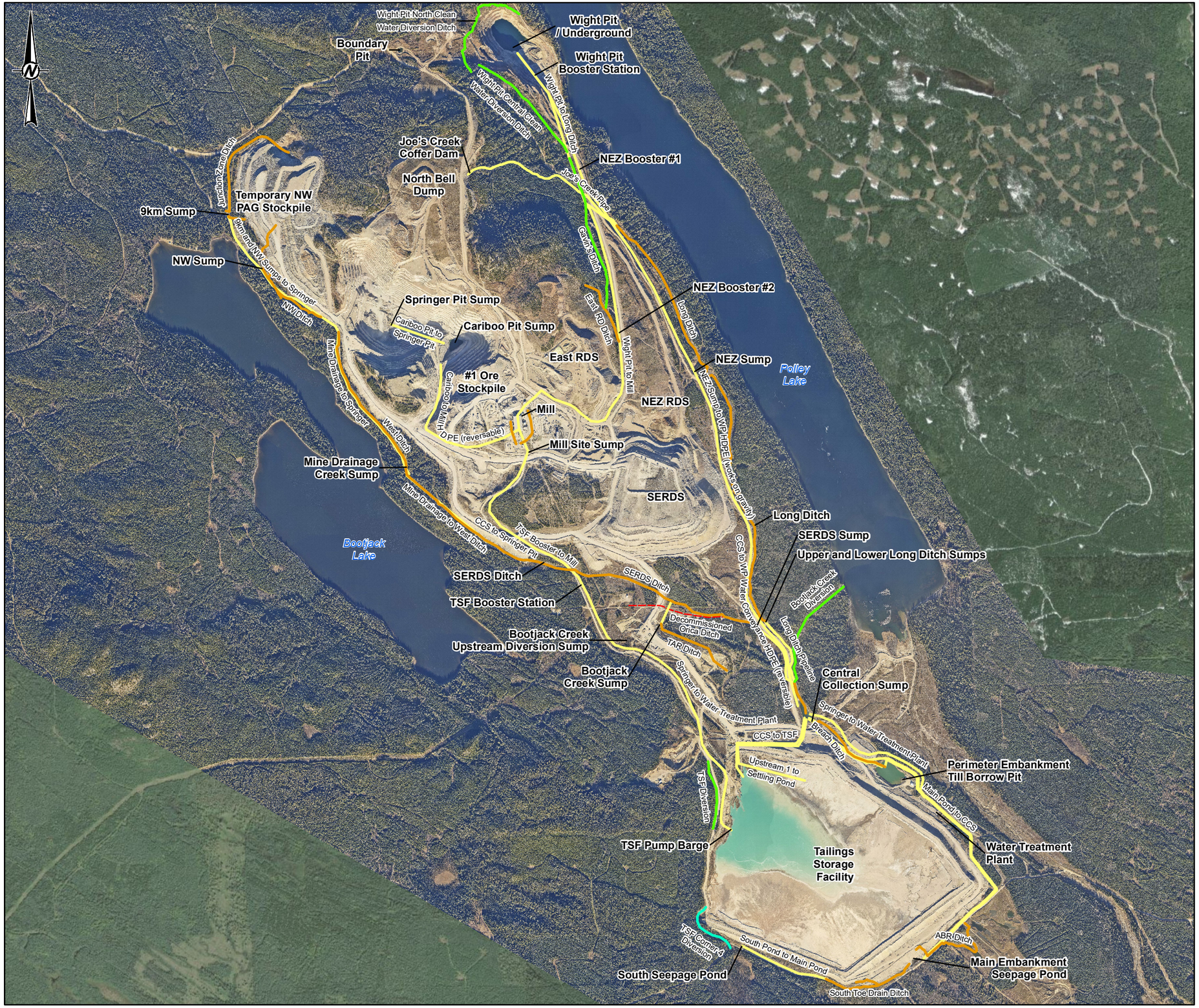
Site Wide Water Balance
Closure Phase Flow Diagram



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

CLIENT	Mount Polley Mining Corporation	TITLE	**Site Wide Water Balance Post-Closure Phase Flow Diagram**
DRAWN SC	DATE 28 AUG 2025		
CHECKED TS	DATE 28 AUG 2025		
SCALE Not to Scale	PROJECT No CA0047730.8440/31191	FIGURE No B-3	REV No 1



LEGEND

WATER COLLECTION SYTEMS

- CLEAN WATER DITCH
- CLEAN WATER PIPELINE
- CONTACT WATER DITCH
- DECOMMISSIONED CONTACT WATER DITCH
- CONTACT WATER PIPELINE

0 600 1,200

1:30,000 METRES

REFERENCES

1. WATER MANAGEMENT INFRASTRUCTURE INFORMATION PROVIDED BY MOUNT POLLEY MINING CORPORATION (2025).
2. PROJECT IMAGERY OBTAINED FROM MOUNT POLLEY MINING CORPORATION (2023).
3. BASE IMAGERY SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.
4. DATUM: NAD 1983 UTM ZONE 10N

CLIENT
MOUNT POLLEY MINING CORPORATION

PROJECT
WATER MANAGEMENT PLAN

TITLE
MINE SITE LAYOUT

CONSULTANT
wsp

YYYY-MM-DD	2025-08-28
DESIGNED	SC
PREPARED	CDB
REVIEWED	JDM
APPROVED	JDM

PROJECT NO.	PHASE	REV.	FIGURE
CA0047730.8440	31100A/31191	1	**B-4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 1in

PATH: W:\Client\Imperial_Metals_Corp\Mount_Polley_Mine\99_PROJECTS\CA0047730_8440\31100A\31191\02_PRODUCTION\MXD\Report\CA0047730_8440_31100A_31191_05_MINE_SITE_LAYOUT.mxd

APPENDIX C

SWWBM TSF Raise to 987m Permit Amendment Application Results

C1.0 SWWBM RESULTS FOR THE ENTIRE MODELLED DURATION

Figure C-1 illustrates daily WTP discharge rates from operations to 10 years after post-closure.

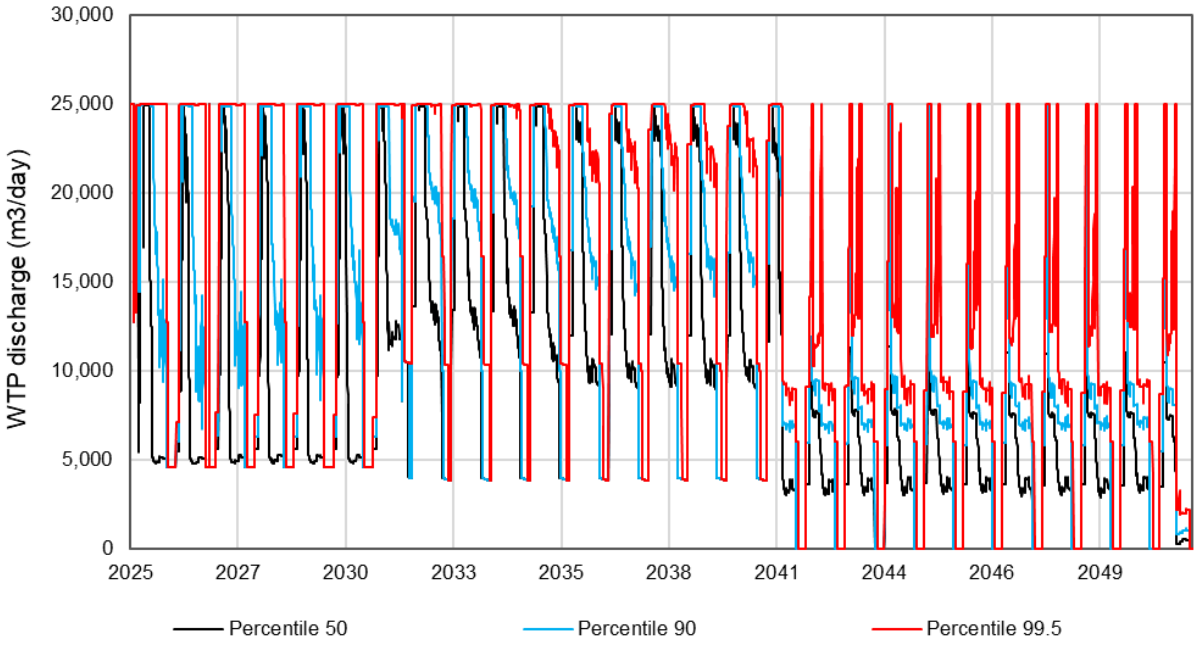


Figure C-1: WTP Discharge Rate

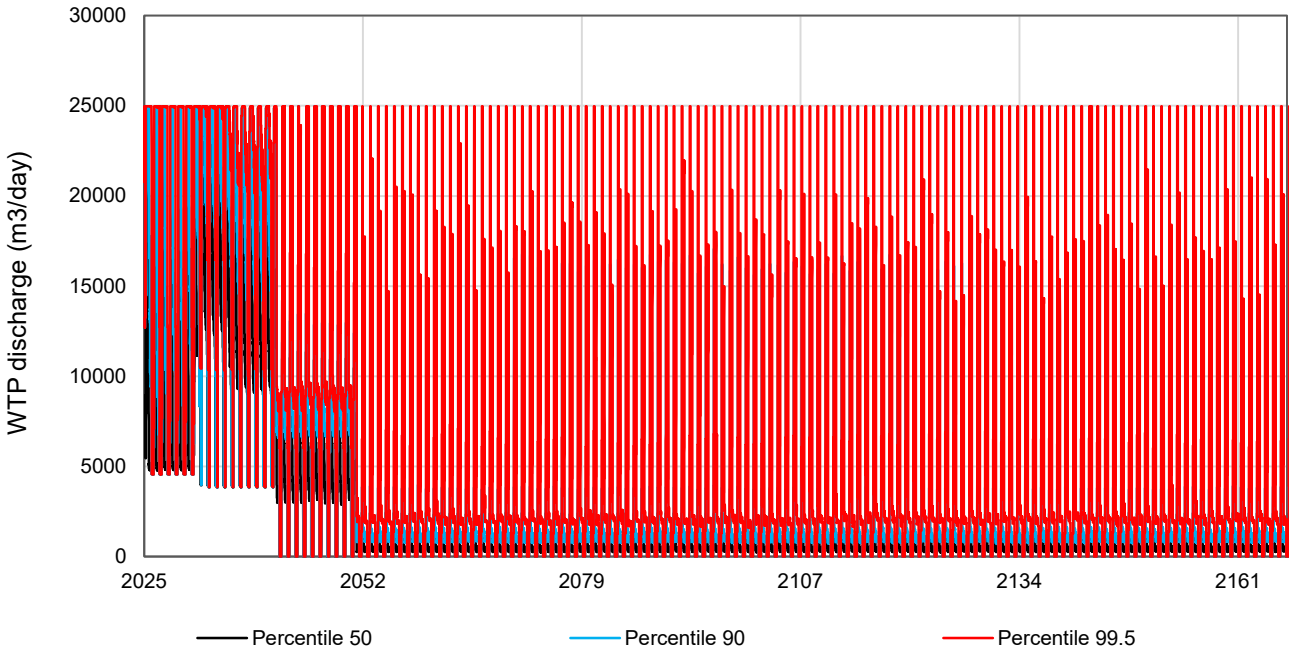


Figure C-2: WTP Discharge Rate

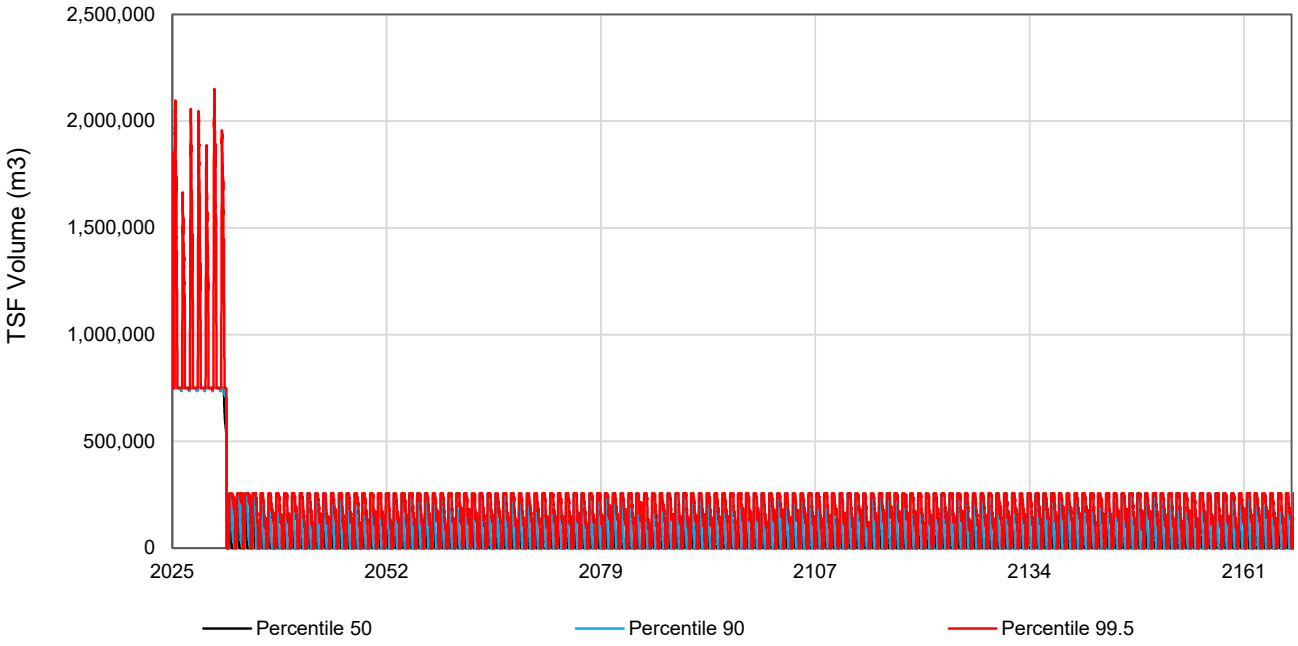


Figure C-3: TSF Water Volume

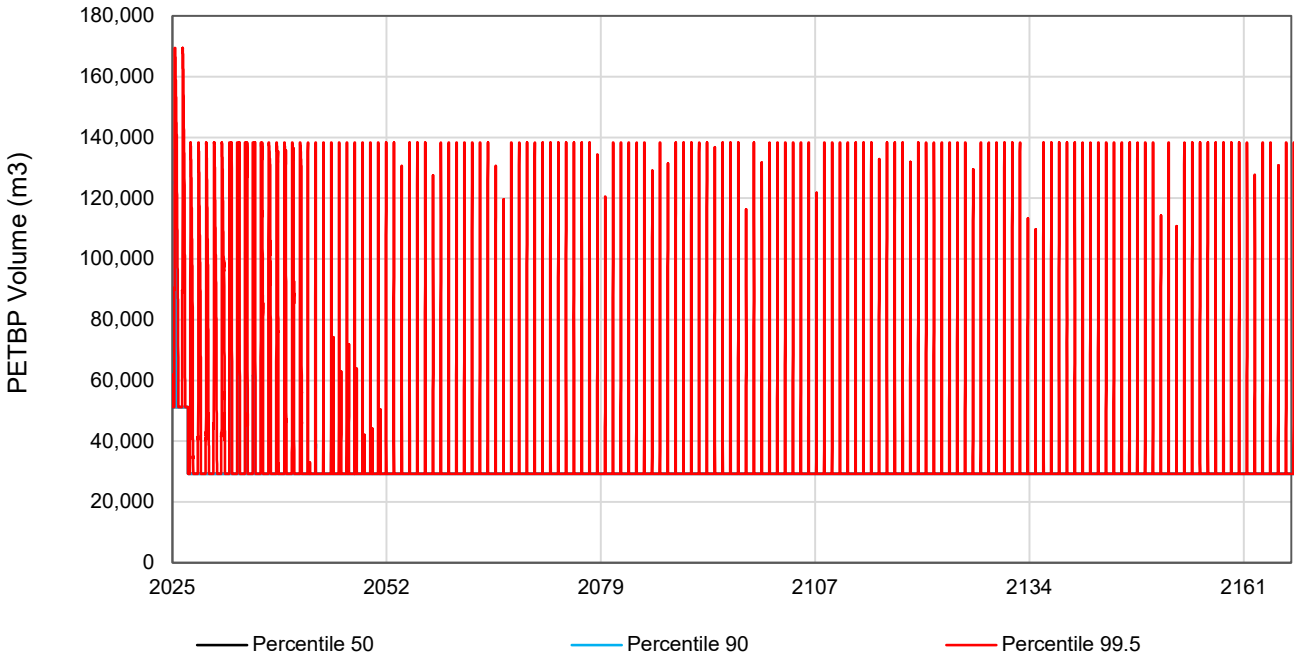


Figure C-4: PETBP Volume

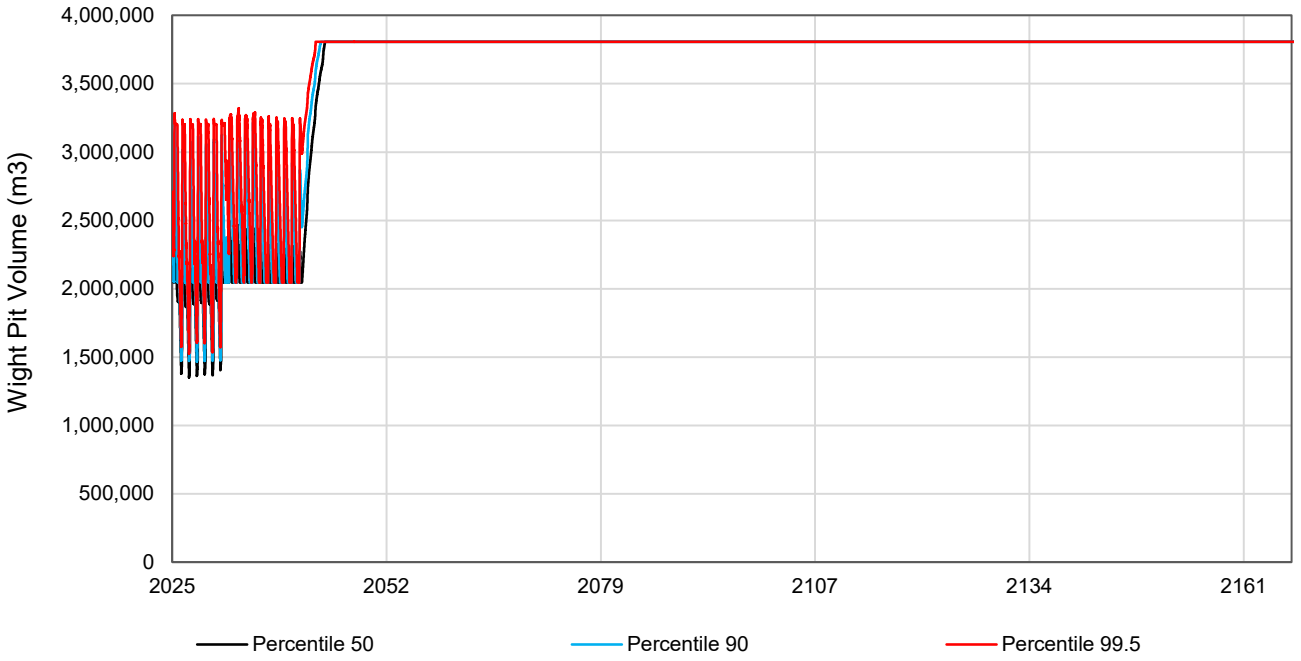


Figure C-5: Wight Pit Volume

C2.0 WTP MONTHLY VOLUME REQUIRING TREATMENT

This section is the monthly WTP volume requiring treatment corresponding to Table 14 in the main report. Results for the 50th, 90th, and 99.5th percentiles are shown in Table C-1,Table C-2, and Table C-3, respectively.

Table C-1: Monthly WTP Volume Requiring Treatment for the 50th Percentile (m^3)

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2025	734,376	370,793	461,865	724,180	742,983	692,826	420,842	181,842	171,875	189,772	205,093	145,279	5,041,726
2026	137,158	127,672	168,198	401,923	703,458	497,697	277,588	184,577	159,518	205,060	182,419	146,000	3,191,268
2027	159,035	127,594	172,806	418,096	722,433	530,789	271,949	189,030	171,903	199,153	194,702	146,432	3,303,922
2028	137,158	127,594	177,981	422,679	718,780	533,585	311,265	193,957	169,886	193,991	190,963	142,197	3,320,036
2029	137,158	127,594	173,232	428,174	714,206	526,223	293,711	191,495	175,622	202,548	191,090	146,292	3,307,345
2030	137,158	127,594	172,791	429,258	714,770	546,009	294,984	218,258	186,677	208,411	211,592	144,547	3,392,049
2031	137,158	127,594	173,106	441,072	728,661	552,222	377,871	366,948	373,958	404,300	374,551	529,191	4,586,632
2032	259,682	111,053	421,750	708,451	744,454	713,731	579,959	470,063	403,738	398,524	328,282	135,709	5,275,396
2033	117,241	107,689	403,653	707,904	737,702	718,245	578,340	448,516	378,904	404,863	339,635	137,666	5,080,358
2034	117,245	107,694	404,009	711,715	736,189	717,062	567,008	461,916	388,676	383,859	335,853	141,492	5,072,718
2035	117,256	107,710	399,861	708,524	735,751	715,735	566,438	422,384	344,357	335,878	290,363	131,743	4,876,000
2036	117,246	107,697	365,050	717,904	708,471	676,054	449,323	321,559	286,345	326,766	283,053	133,786	4,493,254
2041	117,242	107,690	351,113	715,113	691,970	650,017	422,945	109,985	113,287	125,007	117,065	6,310	3,527,744
2046	0	0	105,591	322,725	237,375	239,072	173,033	120,181	115,795	122,198	113,248	9,523	1,558,741
2051	0	0	101,504	310,953	230,557	229,968	173,961	15,448	14,671	17,632	16,351	712	1,111,757
2071	0	0	13,750	71,776	23,991	27,246	16,296	11,693	15,166	19,906	17,487	579	217,890
2091	0	0	14,096	70,915	24,030	25,814	17,345	13,661	14,593	17,736	17,828	563	216,581
2111	0	0	14,076	71,033	24,047	27,037	16,833	12,269	13,930	20,550	17,209	543	217,527
2131	0	0	14,154	71,074	23,329	27,091	16,819	12,000	14,623	18,834	18,140	613	216,676
2165	0	0	14,004	71,323	22,434	27,008	17,909	12,186	15,860	18,785	16,546	617	216,672

Note: “N/A” – Not applicable when the dates are out of the range of modelling dates.

Table C-2: Monthly WTP Volume Requiring Treatment for the 90th Percentile (m^3)

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2025	734,376	370,793	659,192	731,507	738,949	719,938	640,318	510,871	334,672	229,732	235,760	158,148	6,064,256
2026	137,158	127,672	186,027	579,921	747,171	733,266	599,759	346,284	216,136	221,890	269,970	150,881	4,316,135
2027	159,035	127,594	194,459	607,228	762,066	726,308	611,964	361,673	249,208	248,991	235,981	151,996	4,436,503
2028	137,158	127,594	198,218	613,487	756,734	728,646	636,247	411,275	256,592	248,223	242,175	158,508	4,514,857
2029	137,158	127,594	193,924	592,762	756,757	728,120	643,131	384,865	278,744	219,681	220,993	146,306	4,430,035
2030	137,158	127,594	193,087	610,741	760,276	734,315	645,987	438,946	268,049	283,216	254,698	142,817	4,596,884
2031	137,158	127,594	192,880	612,240	763,865	725,406	706,636	543,301	485,115	462,493	396,711	542,954	5,696,353
2032	314,304	173,000	514,116	719,924	750,356	717,941	642,329	577,929	509,799	525,896	449,152	178,204	6,072,950
2033	117,470	107,951	562,199	715,218	742,804	723,848	637,459	582,619	531,224	532,766	467,808	211,373	5,932,739
2034	117,475	107,972	580,855	714,466	747,154	717,716	629,255	569,981	522,925	536,042	449,692	198,756	5,892,289
2035	117,473	107,962	585,762	712,264	743,070	719,743	631,311	540,982	485,169	471,524	413,015	168,822	5,697,097
2036	117,473	107,964	514,522	725,812	720,865	695,681	575,403	487,323	432,589	415,996	332,644	150,990	5,277,262
2041	117,469	107,950	482,757	720,074	717,330	687,940	560,137	183,023	130,469	140,738	127,146	11,090	3,986,123
2046	0	0	169,929	420,394	296,867	236,574	218,892	170,564	133,006	150,772	126,325	11,512	1,934,835
2051	0	0	159,677	410,335	279,277	246,740	217,336	21,828	17,903	20,811	14,719	281	1,388,907
2071	0	0	23,168	206,739	57,177	30,666	30,225	16,213	15,849	18,993	23,024	512	422,566
2091	0	0	23,973	198,676	57,081	31,028	27,864	12,085	21,215	18,478	21,489	1,332	413,221
2111	0	0	23,215	182,730	54,353	37,145	29,719	18,849	16,368	17,362	16,436	740	396,917
2131	0	0	24,097	199,624	56,612	35,941	33,212	14,937	12,336	18,650	21,071	521	417,000
2165	0	0	23,672	197,590	51,059	35,365	30,659	14,520	13,259	19,648	16,476	481	402,729

Table C-3: Monthly WTP Volume Requiring Treatment for the 99.5th Percentile (m^3)

Year	Month												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2025	734,376	370,793	761,694	748,241	774,057	749,019	757,283	659,047	606,627	648,120	543,113	174,554	7,526,924
2026	137,158	127,672	219,240	670,982	774,057	746,921	761,308	733,707	564,231	515,180	323,549	152,797	5,726,802
2027	159,035	127,594	234,717	678,835	772,150	745,598	757,659	746,897	651,387	559,387	390,600	144,387	5,968,246
2028	137,158	127,594	236,964	680,478	770,022	749,088	769,488	739,681	630,794	618,816	423,407	146,353	6,029,843
2029	137,158	127,594	242,986	693,899	755,182	749,088	746,037	752,795	628,974	578,590	383,690	176,525	5,972,518
2030	137,158	127,594	234,666	683,791	770,499	745,586	763,577	759,370	663,404	674,637	442,621	150,209	6,153,112
2031	137,158	127,594	232,274	668,191	774,057	749,088	768,997	762,678	661,617	567,484	517,525	607,547	6,574,210
2032	314,304	292,223	714,303	694,009	762,027	735,842	680,032	606,269	542,077	601,311	605,526	288,965	6,836,888
2033	310,531	126,828	545,872	740,659	766,994	739,527	640,352	592,632	569,734	597,519	589,586	329,420	6,549,654
2034	310,531	216,611	449,462	744,960	770,903	744,842	643,320	637,172	583,256	610,027	519,741	331,457	6,562,282
2035	310,531	138,510	526,566	743,611	760,727	731,826	669,106	578,838	528,392	557,900	487,296	268,120	6,301,423
2036	310,531	117,483	547,675	726,562	731,212	696,930	622,515	558,125	497,027	505,535	485,454	191,715	5,990,764
2041	145,307	108,074	657,837	731,752	711,976	694,920	605,906	223,879	199,543	174,795	128,958	50,237	4,433,184
2046	0	0	258,819	530,359	430,429	289,729	233,463	224,297	176,499	182,538	143,711	30,956	2,500,800
2051	0	0	255,349	519,425	432,531	247,032	236,322	31,822	30,561	35,829	13,541	432	1,802,844
2071	0	0	38,774	505,759	179,810	31,418	47,521	17,375	18,048	17,080	18,062	574	874,421
2091	0	0	39,349	498,071	189,663	26,921	124,272	20,524	11,070	30,717	28,288	941	969,816
2111	0	0	40,854	516,076	173,979	19,499	72,322	27,847	28,631	22,942	13,749	460	916,358
2131	0	0	42,177	501,450	185,272	33,329	45,627	42,292	27,990	18,094	14,524	480	911,235
2165	0	0	42,389	495,412	180,943	43,166	19,649	67,766	10,074	20,895	13,636	371	894,301

C3.0 TOTAL ANNUAL RUNOFF VOLUME FROM STOCKPILES/DUMPS

C3.2 SERDS

The total annual runoff volume during operations for SERDS is shown in Table C-5. The runoff was generated over the catchment area, which was broken down by different land types (i.e., waste rock, disturbed, undisturbed, haul road, and mill site). This catchment area breakdown was inserted as input into SWWBM. Table C-4 presents the distribution of these land types.

Table C-4: SERDS Catchment Area Breakdown by Land Type

Land Type	Catchment Area (m^2)
Waste Rock Area	401,235
Disturbed Area	313,879
Undisturbed Area	383,918
Mill Site Area	273,919
Haul Road Area	165,456

Table C-5: SERDS Annual Runoff Volume during Operations (m^3)

Year	50th Percentile	90th percentile	99.5th percentile
2025	396,522	501,268	677,522
2026	385,476	493,442	641,305
2027	388,746	493,954	657,697
2028	391,746	503,150	663,645
2029	389,842	495,048	642,071
2030	390,449	500,837	679,524
2031	387,450	493,740	639,112

C3.3 NEZ Dump

The total annual runoff volume during operations for NEZ Dump is shown in Table C-7. The runoff was generated over the catchment area, which was broken down by different land types (i.e., waste rock, disturbed, undisturbed, and haul road). This catchment area breakdown was inserted as input into SWWBM. Table C-6 presents the distribution of these land types.

Table C-6: NEZ Dump Catchment Area Breakdown by Land Type

Land Type	Catchment Area (m^2)
Waste Rock Area	199,116
Disturbed Area	238,416
Undisturbed Area	202,646
Haul Road Area	261,421

Table C-7: NEZ Dump Annual Runoff Volume during Operations (m^3)

Year	50th Percentile	90th percentile	99.5th percentile
2025	286,558	361,338	491,333
2026	277,939	355,683	472,738
2027	281,318	359,331	481,196
2028	282,825	364,145	486,629
2029	281,594	359,466	462,812
2030	282,597	361,493	499,351
2031	279,321	356,686	467,460

C3.4 East RDS

The total annual runoff volume during operations for East RDS is shown in

Table C-9. The runoff was generated over the catchment area, which was broken down by different land types (i.e., waste rock and disturbed). This catchment area breakdown was inserted as input into SWWBM. Table C-8 presents the distribution of these land types.

Table C-8: East RDS Catchment Area Breakdown by Land Type

Land Type	Catchment Area (m^2)
Waste Rock Area	693,392
Disturbed Area	900,474

Table C-9: East RDS Annual Runoff Volume during Operations (m^3)

Year	50th Percentile	90th percentile	99.5th percentile
2025	518,735	653,007	893,209
2026	501,688	648,110	867,808
2027	507,994	652,449	873,471
2028	511,324	660,988	889,147
2029	508,664	651,778	849,738
2030	510,832	653,659	901,889
2031	508,769	651,026	862,376



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APPENDIX B

Site-wide Water Quality Model (SWWQM)

REPORT

Mount Polley Mine Water Quality Model

TSF Raise to 987m Permit Amendment Application

Submitted

Mount Polley Mining Corporation

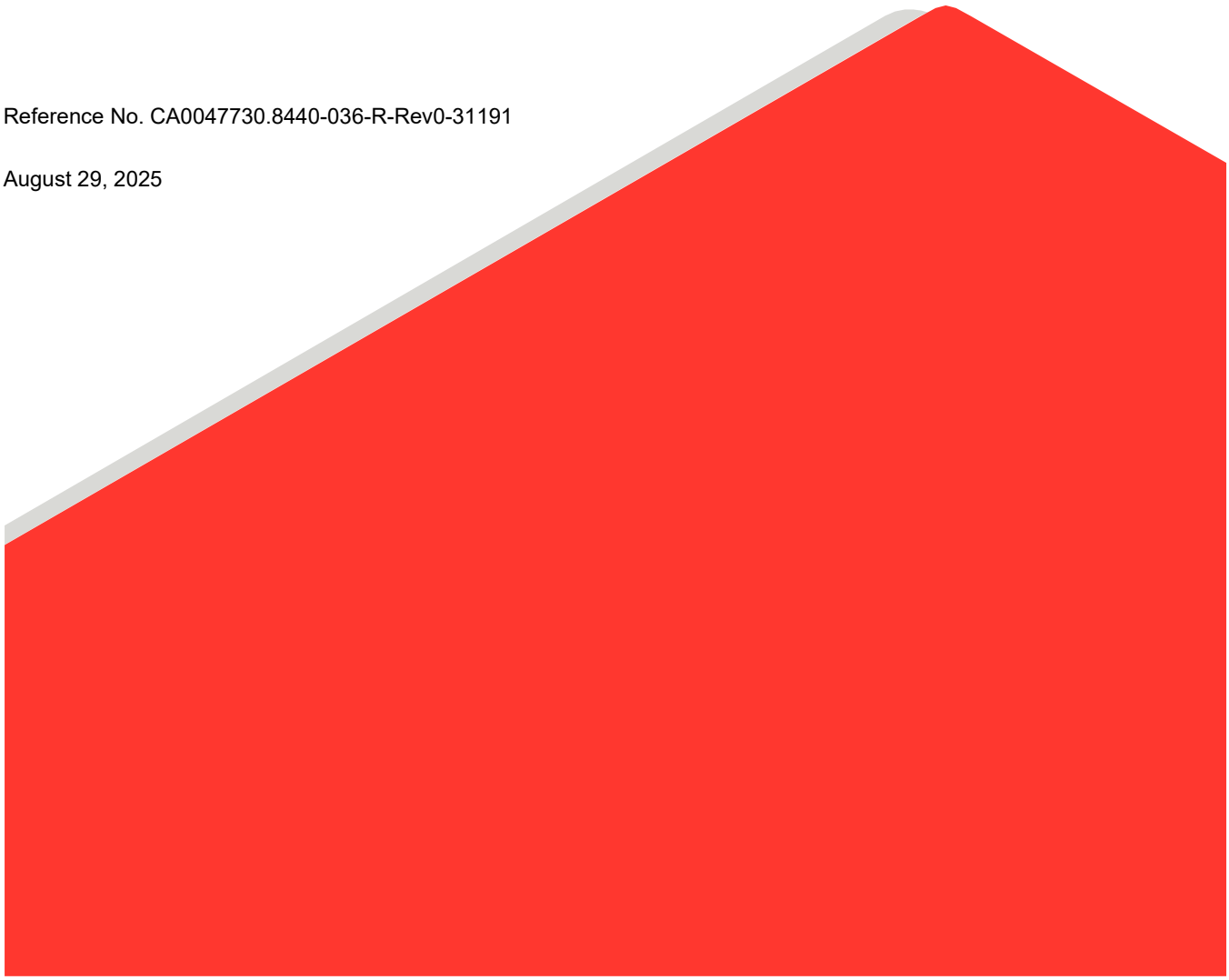
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Reference No. CA0047730.8440-036-R-Rev0-31191

August 29, 2025



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EXECUTIVE SUMMARY

Background

The Mount Polley Mine (The Mine, or Site) is a copper-gold mine owned and operated by Mount Polley Mining Corporation (MPMC), a subsidiary of Imperial Metals Corporation. The Mine is located 56 km northeast of Williams Lake, British Columbia. MPMC began production at the mine in 1997 and operated until October 2001 when operations were suspended temporarily for economic reasons. In March 2005, the Mine restarted production and it was in continuous operation until August 4, 2014. As a result of a foundation failure of the Tailings Storage Facility (TSF) in 2014, mining and milling operations were suspended and MPMC did not have a permitted water discharge. An interim restricted operations M-200 permit application was submitted to regulators on March 20, 2015, and approval to resume operations was received on July 9, 2015. Milling operations resumed on August 4, 2015. Tailings and mine contact water were conveyed to and temporarily stored in the Springer Pit until 2016 when the Tailings Storage Facility was repaired and authorized for use under Mines Act Permit M-200 and *Environmental Management Act* (EMA) Permit 11678.

Also in 2016, MPMC submitted a Technical Assessment Report (TAR) to the British Columbia Ministry of Environment and Climate Change Strategy. The TAR provided details of the proposed Long-term Water Management Plan for the Mine, including the discharge quantity and quality for the operations, closure, and post-closure phases of mine life. It included a technical assessment of the effluent discharge during operations to identify whether or not receiving water uses would be impaired and recommended a preferred discharge approach using an active treatment system and a pipeline discharging treated mine water at depth in Quesnel Lake.

Under Section 1.2.3 of Permit 11678, the “authorized discharge period” for discharge of effluent to Quesnel Lake expires on August 28, 2025. This discharge period is anticipated to support the permitted Phase 4 Cariboo-Springer Pit. However, MPMC is pursuing an extension to the life of the Mount Polley Mine with the development of the Springer Expansion Project, which will add approximately 8 years of operational mining life. If market conditions remain favourable and operations occur continuously, the mine would operate beyond August 28, 2025. Approval of this project is being sought through a Joint Application through the Ministry of Mining and Critical Minerals (BC MCM) and the Ministry of Environment and Parks (BC ENV), with the request to BC ENV being an extension of the discharge period beyond 2025. Springer Expansion Application approval is expected summer 2025.

For the purposes of this report, WSP Canada Inc. (WSP) has assumed that the mine will be in operation until July 31, 2031, followed by a closure phase from August 1, 2031, to July 31, 2041, and a post-closure phase from August 1, 2041, to July 31, 2131. It should be recognized that this mine life may change as a result of metal prices, new exploration, care and maintenance periods, revisions to the mine plan, and other factors that are common to mining operations. These are only assumed mine phase dates to allow completion of modelling and should not be considered by regulators as static dates.

In support of the Water Management Plan (WMP), the site wide water quality model was updated to reflect predicted mine site conditions during operations, closure, and post-closure (this report). This included updates to the water balance inputs based on the TSF raise to 987 m.

The updated predicted concentrations during operations, closure and post-closure in the mine site are similar to those presented in previous iterations of the water quality model including the 2020 Water Management Plan (Golder 2020), the 2023 Water Management Plan (WSP 2024), and the March 2025 Water Management Plan (WSP 2025a). Changes in concentrations from operations to closure and post-closure are caused by progressive reclamation of mine site areas that are mostly assumed remediated by the start of post-closure. Predicted concentrations reach a steady state during post-closure after reclamation of the mine site areas is complete and the Springer Expansion pit is filled. Treatment and mitigation strategies during operations, closure and post-closure are addressed in the treatment section of the WMP (WSP 2025b).

STUDY LIMITATIONS

WSP Canada Inc. (WSP) has prepared this document in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this document. No warranty, express or implied, is made.

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APPENDICES

APPENDIX A
Water Quality Model Calibration Results

APPENDIX B
Water Quality Model Results – Operations, Closure and Post-closure

1.0 INTRODUCTION

Mount Polley Mining Corporation (MPMC) is submitting a Permit Amendment Application for the Tailings Storage Facility Raise to 987 m. The Site Wide Water Quality Model (SWWQM) presented in this report is essential to support the Water Management Plan required to support this Application and for compliance with MPMC's M-200 *Mines Act* permit. It should be noted that the specific operation, closure, and post-closure dates in this report have been assumed for the purpose of modelling. There are many factors that exist that can alter these dates, such as changes to the mine production schedule and mine plan, new exploration, and care and maintenance periods. Thus, these time frames should not be considered static.

The SWWQM was developed as part of the Mount Polley Mine (Mine) Resumed Operations and Closure Water Management Plan Permit Amendment Application and Technical Assessment Report (Golder 2016) to model water quality across the site. The SWWQM was updated in 2020 (Golder 2020), 2023 (WSP 2024) and March 2025 (WSP 2025a) as part of the Water Management Plan that addressed water management through future operations, closure and post-closure.

This report presents the SWWQM based on the Springer Expansion Life-of-Mine (LOM) Plan informed by MPMC (MPMC 2022) during operations, with a TSF crest elevation of 987 m. Water management strategies during closure are aligned with the 2022 Reclamation and Closure Plan. The next update to the Reclamation and Closure Plan will occur in 2027 as per requirements in the BC HSRC. Included here is a summary of the model, assumptions, model inputs and results.

2.0 MODEL APPROACH

A site wide surface water balance model (SWWBM; WSP 2025c) was developed to predict flow at the Mine and potential discharges to the receiving environment during operations, closure and post-closure, and comprises the underlying framework for evaluating mass transfers in the SWWQM. The SWWQM is directly linked to the SWWBM and includes mass transfers for each flow.

The SWWQM model does not include water treatment or mixing in the receiving environment. Rather, monitoring programs characterize the water treatment performance and receiving environment water quality for the operating mine. Water quality was simulated in Mine facilities within the Mine's contact water system so that water quality mitigations during operations and closure can be assessed, as described in the Water Management Plan that was prepared along with this report (WSP 2025b).

2.1 Model Platform

The model was developed using GoldSim Version 14.0 (GoldSim 2021). GoldSim is a graphical, object-oriented mathematical modelling program where all input parameters and functions are defined by the user and are built as individual objects or elements linked together by mathematical expressions. The object-based nature of the program is designed to facilitate an understanding of the various factors that control an engineered or natural system and to predict potential changes in the system.

GoldSim was selected for the current assessment for the following reasons:

- It facilitates probabilistic simulations, allowing descriptive statistics and probabilities to be assigned to the model outputs.
- The model framework can be easily adjusted to account for changing/future conditions on a mine site, allowing the model to be used as a planning tool.
- Water quantity and water quality models can be directly linked, allowing both models to be updated simultaneously when conducting sensitivity scenarios for alternate water management strategies.

2.2 Model Simulation Period

The model simulations included four time periods:

- **Calibration** (January 1, 2017, to December 31, 2024) – the calibration period includes operations (January 1, 2017, to 1 May 2019), care and maintenance of the Mine site (2 May 2019 to 31 October 2021) and the beginning of resumed operations (1 November 2021). During the calibration period, water in the Perimeter Embankment Till Borrow Pond (PETBP) is treated at the water treatment plant (WTP) and discharged to Quesnel Lake.
- **Future Operations** (January 1, 2025, to July 31, 2031) – the resumed operations period when, similar to the calibration period, water in the PETBP is treated at the WTP and discharged to Quesnel Lake.
- **Closure** (August 1, 2031, to July 31, 2041) – a ten-year active closure period is assumed, during which potentially acid generating (PAG) stockpile material from the Temporary Northwest (NW) PAG stockpile is deposited into the Springer-Cariboo Pit and other facilities are reclaimed. The closure phase will include reclamation activities as identified in the WMP. The WTP is assumed to be in operation through all of the closure period. Details on the closure and post-closure management of mine facilities are provided in the SWWBM Report (WSP 2025c).

- **Post-closure** (August 1, 2041, to July 1, 2131) – this period includes filling of pits, discharge, and establishment of steady-state conditions for the drainage from mine facilities. Results are presented for two periods within post-closure:
  - Early post-closure (August 1, 2041, to July 31, 2051) – Represents the first ten years of post-closure during which drainage from Mine facilities is assumed to progressively return to undisturbed water quality. The WTP is assumed to be in operation during this period.
  - Long-term post-closure (August 1, 2051, to July 1, 2131) – this time period has been selected to represent steady-state conditions after all closure and post-closure changes have taken place. The need for treatment during long-term post-closure will be confirmed as MPMC approaches this phase and may be achieved through centralized or distributed treatment, using passive or semi-passive treatment systems if feasible.

Uncertainty exists regarding the exact timing of these transitions. The time periods are intended to show, at a conceptual level, the difference in site drainage quality as the site progresses through the post-closure period; it is not intended to imply that the transitions will occur on precisely those dates.

2.3 Facilities

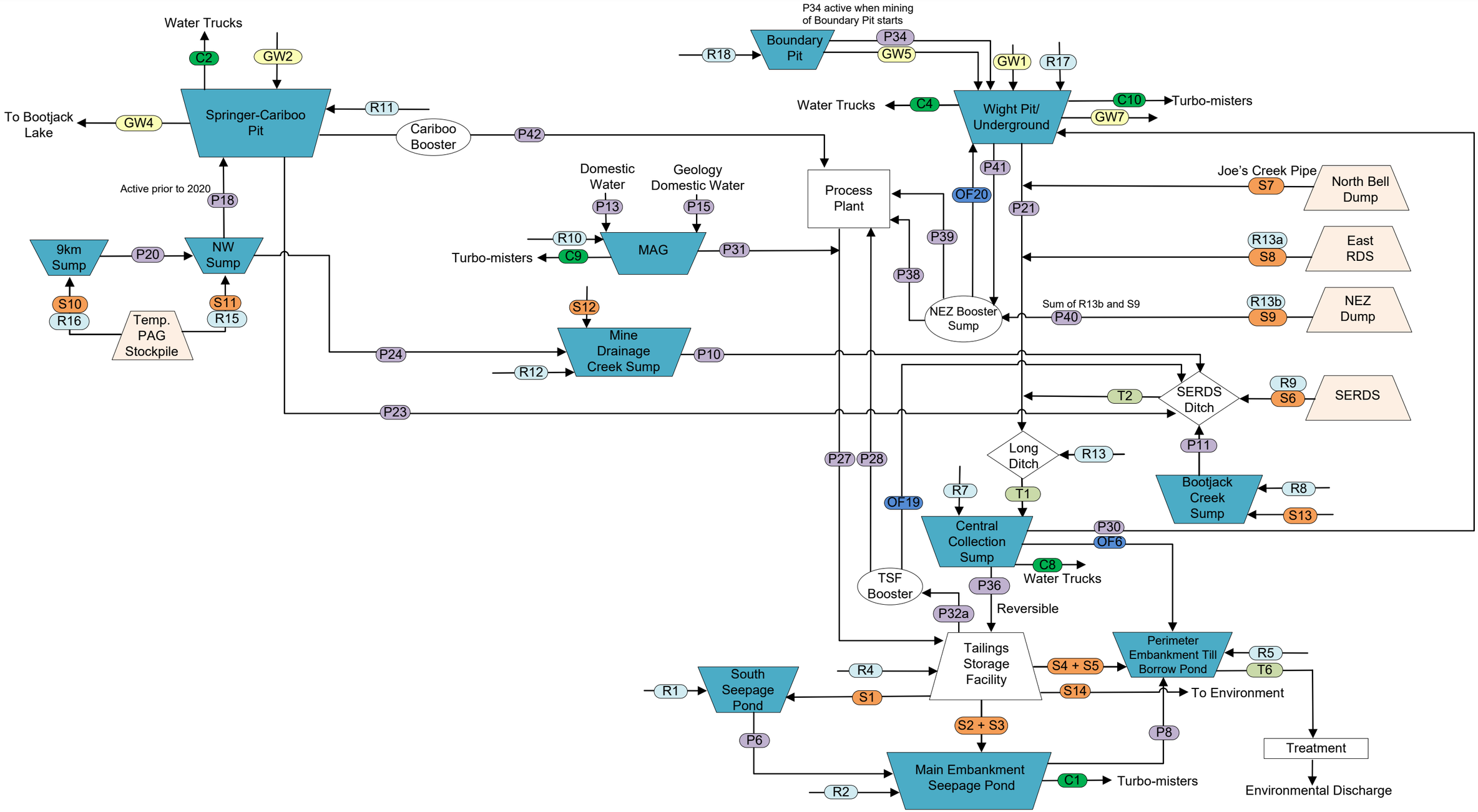
The SWWQM includes the following facilities (grouped into five categories):

- **Open Pits**: Springer-Cariboo Pit, Wight Pit, and Boundary Pit.
- **Sumps**: NW Sump, 9K Sump, Mine Drainage Creek Sump (MDCS), Bootjack Creek Sump (BCS), Central Collection Sump (CCS), Perimeter Embankment Till Borrow Pond (PETBP), South Embankment Seepage Collection Pond (SESCP), and Main Embankment Seepage Collection Pond (MESCP), TSF Booster Sump, MAG Sump and Northeast Zone (NEZ) Booster Sump.
- **Ditches/Drains**: Long Ditch and Southeast Rock Disposal Site (SERDS) Ditch. SERDS Ditch upstream section is West Ditch.
- **Rock Disposal Sites (RDSs)**: East RDS, SERDS, NEZ RDS, North Bell RDS, and Boundary RDS.
- **Other Facilities**: Tailings Storage Facility (TSF), TSF Quarry, Temporary NW PAG Stockpile, and haul roads.

2.4 Mine Site Flows

The SWWBM accounts for mine waste and water management plans, which are described in detail in the TSF Raise to 987 m Permit Amendment Application SWWBM Report (WSP 2025c). During the calibration and operations periods, the Mine facilities are used to manage water within the Mine site and the only Mine discharge to the receiving environment is from the WTP (Table 1 and Figure 1). During closure, water will continue to be managed within the Mine facilities. The combined Springer-Cariboo Pit will be allowed to fill before discharging to Bootjack Lake in late post-closure and Wight Pit will be allowed to fill before discharging to Polley Lake in early post-closure (Table 2 and Figures 2 and 3). To the extent possible, flows from the Mine site will be returned to pre-disturbance watershed flows as the facilities are reclaimed during closure (Table 3).

During post-closure, most site catchment areas are expected to drain directly to their pre-disturbance watersheds; this applies to 9K Sump, NW Sump, Springer-Cariboo Pit, Mine Drainage Creek, Wight Pit, Joe's Creek, and eventually the SESCP and MESCP in late post-closure. Some sumps, ponds, and ditches are expected to flow together and to be discharged as a combined flow to their pre-disturbance watersheds; Long Ditch discharge will include flow from SERDS Ditch and Bootjack Creek Sump, and PETBP discharge will include overflows from the CCS (Table 3).



Runoff (R)
Seepage Flow (S)
Water consumption (C)
Pumped Flows (P)
Groundwater Flows (GW)
Overflow (OF)
Transfer Flows (T)

Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

wsp

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DATE: 28 August 2025

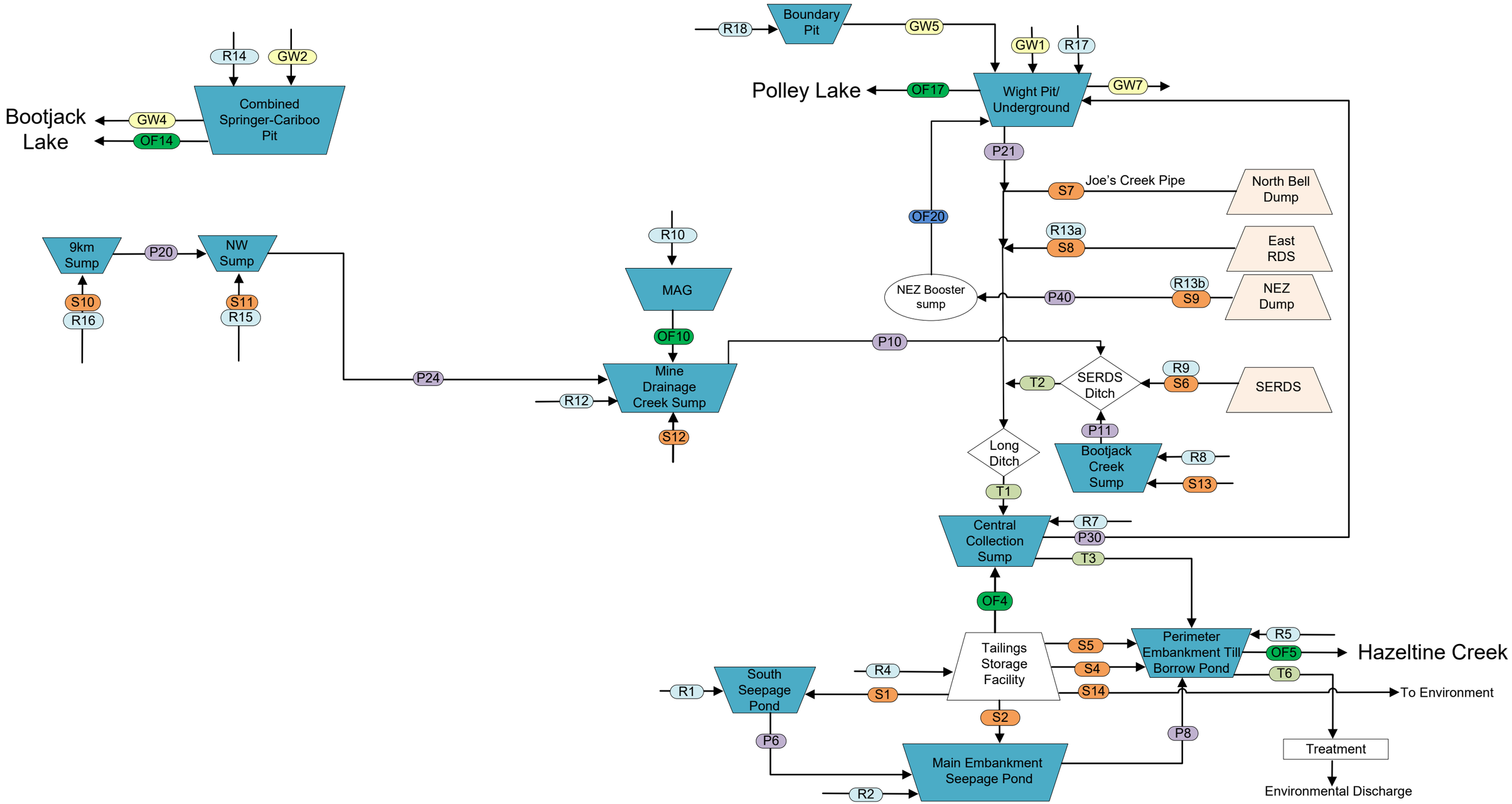
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TITLE

Site Wide Water Balance Operational Phase Flow Diagram

FIGURE No: 1
REV No: 0



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

wsp

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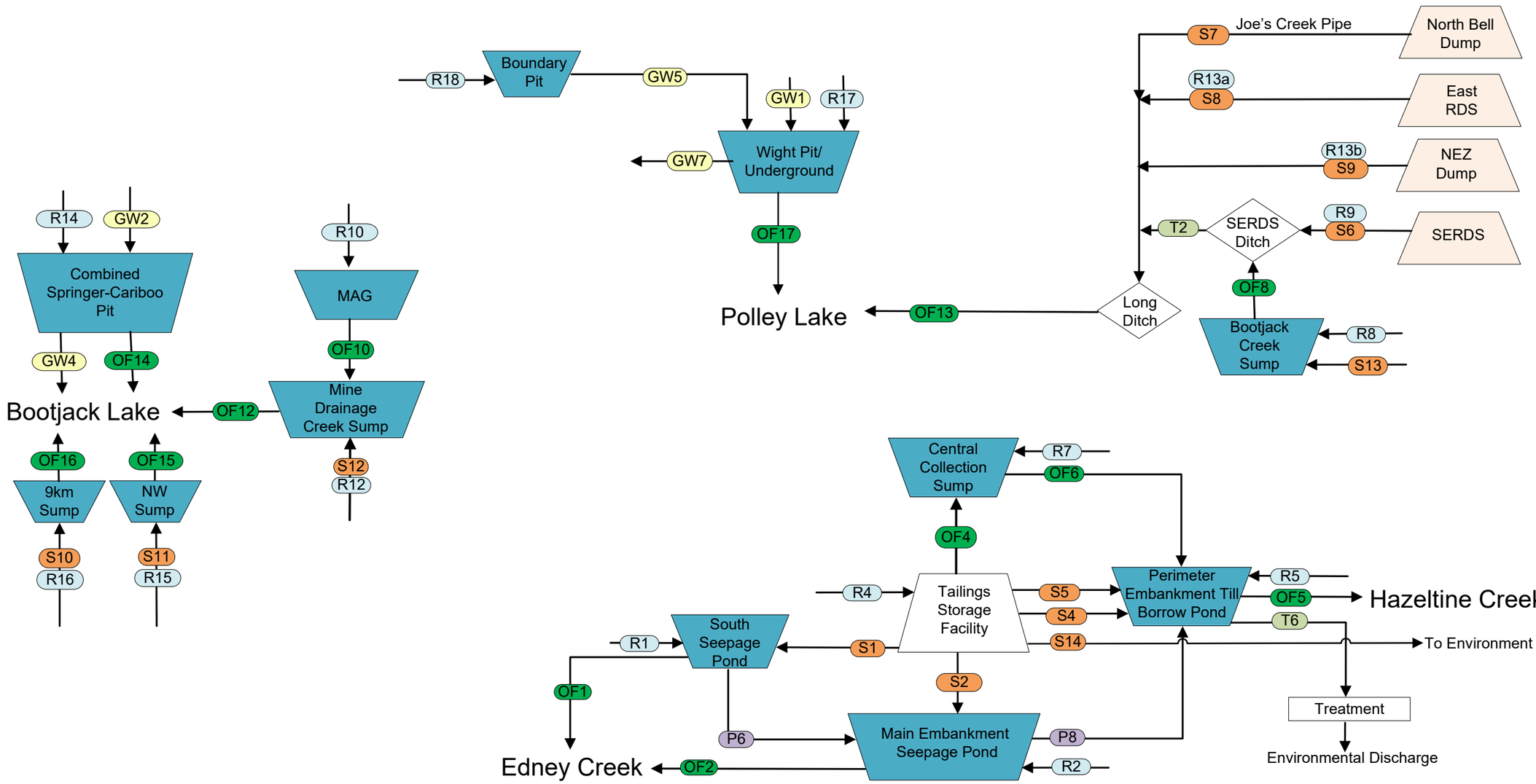
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PROJECT No: CA0047730.8440/31191

TITLE

Site Wide Water Balance
Closure Phase Flow Diagram

FIGURE No: 2
REV No: 0



Runoff (R)
Seepage Flow (S)
Overflow (OF)
Pumped Flows (P)
Groundwater Flows (GW)
Transfer Flows (T)
Flow Path

Note:
(a) Evaporation and Direct Precipitation are modelled for all ponds, but are not shown on this diagram.
(b) Flow quantity may fluctuate based on the year/phase of the model.

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DRAWN: SC
DATE: 28 August 2025

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DATE: 28 August 2025

SCALE: Not to Scale
PROJECT No: CA0047730.8440/31191

TITLE: **Site Wide Water Balance Post-Closure Phase Flow Diagram**

FIGURE No: 3
REV No: 0

Table 1: Facility Flows during Calibration and Operations

Facility	Inflows to the Facility	Discharge Destinations
9KM Sump	Runoff and seepage from the Temporary NW PAG Stockpile, North Bell RDS, disturbed, and undisturbed watershed areas.	NW Sump
NW Sump	Pumping from 9KM Sump; runoff and seepage from the Temporary NW PAG Stockpile, disturbed, and undisturbed watershed areas.	MDCS
Combined Springer-Cariboo Pit	Pit wall runoff, groundwater inflow, disturbed, and undisturbed watershed areas.	SERDS Ditch
MDCS	Pumping from Springer-Cariboo Pit and NW sump; runoff and seepage from haul roads, disturbed, undisturbed and RDS areas.	SERDS Ditch
Wight Pit	Pumping from CCS; seepage from Boundary Pit; overflow from NEZ Booster Sump; pit wall runoff, groundwater inflow, and runoff and seepage from haul roads, undisturbed, disturbed, and RDS areas.	Long Ditch and NEZ Booster Sump
SERDS Ditch	Runoff and seepage from SERDS Dump, pumping from Bootjack Creek Sump.	Long Ditch
Long Ditch	Pumping and overflow from Wight Pit; SERDS Ditch overflow and runoff and seepage from the East RDS, SERDS RDS, haul roads, disturbed and undisturbed watershed areas.	CCS
NEZ Booster Sump	Runoff and seepage from NEZ RDS; pumping from Wight Pit.	Process Plant and Wight Pit
SESCP	TSF seepage and runoff from undisturbed watershed areas.	MESCP
MESCP	Pumping from SESCP; TSF seepage, runoff from the TSF embankment, and runoff and seepage from undisturbed watershed areas.	PETBP
PETBP	Overflow from CCS; seepage, runoff from TSF impoundment, and runoff and seepage from haul roads, disturbed, and undisturbed watershed area.	Influent to the water treatment plant, discharge to submerged outfall in Quesnel Lake
Process Plant	Pumping from NEZ Booster Sump, TSF Booster, Cariboo Booster.	TSF
MAG	Domestic water and Geology domestic water, runoff.	TSF
CCS	Runoff, transfer from Long Ditch.	Pumping to TSF and Wight Pit, overflow to PETBP
TSF Booster	Pumping from TSF.	Process Plant and SERDS Ditch
TSF	Process return from Process Plant, runoff from disturbed, undisturbed, haul road, and tailings beach; pumping from CCS, MAG.	TSF Booster, Seepage to PETBP, SESCP, MESCP, and the environment

Note: NW Sump = Northwest Sump; MDCS = Mine Drainage Creek Sump; SESCP = South Embankment Seepage Collection Pond; MESCP = Main Embankment Seepage Collection Pond; PETBP = Perimeter Embankment Till Borrow Pond; PAG = potentially acid-generating; NAG = Non-potentially acid-generating; RDS = Rock Disposal Site; TSF = Tailings Storage Facility; Central Collection Sump = CCS; SERDS = Southeast Rock Disposal Site; MAG = Mill Site Sump.

Table 2: Facility Flows during Closure

Facility	Inflows to the Facility	Discharge Destinations
9KM Sump	Runoff and seepage from the Temporary NW PAG Stockpile, North Bell RDS, disturbed, and undisturbed watershed areas.	NW Sump
NW Sump	Pumping from 9KM Sump; Runoff and seepage from the Temporary NW PAG Stockpile, disturbed, and undisturbed watershed areas.	Mine Drainage Creek Sump
Combined Springer-Cariboo Pit	Pit wall runoff, groundwater inflow, disturbed, and undisturbed watershed areas.	N/A – pit fills throughout all of closure without discharge
MDCS	Pumping from MAG Sump, runoff and seepage from haul roads, disturbed, undisturbed and RDS areas.	SERDS Ditch
Wight Pit Lake	Overflow from NEZ booster sump; seepage from Boundary Pit; pit wall runoff, groundwater inflow, and runoff and seepage from haul roads, undisturbed, disturbed area, and RDS areas.	Long Ditch
SERDS Ditch	Runoff and seepage from SERDS Dump, pumping from Bootjack Creek Sump	Long Ditch
Long Ditch	SERDS Ditch overflow and runoff and seepage from the East RDS, SERDS RDS, haul roads, disturbed and undisturbed watershed areas.	CCS
CCS	Runoff, transfer from Long Ditch, overflow from TSF	Pumping to Wight Pit, overflow to PETBP
NEZ Booster Sump	Runoff and seepage from NEZ RDS.	Wight Pit
SESCP	TSF seepage and runoff from undisturbed watershed areas.	MESCP
MESCP	Pumping from SESCP; TSF seepage, runoff from the TSF embankment, and runoff and seepage from undisturbed watershed areas.	PETBP
PETBP	TSF pond overflow (via CCS); pumping from MESCP; seepage, runoff from TSF impoundment, and runoff and seepage from haul roads, disturbed, and undisturbed watershed area.	Influent to the water treatment plant, discharge to submerged outfall in Quesnel Lake
TSF	Runoff from disturbed, undisturbed, haul road, and tailings beach.	Overflow to CCS, seepage to SESCP, PETBP, MESCP, and the environment

Note: NW Sump = Northwest Sump; MDCS = Mine Drainage Creek Sump; SESCP = South Embankment Seepage Collection Pond; MESCP = Main Embankment Seepage Collection Pond; PETBP = Perimeter Embankment Till Borrow Pond; PAG = potentially acid-generating; NAG = Non-potentially acid-generating; RDS = Rock Disposal Site; TSF = Tailings Storage Facility; Central Collection Sump = CCS; SERDS = Southeast Rock Disposal Site; MAG = Mill Site Sump.

Table 3: Facility Flows during Post-closure.

Facility	Inflows to the Facility	Discharge Destinations
9K Sump	Runoff and seepage from the Temporary NW PAG Stockpile, North Bell RDS, disturbed, and undisturbed watershed areas.	Bootjack Lake
NW Sump	Runoff and seepage from the Temporary NW PAG Stockpile, disturbed, and undisturbed watershed areas.	
Springer-Cariboo Pit Lake	Pit wall runoff, groundwater inflow, disturbed, and undisturbed watershed areas.	
MDCS	Overflow from MAG sump; runoff and seepage from haul roads, disturbed, undisturbed and RDS areas.	
Wight Pit Lake	Pit wall runoff, groundwater inflow, and runoff and seepage from haul roads, undisturbed, disturbed area, and RDS areas.	Polley Lake
Long Ditch	SERDS Ditch overflow and runoff and seepage from the East RDS, NEZ RDS, SERDS RDS, haul roads, disturbed and undisturbed watershed areas.	
CCS	Runoff, transfer from Long Ditch, overflow from TSF	Overflow to PETBP
SESCP	TSF seepage and runoff from undisturbed watershed areas.	Edney Creek when water quality allows
MESCP	TSF seepage, runoff from the TSF embankment, and runoff and seepage from undisturbed watershed areas.	
PETBP	TSF pond overflow (via CCS), TSF seepage, runoff from TSF impoundment, and runoff and seepage from haul roads, disturbed, and undisturbed watershed area.	Influent to the water treatment plant, discharge to submerged outfall in Quesnel Lake. At some point during post-closure, PETBP is assumed to discharge to Hazeltine Creek when water quality allows.
TSF	Runoff from disturbed, undisturbed, haul road, and tailings beach.	Overflow to CCS, seepage to SESCP, PETBP, MESCP, and the environment.

Note: NW Sump = Northwest Sump; MDCS = Mine Drainage Creek Sump; SESCP = South Embankment Seepage Collection Pond; MESCP = Main Embankment Seepage Collection Pond; PETBP = Perimeter Embankment Till Borrow Pond; PAG = potentially acid-generating; NAG = Non-potentially acid-generating; RDS = Rock Disposal Site; TSF = Tailings Storage Facility; Central Collection Sump = CCS; SERDS = Southeast Rock Disposal Site; MAG = Mill Site Sump.

2.5 Mine Plan

The SWWQM predicts concentrations based on water quality concentrations assigned to runoff from surface areas (Section 2.5.1), scheduled water management pumping and waste rock/tailings production from mine operations according to the mine plan presented in Section 2.5.2 (WSP 2025b).

2.5.1 Mine Site Surface Areas

The SWWQM and SWWBM assumes the entire surface area of the RDS, disturbed runoff areas and undisturbed runoff areas are accounted for at the beginning of operations. Therefore, the runoff and seepage volumes do not change until closure and post-closure when remediation of mine surface areas begin. The total surface areas are presented in the Water Balance Report (WSP 2025c).

2.5.2 Waste Rock and Tailings Deposition

The mine plan for the Springer Expansion was updated in the SWWQM and assumed a milling operational end date of July 2031 (Section 2.2 of the WMP). The open pit mining operation mines on average 6.1 million tonnes (Mt) of ore and 7.7 million tonnes of waste per annum. The model accounted for the placement of tailings in the TSF and the SERDS according to the mine plan:

- Before 2022, tailings were placed in the TSF.
- From 2022 to 2024, tailings and waste rock excavated from Springer Pit were deposited in the SERDS Tailings Co-disposal site with a total of 3.5 Mt of tailings and 71.6 Mt of NAG waste rock deposited by the end of 2024 (WSP 2025d).
- Future tailings are to be placed in the TSF. The tailings beach area increases during operations until deposition is complete in 2031.

2.6 Model Setup

The model simulated concentrations on a daily time step from January 2017 to December 2024 (calibration period), January 2025 to July 2031 (operations) and from August 2031 to July 2131 (closure and post-closure). Probabilistic climate and water quality inputs were used to run the model stochastically for 2000 simulations:

- **Climate Inputs:** The SWWQM was run with probabilistic monthly climate inputs during operations, closure and post-closure as described in the SWWBM report (WSP 2025c). Monthly precipitation data in the Mount Polley Mine Climate Baseline Update (Golder 2022) were fitted to a log-normal probability distribution. The calibration period used historical climate data for the climate inputs.
- **Water Quality Inputs:** For each realization, a unique concentration for each parameter was selected based on randomly sampled values from within a statistical probability distribution function that was derived from each input.

To interpret the results, median and 95th percentile concentrations were calculated for each Mine facility. To put the results in context, a 95th percentile prediction indicates the maximum concentration that is likely to be reached over the duration of the simulation, with a 95% likelihood that concentrations will be at or below that concentration (it does not suggest that concentrations will exceed this value 5% of the time).

2.6.1 Modelled Parameters and Particulate Addition

The parameters in the SWWQM include physical parameters, major ions, nutrients, and dissolved metals and metalloids (Table 4). The dissolved fractions of metals and metalloids are used in all mixing calculations in the model. The total concentrations of metals and metalloids are calculated by adding particulate fractions to the dissolved concentrations as described below.

Table 4: Parameters in the Site Wide Water Quality Model

Category	Parameters
Physical parameters	Total dissolved solids (calculated), hardness (calculated)
Major ions	Calcium, chloride, fluoride, magnesium, potassium, sodium, sulphate
Nutrients	Nitrate, nitrite, total ammonia, total phosphorus
Dissolved metals and metalloids	Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, zinc

Total metal predictions were calculated using dissolved metal predictions and empirical particulate metal concentrations for Operations and Closure (Section 2.6.1.1) and Post-closure (Section 2.6.1.2).

2.6.1.1 Particulate Addition – Operations and Closure

Monitoring data from the SERDS Ditch and Long Ditch (2017 to 2024) were used to establish the empirical particulate metal concentrations because these facilities are expected to contribute the majority of particulate load to site discharges during operations and closure. The model assumes that TSS will be settled/removed to 15 mg/L (i.e., the current average authorized discharge concentrations) prior to discharge.

Monitored data for total and dissolved metals were used to calculate observed particulate metal concentrations in the SERDS Ditch and Long Ditch. The strength of correlation of measured particulate metal concentrations to TSS concentrations was calculated using linear regressions. An empirical particulate metal concentration for each parameter was established by grouping each parameter into the following categories:

- Correlated parameters ($R^2 \geq 0.75$)—a particulate concentration using 15 mg/L during operations/closure was calculated using the regression equation, and this concentration was added to both the maximum median and 95th percentile dissolved metal predictions to calculate a total metal concentration.
- Poorly-correlated parameters ($0.25 < R^2 < 0.75$)—median and 95th percentile particulate concentrations were calculated based on observed data for samples with a TSS below 15 mg/L, and these concentrations were added to the maximum median and 95th percentile dissolved metal concentrations, respectively.
- Non-correlated parameters ($R^2 \leq 0.25$)—median and 95th percentile particulate concentrations were calculated based on all observed data, and these concentrations were added to the maximum median and 95th percentile dissolved metal concentrations, respectively.

A summary of the correlated and non-correlated parameters and the particulate concentrations used for operations and closure in the model are presented in Table 5.

Table 5: Particulate Metal Concentrations – Operations and Closure

Parameter	Coefficient of Determination (R^2)	Category	Median Particulate Concentration (mg/L)	95th Percentile Particulate Concentration (mg/L)
Aluminum	0.82	Correlated	0.45	0.45
Antimony	0.023	Non-correlated	0.00002	0.00014
Arsenic	0.87	Correlated	0.00027	0.00027
Barium	0.75	Poorly-correlated	0.0019	0.0086
Beryllium	0.39	Poorly-correlated	0	0
Boron	0.00085	Non-correlated	0.004	0.03
Cadmium	0.38	Poorly-correlated	0.0000025	0.000046
Chromium	0.76	Correlated	0.0004	0.0004
Cobalt	0.85	Correlated	0.00029	0.00029
Copper	0.026	Non-correlated	0.0072	0.15
Iron	0.85	Correlated	0.45	0.45
Lead	0.87	Correlated	0.00011	0.00011
Lithium	0.52	Poorly-correlated	0.0002	0.00097
Manganese	0.8	Correlated	0.021	0.021
Mercury	0.017	Non-correlated	0	0
Molybdenum	0.0061	Non-correlated	0.0004	0.011
Nickel	0.84	Correlated	0.00054	0.00054
Selenium	0.011	Non-correlated	0.00010	0.0062
Silver	0.63	Poorly-correlated	0	0.0000073
Strontium	0.0027	Non-correlated	0.017	0.35
Thallium	0.41	Poorly-correlated	0	0.0000017
Tin	0.21	Non-correlated	0	0.00007
Titanium	0.81	Correlated	0.019	0.019
Uranium	0.0081	Non-correlated	0.00003	0.00029
Vanadium	0.85	Correlated	0.0012	0.0012
Zinc	0.77	Correlated	0.0026	0.0026

Note: Particulate concentrations of 0 mg/L indicate that dissolved and total metal concentrations are equivalent.

2.6.1.2 Particulate Addition – Post-closure

Monitoring data from Edney Creek (2017 to 2024) was used to establish the empirical particulate metal concentrations because data from this location is considered representative of undisturbed (i.e., reclaimed) surface runoff. The model assumes that TSS will be settled to 3 mg/L (i.e., the 95th percentile of TSS from monitoring data at Edney Creek from 2016 to 2024).

Monitored data for total and dissolved metals were used to calculate observed particulate metal concentrations in Edney Creek. The strength of correlation of measured particulate metal concentrations to TSS concentrations was calculated using linear regressions. Measured particulate metal concentrations were not correlated to TSS ($R^2 \leq 0.25$) for all parameters. Median and 95th percentile particulate concentrations were calculated based on all observed data, and these concentrations were added to the maximum median and 95th percentile dissolved metal concentrations, respectively (Table 6).

Table 6: Particulate Metal Concentrations – Post-closure

Parameter	Coefficient of Determination (R^2)	Category	Median Particulate Concentration (mg/L)	95th Percentile Particulate Concentration (mg/L)
Aluminum	0.074	Non-correlated	0.033	0.13
Antimony	0.0043	Non-correlated	0	0
Arsenic	0.0046	Non-correlated	0.00005	0.00013
Barium	0.011	Non-correlated	0.0004	0.0018
Beryllium	-(a)	Non-correlated	0	0
Boron	0.0031	Non-correlated	0	0
Cadmium	0.0036	Non-correlated	0.0000016	0.0000078
Chromium	0.021	Non-correlated	0.00012	0.00052
Cobalt	0.017	Non-correlated	0	0
Copper	0.0048	Non-correlated	0.00035	0.0016
Iron	0.098	Non-correlated	0.052	0.22
Lead	0.003	Non-correlated	0	0.000065
Lithium	0.091	Non-correlated	0	0.00013
Manganese	0.091	Non-correlated	0.004	0.023
Mercury	-(a)	Non-correlated	0	0
Molybdenum	0.000078	Non-correlated	0.000025	0.00042
Nickel	0.053	Non-correlated	0.00008	0.00033
Selenium	0.0053	Non-correlated	0.000011	0.00012
Silver	0.00053	Non-correlated	0	0.0000073
Strontium	0.0075	Non-correlated	0.0022	0.017
Thallium	-(a)	Non-correlated	0	0
Tin	0.0014	Non-correlated	0	0
Titanium	0.0046	Non-correlated	0	0
Uranium	0.098	Non-correlated	0.000002	0.000038
Vanadium	0.15	Non-correlated	0.00018	0.00048
Zinc	0.0016	Non-correlated	0	0

Note: Particulate concentrations of 0 mg/L indicate that dissolved and total metal concentrations are equivalent.

(a) Coefficients of determination could not be calculated for beryllium, mercury, thallium and titanium because concentrations in the Edney Creek monitoring data were all below detection limits.

2.6.2 Water Quality Calculations

In the SWWQM, Mine facilities were grouped into four categories: open pits, water management ponds, sumps and ditches, RDSs, and TSF. The concentrations of parameters at each Mine facility were estimated as described below.

2.6.2.1 Pits, Ponds and Ditches

Conveyance facilities on site (Long Ditch and SERDS Ditch) that are flow-through systems (i.e., they do not retain water for more than a single timestep) were modelled by assigning a water quality to each inflow and calculating a mixed water quality based on the proportions of each inflow (Equation 1). For pits, sumps, and ponds where water can be stored (9K Sump, NW Sump, Springer-Cariboo Pit, MDCS, Wight Pit, SESCP, MESCP and the PETBP), the concentration and volume retained from the previous time step is included in the calculation (Equation 2).

$$C_{pond} = \frac{\sum C_i Q_i}{\sum Q_i}$$ Equation 1

Where:

C_{pond} = concentration in facility
C_i = concentration in inflow *i*
Q_i = flow rate of inflow *i*

$$C_{pond} = \frac{C_x V_x + \sum C_i Q_i - \sum C_x Q_o}{V_x + \sum Q_i - \sum Q_o}$$ Equation 2

Where:

C_{pond} = concentration in facility
C_i = concentration in inflow *i*
Q_i = flow rate of inflow *i*
C_x = concentration in facility in previous timestep *x*
V_x = volume of water in facility in previous timestep *x*
Q_o = flow rate of outflow *o*

Evaporation from water surfaces was included as a decrease in total volume (V_i); in other words, evaporation was a water quantity reduction only and did not remove mass of modelled parameters from the system.

2.6.2.2 Rock Disposal Sites and Tailings Storage Facility

Runoff and seepage volumes from RDSs and the TSF were predicted by the SWWBM and input water quality was assigned to these flows based on site monitoring data. Concentrations at these Mine facilities were calculated using Equation 1.

2.6.2.3 SERDS Tailings Co-Disposal

Water quality modelling of seepage from the SERDS Tailings Co-disposal Facility was consistent with the modelling presented in the 2022 Permit Amendment Application (MPMC 2022). Seepage from the SERDS Tailings Co-disposal Facility into SERDS Ditch is assigned a combination of unsaturated TSF seepage water quality and NAG waste rock seepage water quality (Equation 3; Section 2.6.3). Source terms for waste rock were not modified upwards to reflect co-disposal with tailings because concentrations in the waste rock are a function of solubility rather than oxygen penetration (MPMC 2022).

$$C_{SERDS} = \left(C_{Tailings} \times \frac{\sum M_{Tailings}}{\sum M_{Tailings} + \sum M_{NAG}}\right) + \left(C_{NAG} \times \frac{\sum M_{NAG}}{\sum M_{Tailings} + \sum M_{NAG}}\right)$$ Equation 3

Where:

C_{SERDS} = concentration of SERDS runoff or seepage during mine operations

$C_{Tailings}$ = unsaturated tailings water quality input (Section 2.6.3)

$\Sigma M_{Tailings}$ = cumulative mass of tailings deposited in the SERDS Tailings Co-disposal Facility

ΣM_{NAG} = cumulative mass of waste rock deposited in the SERDS Tailings Co-disposal Facility

$C_{Tailings}$ = NAG waste rock seepage water quality input (Section 2.6.3)

2.6.3 Model Inputs

Water quality inputs in the SWWQM were derived from site water quality monitoring data. A summary of the water quality inputs assigned to each flow in the SWWQM is presented in Table 7 and described below. Site water quality monitoring data from 2006 to 2024 (depending on the input) were used to develop water quality inputs in the SWWQM. For each parameter, water quality inputs were represented in the model by probability distribution functions. The development of the distribution inputs is described in Section 2.6.3.1. A summary of the distributions selected, the maximum and mean values used for each parameter, and the number of samples for each water quality input are presented in Table 8.

As areas in the mine site are reclaimed, the assigned water quality inputs are adjusted in the SWWQM (Table 6):

- Before reclamation of the RDS facilities, the water quality of runoff is assigned either PAG, non-potentially acid-generating (NAG), Boundary Dump (in the Boundary Pit RDS runoff), or Joe' s Creek Pipe (in the Wight Pit RDS runoff) water quality depending on the RDS location. The water quality of runoff is assumed to be equal to disturbed runoff while the facilities are being reclaimed, and then gradually return to undisturbed watershed runoff.
- Seepage from the RDS facilities is conservatively assumed to remain as contact water in perpetuity.
- For Wight Pit and Boundary Pit, the pit wall runoff is assigned the same water quality input during the calibration, operations, closure and post-closure periods. The water quality input assigned to runoff from each of the pit walls is calculated using monitoring data from the corresponding pit (e.g., the water quality distribution assigned to pit wall runoff into Wight Pit is calculated using monitoring data from Wight Pit).
- Pit wall runoff into the Springer-Cariboo Pit during calibration, operations, closure and post-closure is assigned water quality from two source terms:
  - For pit walls of the former Springer Pit, the source term is calculated based on observed data from Springer Pit. This assumes no acid generation or change in pit wall runoff water quality over time.
  - For pit walls of the former Cariboo Pit, the source term is calculated based on observed data from Cariboo Pit. This assumes no acid generation or change in pit wall runoff water quality over time.
  - For pit walls of the former WX and C2 Pits, the source term is calculated based on observed data from Springer Pit. This assumes no acid generation or change in pit wall runoff water quality over time.

- During the calibration, operations, closure and post-closure periods, disturbed areas are assigned a water quality input calculated using monitoring data from the North Dump Creek and Bootjack Creek (Stations W4 and W5).
- During the calibration, operations, closure and post-closure periods, undisturbed areas are assigned a water quality input calculated using monitoring data from undisturbed runoff (Stations W8 and W8z).
- During the calibration, operations and closure periods, runoff from the TSF beach, impoundment and embankment is assigned a water quality input calculated using monitoring data from the TSF supernatant (Stations E1 and E1a). The water quality of TSF beach, impoundment and embankment runoff is assumed to be equal to undisturbed runoff once the area has been reclaimed in post-closure.
- It was assumed in the model that the TSF will be fully saturated during Operations; however, following Operations, seepage from the TSF will originate from both saturated and unsaturated tailings as draindown of the tailings occurs. The proportion of seepage from saturated and unsaturated tailings in the TSF during Closure and Post-closure are based on hydrogeologic modelling of the facility (Golder 2016). Seepage from unsaturated tailings is assigned the water quality input calculated using monitoring data from the MESCP (Stations E4 and E5). Seepage from the saturated tailings is assigned predicted water quality from the TSF.
- Runoff from the Haul Road is assigned NAG water quality until it is reclaimed in post-closure. Once the Haul Road is reclaimed, runoff from this area is assigned the undisturbed water quality input.
- During the calibration, operations, closure and post-closure periods, groundwater inflow into the combined Springer-Cariboo Pit is assigned a water quality input calculated using monitoring data from Springer Pit Wells (Stations GW12-1/2 and GW15-1/2).

Table 7: Site-Wide Water Quality Model Inputs

Category	Description	Model Input		
		Calibration Period and Operations	Closure	Post-closure
Rock Disposal Site Contact Water	RDS Runoff to Boundary Pit	Boundary Dump Seep station water quality data (n = 79, June 2013 – November 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	RDS Seepage to Boundary Pit	Boundary Dump Seep station water quality data (n = 79, June 2013 – July 2024)		
	RDS Runoff to Wight Pit	Joe's Creek Pipe station (from North Bell Dump) water quality (n = 73, August 2014 to November 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	RDS Seepage to Wight Pit	Joe's Creek Pipe station (from North Bell Dump) water quality (n = 73, August 2014 to November 2024)		
	NAG Waste Rock Runoff	East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep water quality (n = 547, May 2013 to December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	NAG Waste Rock Seepage	East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep station water quality (n = 547, May 2013 to December 2024)		
	NEZ Waste Rock Runoff	East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep water quality (n = 547, May 2013 to December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	NEZ Waste Rock Seepage	East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep station water quality (n = 547, May 2013 to December 2024)		
	Temporary NW PAG Stockpile Runoff	PAG Dump Seep station water quality (n = 151, May 2013 – December 2024)	Disturbed Runoff: W4 and W5 site monitored data (n = 312, January 2014 to December 2024)	Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Temporary NW PAG Stockpile Seepage	PAG Dump Seep station water quality (n = 151, May 2013 – December 2024)	NAG Waste Rock: East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep station water quality (n = 547, May 2013 to August 2023)	

Table 7: Site-Wide Water Quality Model Inputs

Category	Description	Model Input		
		Calibration Period and Operations	Closure	Post-closure
Pit Wall Runoff	Boundary Pit Wall Runoff	Boundary Pit station water quality (n = 20, February 2016 – November 2024)		
	Wight Pit Wall Runoff	Wight Pit (Station E10) water quality (n =137, February 2016 – December 2024)		
	Springer Pit Wall Runoff	Springer Pit (Station E11) water quality (n = 58, January 2016 – November 2024)		
	C2 and WX Pit Wall Runoff	Springer Pit (Station E11) water quality (n = 58, January 2016 – November 2024)		
	Cariboo Pit Wall Runoff	Cariboo Pit (Station E8) water quality (n = 64, June 2016 - November 2024)		
Tailings Storage Facility	TSF Beach, Impoundment, and Embankment Runoff	TSF supernatant (Station E1a) water quality (n = 243, May 2011 to December 2024)		Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Unsaturated TSF Seepage	TSF Main Embankment Seepage Collection Pond (Station E5) water quality (n = 141, January 2006 – November 2024)		
	Saturated TSF Seepage	Predicted concentration in the TSF		
Other	Haul Road Runoff	NAG Waste Rock: East Rock Disposal Site station, Northeast Zone Sump and Seepage stations, SERDS Seep station water quality (n = 547, May 2013 to December 2024)		Undisturbed Runoff: W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)
	Disturbed Runoff	W4 and W5 site monitored data (n = 312, January 2014 to December 2024)		
	Undisturbed Runoff	W8 and W8z site monitored water quality (n = 220, January 2006 to November 2024)		
	Groundwater Inflow to Springer-Cariboo Pit	GW12-1/2, GW15-1/2 site monitored data (n = 346, January 2016 to December 2024)		

Note: NW Sump = Northwest Sump; MDCS = Mine Drainage Creek Sump; SESCP = South Embankment Seepage Collection Pond; MESCP = Main Embankment Seepage Collection Pond; PETBP = Perimeter Embankment Till Borrow Pond; PAG = potentially acid-generating; NAG = Non-potentially acid-generating; RDS = Rock Disposal Site; TSF = Tailings Storage Facility; SERDS = Southeast Rock Disposal Site.

Table 8: Summary of Stochastic Water Quality Inputs

Parameter	Units	RDS Runoff and Seepage Water to Boundary Pit					RDS Runoff and Seepage Water to Wight Pit				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Normal	722	280	1,190	79	Normal	1,541	176	1,820	73
Major Ions											
Calcium	mg/L	Normal	173	65	264	79	Normal	317	36	396	73
Chloride	mg/L	Delta-lognormal	1.1	0.48	2.5	79	Lognormal	4.5	2.9	17	73
Fluoride	mg/L	Lognormal	0.21	0.24	1.2	79	Delta-lognormal	0.22	0.064	0.29	73
Magnesium	mg/L	Normal	22	11	47	79	Normal	63	8.2	79	73
Potassium	mg/L	Normal	1.4	0.29	2.0	79	Normal	2.2	0.32	2.8	73
Sodium	mg/L	Normal	6.1	1.5	9.9	79	Normal	17	2.0	20	73
Sulphate	mg/L	Normal	378	180	731	79	Normal	905	91	1,080	65
Nutrients											
Ammonia	mg/L (as N)	Lognormal	0.025	0.092	0.65	79	Delta-lognormal	0.0081	0.0029	0.019	73
Nitrate	mg/L (as N)	Delta-lognormal	0.3	0.55	2.2	79	Normal	23	12	46	73
Nitrite	mg/L (as N)	Lognormal	0.0029	0.0044	0.025	79	Constant	-	-	0.0025	73
Total Phosphorus	mg/L	Delta-lognormal	0.035	0.076	0.32	79	Lognormal	0.044	0.007	0.071	73
Dissolved Metals											
Aluminum	mg/L	Lognormal	0.0029	0.0025	0.014	79	Normal	0.0036	0.0014	0.0074	73
Antimony	mg/L	Normal	0.00013	0.000056	0.00028	79	Lognormal	0.0005	0.000053	0.00066	73
Arsenic	mg/L	Lognormal	0.00074	0.00045	0.0029	79	Normal	0.0014	0.00013	0.0018	73
Barium	mg/L	Normal	0.037	0.0096	0.056	79	Normal	0.055	0.012	0.079	73
Beryllium	mg/L	Constant	-	-	0.00005	79	Constant	-	-	0.001	73
Boron	mg/L	Normal	0.049	0.015	0.076	79	Normal	0.074	0.01	0.095	73
Cadmium	mg/L	Normal	0.000033	0.000019	0.0001	79	Lognormal	0.000042	0.000011	0.000096	73
Chromium	mg/L	Constant	-	-	0.00025	79	Constant	-	-	0.00025	73
Cobalt	mg/L	Lognormal	0.00013	0.00026	0.0016	79	Lognormal	0.000076	0.000034	0.00021	73
Copper	mg/L	Delta-lognormal	0.0054	0.0062	0.023	79	Lognormal	0.018	0.0014	0.022	73
Iron	mg/L	Lognormal	0.032	0.077	0.34	79	Constant	-	-	0.015	73
Lead	mg/L	Delta-lognormal	0.000095	0.000042	0.00017	79	Constant	-	-	0.000025	73
Lithium	mg/L	Lognormal	0.0025	0.0031	0.017	79	Normal	0.0041	0.00052	0.0055	73
Manganese	mg/L	Lognormal	0.036	0.14	1.6	79	Lognormal	0.012	0.013	0.07	73
Mercury	mg/L	Constant	-	-	0	0	Constant	-	-	0.0000025	1.0
Molybdenum	mg/L	Lognormal	0.032	0.049	0.27	79	Lognormal	0.074	0.011	0.11	73
Nickel	mg/L	Constant	-	-	0.00025	79	Constant	-	-	0.00025	73

Table 8: Summary of Stochastic Water Quality Inputs

Parameter	Units	RDS Runoff and Seepage Water to Boundary Pit					RDS Runoff and Seepage Water to Wight Pit				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Selenium	mg/L	Lognormal	0.0043	0.0088	0.05	79	Lognormal	0.068	0.018	0.12	73
Silicon	mg/L	Normal	5.5	1.3	7.6	79	Normal	6.0	0.32	6.8	73
Silver	mg/L	Delta-lognormal	0.000019	0.0000063	0.00005	79	Constant	-	-	0.000005	73
Strontium	mg/L	Normal	2.2	0.86	4.0	79	Normal	3.2	0.43	4.0	73
Thallium	mg/L	Constant	-	-	0.000005	79	Constant	-	-	0.000005	73
Tin	mg/L	Constant	-	-	0.00005	79	Constant	-	-	0.00005	73
Titanium	mg/L	Delta-lognormal	0.015	0.005	0.024	79	Delta-lognormal	0.017	0.0048	0.023	73
Uranium	mg/L	Lognormal	0.0011	0.0017	0.009	79	Normal	0.0013	0.00021	0.0017	73
Vanadium	mg/L	Lognormal	0.0004	0.00025	0.0015	79	Normal	0.00058	0.000088	0.00078	73
Zinc	mg/L	Constant	-	-	0.0015	79	Normal	0.0057	0.001	0.0085	73

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	NAG Waste Rock Runoff and Seepage					PAG Waste Rock Runoff and Seepage				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Normal	1,423	550	3,410	547	Normal	1,294	515	2,280	147
Major Ions											
Calcium	mg/L	Normal	296	102	626	547	Normal	272	109	485	147
Chloride	mg/L	Delta-lognormal	5.0	3.0	21	547	Lognormal	2.4	2.5	14	147
Fluoride	mg/L	Lognormal	0.26	0.17	1.4	547	Lognormal	0.11	0.067	0.39	147
Magnesium	mg/L	Normal	56	21	124	547	Normal	47	17	79	147
Potassium	mg/L	Normal	2.1	0.68	4.2	547	Lognormal	2.7	1.3	9.0	147
Sodium	mg/L	Normal	18	6.4	44	547	Lognormal	20	12	70	147
Sulphate	mg/L	Normal	829	319	1,590	514	Normal	701	346	1,480	113
Nutrients											
Ammonia	mg/L (as N)	Lognormal	0.0045	0.05	0.35	547	Lognormal	0.0097	0.04	0.2	147
Nitrate	mg/L (as N)	Delta-lognormal	3.5	24	157	547	Delta-lognormal	8.1	12	54	151
Nitrite	mg/L (as N)	Delta-lognormal	0.024	0.011	0.1	547	Lognormal	0.0073	0.08	0.45	151
Total Phosphorus	mg/L	Lognormal	0.013	0.034	0.24	547	Normal	0.027	0.015	0.066	151

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	NAG Waste Rock Runoff and Seepage					PAG Waste Rock Runoff and Seepage				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Dissolved Metals											
Aluminum	mg/L	Lognormal	0.0055	0.014	0.076	547	Lognormal	0.0044	0.0069	0.048	151
Antimony	mg/L	Lognormal	0.00024	0.00018	0.0014	547	Normal	0.00023	0.00013	0.0006	151
Arsenic	mg/L	Lognormal	0.00032	0.00033	0.0028	547	Normal	0.00039	0.00015	0.00082	151
Barium	mg/L	Normal	0.037	0.012	0.074	547	Lognormal	0.049	0.036	0.24	151
Beryllium	mg/L	Constant	-	-	0.00005	547	Constant	-	-	0.00005	151
Boron	mg/L	Normal	0.063	0.02	0.12	547	Normal	0.065	0.034	0.17	151
Cadmium	mg/L	Lognormal	0.000063	0.00012	0.0012	547	Lognormal	0.000035	0.000091	0.0007	151
Chromium	mg/L	Constant	-	-	0.0001	547	Constant	-	-	0.00025	151
Cobalt	mg/L	Delta-lognormal	0.00081	0.0011	0.005	547	Lognormal	0.00017	0.001	0.005	151
Copper	mg/L	Lognormal	0.011	0.038	0.2	547	Normal	0.006	0.0027	0.014	151
Iron	mg/L	Delta-lognormal	0.038	0.006	0.049	547	Delta-lognormal	0.082	0.073	0.44	151
Lead	mg/L	Lognormal	0.000033	0.000019	0.0002	547	Constant	-	-	0.000025	151
Lithium	mg/L	Lognormal	0.0029	0.0014	0.024	547	Lognormal	0.0016	0.0019	0.012	151
Manganese	mg/L	Lognormal	0.025	0.38	8.0	547	Delta-lognormal	0.092	0.72	2.7	151
Mercury	mg/L	Constant	-	-	0	0	Constant	-	-	0	0
Molybdenum	mg/L	Normal	0.13	0.073	0.35	547	Normal	0.1	0.089	0.39	151
Nickel	mg/L	Lognormal	0.00065	0.0014	0.021	547	Lognormal	0.00039	0.0004	0.0032	151
Selenium	mg/L	Lognormal	0.047	0.066	0.7	547	Normal	0.062	0.043	0.19	151
Silicon	mg/L	Lognormal	5.7	1.2	9.5	547	Normal	7.2	1.0	9.5	151
Silver	mg/L	Constant	-	-	0.000005	547	Constant	-	-	0.000005	151
Strontium	mg/L	Normal	3.4	1.8	14	547	Normal	1.1	0.37	1.8	151
Thallium	mg/L	Constant	-	-	0.000005	547	Constant	-	-	0.000005	151
Tin	mg/L	Constant	-	-	0.00005	547	Constant	-	-	0.00005	151
Titanium	mg/L	Lognormal	0.0062	0.0062	0.031	547	Constant	-	-	0	151
Uranium	mg/L	Normal	0.0018	0.0012	0.005	547	Normal	0.0011	0.00069	0.0027	151
Vanadium	mg/L	Lognormal	0.0004	0.0005	0.004	547	Delta-lognormal	0.00067	0.00022	0.0012	151
Zinc	mg/L	Lognormal	0.0034	0.0072	0.047	547	Lognormal	0.0022	0.0046	0.042	151

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Boundary Pit Wall Runoff					Wight Pit Wall Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Normal	370	105	490	20	Lognormal	1,170	556	2,350	137
Major Ions											
Calcium	mg/L	Normal	91	27	129	20	Lognormal	253	121	486	137
Chloride	mg/L	Delta-lognormal	1.1	0.56	1.6	20	Lognormal	2.8	2.5	14	137
Fluoride	mg/L	Normal	0.66	0.18	0.88	20	Lognormal	0.63	0.3	1.3	137
Magnesium	mg/L	Normal	8.3	2.3	11	20	Lognormal	32	15	59	137
Potassium	mg/L	Normal	1.4	0.28	1.8	20	Lognormal	2.0	1.1	4.4	137
Sodium	mg/L	Normal	5.2	1.5	7.1	20	Normal	28	6.1	44	137
Sulphate	mg/L	Normal	164	62	250	20	Lognormal	689	336	1,370	137
Nutrients											
Ammonia	mg/L (as N)	Lognormal	0.0071	0.0047	0.027	20	Delta-lognormal	0.015	0.022	0.14	137
Nitrate	mg/L (as N)	Delta-lognormal	0.35	1.4	4.2	20	Normal	1.5	1.4	4.2	137
Nitrite	mg/L (as N)	Lognormal	0.0016	0.0042	0.025	20	Lognormal	0.0056	0.0059	0.031	137
Total Phosphorus	mg/L	Delta-lognormal	0.0052	0.0025	0.0087	20	Lognormal	0.0037	0.003	0.018	137
Dissolved Metals											
Aluminum	mg/L	Lognormal	0.0032	0.0063	0.031	20	Lognormal	0.0026	0.0032	0.03	137
Antimony	mg/L	Normal	0.00094	0.00045	0.0017	20	Lognormal	0.00067	0.00031	0.0012	137
Arsenic	mg/L	Normal	0.00061	0.00019	0.00092	20	Normal	0.00072	0.00024	0.0012	137
Barium	mg/L	Normal	0.033	0.0092	0.053	20	Lognormal	0.03	0.016	0.063	137
Beryllium	mg/L	Constant	-	-	0.0005	20	Constant	-	-	0.00005	137
Boron	mg/L	Delta-lognormal	0.028	0.011	0.04	20	Lognormal	0.19	0.12	0.55	137
Cadmium	mg/L	Lognormal	0.000057	0.000037	0.00023	20	Lognormal	0.00031	0.00024	0.0014	137
Chromium	mg/L	Constant	-	-	0.00025	20	Constant	-	-	0.00025	137
Cobalt	mg/L	Constant	-	-	0.00005	20	Delta-lognormal	0.00044	0.0004	0.0016	137
Copper	mg/L	Normal	0.023	0.0098	0.053	20	Normal	0.013	0.0041	0.026	137
Iron	mg/L	Constant	-	-	0.015	20	Delta-lognormal	0.17	0.048	0.42	137
Lead	mg/L	Constant	-	-	0.000025	20	Constant	-	-	0.000025	137
Lithium	mg/L	Normal	0.0081	0.0028	0.012	20	Lognormal	0.0087	0.0038	0.015	137
Manganese	mg/L	Lognormal	0.014	0.036	0.22	20	Normal	0.11	0.097	0.4	137
Mercury	mg/L	Constant	-	-	0.0000025	14	Constant	-	-	0	0
Molybdenum	mg/L	Normal	0.11	0.054	0.21	20	Lognormal	0.14	0.063	0.26	137
Nickel	mg/L	Constant	-	-	0.00025	20	Lognormal	0.00075	0.00065	0.0034	137
Selenium	mg/L	Normal	0.019	0.01	0.036	20	Lognormal	0.018	0.015	0.091	137

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Boundary Pit Wall Runoff					Wight Pit Wall Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Silicon	mg/L	Normal	3.6	0.99	4.7	20	Normal	6.4	1.1	9.7	137
Silver	mg/L	Constant	-	-	0.000005	20	Constant	-	-	0.000005	137
Strontium	mg/L	Normal	2.7	0.91	4.0	20	Lognormal	6.4	3.6	16	137
Thallium	mg/L	Constant	-	-	0.000005	20	Lognormal	0.000013	0.00001	0.000049	137
Tin	mg/L	Constant	-	-	0.00005	20	Constant	-	-	0.00005	137
Titanium	mg/L	Constant	-	-	0.005	20	Constant	-	-	0.005	137
Uranium	mg/L	Normal	0.0041	0.0018	0.0068	20	Lognormal	0.0035	0.0018	0.0073	137
Vanadium	mg/L	Constant	-	-	0.00025	20	Lognormal	0.00056	0.00037	0.002	137
Zinc	mg/L	Constant	-	-	0.0015	20	Delta-lognormal	0.025	0.035	0.12	137

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Springer Pit Wall Runoff					Cariboo Pit Wall Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Normal	742	156	948	58	Normal	748	120	1,090	64
Major Ions											
Calcium	mg/L	Normal	133	28	164	58	Normal	138	24	216	64
Chloride	mg/L	Normal	8.3	3.6	19	58	Normal	5.5	1.7	7.8	64
Fluoride	mg/L	Normal	0.46	0.13	0.67	58	Lognormal	0.41	0.14	0.76	64
Magnesium	mg/L	Normal	25	6.7	33	58	Lognormal	25	8.7	48	64
Potassium	mg/L	Normal	8.6	5.5	20	58	Lognormal	2.3	1.2	6.2	64
Sodium	mg/L	Normal	43	13	64	58	Normal	30	8.2	56	64
Sulphate	mg/L	Normal	440	107	561	58	Normal	408	80	554	64
Nutrients											
Ammonia	mg/L (as N)	Delta-lognormal	0.06	0.082	0.38	58	Lognormal	0.049	1.5	1.7	64
Nitrate	mg/L (as N)	Normal	6.2	2.8	11	58	Lognormal	7.4	9.5	47	64
Nitrite	mg/L (as N)	Normal	0.046	0.026	0.12	58	Delta-lognormal	0.033	0.055	0.21	64
Total Phosphorus	mg/L	Lognormal	0.011	0.011	0.066	58	Delta-lognormal	0.012	0.011	0.046	64

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Springer Pit Wall Runoff					Cariboo Pit Wall Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Dissolved Metals											
Aluminum	mg/L	Delta-lognormal	0.011	0.0074	0.033	58	Normal	0.0045	0.0019	0.0098	64
Antimony	mg/L	Normal	0.0013	0.00037	0.0018	58	Lognormal	0.0017	0.0019	0.007	64
Arsenic	mg/L	Lognormal	0.0014	0.00068	0.0035	58	Lognormal	0.0016	0.00095	0.0048	64
Barium	mg/L	Normal	0.049	0.016	0.094	58	Normal	0.052	0.013	0.074	64
Beryllium	mg/L	Constant	-	-	0.00005	58	Constant	-	-	0.0005	64
Boron	mg/L	Normal	0.14	0.023	0.19	58	Lognormal	0.17	0.13	0.5	64
Cadmium	mg/L	Lognormal	0.000019	0.00003	0.00017	58	Lognormal	0.000044	0.000028	0.00014	64
Chromium	mg/L	Constant	-	-	0.00025	58	Constant	-	-	0.00025	64
Cobalt	mg/L	Lognormal	0.00012	0.00011	0.00061	58	Delta-lognormal	0.0002	0.00011	0.00047	64
Copper	mg/L	Lognormal	0.0075	0.014	0.085	58	Lognormal	0.015	0.018	0.085	64
Iron	mg/L	Constant	-	-	0.015	58	Constant	-	-	0.015	64
Lead	mg/L	Constant	-	-	0.000025	58	Constant	-	-	0.000025	64
Lithium	mg/L	Normal	0.011	0.0048	0.018	58	Normal	0.0069	0.0014	0.0099	64
Manganese	mg/L	Normal	0.032	0.017	0.08	58	Normal	0.057	0.017	0.1	64
Mercury	mg/L	Constant	-	-	0	26	Constant	-	-	0.0000025	16
Molybdenum	mg/L	Normal	0.16	0.03	0.23	58	Normal	0.17	0.045	0.26	64
Nickel	mg/L	Normal	0.00049	0.00024	0.0013	58	Lognormal	0.00047	0.00034	0.0018	64
Selenium	mg/L	Normal	0.035	0.0043	0.047	58	Lognormal	0.056	0.019	0.091	64
Silicon	mg/L	Lognormal	4.6	1.7	8.2	58	Normal	6.7	1.4	10	64
Silver	mg/L	Constant	-	-	0.00001	58	Constant	-	-	0.000005	64
Strontium	mg/L	Normal	1.8	0.76	3.0	58	Normal	1.2	0.26	1.8	64
Thallium	mg/L	Constant	-	-	0.000005	58	Constant	-	-	0.000005	64
Tin	mg/L	Constant	-	-	0.00005	58	Constant	-	-	0.00005	64
Titanium	mg/L	Delta-lognormal	0.015	0.0053	0.022	58	Constant	-	-	0.005	64
Uranium	mg/L	Normal	0.0017	0.00047	0.0031	58	Lognormal	0.003	0.0019	0.0092	64
Vanadium	mg/L	Lognormal	0.0013	0.00094	0.0054	58	Lognormal	0.0019	0.00094	0.0055	64
Zinc	mg/L	Constant	-	-	0.0015	58	Constant	-	-	0.0015	64

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Unsaturated TSF Seepage					TSF Beach, Impoundment and Embankment Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Lognormal	903	146	1,310	107	Normal	890	213	1,430	247
Major Ions											
Calcium	mg/L	Lognormal	150	30	230	96	Normal	139	29	238	243
Chloride	mg/L	Normal	20	4.6	31	113	Normal	19	9.9	40	249
Fluoride	mg/L	Lognormal	0.69	0.15	1.1	81	Normal	0.61	0.18	1.1	241
Magnesium	mg/L	Lognormal	24	5.7	42	96	Normal	21	5.8	34	243
Potassium	mg/L	Normal	12	2.2	16	141	Normal	14	7.1	36	243
Sodium	mg/L	Normal	77	13	106	96	Normal	77	34	136	243
Sulphate	mg/L	Normal	515	94	784	107	Normal	530	132	868	249
Nutrients											
Ammonia	mg/L (as N)	Lognormal	0.026	0.042	0.4	107	Delta-lognormal	0.082	0.16	0.7	247
Nitrate	mg/L (as N)	Lognormal	1.9	3.5	22	107	Normal	4.0	2.9	13	247
Nitrite	mg/L (as N)	Delta-lognormal	0.031	0.061	0.22	149	Normal	0.11	0.085	0.34	247
Total Phosphorus	mg/L	Normal	0.024	0.012	0.061	109	Lognormal	0.017	0.016	0.12	247
Dissolved Metals											
Aluminum	mg/L	Delta-lognormal	0.0033	0.0012	0.0077	141	Lognormal	0.026	0.015	0.09	243
Antimony	mg/L	Lognormal	0.00034	0.00016	0.001	141	Normal	0.0015	0.00094	0.0041	243
Arsenic	mg/L	Normal	0.0017	0.0003	0.0024	141	Delta-lognormal	0.0014	0.00068	0.0031	243
Barium	mg/L	Normal	0.053	0.018	0.09	96	Lognormal	0.05	0.021	0.12	243
Beryllium	mg/L	Constant	-	-	0.000025	141	Constant	-	-	0.00005	243
Boron	mg/L	Normal	0.13	0.019	0.17	141	Normal	0.11	0.036	0.2	243
Cadmium	mg/L	Lognormal	0.000049	0.000084	0.0005	141	Lognormal	0.000026	0.000026	0.00019	242
Chromium	mg/L	Constant	-	-	0.0001	141	Constant	-	-	0.00025	243
Cobalt	mg/L	Delta-lognormal	0.00029	0.00013	0.00046	141	Lognormal	0.000086	0.000094	0.00048	243
Copper	mg/L	Lognormal	0.0023	0.0053	0.029	141	Lognormal	0.0039	0.025	0.12	243
Iron	mg/L	Constant	-	-	0.0025	141	Constant	-	-	0.005	243
Lead	mg/L	Constant	-	-	0.00001	141	Constant	-	-	0.000025	243
Lithium	mg/L	Normal	0.0061	0.002	0.012	141	Delta-lognormal	0.011	0.0065	0.027	243
Manganese	mg/L	Normal	0.22	0.17	0.76	96	Lognormal	0.029	0.046	0.36	243
Mercury	mg/L	Constant	-	-	0	0	Constant	-	-	0	8.0
Molybdenum	mg/L	Lognormal	0.17	0.059	0.38	141	Normal	0.18	0.045	0.27	243
Nickel	mg/L	Delta-lognormal	0.00075	0.00018	0.0011	141	Lognormal	0.00052	0.00071	0.0039	243
Selenium	mg/L	Lognormal	0.012	0.019	0.12	96	Normal	0.028	0.007	0.045	243

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Unsaturated TSF Seepage					TSF Beach, Impoundment and Embankment Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Silicon	mg/L	Normal	6.2	0.86	7.6	96	Lognormal	3.9	1.4	7.5	243
Silver	mg/L	Constant	-	-	0.000005	141	Constant	-	-	0.000005	243
Strontium	mg/L	Normal	1.9	0.84	4.3	141	Normal	1.6	0.36	2.6	243
Thallium	mg/L	Constant	-	-	0.000005	141	Constant	-	-	0.000005	243
Tin	mg/L	Constant	-	-	0.000025	141	Constant	-	-	0.00005	243
Titanium	mg/L	Constant	-	-	0.005	96	Constant	-	-	0.0003	243
Uranium	mg/L	Lognormal	0.0015	0.0005	0.0034	96	Normal	0.0011	0.00042	0.002	243
Vanadium	mg/L	Lognormal	0.00056	0.0003	0.0018	96	Lognormal	0.0013	0.0016	0.01	243
Zinc	mg/L	Delta-lognormal	0.0028	0.0015	0.01	141	Delta-lognormal	0.0045	0.0012	0.007	243

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Disturbed Runoff					Undisturbed Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters											
Total Dissolved Solids	mg/L	Delta-lognormal	174	70	1,880	322	Normal	170	70	499	233
Major Ions											
Calcium	mg/L	Delta-lognormal	33	20	378	312	Normal	29	14	52	220
Chloride	mg/L	Lognormal	0.54	0.76	9.0	322	Delta-lognormal	3.3	2.3	12	165
Fluoride	mg/L	Lognormal	0.069	0.018	0.17	318	Lognormal	0.07	0.04	0.24	111
Magnesium	mg/L	Delta-lognormal	5.6	2.8	53	312	Normal	13	7.5	24	220
Potassium	mg/L	Normal	0.63	0.28	1.5	312	Normal	0.96	0.3	1.8	220
Sodium	mg/L	Delta-lognormal	3.6	1.9	29	312	Normal	6.6	3.1	12	220
Sulphate	mg/L	Lognormal	23	24	1100	322	Delta-lognormal	6.4	5.9	38	234
Nutrients											
Ammonia	mg/L (as N)	Delta-lognormal	0.0077	0.0023	0.016	321	Delta-lognormal	0.0083	0.0036	0.017	234
Nitrate	mg/L (as N)	Lognormal	0.039	1.8	11	322	Lognormal	0.038	0.12	1.5	219
Nitrite	mg/L (as N)	Delta-lognormal	0.0031	0.003	0.017	321	Delta-lognormal	0.002	0.003	0.005	226
Total Phosphorus	mg/L	Normal	0.016	0.0052	0.032	322	Normal	0.023	0.0069	0.041	237

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Disturbed Runoff					Undisturbed Runoff				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples	Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Dissolved Metals											
Aluminum	mg/L	Lognormal	0.02	0.088	0.82	312	Delta-lognormal	0.046	0.059	0.44	219
Antimony	mg/L	Lognormal	0.000062	0.000011	0.0076	312	Constant	-	-	0.000025	220
Arsenic	mg/L	Delta-lognormal	0.0003	0.000068	0.00055	312	Normal	0.00088	0.00045	0.0021	220
Barium	mg/L	Normal	0.016	0.0057	0.033	312	Normal	0.0093	0.0022	0.016	220
Beryllium	mg/L	Constant	-	-	0.00005	312	Constant	-	-	0.000025	220
Boron	mg/L	Normal	0.026	0.012	0.061	312	Normal	0.017	0.0074	0.041	220
Cadmium	mg/L	Lognormal	0.000006	0.0000045	0.00008	312	Lognormal	0.000008	0.0000092	0.000066	220
Chromium	mg/L	Delta-lognormal	0.00058	0.00024	0.0019	312	Normal	0.00078	0.00029	0.0016	220
Cobalt	mg/L	Delta-lognormal	0.00019	0.0001	0.0006	312	Lognormal	0.000056	0.000034	0.00028	220
Copper	mg/L	Delta-lognormal	0.0061	0.0031	0.017	312	Normal	0.0023	0.0017	0.0071	220
Iron	mg/L	Delta-lognormal	0.097	0.073	0.33	312	Lognormal	0.086	0.075	0.79	220
Lead	mg/L	Delta-lognormal	0.000079	0.000021	0.00015	312	Lognormal	0.000031	0.000051	0.00063	220
Lithium	mg/L	Lognormal	0.00054	0.00013	0.015	312	Normal	0.00085	0.00051	0.002	220
Manganese	mg/L	Lognormal	0.0043	0.012	0.092	312	Lognormal	0.0067	0.0067	0.05	220
Mercury	mg/L	Constant	-	-	0	0	Constant	-	-	0	0
Molybdenum	mg/L	Lognormal	0.0041	0.0029	0.18	312	Normal	0.0017	0.0012	0.0056	220
Nickel	mg/L	Delta-lognormal	0.00076	0.00028	0.002	312	Normal	0.00079	0.00055	0.0026	220
Selenium	mg/L	Lognormal	0.00096	0.0084	0.082	311	Delta-lognormal	0.00025	0.00025	0.0014	220
Silicon	mg/L	Normal	5.6	1.0	7.4	312	Normal	6.0	1.7	9.3	220
Silver	mg/L	Delta-lognormal	0.000015	0.0000032	0.000032	312	Delta-lognormal	0.000015	0.0000048	0.000043	220
Strontium	mg/L	Delta-lognormal	0.19	0.081	0.51	311	Lognormal	0.21	0.15	0.78	220
Thallium	mg/L	Constant	-	-	0.000005	312	Constant	-	-	0.000005	220
Tin	mg/L	Constant	-	-	0.000005	312	Constant	-	-	0.000025	220
Titanium	mg/L	Constant	-	-	0.000005	312	Normal	0.0019	0.00062	0.0028	220
Uranium	mg/L	Lognormal	0.00018	0.00012	0.0056	312	Normal	0.00054	0.00038	0.0016	220
Vanadium	mg/L	Delta-lognormal	0.00073	0.00023	0.0015	312	Lognormal	0.00056	0.00025	0.0025	220
Zinc	mg/L	Lognormal	0.0052	0.0078	0.042	312	Delta-lognormal	0.0022	0.0012	0.0076	220

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Groundwater Inflow to Springer-Cariboo Pit				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Physical Parameters						
Total Dissolved Solids	mg/L	Normal	213	131	639	346
Major Ions						
Calcium	mg/L	Normal	48	30	150	346
Chloride	mg/L	Lognormal	1.8	7.0	43	346
Fluoride	mg/L	Normal	0.27	0.13	0.51	346
Magnesium	mg/L	Lognormal	6.2	8.1	60	345
Potassium	mg/L	Delta-lognormal	0.45	0.24	1.9	346
Sodium	mg/L	Normal	20	12	70	346
Sulphate	mg/L	Normal	85	66	341	318
Nutrients						
Ammonia	mg/L (as N)	Delta-lognormal	0.018	0.004	0.1	345
Nitrate	mg/L (as N)	Delta-lognormal	0.26	0.52	2.1	346
Nitrite	mg/L (as N)	Delta-lognormal	0.009	0.0096	0.036	346
Total Phosphorus	mg/L	Lognormal	0.015	0.0049	0.054	346
Dissolved Metals						
Aluminum	mg/L	Lognormal	0.0024	0.0016	0.028	345
Antimony	mg/L	Lognormal	0.000065	0.000085	0.00087	345
Arsenic	mg/L	Normal	0.0024	0.0015	0.0077	345
Barium	mg/L	Lognormal	0.018	0.019	0.12	345
Beryllium	mg/L	Constant	-	-	0.00005	346
Boron	mg/L	Normal	0.25	0.15	0.57	346
Cadmium	mg/L	Lognormal	0.0000063	0.0000055	0.000043	346
Chromium	mg/L	Delta-lognormal	0.00079	0.000098	0.0012	346
Cobalt	mg/L	Delta-lognormal	0.00022	0.000026	0.0006	346
Copper	mg/L	Lognormal	0.00038	0.00036	0.0031	346
Iron	mg/L	Delta-lognormal	0.16	0.019	0.33	346
Lead	mg/L	Constant	-	-	0.000025	346
Lithium	mg/L	Normal	0.0032	0.0011	0.0065	346
Manganese	mg/L	Delta-lognormal	0.018	0.071	0.79	346
Mercury	mg/L	Constant	-	-	0.0000025	3.0
Molybdenum	mg/L	Normal	0.033	0.015	0.077	346
Nickel	mg/L	Lognormal	0.00033	0.00039	0.0058	346
Selenium	mg/L	Lognormal	0.00024	0.0043	0.045	346
Silicon	mg/L	Lognormal	8.0	0.97	14	346
Silver	mg/L	Constant	-	-	0.000005	346
Strontium	mg/L	Lognormal	0.15	0.18	1.3	345
Thallium	mg/L	Constant	-	-	0.000005	346
Tin	mg/L	Delta-lognormal	0.00019	0.000025	0.00046	346
Titanium	mg/L	Constant	-	-	0.005	346

Table 8: Summary of Stochastic Water Quality Inputs (Continued)

Parameter	Units	Groundwater Inflow to Springer-Cariboo Pit				
		Distribution Selected	Mean	Standard Deviation	Maximum	Number of Samples
Uranium	mg/L	Delta-lognormal	0.00028	0.00036	0.0024	346
Vanadium	mg/L	Lognormal	0.00046	0.00085	0.011	346
Zinc	mg/L	Lognormal	0.0022	0.0039	0.051	346

Note: Standard deviation calculated as $\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{n}}$ where σ = standard deviation; x_i = individual sample from distribution dataset; μ = mean of dataset distribution; n = number of samples from distribution dataset.

2.6.3.1 Development of Water Quality Inputs

The following standardized process was used to develop a statistical distribution for each parameter (Table 8):

- Step 1: Determine if data are available and if values are less than the method detection limit (MDL). Except for special cases listed below under Step 5, values below the MDL were set equal to half of the MDL.
- Step 2: Examine time-series of available data to select the most representative range of data to use for input:
  - The following general rules were used to select the data used for input to the model:
    - Where no trend was apparent in the monitoring data over time, the whole data set was used as input to the model.
    - Where a decreasing trend was observed in the monitoring data, the whole data set was used, including the earlier, higher values, thereby adding conservatism and representing a potential return to conditions that led to higher concentrations (without specifying what those conditions were).
    - Where an increasing trend was observed in the monitoring data, input data were limited to the range of data most representative of current or recent conditions.
- Step 3: Remove outliers from selected data:
  - Three statistical tests were used to identify outliers. These included the three times standard deviation (3σ) rule, the Hampel identifier, and combined Rosner-Dixon test. A data point was considered an outlier only if it was flagged by all three tests. By using multiple tests, the possibility of misdiagnoses was reduced (Beckman and Cook 1983; Jain 1981; Kottegoda 1984; Pearson 2001).
- Step 4: Fit suitable statistical distributions to the resulting data:
  - The probability distributions considered for the water quality data were normal, lognormal, or delta-lognormal, as these are typical distributions for water quality data (AEP 1995; US EPA 1991). To identify which distribution best described a constituent, all three distributions were initially fitted to the available data. Statistical goodness of fit tests, consisting of the Chi-squared test, the Kolmogorov-Smirnov test and the squared correlation coefficient (Sokal and Rohlf 1981) were used to determine which distribution was most appropriate.
- Step 5: Process data with a single value:
  - Where all data were at a single value a constant input was used equal to this value.
  - Where all data were below the MDL, a constant input was used at half the MDL.

  - Where dissolved mercury data were not available for a location, a constant input was used equal to half the lowest detection limit measured on site, consistent with other locations.

- Step 6: Determine the minimum and maximum bounds to define a reasonable range for the selected distribution:
  - When possible, the maximum observed value was used as the maximum bound of all distributions. In cases where the maximum observed value was too low to result in a fitted distribution, the lowest maximum value acceptable for a fitted distribution was used as the maximum bound. The maximum is considered reasonable because there is a large dataset of mine water chemistry and parameter concentrations in drainage water are not expected to increase significantly from the period of observed data to closure.

The minimum value of a distribution was set to zero for the normal distribution, a value very close to zero (e.g., 0.00000001) for the lognormal distribution, or half the detection limit for the delta-lognormal distribution.

2.6.4 Geochemical Source Terms

Water quality inputs derived from geochemical source terms developed by SRK Consulting Canada were applied to the SWWQM as an additional scenario in the 2016 Long Term Water Management Plan (Golder 2016). Updates to these geochemical source terms were completed by SRK consulting in 2023 (SRK 2023) and were recently updated again in March 2025 (SRK 2025). WSP recently completed a model sensitivity using the geochemical source terms developed by SRK and the water quality model from the 2023 WMP (WSP 2025e). Results from that sensitivity indicate that some metals, including copper, may have divergence in their long-term concentration trend compared to the results presented in this report. The 2026 WMP will also include a summary of the 2025 SRK geochemical source term SWWQM results and treatment impacts. Although preliminary, the 2025 WMP for the TSF raise to 987 m does discuss some predicted long-term pit water quality trends using the 2023 SRK geochemical source terms, as well as potential treatment mitigations (Section 4.6 of the WMP).

2.6.5 Initial Water Quality

Concentrations in ponds, sumps, and pits at the beginning of the calibration period are based on monitoring data in January 2017. Concentrations in ponds, sumps, and pits at the beginning of the future operations period are based on the most recent monitoring data available in each location as of December 2024.

2.7 Model Assumptions

Assumptions that have been made in the SWWQM are:

- The input water qualities used in the SWWQM are representative of their respective input sources and will continue to be representative over the modelled timeframe. Water quality data for model inputs were selected from available lab testing and field monitoring, augmented by professional judgement where necessary.
- Concentrations of parameters from monitoring data that were lower than the analytical detection limit were set equal to half the detection limit.
- Concentrations of parameters in direct precipitation onto the water surface of water management facilities were assumed to be zero. No mass was removed or added to modelled systems through evaporation or direct precipitation. These processes affected water quantity only and did not affect mass of modelled parameters in the system.

- All open pits, ponds, and sumps are fully mixed systems. No stratification is considered over the modelled timeframe. All inputs are mixed with existing water volumes to calculate concentrations of parameters.
- All parameters are assumed to behave conservatively. That is, they are assumed to not settle, precipitate, sorb, degrade, or undergo any other process that would reduce concentrations. This assumption is likely to have negligible effects on major ion predictions but may lead to over-estimation of some nutrients and metals.
- All PAG waste rock will be disposed sub-aqueously in the Springer-Cariboo Pit at closure to mitigate onset of acid generation. Acid generation is not expected to occur prior to subaqueous disposal, and disposal in the Springer-Cariboo Pit Lake will prevent acid onset in the future by limiting oxidation in the waste rock. Geochemical characterization studies estimate the time to the onset of acid generation varies between decades and 100 years (MPMC 2022).
- The combined Springer-Cariboo Pit is assumed to be empty at the start of closure.
- Rock disposal sites are assumed to be reclaimed in post-closure. Following revegetation, the runoff from these facilities is assumed to return to undisturbed runoff quality over the course of ten years.
- Diffusive flux from the submerged PAG waste rock into the Springer-Cariboo Pit Lake water was not modelled.
- Accumulation and flushing of oxidation products from weathered PAG material prior to subaqueous disposal was not modelled.
- Ice formation and melting were not considered in pits, ponds, and ditches that retain water.

3.0 MODEL CALIBRATION

The SWWQM was set up to hindcast concentrations from January 1, 2017, to December 31, 2024, at seven locations:

- Springer Pit
- Cariboo Pit
- Wight Pit
- CCS
- PETBP
- TSF
- NW Sump

Where discrepancies between model results and monitoring data existed, the model was adjusted to better reflect monitoring data. The same adjustments, made during calibration of the SWWQM in the 2020 Water Management Plan (Golder 2020) and during the calibration of the SWWQM in the 2023 Water Management Plan (WSP 2024), were maintained in this update to achieve calibration with monitoring data:

- Adjusting the proportion of Wight Pit runoff and groundwater inflows that are assigned a waste rock contact water input based on storage of waste rock in the pit.
- Adjusting the proportion of runoff from waste rock that is assigned an undisturbed water quality input.
- In the TSF, applying calibration factors greater than 1.0 to improve the model calibration for chloride, fluoride, potassium, sodium, nitrite, dissolved antimony, dissolved arsenic, dissolved barium, dissolved lithium, dissolved molybdenum, and dissolved vanadium. These calibration factors are applied during periods when tailings are deposited to the TSF.

3.1 Calibration Results

Model calibration results are shown compared to monitoring data in Figures 4 to 10 (model calibration results for all parameters and locations are provided in Appendix A). Monitoring data were generally between the projected 5^{th} and 95^{th} percentile model calibration results for all parameters during the calibration period with the following exceptions:

- Several parameters (e.g., dissolved copper) were underpredicted during periods in 2018, 2020 and 2021 (Figure 4, Figure 5, Figure 7, Figure 8 and Figure 9). The source of the increased concentrations in the monitoring data for these parameters is thought to be due to the discharge of leachate to the TSF from the onsite test heap leach facility (Golder 2022b). These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process.

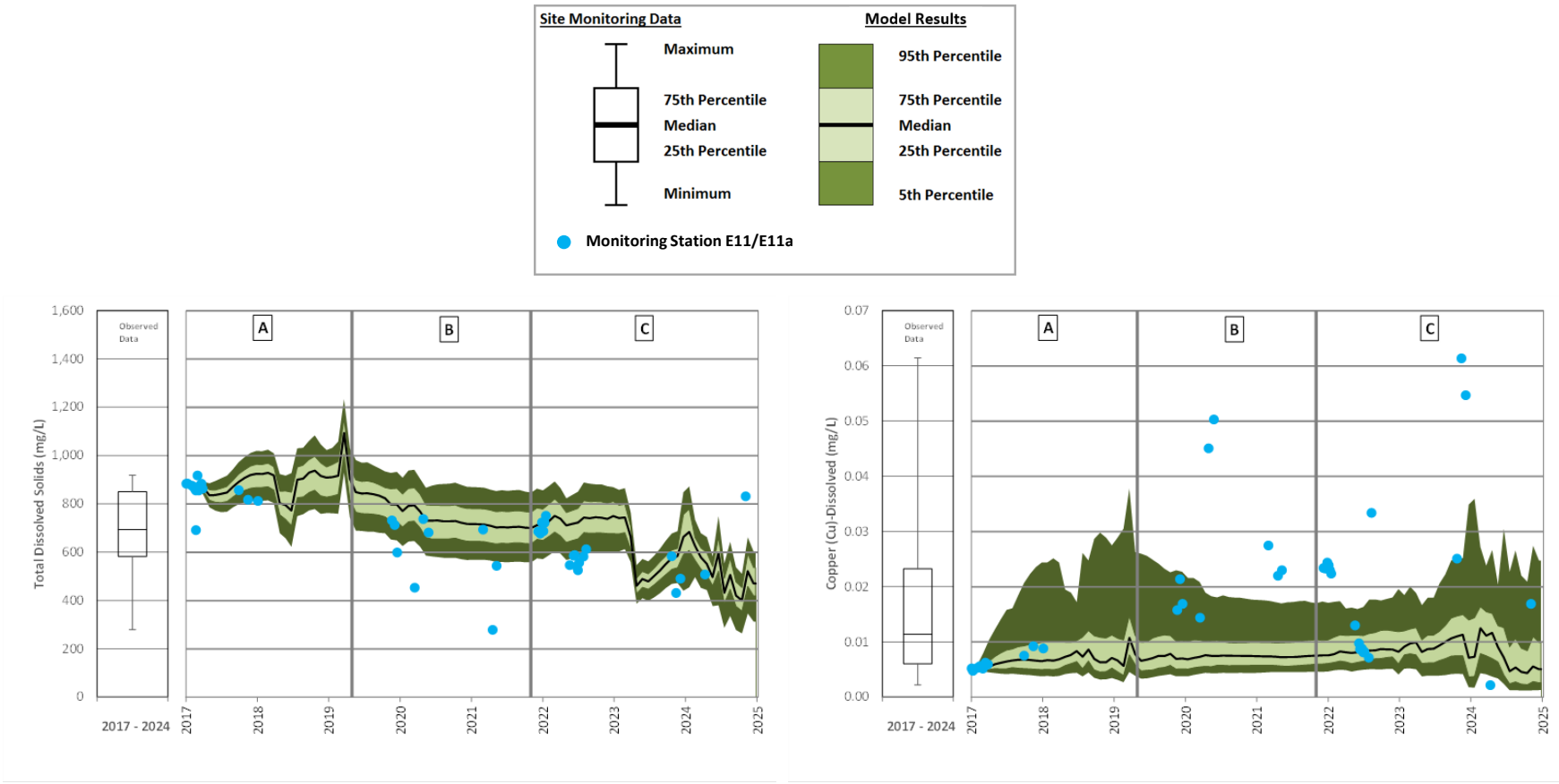
- Several parameters (e.g., total dissolved solids) were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for these parameters is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Where monitoring data fell within the 5th and 95th percentile model calibration results, the model was considered to be in good agreement with monitoring data. The good agreement indicates that model inputs were well characterized and that these parameters had low sensitivity to assumptions or model conditions not matching site conditions.

Where monitoring data were consistently below the 5th percentile predictions, the model was considered to be over predicting concentrations. Possible reasons why the model may be over-predicting concentrations are:

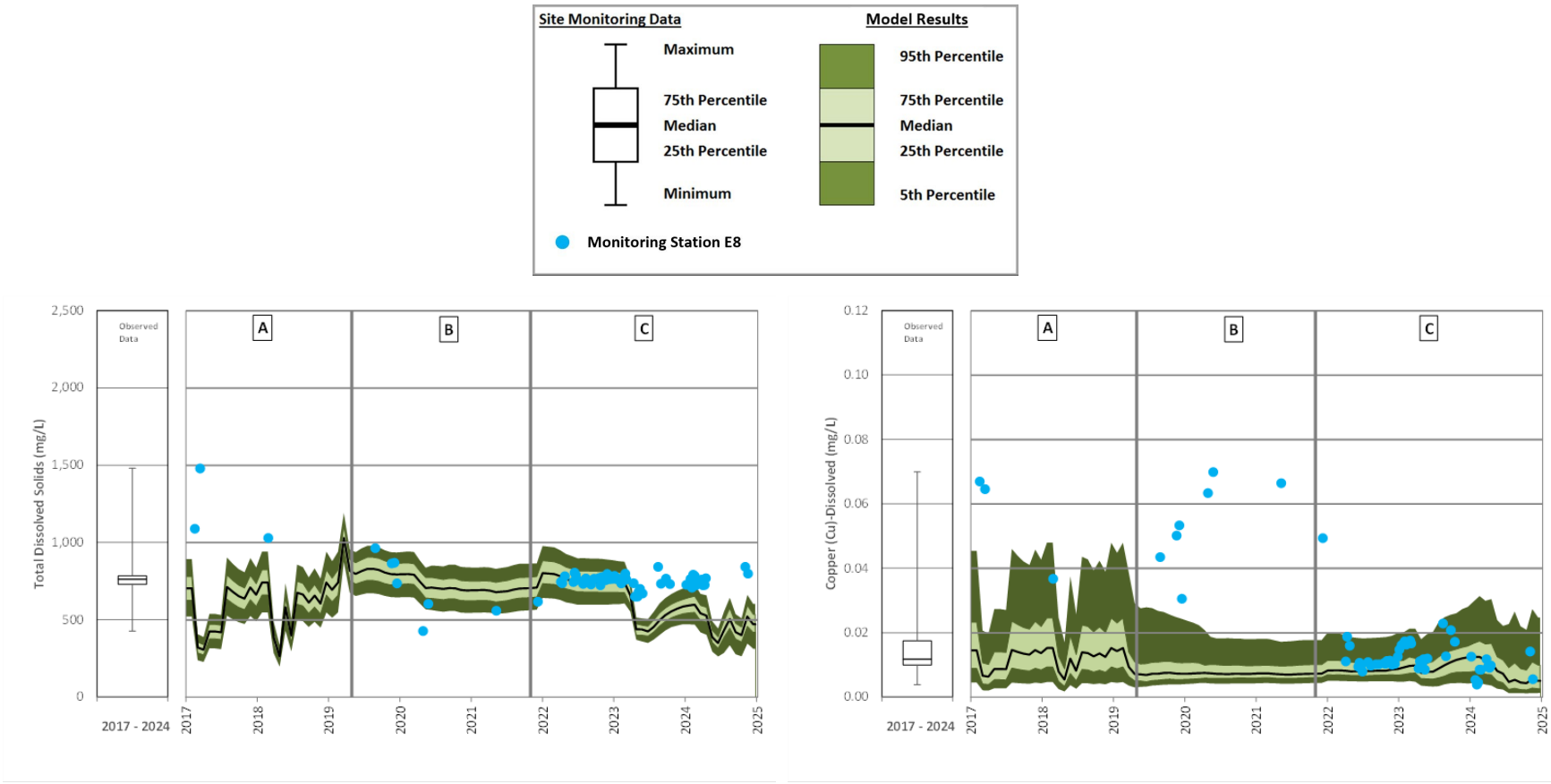
- The model was developed to predict water quality conservatively; where uncertainty exists in model inputs, the inputs are selected such that under-prediction would be minimized. Thus, over-prediction is generally expected. For example, seepage from RDSs was assigned a NAG water quality for the entire model simulation period, which is a conservative assumption.
- Metal concentrations that are far below detection limits may be skewed upward by model inputs where half-detection limits were applied.
- Settling of particulate material is not accounted for in the model.
- Geochemical processes, such as precipitation and adsorption, are not accounted for in the model.

Although these factors may lead to over-prediction of concentrations, the model is considered valid for the purpose of predicting concentrations of parameters on the mine site and in the influent to the WTP because deviations in model predictions from monitoring data in this category tend toward additional environmental protection.



A = Operations; B = Care and Maintenance; C = Resumed Operations

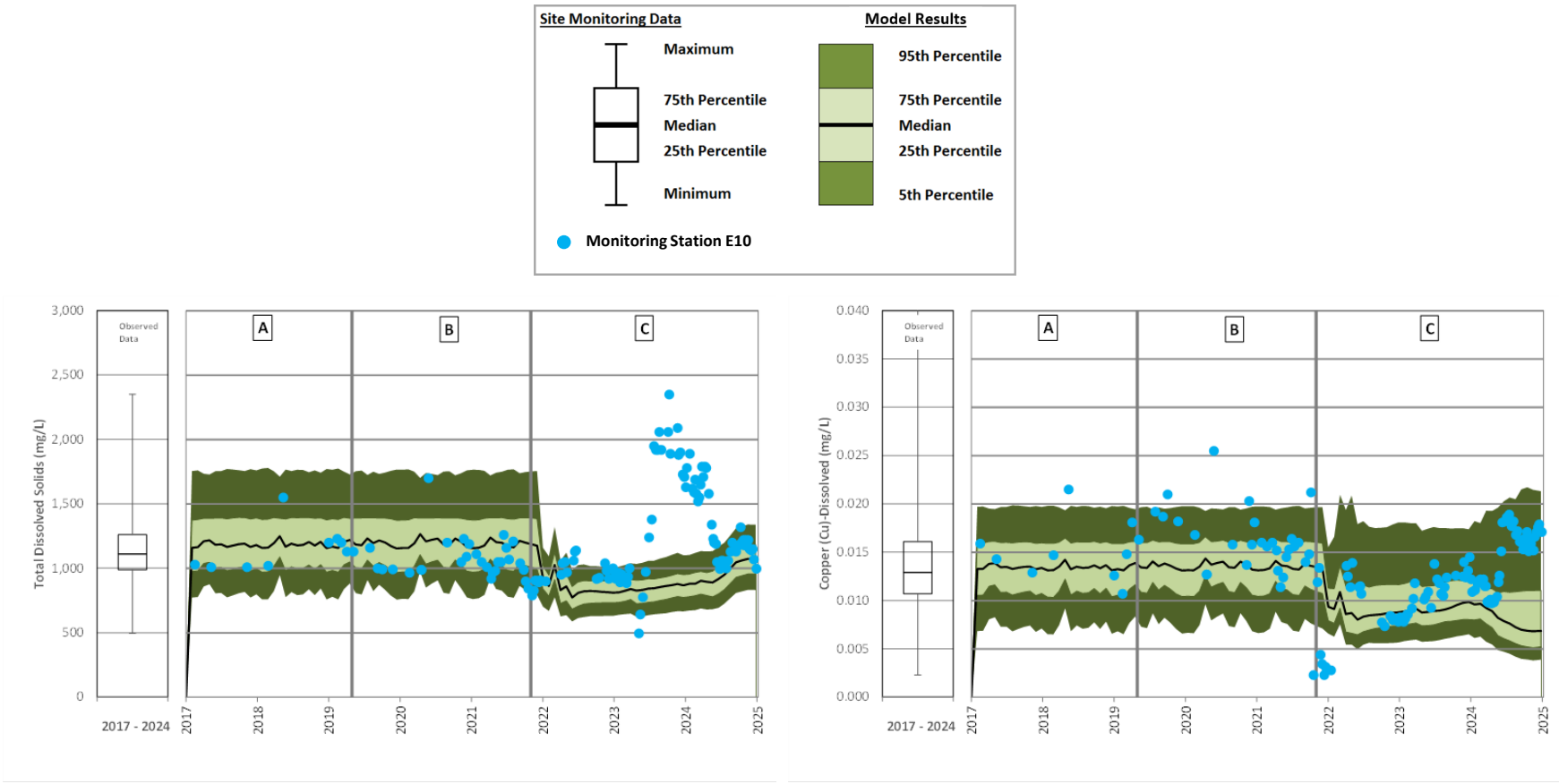
Figure 4: Springer Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Note: Cariboo Pit is a flow-through system from the beginning of the model simulation to March 2019, which results in a wide range in predicted concentrations. After March 2019, Cariboo Pit stores water, which reduces the range in predicted concentrations. The source of increased copper concentrations in 2019, 2020 and 2021 monitoring data is due to the discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to Cariboo Pit. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022b).

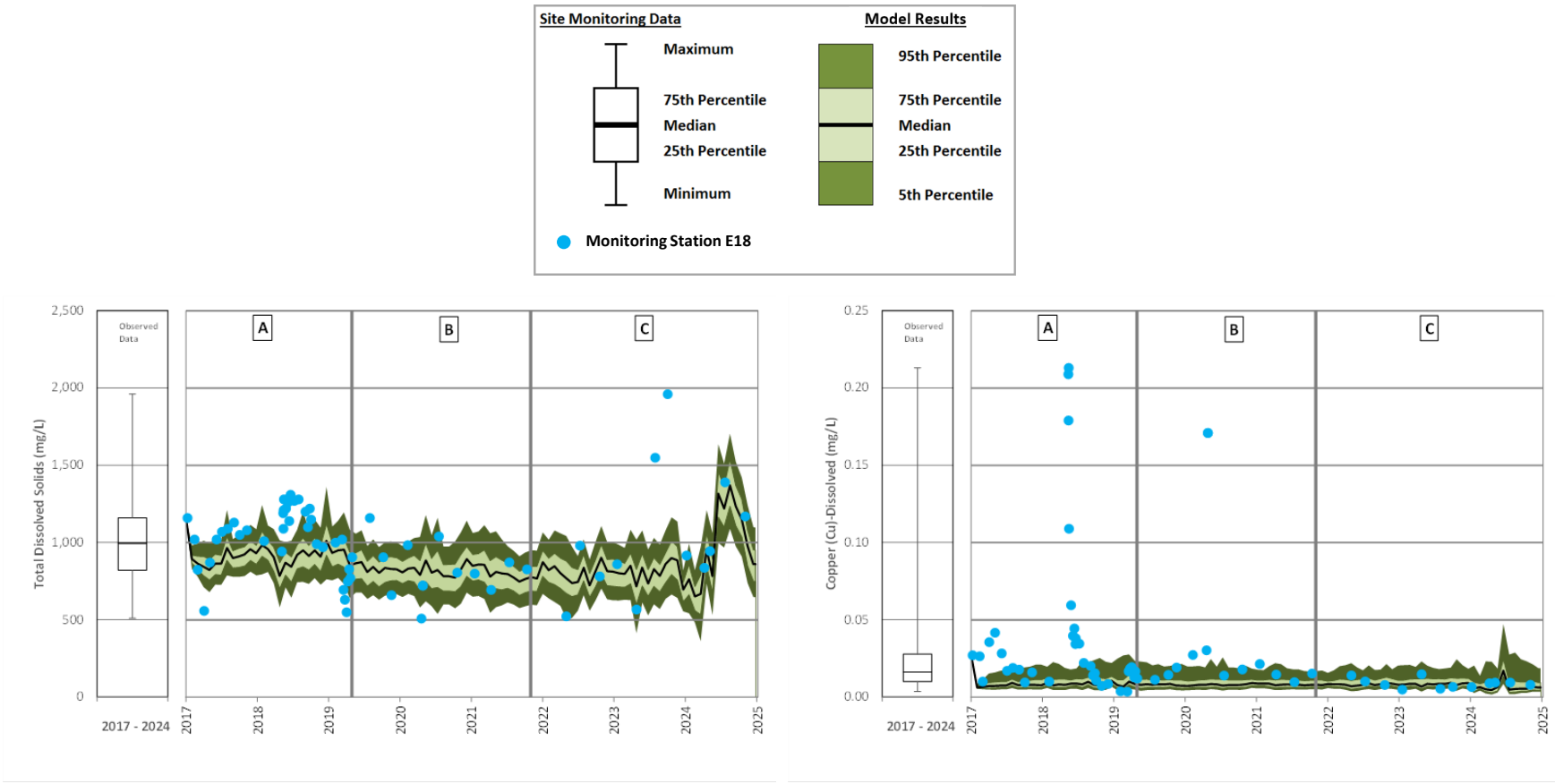
Figure 5: Cariboo Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Note: Total dissolved solids were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for total dissolved solids is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

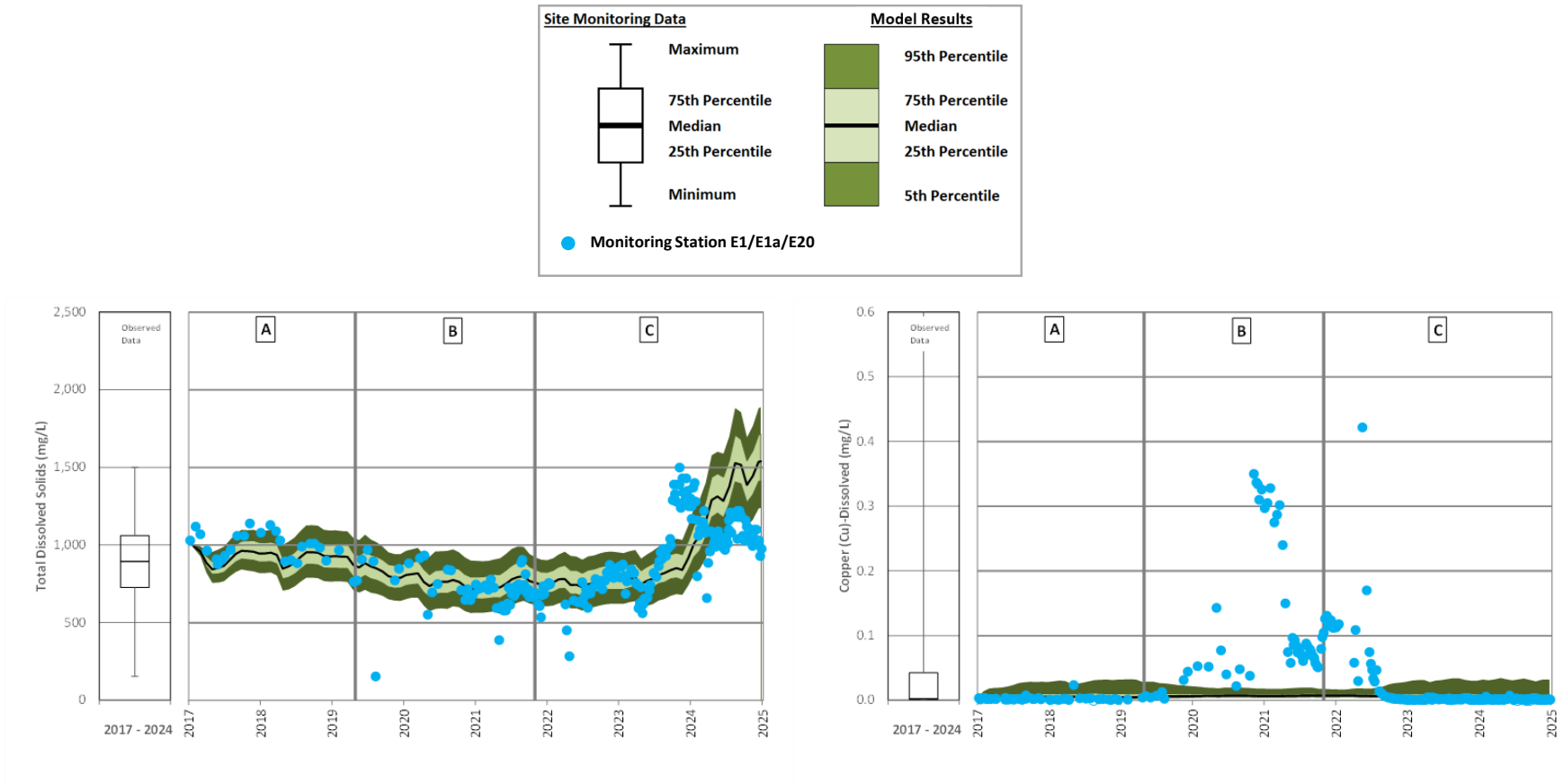
Figure 6: Wight Pit Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Note: The source of increased dissolved copper concentrations in the Central Collection Sump 2018 monitoring data is due to discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to the CCS. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022b).

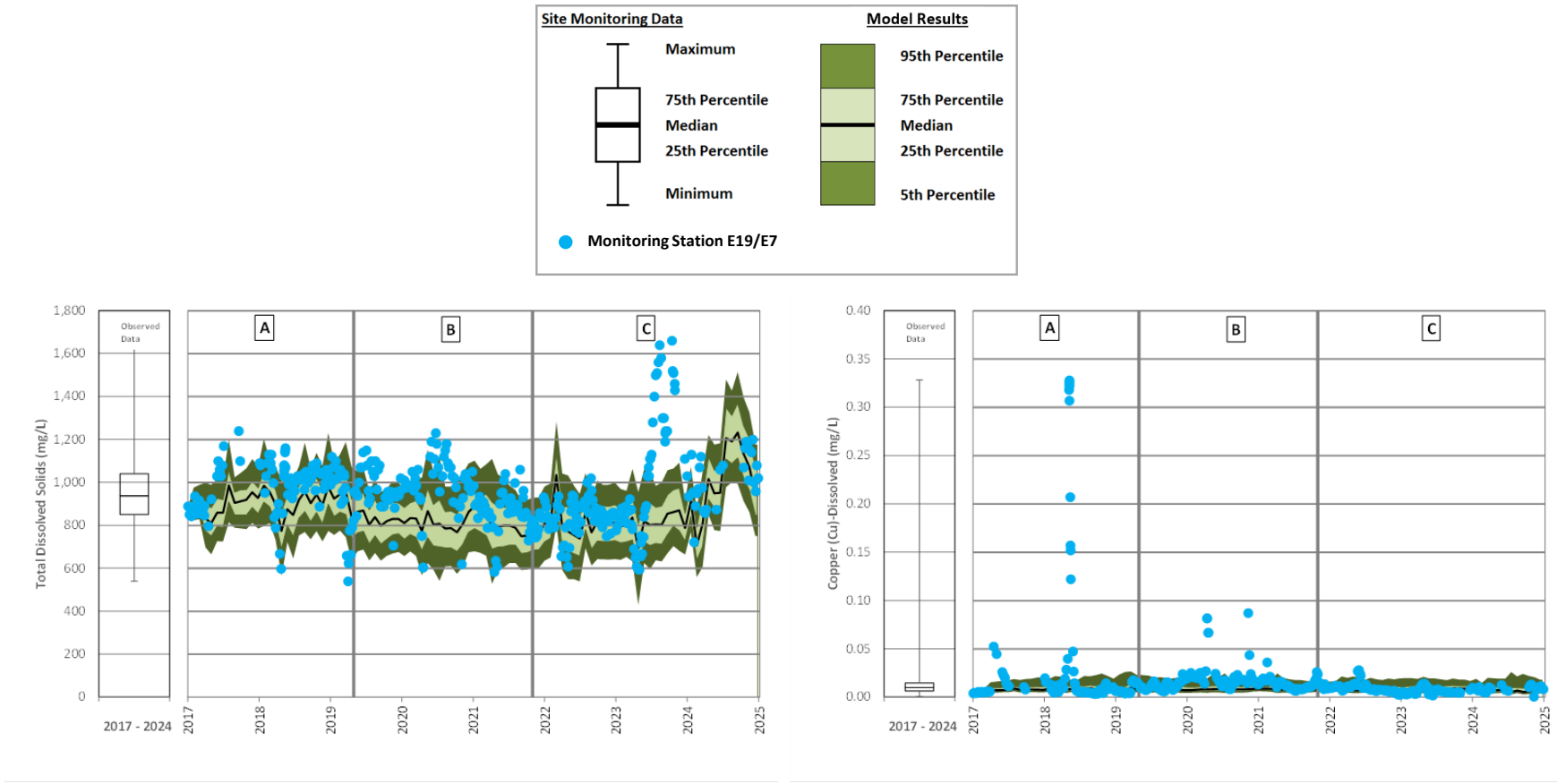
Figure 7: Central Collection Sump Calibration – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Note: The source of increased copper concentrations in 2018 and from 2020 to 2022 in the monitoring data of the Tailings Storage Facility (TSF) is due to the discharge of leachate to the TSF from the onsite test heap leach facility. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022b).

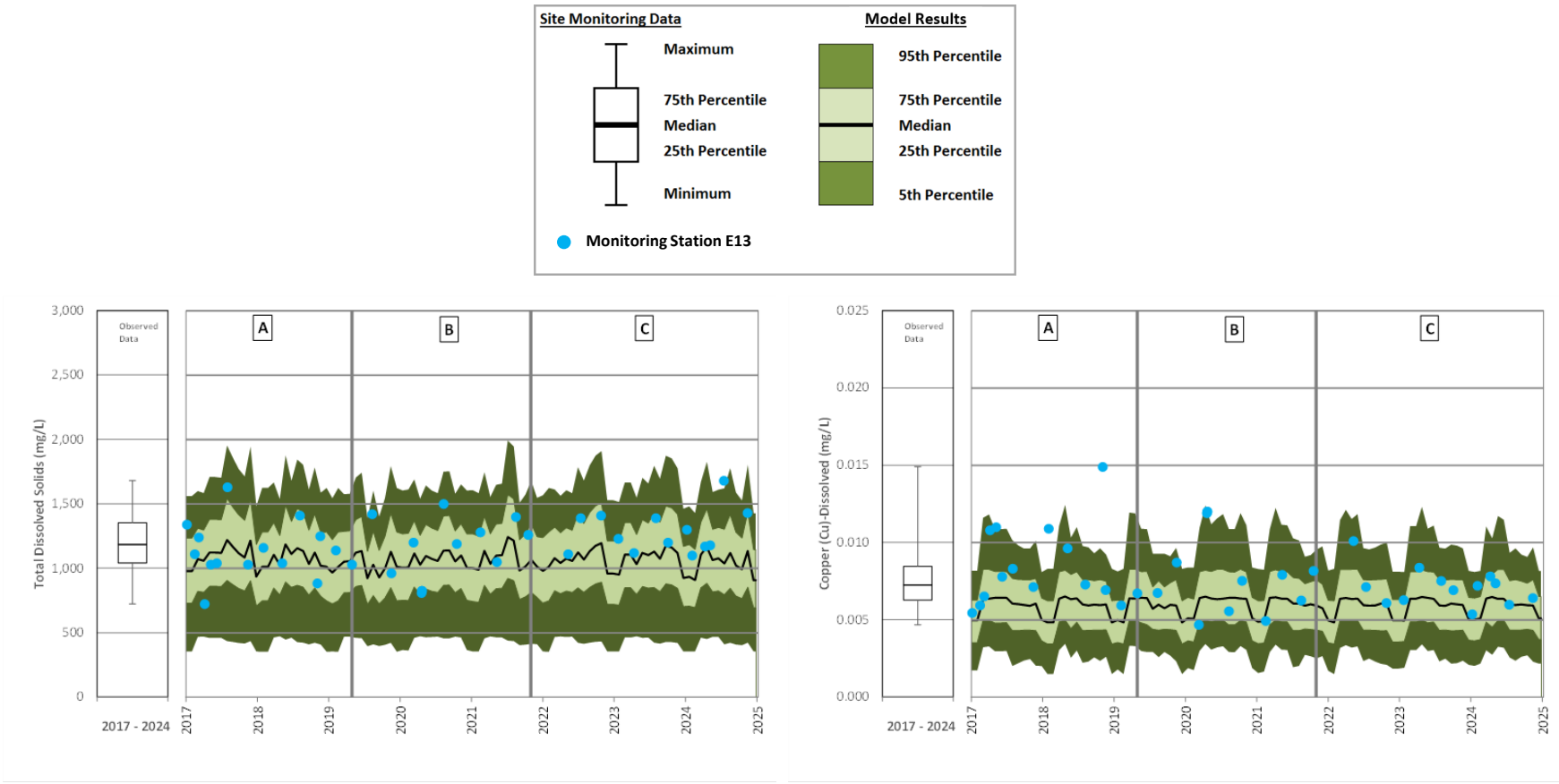
Figure 8: Tailings Storage Facility Supernatant Pond – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Note: The source of increased dissolved copper concentrations in the Perimeter Embankment Till Borrow Pond 2018 monitoring data is due to discharge of leachate from the onsite test heap leach facility to the TSF, which is then pumped to the PETBP. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process (Golder 2022b). Total dissolved solids were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for total dissolved solids is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure 9: Perimeter Embankment Till Borrow Pond – Total Dissolved Solids and Dissolved Copper



A = Operations; B = Care and Maintenance; C = Resumed Operations

Figure 10: Northwest Sump – Total Dissolved Solids and Dissolved Copper

4.0 MODEL RESULTS

After the model calibration was completed, model simulations were performed for the following periods:

- Operations (January 1, 2025, to July 31, 2031)
- Closure (August 1, 2031, to July 31, 2041)
- Post-closure (August 1, 2041, to July 31, 2131)

The following sections present predicted discharge concentrations for the PETBP in operations, which represents predicted WTP influent concentrations, and each of the nine discharge locations in closure and post-closure that discharge to receiving environments (Section 2.4):

- PETBP
- 9 km Sump
- NW Sump
- Springer-Cariboo Pit Sump
- MDCS
- Wight Pit
- Long Ditch
- SESCP
- MESCP

Maximum of median and 95th percentile predicted concentrations are presented for all modelled parameters. Time series of predicted dissolved concentrations are presented for parameters with permit limits. Time series plots of predicted concentrations for all modeled parameters are presented in Appendix B. Time series predictions are also compared to historical observed data for each facility in the model as a quality control check.

4.1 Perimeter Embankment Till Borrow Pond

During operations, closure and the first ten years of post-closure (early post-closure), the PETBP is the influent water to the WTP, which discharges to Quesnel Lake. Maximum of the daily median and maximum of the daily 95th percentile concentrations in the PETBP are presented in Table 9. Predicted total concentrations in the PETBP are based on a TSS concentration of 15 mg/L during operations and closure and 3 mg/L during post-closure. Time series for predicted concentrations in the PETBP are presented for parameters with permit limits in Figures 11 to 16.

In general, concentrations in the PETBP are predicted to remain relatively consistent during operations until the end of pumping from the mill processing plant in 2031. This consistency is due to the assumption that the entire surface areas of the RDS are accounted for at the beginning of the model simulation. Therefore, the runoff and seepage assumptions for the RDS do not change. Changes in predicted concentrations in the PETBP are due to:

- Variable flows from the CCS and MESCP to the PETBP.

- Changes in tailings beach area. Runoff from the tailings beach area flows into the TSF. Seepage from the TSF reaches the PETBP.
- Surface runoff at the mine site causes fluctuations in concentrations depending on the proportions of the catchment areas flowing into the facilities (e.g., RDS areas, disturbed areas, undisturbed areas). Parameter concentrations reach steady-state during the winter months because surface runoff is low.

Discharge from the PETBP, through the WTP, and to Quesnel Lake, will continue through closure and post-closure until remediation or treatment allows local discharge to Hazeltine Creek (pre-mining catchment discharge). During closure, the PETBP receives contact water from the entire Site except from Springer-Cariboo pit (which is allowed to fill during closure). During post-closure, the PETBP receives overflow and seepage from the TSF, pumped flows from the SESCP and MESCP, as well as runoff from catchment areas of the PETBP, TSF, and CCS. At long-term post-closure (2051), the SESCP and MESCP catchments are considered non-contact water and the PETBP only receives gravity overflow and seepage from the TSF, as well as runoff from the catchment areas of the PETBP, TSF, and CCS. PETBP water treatment requirements will continue into closure and post-closure until permitted otherwise.

Predicted concentrations in the PETBP change from operations to closure and into early post-closure because of the staggered reclamation of areas which are then assigned an undisturbed water quality once the areas are reclaimed. As more areas are reclaimed on the mine site, undisturbed runoff water quality is assigned to more inflows to the PETBP. In closure and post-closure, concentrations in the PETBP follow two patterns:

1) Decrease from operations because the statistical distributions assigned to undisturbed runoff water quality have lower concentrations than the statistical distributions assigned to the TSF beach runoff and the NAG waste rock runoff quality (e.g., sulphate, nitrate and dissolved copper).
2) Increase from operations because the statistical distributions assigned to undisturbed runoff water quality have higher concentrations than the statistical distributions assigned to the TSF beach runoff and the NAG waste rock runoff quality (e.g., total phosphorus, dissolved chromium and dissolved iron).

Predicted concentrations in the PETBP reach a steady state approximately 10 years after the start of post-closure (long term post-closure) when all mine site areas have been reclaimed.

Table 9: Predicted Maximum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	695	859	517	686	294	457	184	287
Total Dissolved Solids	mg/L	1056	1360	776	1025	460	810	301	442
Major Ions									
Calcium	mg/L	219	269	161	214	90	142	51	76
Chloride	mg/L	18	22	6.1	9.9	6.6	10	6.0	9.4
Fluoride	mg/L	0.65	0.7	0.3	0.43	0.22	0.37	0.2	0.3
Magnesium	mg/L	36	45	28	37	16	25	14	24
Potassium	mg/L	9.8	14	4.3	7.0	3.6	4.8	3.2	4.5
Sodium	mg/L	58	76	26	38	23	31	21	29
Sulphate	mg/L	589	751	424	568	233	447	124	175
Nutrients									
Ammonia	mg/L (as N)	0.068	0.12	0.022	0.1	0.01	0.045	0.0091	0.04
Nitrate	mg/L (as N)	4.5	16	2.1	7.8	0.85	3.1	0.51	2.3
Nitrite	mg/L (as N)	0.079	0.11	0.027	0.056	0.0049	0.038	0.0039	0.034
Total Phosphorus	mg/L	0.018	0.03	0.015	0.028	0.017	0.024	0.026	0.038
Total Metals									
Aluminum	mg/L	0.48	0.54	0.48	0.55	0.056	0.23	0.086	0.41
Antimony	mg/L	0.0022	0.0025	0.00064	0.0011	0.00013	0.00025	0.000094	0.00018
Arsenic	mg/L	0.0036	0.0037	0.0015	0.0025	0.00085	0.0014	0.001	0.0019
Barium	mg/L	0.047	0.07	0.031	0.049	0.021	0.036	0.018	0.028
Beryllium	mg/L	0.000072	0.00009	0.000059	0.000062	0.000037	0.000046	0.000032	0.000035
Boron	mg/L	0.14	0.21	0.13	0.25	0.063	0.12	0.039	0.056
Cadmium	mg/L	0.00018	0.00039	0.0001	0.00028	0.000026	0.000077	0.000019	0.000067
Chromium	mg/L	0.00073	0.0009	0.00071	0.00094	0.00061	0.0012	0.00095	0.0019
Cobalt	mg/L	0.00065	0.001	0.00045	0.00092	0.000096	0.00038	0.000083	0.00026
Copper	mg/L	0.025	0.17	0.015	0.17	0.0046	0.013	0.0037	0.0077
Iron	mg/L	0.49	0.53	0.49	0.57	0.099	0.38	0.15	0.63
Lead	mg/L	0.00016	0.00016	0.00014	0.00015	0.000028	0.00011	0.000034	0.00014
Lithium	mg/L	0.013	0.016	0.0051	0.0086	0.0023	0.0072	0.0019	0.0031
Manganese	mg/L	0.17	0.4	0.084	0.34	0.07	0.19	0.062	0.15
Mercury	mg/L	0.0000054	0.000007	0.0000046	0.0000048	0.0000051	0.0000052	0.0000057	0.0000063

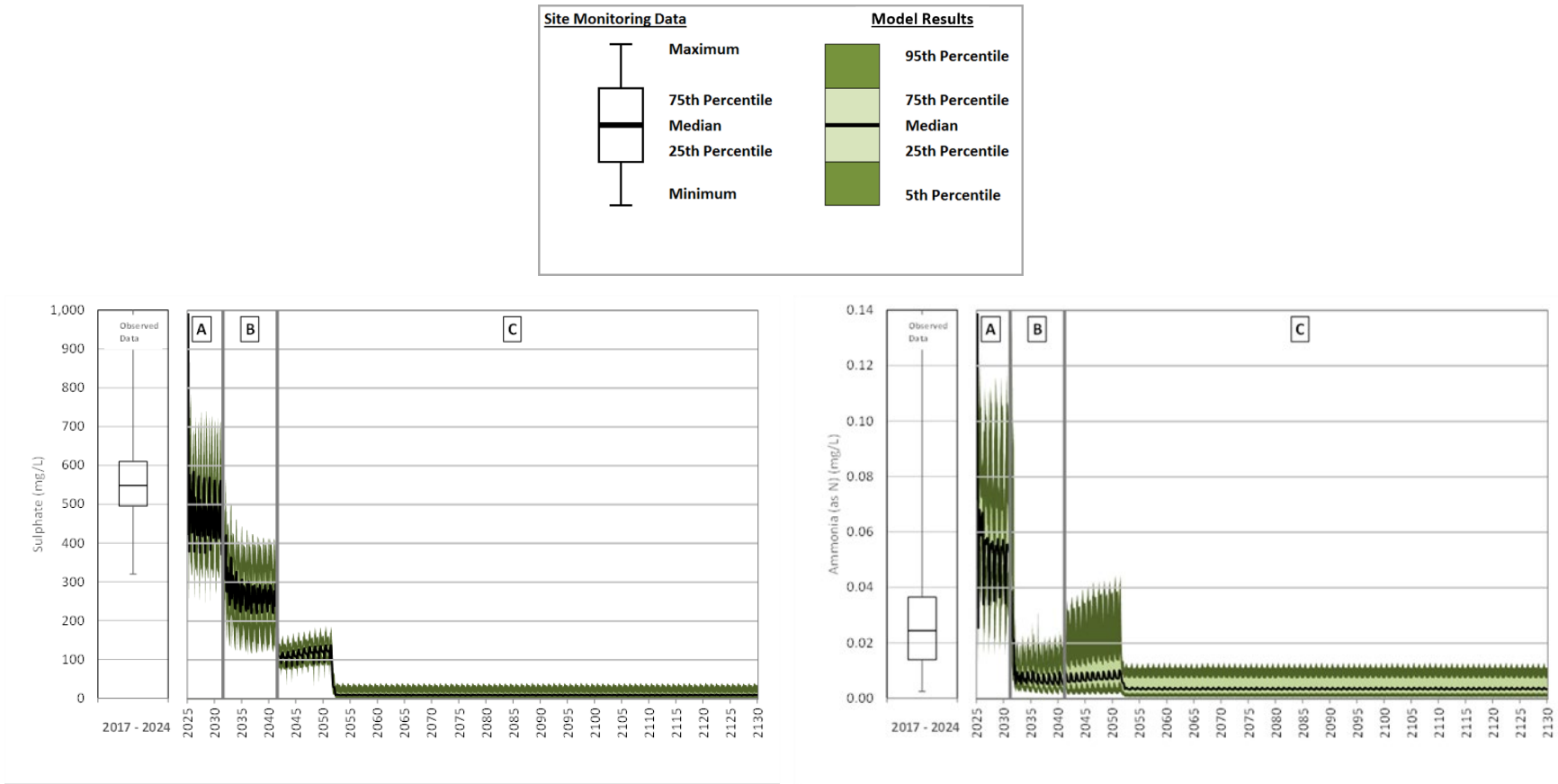
Table 9: Predicted Maximum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Molybdenum	mg/L	0.24	0.28	0.24	0.56	0.16	0.28	0.085	0.23
Nickel	mg/L	0.0013	0.0022	0.0012	0.002	0.00062	0.0013	0.0010	0.0022
Selenium	mg/L	0.051	0.1	0.023	0.08	0.014	0.035	0.0031	0.011
Silver	mg/L	0.0000092	0.000018	0.0000045	0.000017	0.000004	0.000019	0.0000037	0.000027
Strontium	mg/L	3.9	5.9	2.4	4.1	0.89	1.6	0.56	0.95
Thallium	mg/L	0.0000089	0.000016	0.0000063	0.000012	0.0000056	0.0000063	0.0000057	0.0000063
Tin	mg/L	0.000065	0.00014	0.000037	0.00011	0.000031	0.000042	0.000026	0.000029
Titanium	mg/L	0.025	0.026	0.022	0.024	0.0027	0.0034	0.002	0.0031
Uranium	mg/L	0.0025	0.0036	0.0015	0.0024	0.00094	0.0015	0.00065	0.0013
Vanadium	mg/L	0.003	0.0034	0.0019	0.0025	0.0007	0.0012	0.00081	0.0016
Zinc	mg/L	0.013	0.032	0.01	0.024	0.0018	0.0051	0.0015	0.0047
Dissolved Metals									
Aluminum	mg/L	0.03	0.086	0.023	0.10	0.023	0.1	0.053	0.28
Antimony	mg/L	0.0022	0.0023	0.00062	0.00097	0.00013	0.00025	0.000094	0.00018
Arsenic	mg/L	0.0033	0.0035	0.0013	0.0022	0.0008	0.0013	0.00096	0.0017
Barium	mg/L	0.045	0.06	0.029	0.041	0.02	0.034	0.017	0.026
Beryllium	mg/L	0.000072	0.00009	0.000059	0.000062	0.000037	0.000046	0.000032	0.000035
Boron	mg/L	0.14	0.18	0.13	0.22	0.063	0.11	0.039	0.054
Cadmium	mg/L	0.00018	0.00035	0.000098	0.00024	0.000025	0.000069	0.000017	0.00006
Chromium	mg/L	0.00033	0.00048	0.00031	0.00054	0.00049	0.00072	0.00083	0.0013
Cobalt	mg/L	0.00036	0.00075	0.00016	0.00063	0.000096	0.00026	0.000083	0.00014
Copper	mg/L	0.018	0.026	0.0078	0.019	0.0043	0.011	0.0033	0.0061
Iron	mg/L	0.036	0.08	0.037	0.12	0.047	0.16	0.095	0.41
Lead	mg/L	0.000042	0.000051	0.000026	0.000041	0.000028	0.000047	0.000034	0.000075
Lithium	mg/L	0.013	0.015	0.0049	0.0077	0.0023	0.0071	0.0019	0.003
Manganese	mg/L	0.15	0.38	0.063	0.32	0.066	0.17	0.058	0.13
Mercury	mg/L	0.0000054	0.000007	0.0000046	0.0000048	0.0000051	0.0000052	0.0000057	0.0000063
Molybdenum	mg/L	0.24	0.27	0.24	0.55	0.16	0.28	0.085	0.23
Nickel	mg/L	0.00073	0.0017	0.00063	0.0014	0.00054	0.00093	0.00092	0.0019
Selenium	mg/L	0.051	0.1	0.023	0.073	0.014	0.035	0.0031	0.011
Silicon	mg/L	6.7	8	6.4	7.9	5.2	6.5	6.8	9.6
Silver	mg/L	0.0000092	0.000011	0.0000045	0.0000093	0.000004	0.000011	0.0000037	0.00002
Strontium	mg/L	3.9	5.5	2.4	3.7	0.89	1.6	0.56	0.93

Table 9: Predicted Maximum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Thallium	mg/L	0.0000089	0.000014	0.0000063	0.000011	0.0000056	0.0000063	0.0000057	0.0000063
Tin	mg/L	0.000065	0.00007	0.000037	0.000042	0.000031	0.000042	0.000026	0.000029
Titanium	mg/L	0.0059	0.007	0.0035	0.005	0.0027	0.0034	0.002	0.0031
Uranium	mg/L	0.0025	0.0033	0.0015	0.0021	0.00094	0.0015	0.00065	0.0013
Vanadium	mg/L	0.0018	0.0022	0.00069	0.0013	0.00052	0.0007	0.00064	0.0011
Zinc	mg/L	0.011	0.03	0.0077	0.021	0.0018	0.0051	0.0015	0.0047

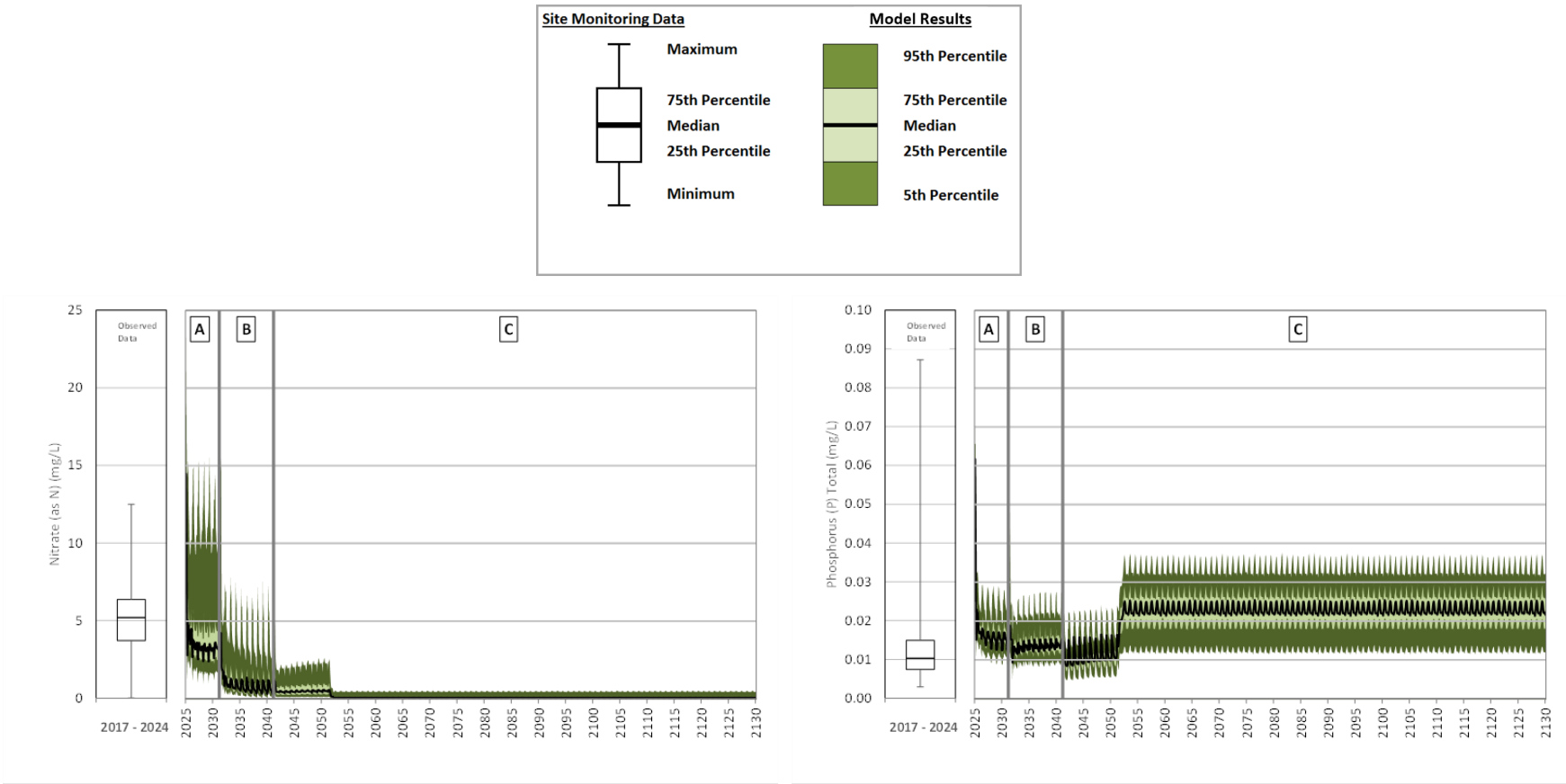
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. The increase in total ammonia concentrations during the first ten years of post-closure is caused by the pumping from the MESCP which ends in 2051. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

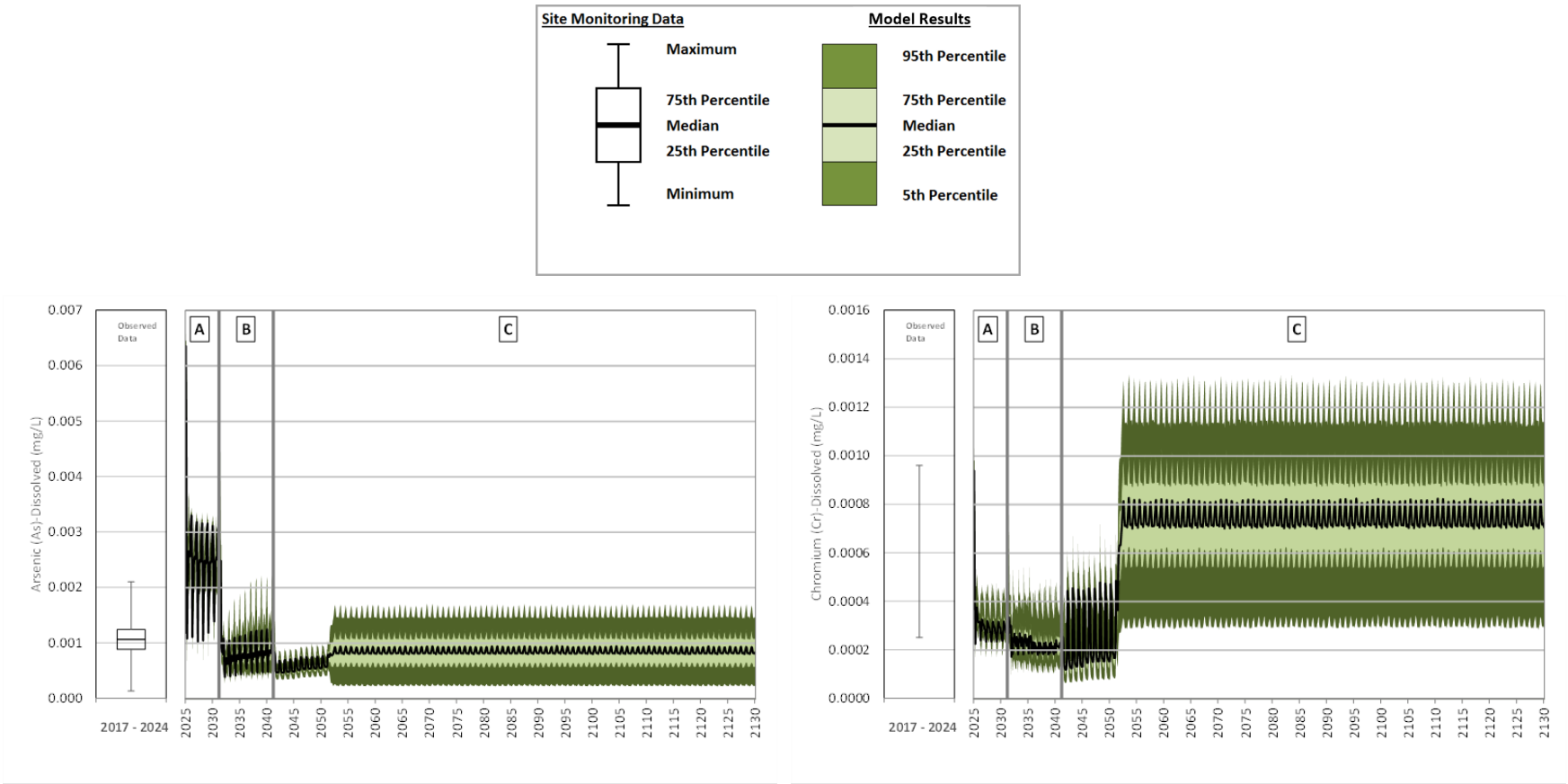
Figure 11: Predicted Sulphate and Total Ammonia Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

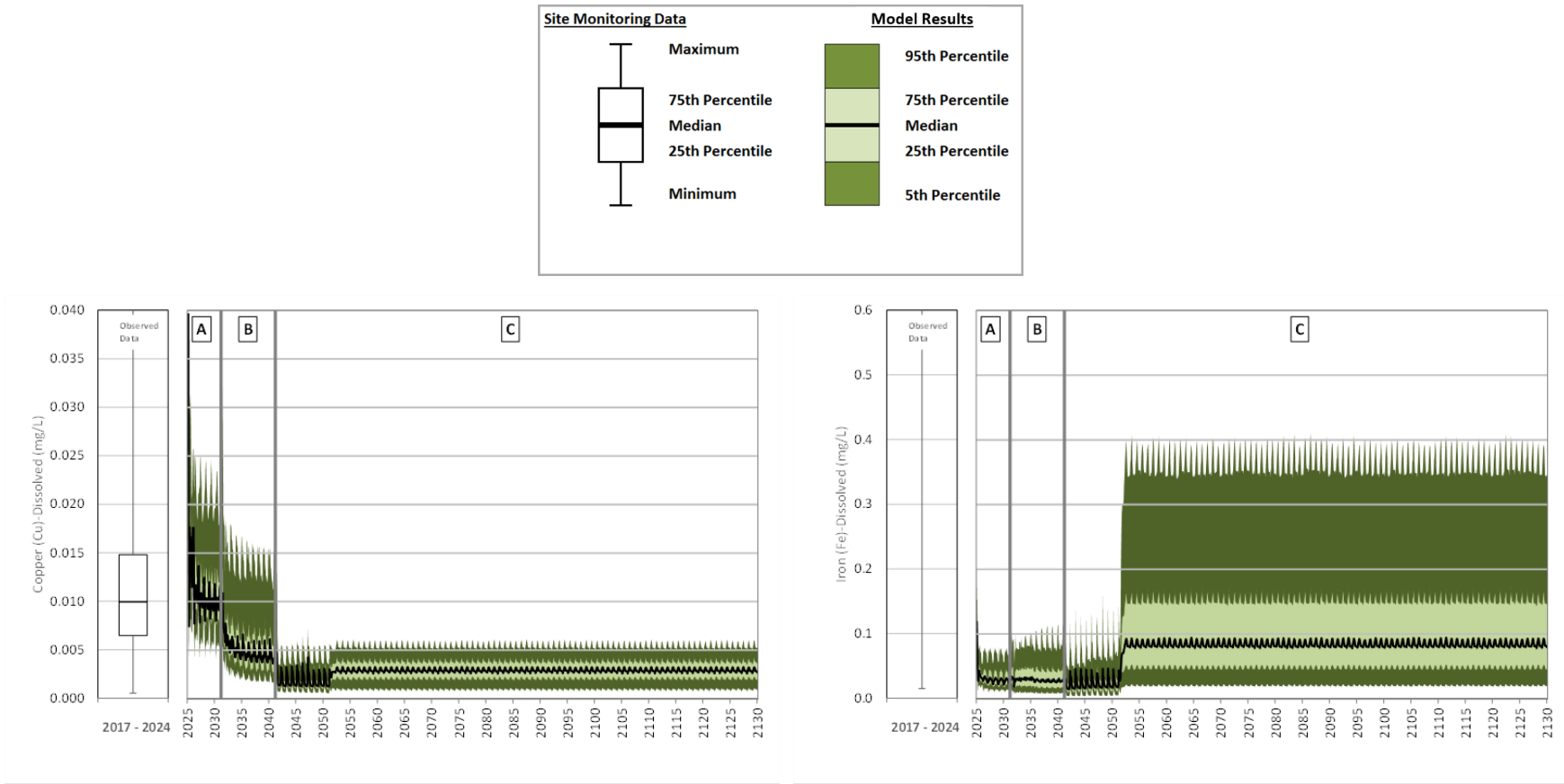
Figure 12: Predicted Nitrate and Total Phosphorus Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

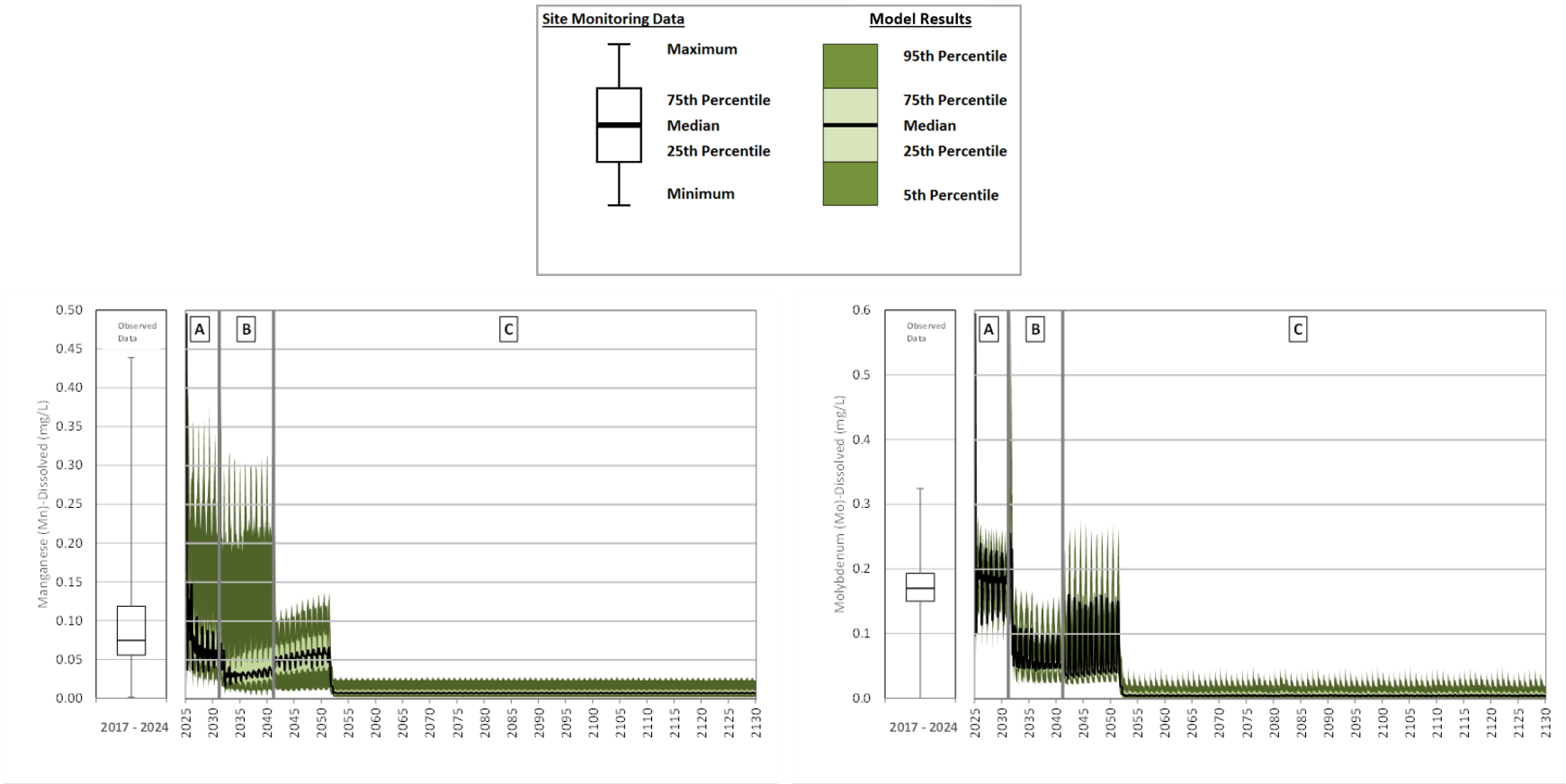
Figure 13: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

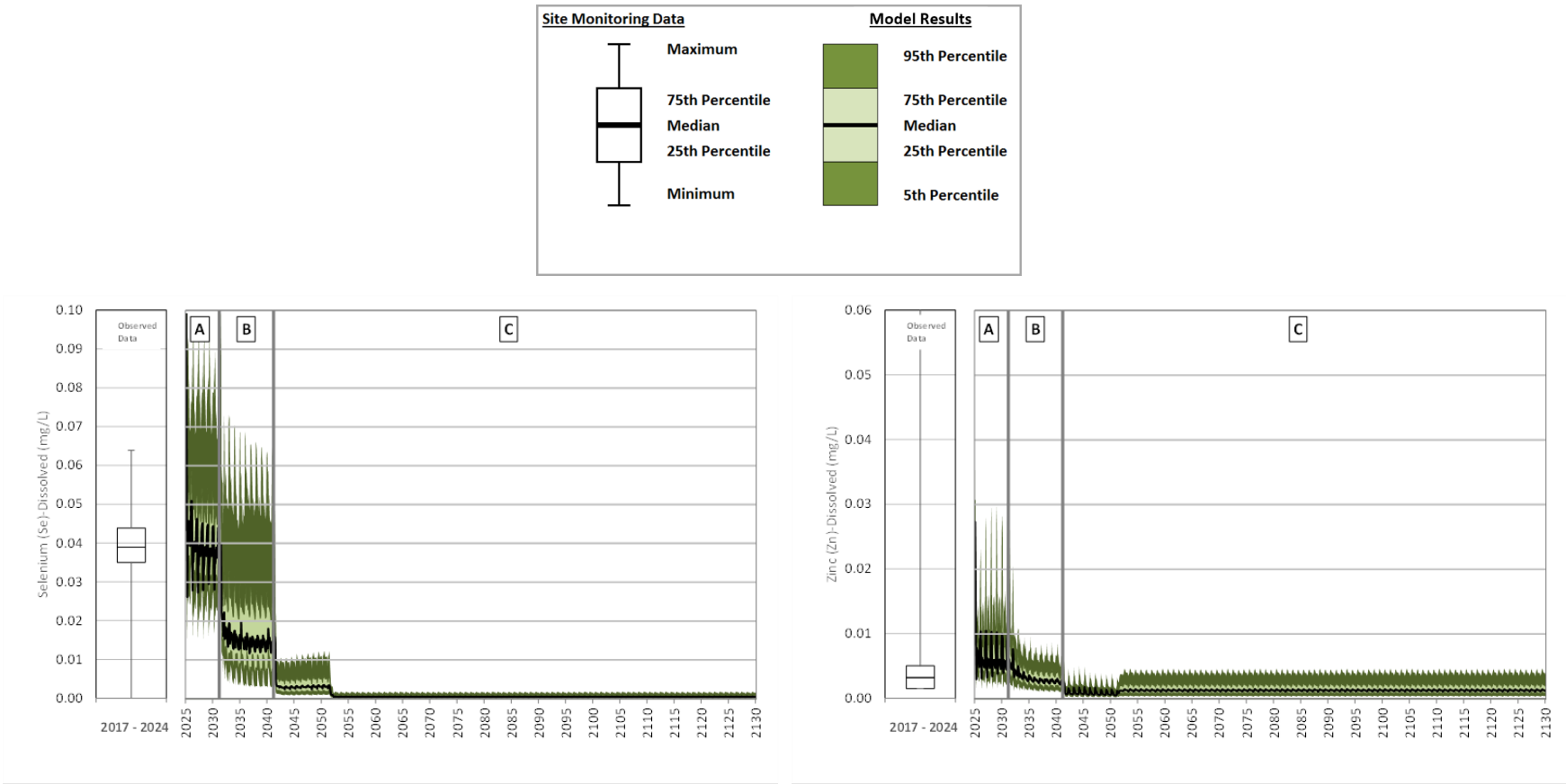
Figure 14: Predicted Dissolved Copper and Dissolved Iron Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. The increase in manganese concentrations during the first ten years of post-closure is caused by the pumping from the MESCP which ends in 2051. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 15: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 16: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the Perimeter Embankment Till Borrow Pond – Operations, Closure and Post-closure

4.2 9 km Sump and Northwest Sump

The 9 km (9K) Sump and the NW Sump receive drainage from undisturbed and disturbed areas in their catchment areas, as well as runoff and seepage from the Temporary NW PAG Stockpile. Discharge from the 9K Sump and NW Sump is directed to Mine Drainage Creek Sump (and eventually the PETBP and treatment) during operations and closure and assumed to be directed to Bootjack Lake during post-closure.

Time series plots for key parameters in the 9K Sump for operations, closure and post-closure are shown in Figures 17 to 22. Time series plots for key parameters in the Northwest Sump for closure and post-closure are shown in Figures 23 to 28. Maximum of median and 95th percentile predictions are presented in Tables 10 and 11 for the 9K Sump and NW Sump, respectively.

Changes in concentrations in the 9K and Northwest Sumps from operations to closure and post-closure are due to remediation of the catchment areas. Trends for all key parameters reach steady state conditions in the 9K Sump and NW Sump 10 years after the start of post-closure when the runoff areas are assumed to be reclaimed (Figures 17 to 22 for the 9K Sump; Figures 23 to 28 for the NW Sump). Concentrations of most parameters gradually decrease as runoff water qualities from all facilities reporting to the 9K Sump are predicted to return to undisturbed water quality (Table 7). After the PAG material has been removed from the 9K Sump catchment area, runoff from the Temporary NW PAG Stockpile is assigned the disturbed runoff water quality and returns to undisturbed after ten years, which causes concentrations of most parameters to decrease.

Seasonal concentration peaks during winter are associated with continued seepage through the reclaimed Temporary NW PAG Stockpile. During winter months, the relative flow contribution of seepage from the Temporary NW PAG Stockpile is high compared to runoff because snowfall is assumed to accumulate on the stockpile and not melt until spring. Seepage from the Temporary NW PAG Stockpile is assigned a PAG water quality input during reclamation and then a NAG water quality input in perpetuity once reclamation is complete. The NAG and PAG water quality in the seepage flows during the winter results in the seasonal winter peaks in concentrations.

The only parameters with predicted maximum concentrations greater in post-closure than closure are aluminum, arsenic, chromium, iron, lead, nickel, silver, silicon and titanium. These parameters have higher concentrations in the statistical distributions assigned for undisturbed runoff water quality than the statistical distributions assigned for PAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more flows on the Mine site, which results in predicted concentrations of aluminum, arsenic, chromium, iron, lead, silver and silicon to be higher in post-closure than closure.

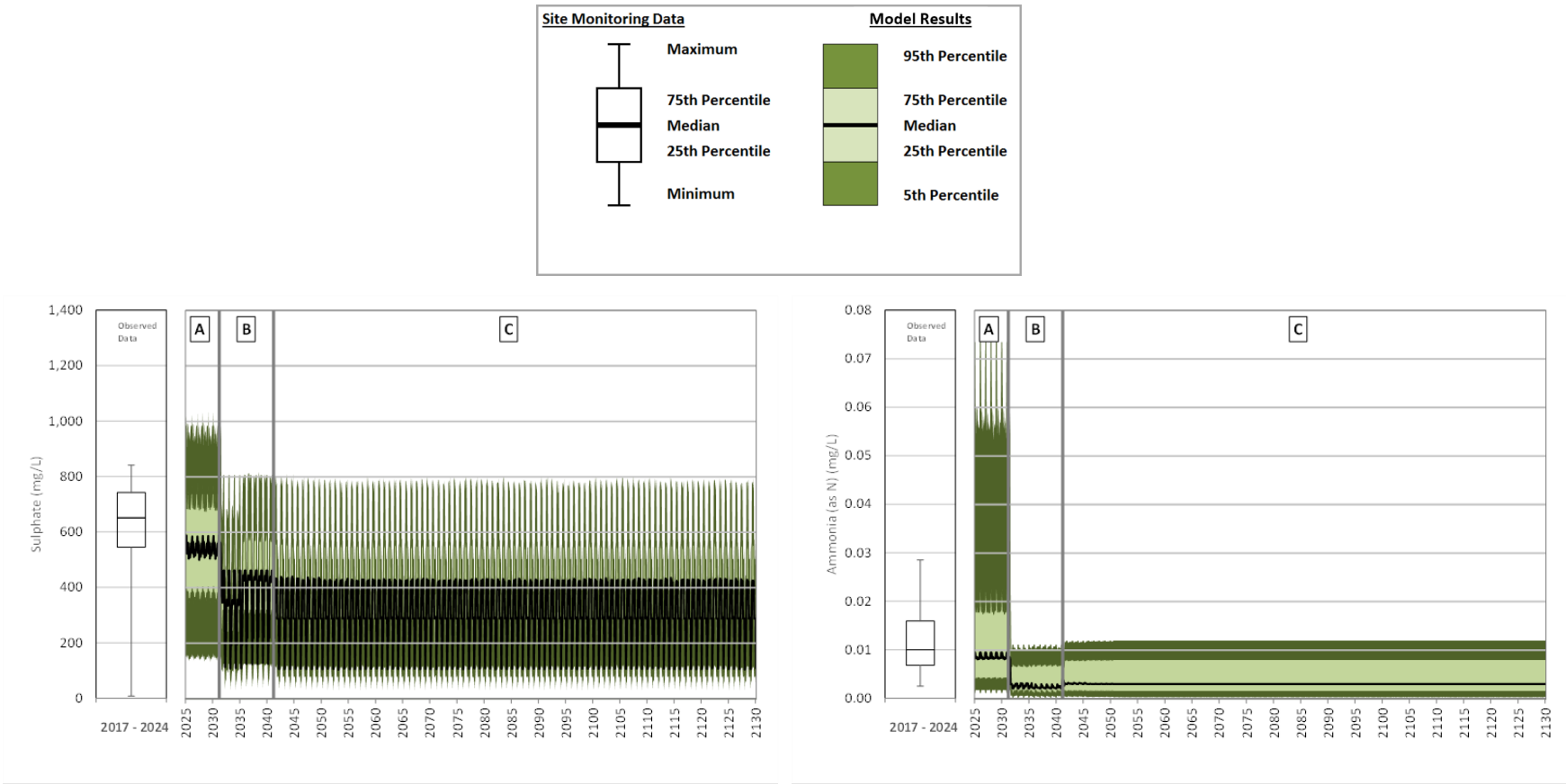
Table 10: Predicted Maximum Concentrations in the 9K Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	747	1169	590	971	579	966	575	966
Total Dissolved Solids	mg/L	1101	1733	853	1417	843	1406	838	1414
Major Ions									
Calcium	mg/L	232	367	182	302	177	298	175	298
Chloride	mg/L	2.5	7.0	1.6	4.2	2.3	7.3	2.3	7.5
Fluoride	mg/L	0.1	0.22	0.094	0.19	0.095	0.19	0.096	0.19
Magnesium	mg/L	41	61	33	53	33	54	33	54
Potassium	mg/L	2.4	5.0	1.6	2.5	1.6	2.5	1.6	2.5
Sodium	mg/L	17	39	13	21	13	21	13	21
Sulphate	mg/L	593	1039	465	822	444	814	439	809
Nutrients									
Ammonia	mg/L (as N)	0.0096	0.074	0.004	0.011	0.0033	0.012	0.003	0.012
Nitrate	mg/L (as N)	5.9	38	0.059	0.92	0.048	0.44	0.037	0.44
Nitrite	mg/L (as N)	0.0073	0.087	0.00038	0.0039	0.00042	0.0023	0.0004	0.0023
Total Phosphorus	mg/L	0.026	0.046	0.018	0.03	0.021	0.031	0.021	0.031
Total Metals									
Aluminum	mg/L	0.47	0.52	0.49	0.64	0.072	0.34	0.07	0.35
Antimony	mg/L	0.00023	0.00052	0.00016	0.00044	0.00013	0.00029	0.00013	0.00029
Arsenic	mg/L	0.00076	0.001	0.0008	0.0011	0.00082	0.0015	0.00083	0.0015
Barium	mg/L	0.045	0.13	0.029	0.053	0.027	0.046	0.026	0.046
Beryllium	mg/L	0.000048	0.000048	0.000048	0.000049	0.000045	0.000048	0.000044	0.000048
Boron	mg/L	0.063	0.14	0.048	0.1	0.042	0.073	0.042	0.072
Cadmium	mg/L	0.000033	0.00026	0.000022	0.00014	0.000021	0.0001	0.000022	0.0001
Chromium	mg/L	0.00075	0.00092	0.00081	0.0012	0.00076	0.0016	0.00077	0.0016
Cobalt	mg/L	0.00044	0.0016	0.00034	0.00069	0.000057	0.00053	0.000058	0.00053
Copper	mg/L	0.013	0.16	0.013	0.16	0.0048	0.0097	0.0047	0.0097
Iron	mg/L	0.49	0.62	0.51	0.64	0.12	0.53	0.12	0.54
Lead	mg/L	0.00014	0.00015	0.00014	0.00017	0.000029	0.00013	0.00003	0.00013
Lithium	mg/L	0.0017	0.0062	0.0014	0.0042	0.0012	0.0034	0.0012	0.0034
Manganese	mg/L	0.084	1.2	0.032	0.22	0.015	0.22	0.015	0.22
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Molybdenum	mg/L	0.099	0.23	0.07	0.16	0.066	0.14	0.065	0.14
Nickel	mg/L	0.001	0.0015	0.0011	0.0015	0.00083	0.0018	0.00084	0.0018
Selenium	mg/L	0.056	0.12	0.026	0.086	0.025	0.079	0.025	0.078
Silver	mg/L	0.0000047	0.000015	0.0000047	0.000021	0.0000046	0.000023	0.0000046	0.000023

Table 10: Predicted Maximum Concentrations in the 9K Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Strontium	mg/L	0.96	1.7	0.85	1.7	0.84	1.3	0.84	1.3
Thallium	mg/L	0.000005	0.0000066	0.000005	0.0000066	0.000005	0.000005	0.000005	0.000005
Tin	mg/L	0.000044	0.00012	0.000042	0.00012	0.000044	0.000048	0.000044	0.000048
Titanium	mg/L	0.019	0.02	0.02	0.02	0.0015	0.0021	0.0015	0.0022
Uranium	mg/L	0.0011	0.0022	0.00085	0.0019	0.00086	0.0017	0.00087	0.0017
Vanadium	mg/L	0.0016	0.002	0.0017	0.0021	0.00068	0.0013	0.00068	0.0013
Zinc	mg/L	0.0052	0.0088	0.0066	0.018	0.0017	0.0041	0.0015	0.0039
Dissolved Metals									
Aluminum	mg/L	0.017	0.071	0.036	0.19	0.039	0.21	0.037	0.22
Antimony	mg/L	0.00021	0.00038	0.00014	0.0003	0.00013	0.00029	0.00013	0.00029
Arsenic	mg/L	0.00049	0.00076	0.00053	0.00082	0.00077	0.0014	0.00078	0.0014
Barium	mg/L	0.043	0.12	0.027	0.045	0.026	0.044	0.026	0.044
Beryllium	mg/L	0.000048	0.000048	0.000048	0.000049	0.000045	0.000048	0.000044	0.000048
Boron	mg/L	0.059	0.11	0.044	0.072	0.042	0.071	0.042	0.07
Cadmium	mg/L	0.000031	0.00022	0.000019	0.000095	0.00002	0.000094	0.00002	0.000095
Chromium	mg/L	0.00036	0.00053	0.00041	0.00084	0.00064	0.001	0.00065	0.0011
Cobalt	mg/L	0.00015	0.0013	0.000046	0.0004	0.000057	0.00041	0.000058	0.00041
Copper	mg/L	0.0058	0.0094	0.0054	0.01	0.0045	0.0081	0.0044	0.0081
Iron	mg/L	0.036	0.17	0.06	0.19	0.069	0.31	0.071	0.32
Lead	mg/L	0.000026	0.000035	0.000024	0.000053	0.000029	0.000061	0.00003	0.000062
Lithium	mg/L	0.0015	0.0052	0.0012	0.0032	0.0012	0.0033	0.0012	0.0033
Manganese	mg/L	0.063	1.2	0.011	0.19	0.011	0.19	0.011	0.2
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Molybdenum	mg/L	0.099	0.21	0.069	0.15	0.066	0.14	0.065	0.14
Nickel	mg/L	0.0005	0.00098	0.00055	0.0010	0.00075	0.0015	0.00076	0.0015
Selenium	mg/L	0.055	0.11	0.026	0.08	0.025	0.079	0.025	0.078
Silicon	mg/L	6.9	8.3	5.7	7.0	5.9	7.9	5.9	8.0
Silver	mg/L	0.0000047	0.0000081	0.0000047	0.000013	0.0000046	0.000016	0.0000046	0.000016
Strontium	mg/L	0.94	1.4	0.84	1.3	0.84	1.3	0.84	1.3
Thallium	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Tin	mg/L	0.000044	0.000047	0.000042	0.000047	0.000044	0.000048	0.000044	0.000048
Titanium	mg/L	0.00038	0.00078	0.00072	0.001	0.0015	0.0021	0.0015	0.0022
Uranium	mg/L	0.001	0.0019	0.00082	0.0016	0.00085	0.0017	0.00087	0.0017
Vanadium	mg/L	0.00037	0.00076	0.0005	0.0009	0.0005	0.00083	0.0005	0.00084
Zinc	mg/L	0.0026	0.0061	0.004	0.015	0.0017	0.0041	0.0015	0.0039

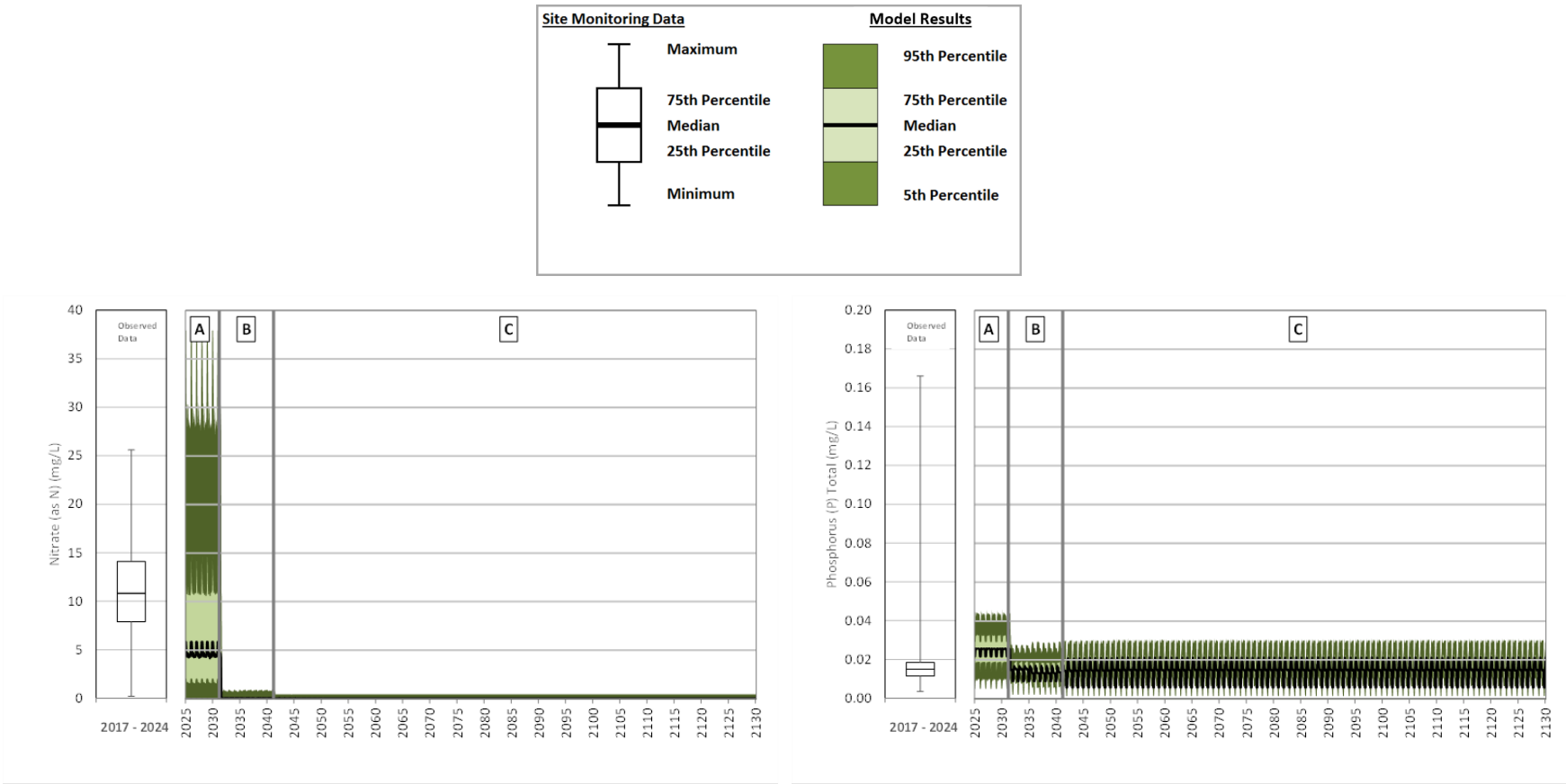
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

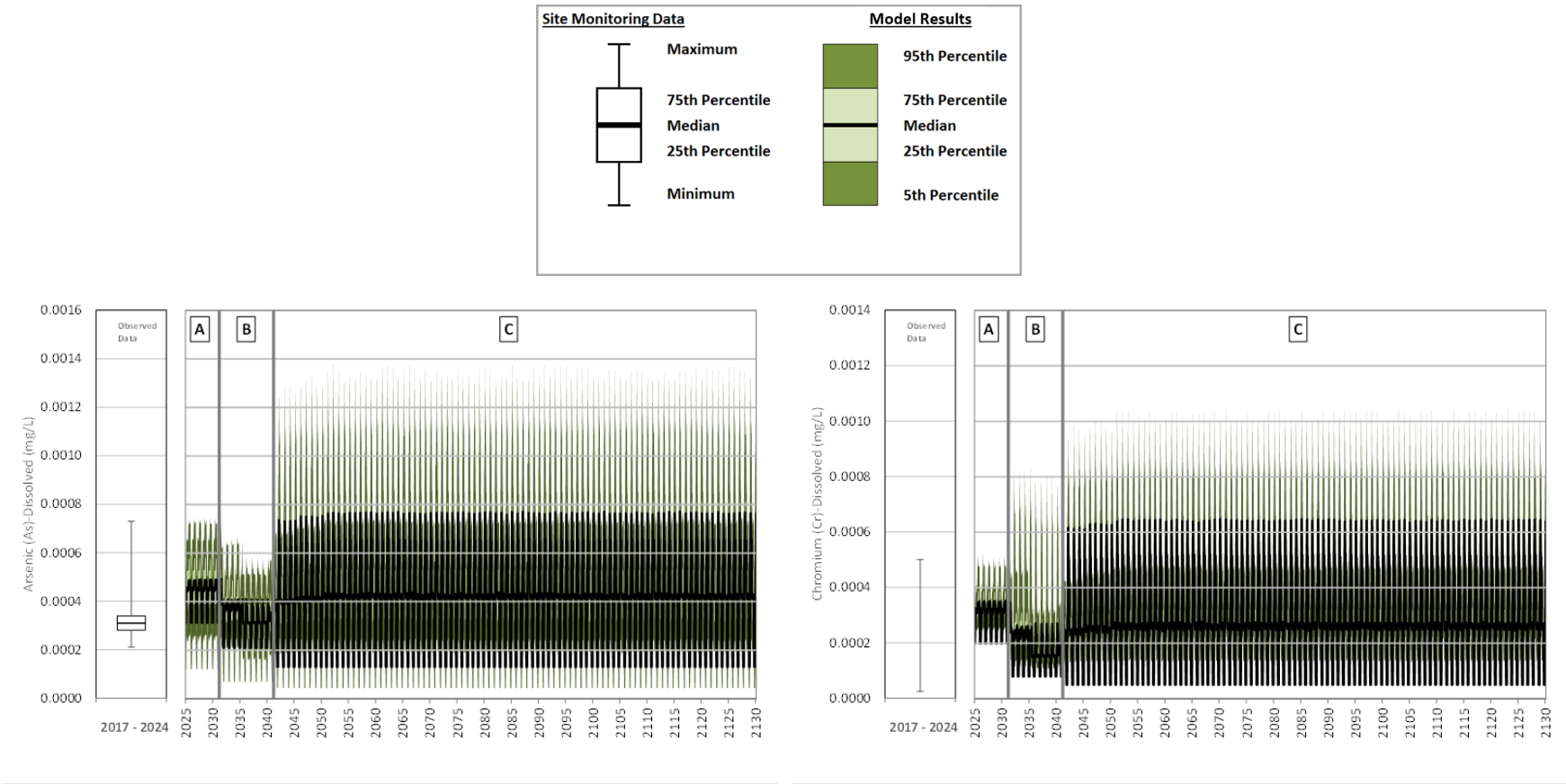
Figure 17: Predicted Sulphate and Total Ammonia Concentrations in the 9K Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

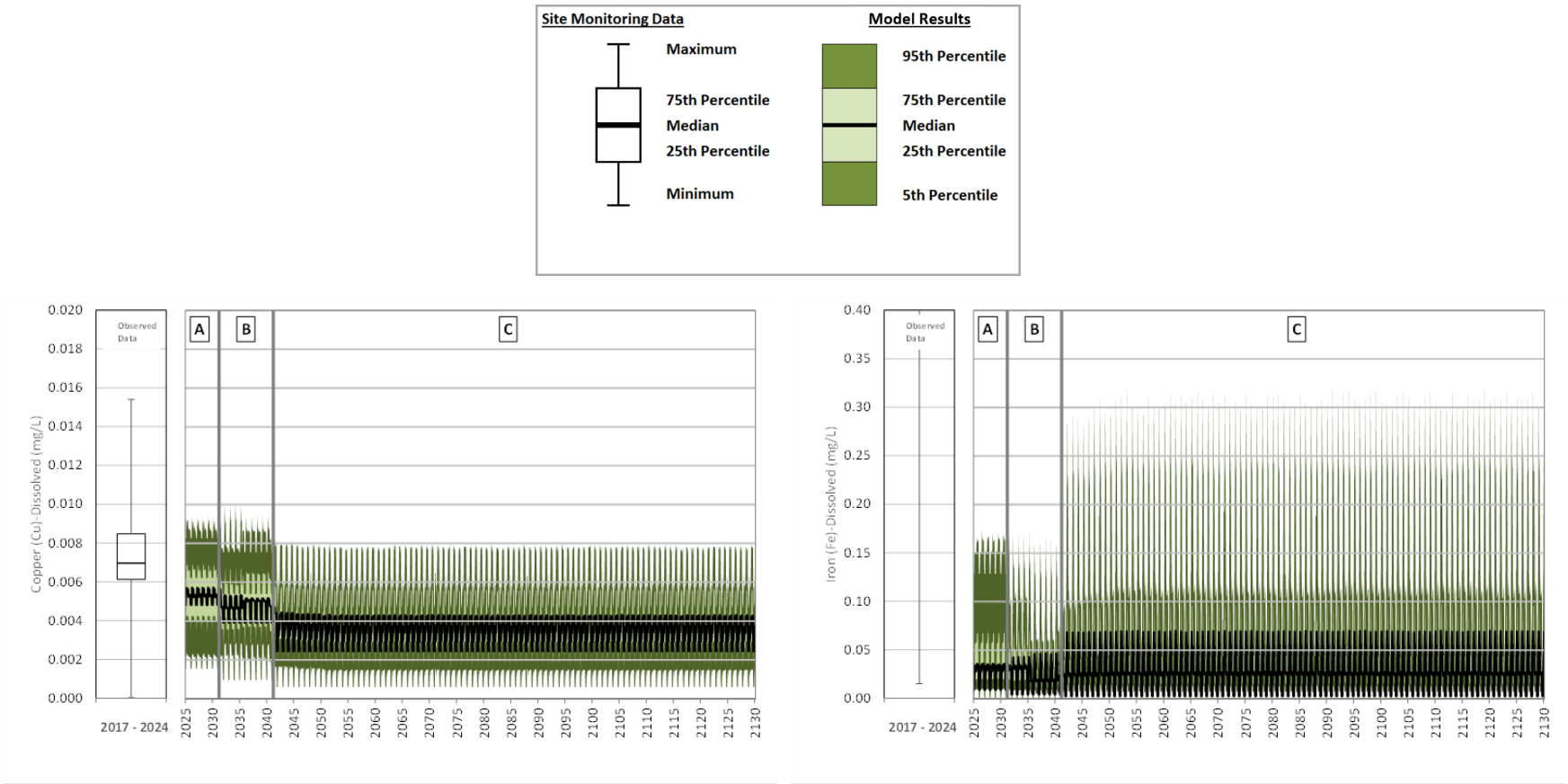
Figure 18: Predicted Nitrate and Total Phosphorus Concentrations in the 9K Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

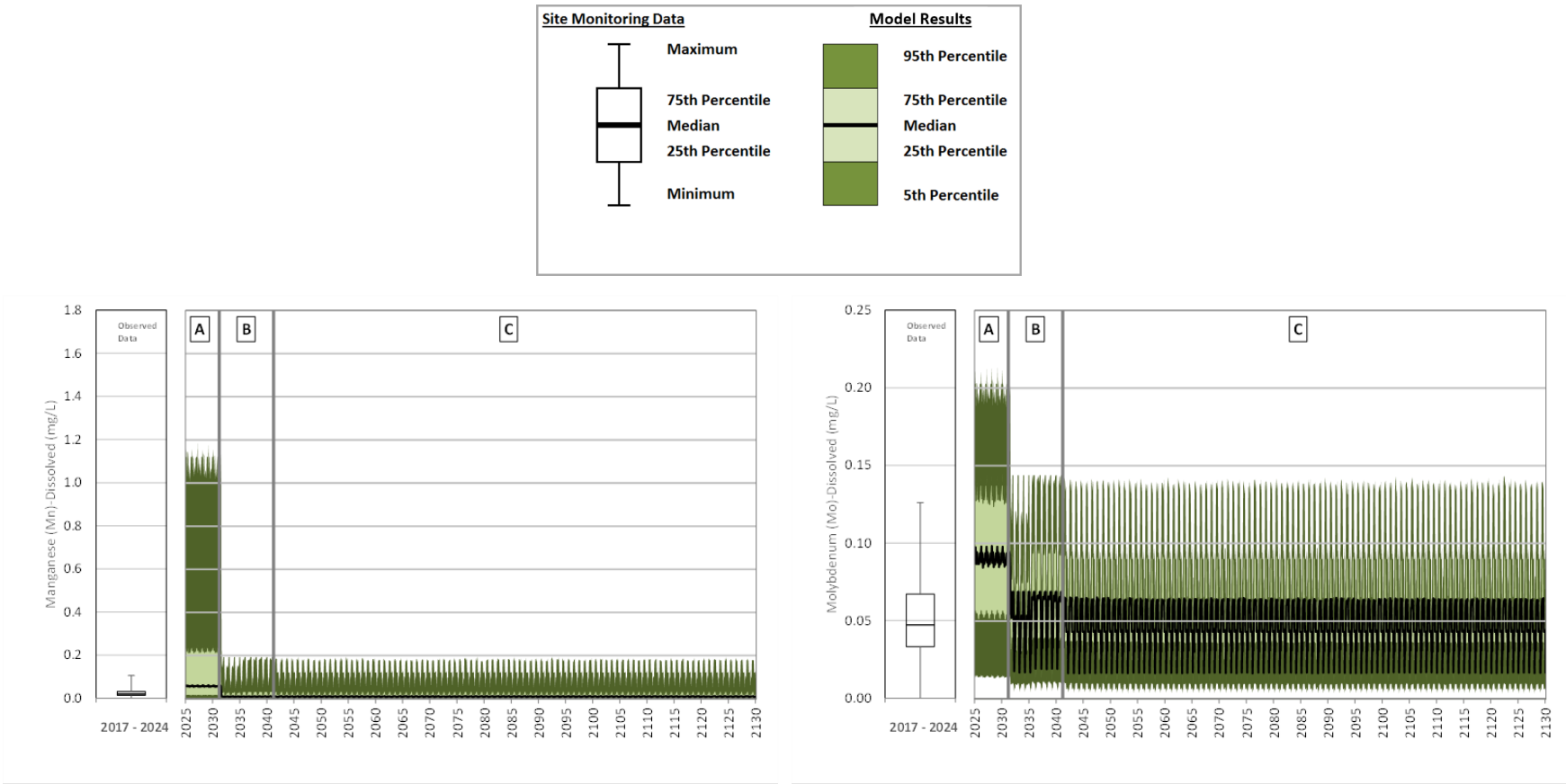
Figure 19: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the 9K Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

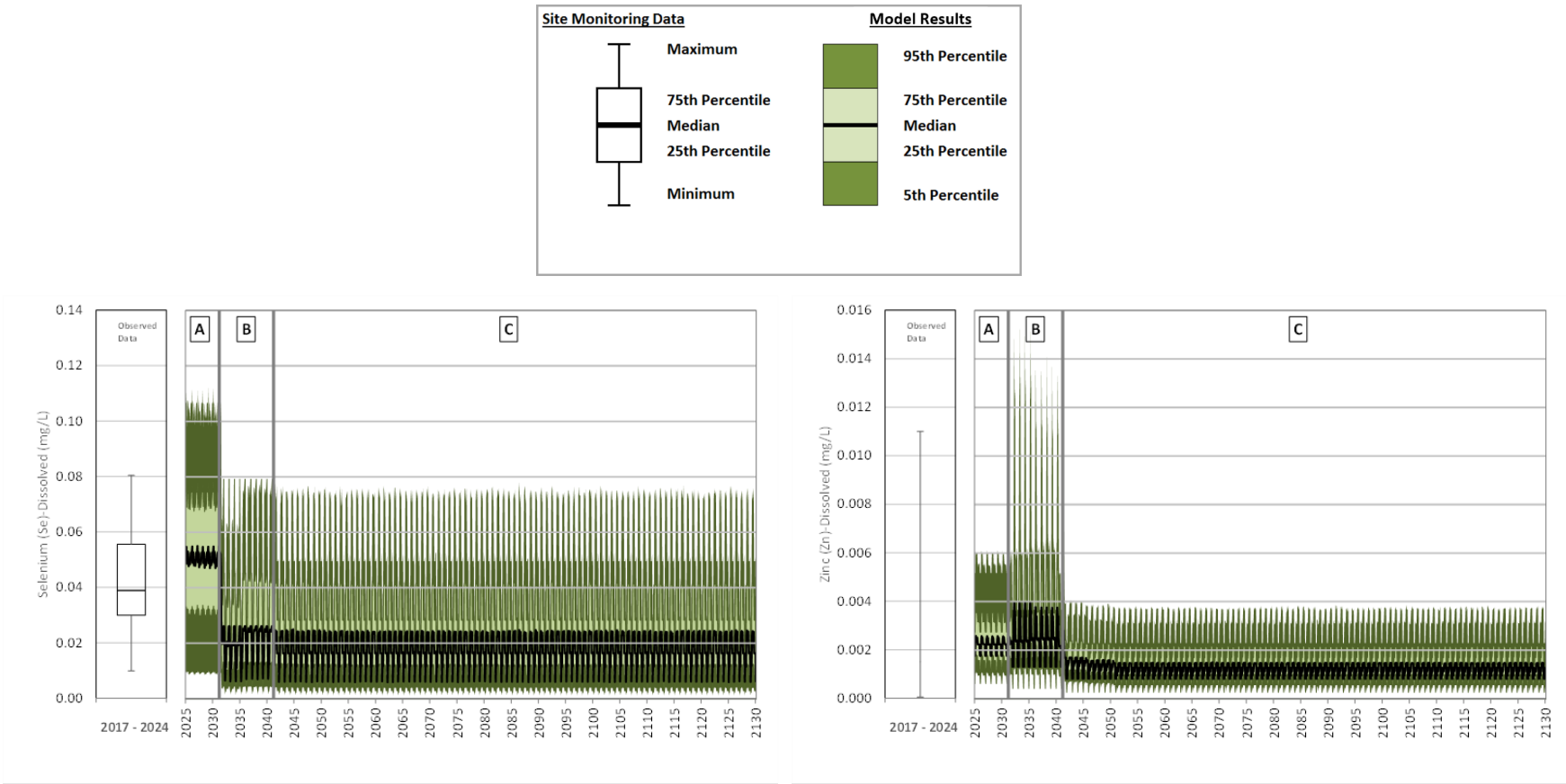
Figure 20: Predicted Dissolved Copper and Dissolved Iron Concentrations in the 9K Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 21: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the 9K Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 22: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the 9K Sump – Operations, Closure and Post-closure

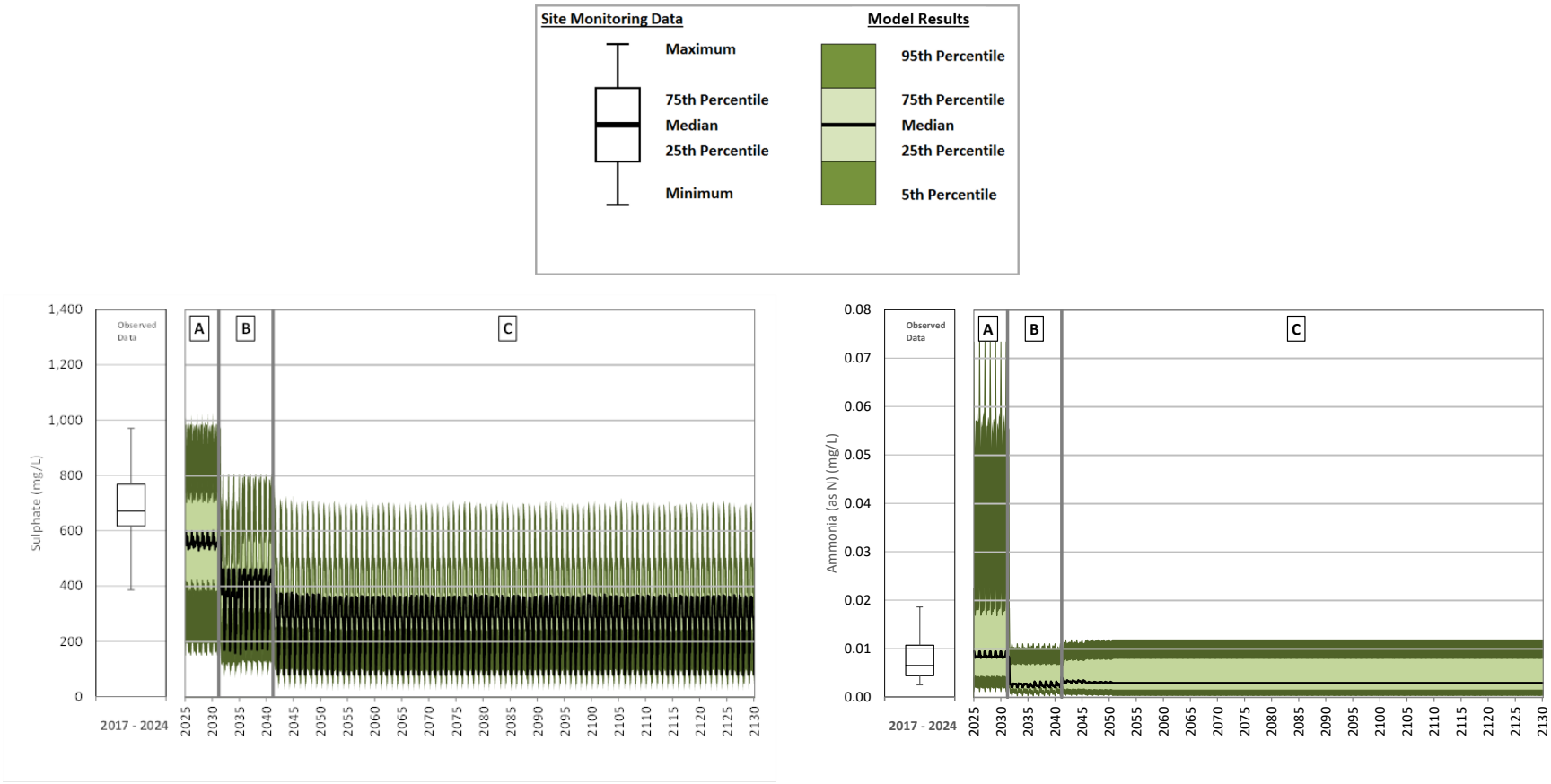
Table 11: Predicted Maximum Concentrations in the Northwest Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	758	1162	584	961	515	875	506	871
Total Dissolved Solids	mg/L	1121	1723	853	1398	748	1274	738	1277
Major Ions									
Calcium	mg/L	235	364	180	299	156	269	153	267
Chloride	mg/L	2.4	6.8	1.6	4.0	2.3	7.8	2.3	7.9
Fluoride	mg/L	0.12	0.23	0.098	0.19	0.093	0.18	0.093	0.18
Magnesium	mg/L	41	61	33	52	30	49	30	49
Potassium	mg/L	2.4	4.9	1.6	2.5	1.5	2.3	1.5	2.4
Sodium	mg/L	17	38	12	21	12	19	12	19
Sulphate	mg/L	607	1033	465	811	380	732	374	725
Nutrients									
Ammonia	mg/L (as N)	0.0096	0.074	0.0043	0.011	0.0036	0.012	0.003	0.012
Nitrate	mg/L (as N)	5.9	38	0.39	4.1	0.053	0.45	0.037	0.44
Nitrite	mg/L (as N)	0.0073	0.087	0.00054	0.0044	0.00042	0.0023	0.0004	0.0023
Total Phosphorus	mg/L	0.026	0.044	0.018	0.03	0.022	0.032	0.022	0.032
Total Metals									
Aluminum	mg/L	0.47	0.51	0.49	0.63	0.074	0.35	0.072	0.36
Antimony	mg/L	0.00023	0.00052	0.00016	0.00044	0.00012	0.00026	0.00011	0.00026
Arsenic	mg/L	0.00073	0.00096	0.00079	0.0011	0.00085	0.0016	0.00086	0.0016
Barium	mg/L	0.044	0.13	0.029	0.053	0.024	0.042	0.024	0.042
Beryllium	mg/L	0.000048	0.000049	0.000048	0.000049	0.000043	0.000047	0.000042	0.000047
Boron	mg/L	0.063	0.13	0.048	0.1	0.039	0.067	0.039	0.067
Cadmium	mg/L	0.000039	0.00026	0.000023	0.00014	0.00002	0.000091	0.00002	0.000092
Chromium	mg/L	0.00072	0.00085	0.00078	0.0012	0.0008	0.0016	0.00081	0.0016
Cobalt	mg/L	0.00046	0.0016	0.00034	0.00069	0.000058	0.00048	0.000058	0.00048
Copper	mg/L	0.014	0.16	0.014	0.16	0.0047	0.0092	0.0044	0.009
Iron	mg/L	0.48	0.61	0.51	0.63	0.13	0.55	0.13	0.56
Lead	mg/L	0.00014	0.00015	0.00014	0.00017	0.00003	0.00013	0.00003	0.00013
Lithium	mg/L	0.0018	0.0061	0.0014	0.0042	0.0011	0.0031	0.0012	0.0031
Manganese	mg/L	0.096	1.2	0.034	0.22	0.015	0.19	0.015	0.19
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Molybdenum	mg/L	0.1	0.22	0.07	0.16	0.057	0.13	0.056	0.13
Nickel	mg/L	0.001	0.0015	0.0011	0.0016	0.00085	0.0019	0.00086	0.0019
Selenium	mg/L	0.057	0.12	0.026	0.086	0.022	0.069	0.021	0.068
Silver	mg/L	0.0000047	0.000015	0.0000046	0.00002	0.0000045	0.000024	0.0000044	0.000024
Strontium	mg/L	1.1	1.9	0.89	1.7	0.75	1.2	0.76	1.2

Table 11: Predicted Maximum Concentrations in the Northwest Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Thallium	mg/L	0.000005	0.0000066	0.000005	0.0000066	0.000005	0.000005	0.000005	0.000005
Tin	mg/L	0.000044	0.00012	0.000042	0.00012	0.000041	0.000046	0.000042	0.000047
Titanium	mg/L	0.02	0.02	0.02	0.021	0.0016	0.0023	0.0016	0.0023
Uranium	mg/L	0.0011	0.0022	0.00086	0.0019	0.00082	0.0016	0.00083	0.0016
Vanadium	mg/L	0.0016	0.002	0.0017	0.0021	0.00069	0.0013	0.00069	0.0014
Zinc	mg/L	0.0057	0.0094	0.0069	0.018	0.0018	0.0042	0.0014	0.0036
Dissolved Metals									
Aluminum	mg/L	0.015	0.058	0.034	0.18	0.041	0.22	0.039	0.23
Antimony	mg/L	0.00021	0.00038	0.00014	0.0003	0.00012	0.00026	0.00011	0.00026
Arsenic	mg/L	0.00047	0.00069	0.00052	0.0008	0.0008	0.0014	0.00081	0.0015
Barium	mg/L	0.043	0.12	0.027	0.044	0.024	0.04	0.024	0.04
Beryllium	mg/L	0.000048	0.000049	0.000048	0.000049	0.000043	0.000047	0.000042	0.000047
Boron	mg/L	0.059	0.1	0.044	0.071	0.039	0.065	0.039	0.065
Cadmium	mg/L	0.000036	0.00022	0.000021	0.000095	0.000018	0.000084	0.000019	0.000084
Chromium	mg/L	0.00032	0.00045	0.00039	0.00079	0.00068	0.0011	0.00069	0.0011
Cobalt	mg/L	0.00017	0.0013	0.00005	0.0004	0.000058	0.00036	0.000058	0.00036
Copper	mg/L	0.0065	0.011	0.0064	0.012	0.0043	0.0076	0.0041	0.0074
Iron	mg/L	0.032	0.16	0.057	0.17	0.074	0.33	0.075	0.34
Lead	mg/L	0.000025	0.000033	0.000024	0.000053	0.00003	0.000063	0.00003	0.000064
Lithium	mg/L	0.0016	0.0052	0.0012	0.0033	0.0011	0.003	0.0012	0.003
Manganese	mg/L	0.075	1.2	0.013	0.2	0.011	0.17	0.011	0.17
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Molybdenum	mg/L	0.1	0.21	0.069	0.14	0.057	0.13	0.056	0.13
Nickel	mg/L	0.00049	0.001	0.00059	0.0011	0.00077	0.0015	0.00078	0.0016
Selenium	mg/L	0.057	0.11	0.026	0.08	0.022	0.069	0.021	0.068
Silicon	mg/L	6.9	8.2	5.7	7.0	5.9	8.1	5.9	8.1
Silver	mg/L	0.0000047	0.0000072	0.0000046	0.000013	0.0000045	0.000016	0.0000044	0.000017
Strontium	mg/L	1.1	1.5	0.87	1.3	0.75	1.2	0.75	1.2
Thallium	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
Tin	mg/L	0.000044	0.000047	0.000042	0.000046	0.000041	0.000046	0.000042	0.000047
Titanium	mg/L	0.00064	0.0012	0.0011	0.0017	0.0016	0.0023	0.0016	0.0023
Uranium	mg/L	0.0011	0.0019	0.00083	0.0016	0.00082	0.0016	0.00083	0.0016
Vanadium	mg/L	0.00037	0.00076	0.00049	0.0009	0.00052	0.00086	0.00052	0.00087
Zinc	mg/L	0.0031	0.0067	0.0043	0.016	0.0018	0.0042	0.0014	0.0036

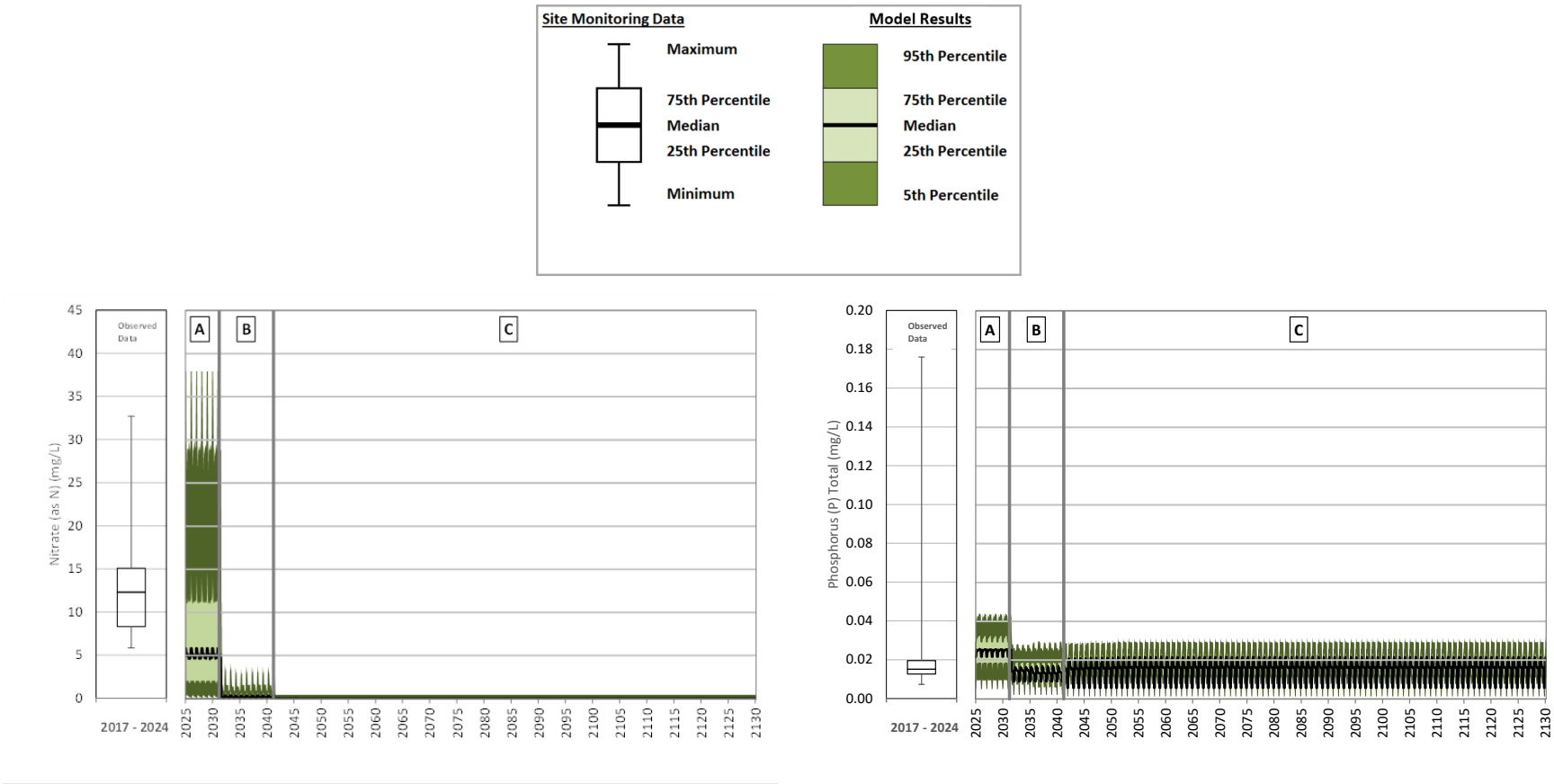
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

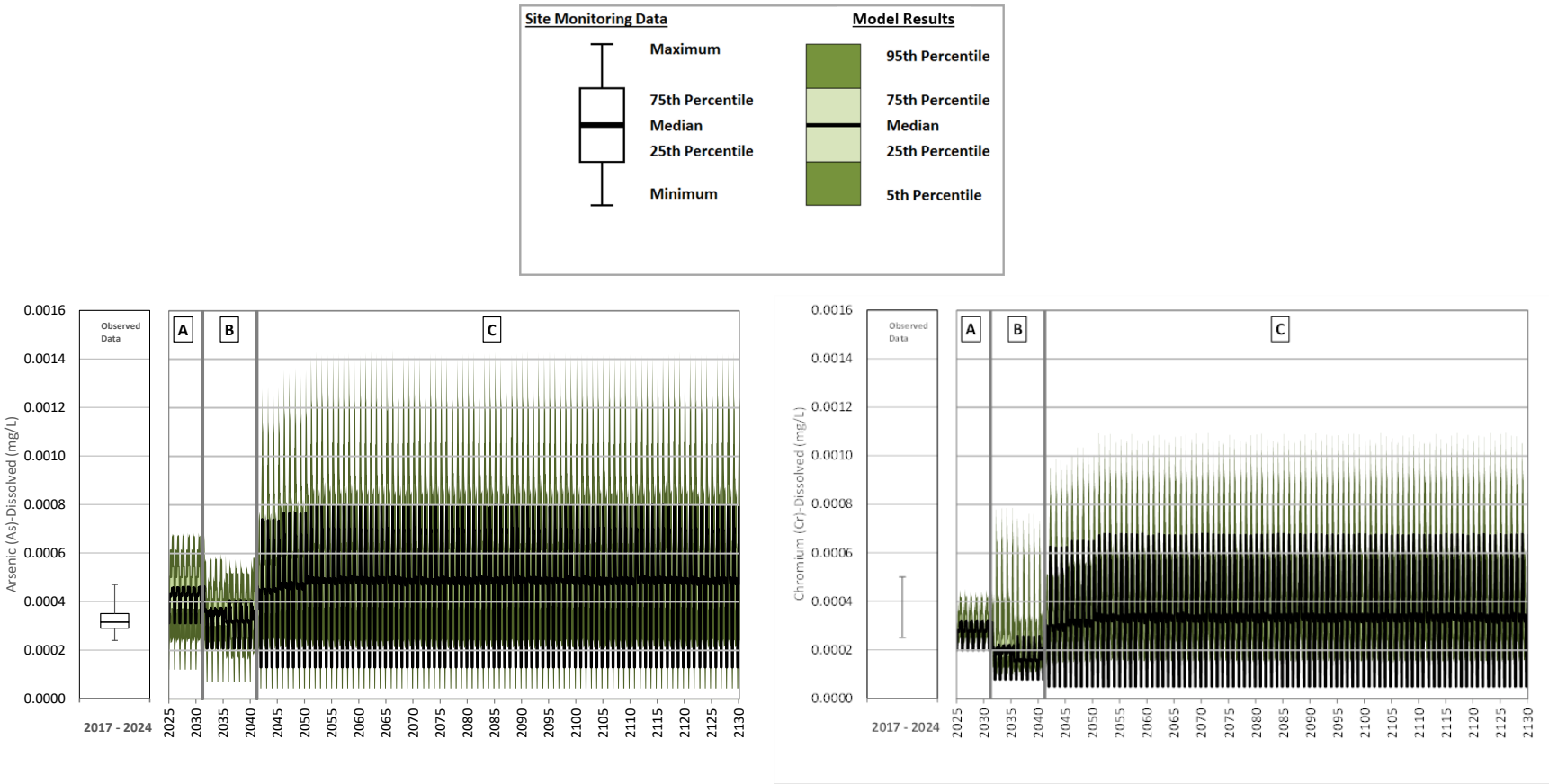
Figure 23: Predicted Sulphate and Total Ammonia Concentrations in the Northwest Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

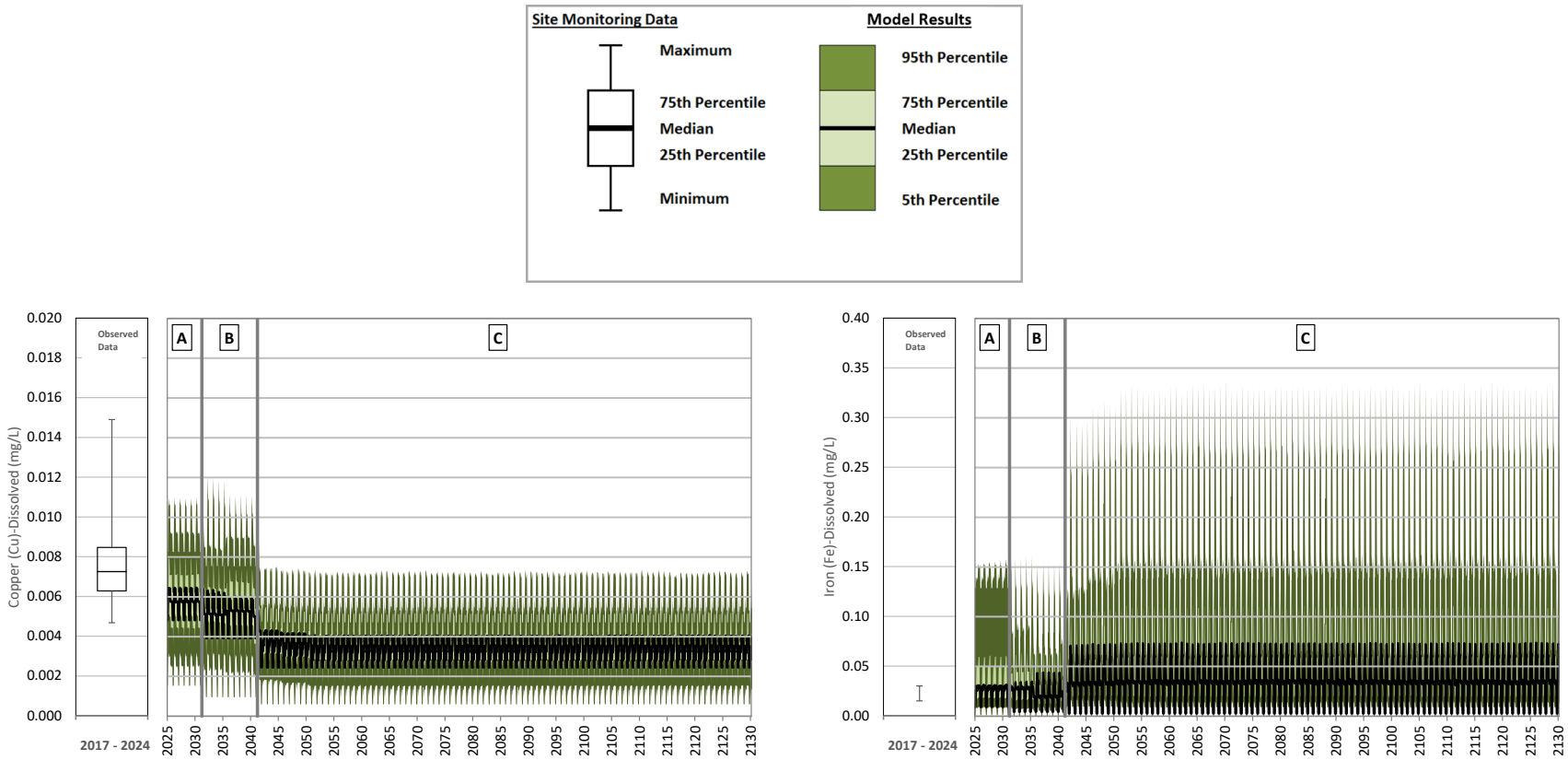
Figure 24: Predicted Nitrate and Total Phosphorus Concentrations in the Northwest Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

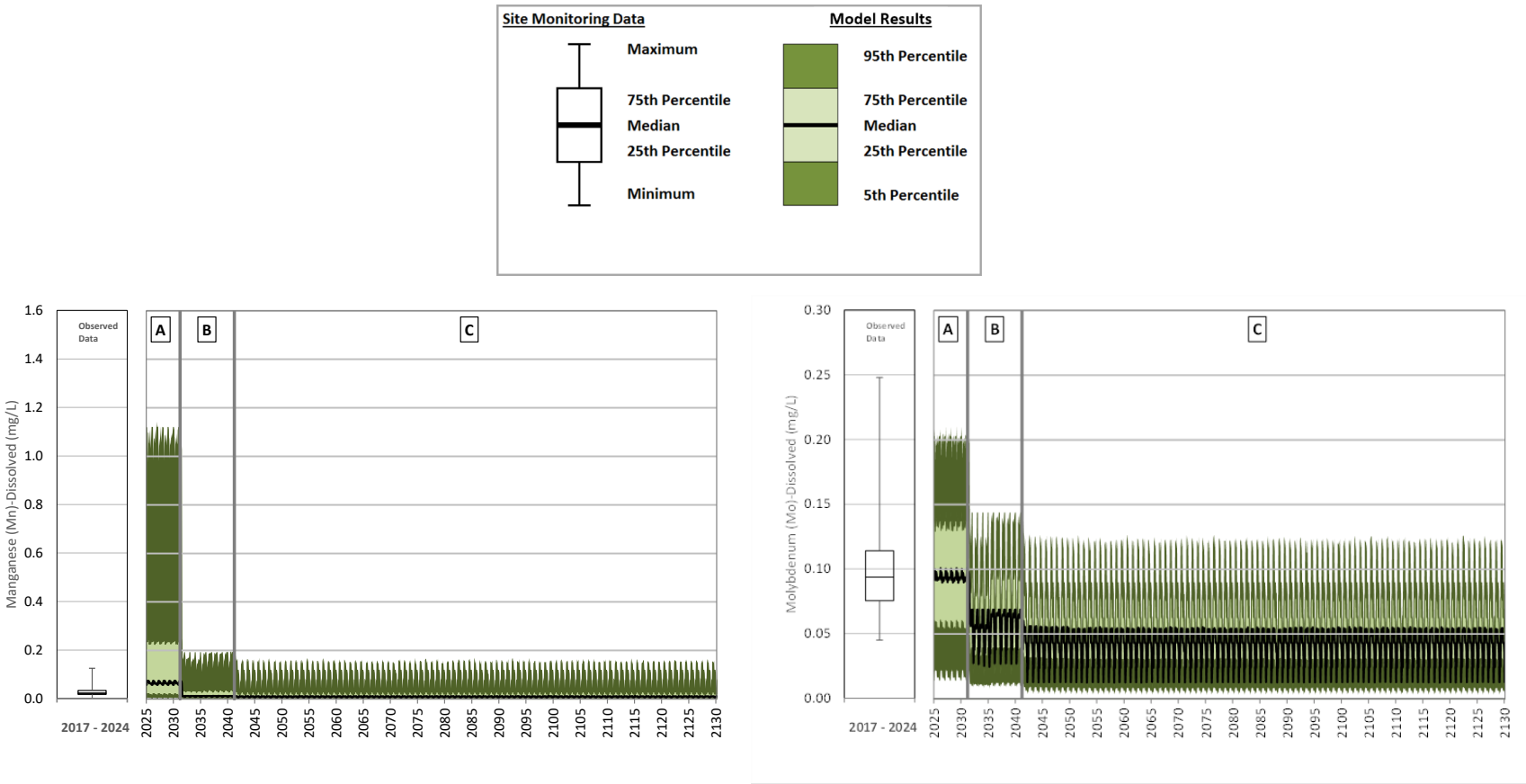
Figure 25: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the Northwest Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

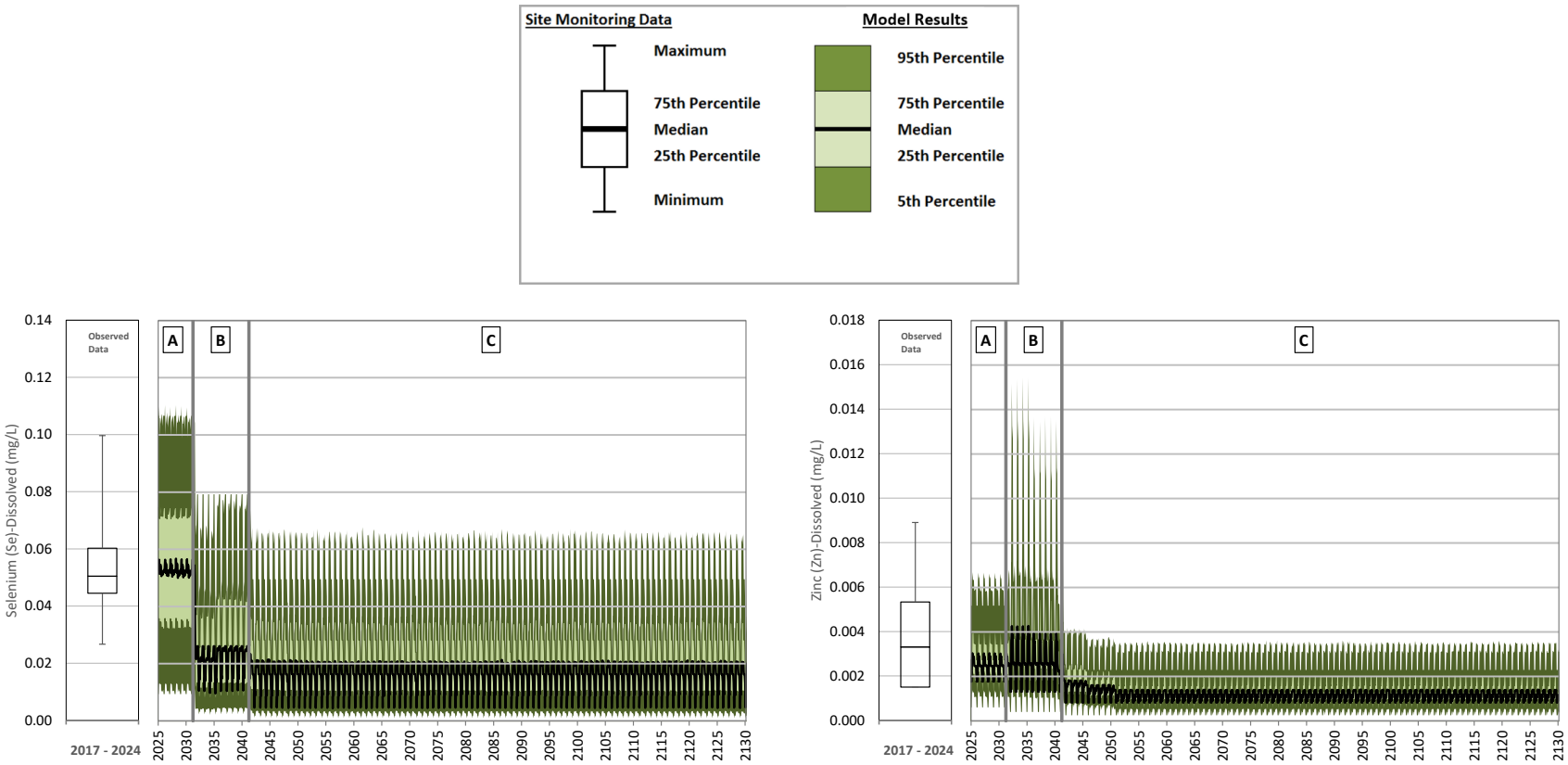
Figure 26: Predicted Dissolved Copper and Dissolved Iron Concentrations in the Northwest Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 27: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the Northwest Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 28: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the Northwest Sump – Operations, Closure and Post-closure

4.3 Springer-Cariboo Pit

At closure, the PAG material from the Temporary NW PAG Stockpile will be placed in the Springer-Cariboo Pit, and a pit lake will form. The pit will fill passively with groundwater and surface runoff from the pit catchment area. The groundwater inflow to the pit is assumed to flow into the stored PAG material in closure and post-closure. The surface runoff includes runoff and seepage from North Bell RDS and the haul roads. These facilities will be reclaimed during closure. Under the 50th percentile results, the pit lake is estimated to start overflowing in 2153, while under the 90th percentile it is estimated to start overflowing in 2148, and in 2144 under the 99.5th percentile. Overflow from the pit will discharge to Bootjack Lake.

Time series plots for key parameters in the Springer-Cariboo Pit for operations, closure and post-closure are shown in Figures 29 to 34. Maximum of median and 95th percentile predictions are presented in Table 12. It is anticipated that particulate metals such as aluminum and copper will be lower in pit lake waters compared to model predictions, as has been observed in operational monitoring (Golder 2016b).

Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake. For most parameters, predicted peak concentrations in the Springer-Cariboo Pit occur during operations, and then decrease as areas are reclaimed. Predicted water quality reaches steady state near the end of post-closure, when the pit lake begins to overflow.

Iron is the only parameter with predicted maximum concentrations greater in post-closure than closure. This is due to higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to the NAG waste rock and disturbed area water qualities. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to a greater proportion of the total inflows to the Springer-Cariboo pit.

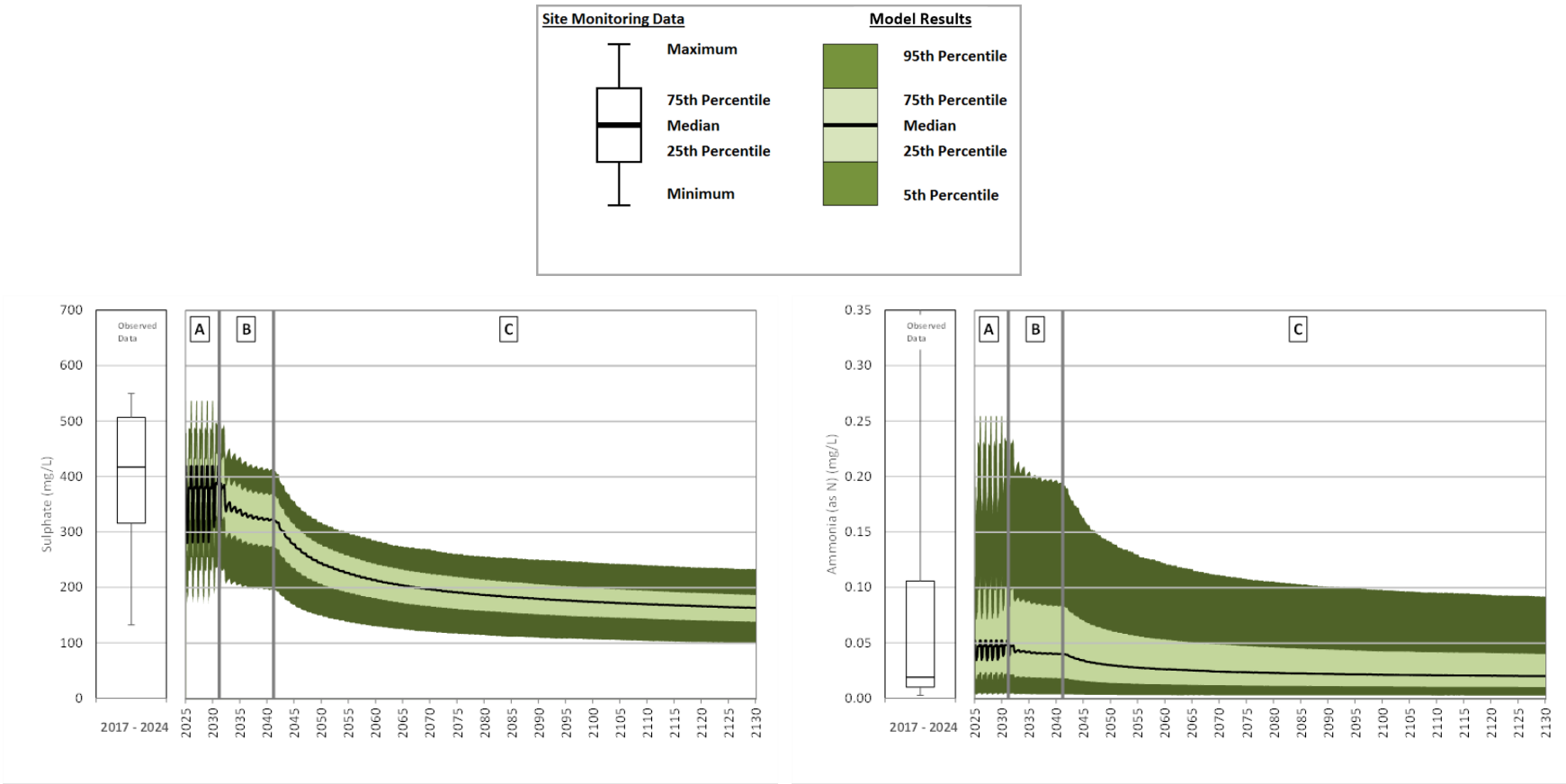
Table 12: Predicted Maximum Concentrations in the Springer-Cariboo Pit during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	418	527	389	490	327	412	257	359
Total Dissolved Solids	mg/L	723	911	672	843	561	706	441	570
Major Ions									
Calcium	mg/L	128	159	119	148	100	125	79	111
Chloride	mg/L	8.3	14	7.7	13	6.4	11	4.7	7.9
Fluoride	mg/L	0.46	0.63	0.42	0.58	0.35	0.48	0.26	0.36
Magnesium	mg/L	24	32	22	29	19	24	15	20
Potassium	mg/L	8.9	17	8.2	16	6.8	13	5.0	9.3
Sodium	mg/L	42	60	39	55	32	46	24	34
Sulphate	mg/L	422	541	388	499	323	414	239	313
Nutrients									
Ammonia	mg/L (as N)	0.053	0.26	0.048	0.24	0.04	0.19	0.03	0.14
Nitrate	mg/L (as N)	6.1	9.9	5.6	9.2	4.6	7.6	3.3	5.4
Nitrite	mg/L (as N)	0.047	0.088	0.043	0.081	0.036	0.067	0.026	0.048
Total Phosphorus	mg/L	0.011	0.035	0.011	0.032	0.0097	0.027	0.0094	0.023
Total Metals									
Aluminum	mg/L	0.46	0.49	0.46	0.48	0.044	0.16	0.043	0.16
Antimony	mg/L	0.018	0.019	0.0012	0.0017	0.00096	0.0013	0.00069	0.00094
Arsenic	mg/L	0.033	0.034	0.0016	0.0026	0.0011	0.002	0.00088	0.0016
Barium	mg/L	0.051	0.083	0.047	0.077	0.038	0.059	0.031	0.046
Beryllium	mg/L	0.00005	0.00005	0.000047	0.000049	0.000041	0.000041	0.000039	0.00004
Boron	mg/L	0.14	0.2	0.13	0.19	0.1	0.13	0.079	0.1
Cadmium	mg/L	0.000022	0.00013	0.00002	0.00012	0.000017	0.000071	0.000014	0.000054
Chromium	mg/L	0.00065	0.00068	0.00063	0.00066	0.00032	0.00077	0.00031	0.00076
Cobalt	mg/L	0.00041	0.00061	0.0004	0.00059	0.000091	0.00036	0.000073	0.00031
Copper	mg/L	0.015	0.19	0.014	0.18	0.0063	0.031	0.0058	0.023
Iron	mg/L	0.47	0.48	0.47	0.48	0.066	0.24	0.067	0.25
Lead	mg/L	0.00014	0.00014	0.00014	0.00014	0.00002	0.000088	0.000017	0.000087
Lithium	mg/L	0.011	0.018	0.01	0.016	0.0083	0.013	0.006	0.0093
Manganese	mg/L	0.053	0.081	0.051	0.076	0.029	0.069	0.023	0.058
Mercury	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Molybdenum	mg/L	0.51	0.56	0.15	0.2	0.12	0.16	0.09	0.12
Nickel	mg/L	0.001	0.0014	0.001	0.0014	0.00048	0.001	0.00043	0.00094
Selenium	mg/L	0.036	0.049	0.033	0.045	0.027	0.032	0.02	0.024
Silver	mg/L	0.00001	0.000017	0.0000093	0.000017	0.0000078	0.000016	0.0000062	0.000015
Strontium	mg/L	1.8	3.1	1.6	2.9	1.4	2.1	1.0	1.6

Table 12: Predicted Maximum Concentrations in the Springer-Cariboo Pit during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Thallium	mg/L	0.000005	0.0000067	0.0000047	0.0000065	0.0000041	0.0000042	0.000004	0.0000041
Tin	mg/L	0.00005	0.00012	0.000046	0.00012	0.000038	0.000039	0.000029	0.00003
Titanium	mg/L	0.022	0.037	0.022	0.036	0.0027	0.014	0.002	0.0099
Uranium	mg/L	0.0018	0.0028	0.0016	0.0026	0.0013	0.0019	0.001	0.0015
Vanadium	mg/L	0.0025	0.0043	0.0024	0.0041	0.0012	0.0029	0.001	0.0023
Zinc	mg/L	0.0042	0.006	0.0042	0.0051	0.0014	0.0022	0.0013	0.0019
Dissolved Metals									
Aluminum	mg/L	0.011	0.036	0.011	0.027	0.011	0.025	0.01	0.024
Antimony	mg/L	0.018	0.019	0.0012	0.0016	0.00096	0.0013	0.00069	0.00094
Arsenic	mg/L	0.033	0.034	0.0013	0.0023	0.0011	0.0019	0.00083	0.0014
Barium	mg/L	0.049	0.074	0.045	0.068	0.038	0.057	0.03	0.044
Beryllium	mg/L	0.00005	0.00005	0.000047	0.000049	0.000041	0.000041	0.000039	0.00004
Boron	mg/L	0.14	0.17	0.13	0.16	0.1	0.13	0.079	0.1
Cadmium	mg/L	0.000019	0.000083	0.000018	0.000076	0.000015	0.000063	0.000012	0.000046
Chromium	mg/L	0.00025	0.00028	0.00023	0.00026	0.0002	0.00025	0.00019	0.00024
Cobalt	mg/L	0.00012	0.00032	0.00011	0.0003	0.000091	0.00025	0.000073	0.00019
Copper	mg/L	0.0074	0.038	0.007	0.035	0.0059	0.029	0.0054	0.022
Iron	mg/L	0.015	0.034	0.014	0.025	0.014	0.023	0.015	0.032
Lead	mg/L	0.000025	0.000025	0.000023	0.000025	0.00002	0.000022	0.000017	0.000022
Lithium	mg/L	0.011	0.017	0.01	0.015	0.0083	0.013	0.006	0.0092
Manganese	mg/L	0.032	0.06	0.03	0.055	0.025	0.046	0.019	0.035
Mercury	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Molybdenum	mg/L	0.51	0.55	0.15	0.19	0.12	0.16	0.09	0.12
Nickel	mg/L	0.0005	0.00088	0.00047	0.00083	0.0004	0.0007	0.00035	0.00061
Selenium	mg/L	0.035	0.042	0.033	0.039	0.027	0.032	0.02	0.024
Silicon	mg/L	5.4	7.6	4.4	6.4	3.8	5.5	3.7	5.2
Silver	mg/L	0.00001	0.00001	0.0000093	0.0000097	0.0000078	0.0000085	0.0000062	0.0000081
Strontium	mg/L	1.8	2.8	1.6	2.5	1.4	2.1	1.0	1.5
Thallium	mg/L	0.000005	0.000005	0.0000047	0.0000049	0.0000041	0.0000042	0.000004	0.0000041
Tin	mg/L	0.00005	0.00005	0.000046	0.000047	0.000038	0.000039	0.000029	0.00003
Titanium	mg/L	0.0036	0.018	0.0033	0.017	0.0027	0.014	0.002	0.0099
Uranium	mg/L	0.0017	0.0025	0.0016	0.0023	0.0013	0.0019	0.0010	0.0014
Vanadium	mg/L	0.0013	0.0031	0.0012	0.0029	0.001	0.0024	0.00086	0.0018
Zinc	mg/L	0.0016	0.0034	0.0015	0.0025	0.0014	0.0022	0.0013	0.0019

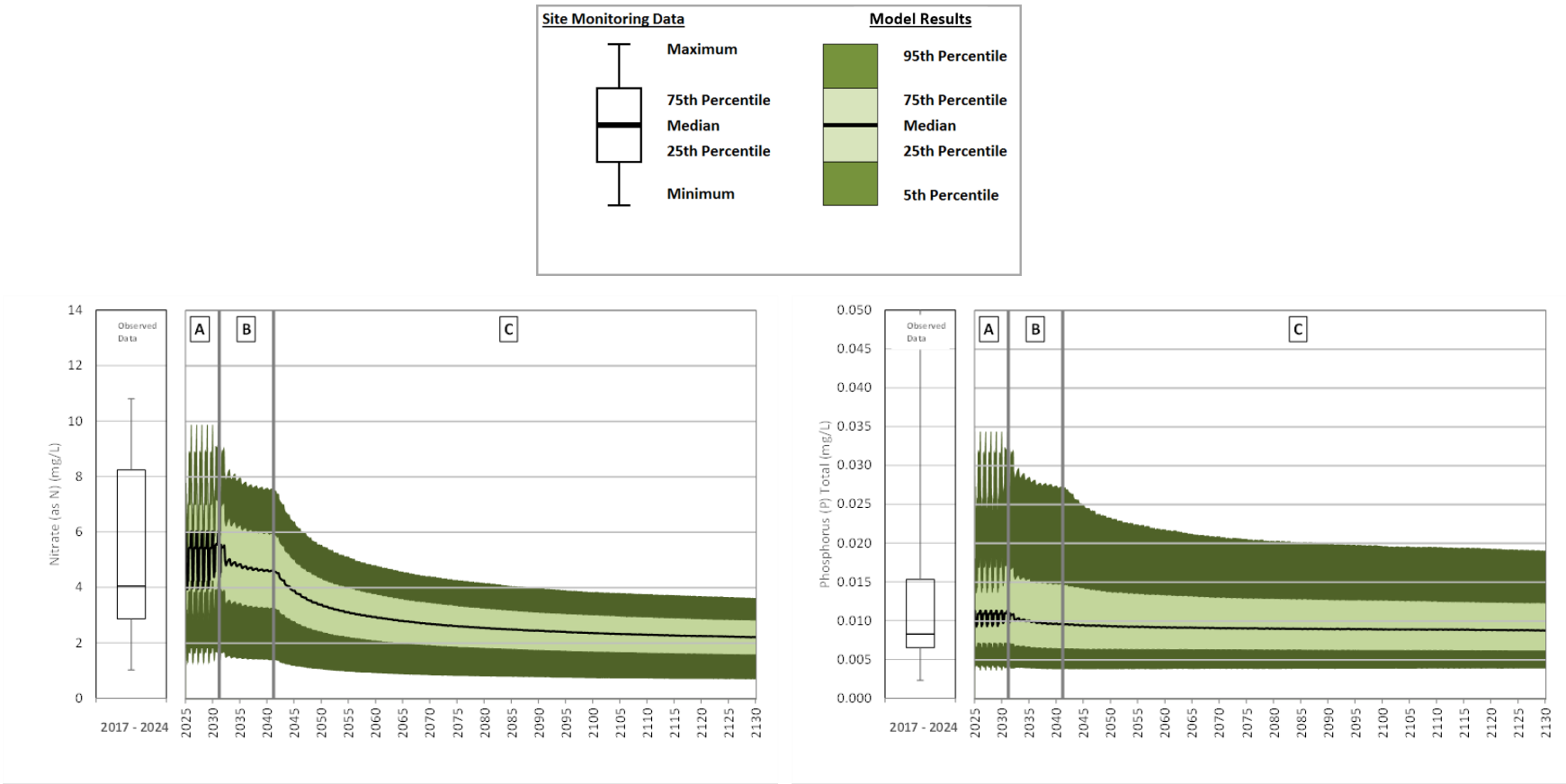
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

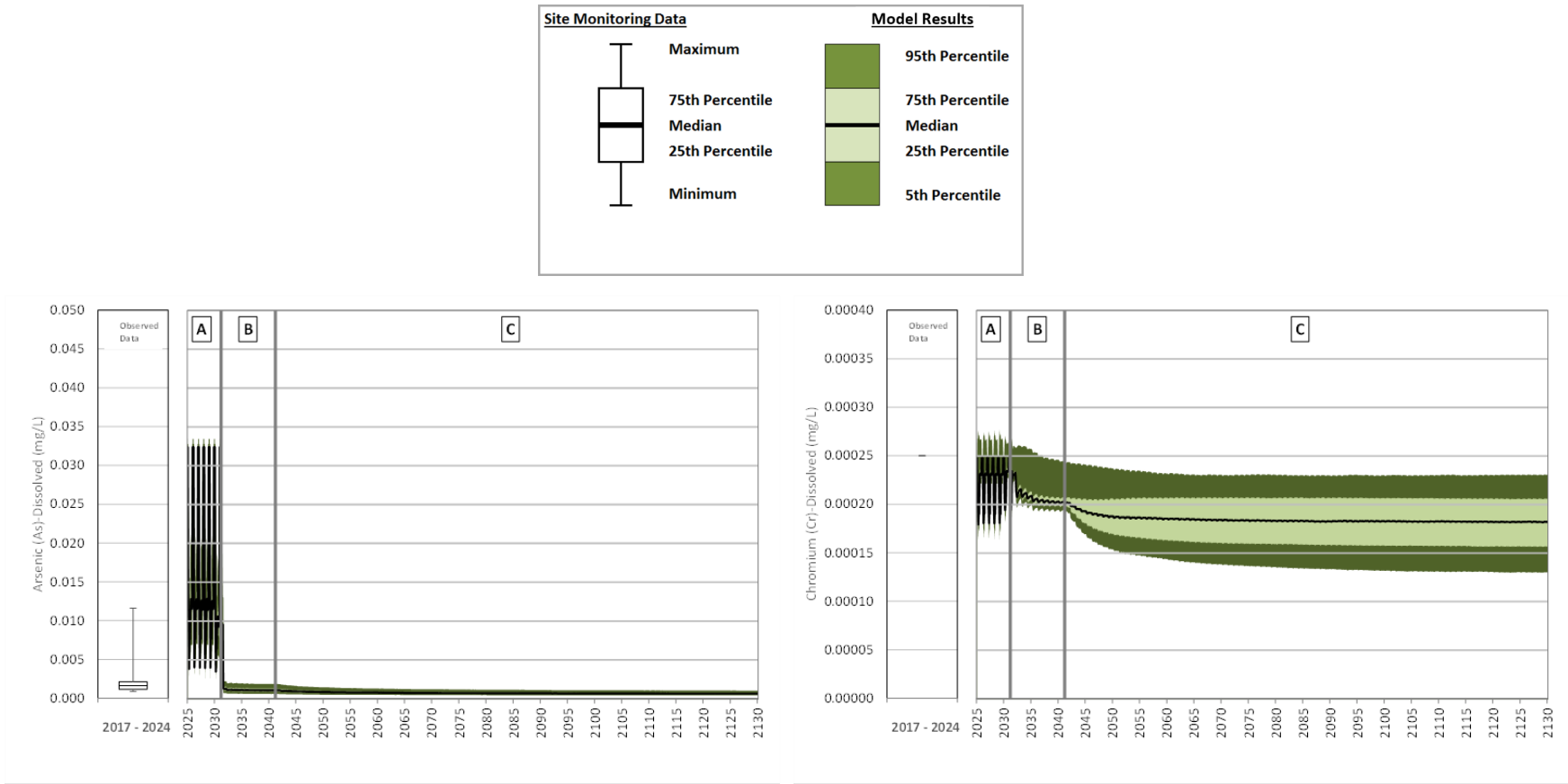
Figure 29: Predicted Sulphate and Total Ammonia Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

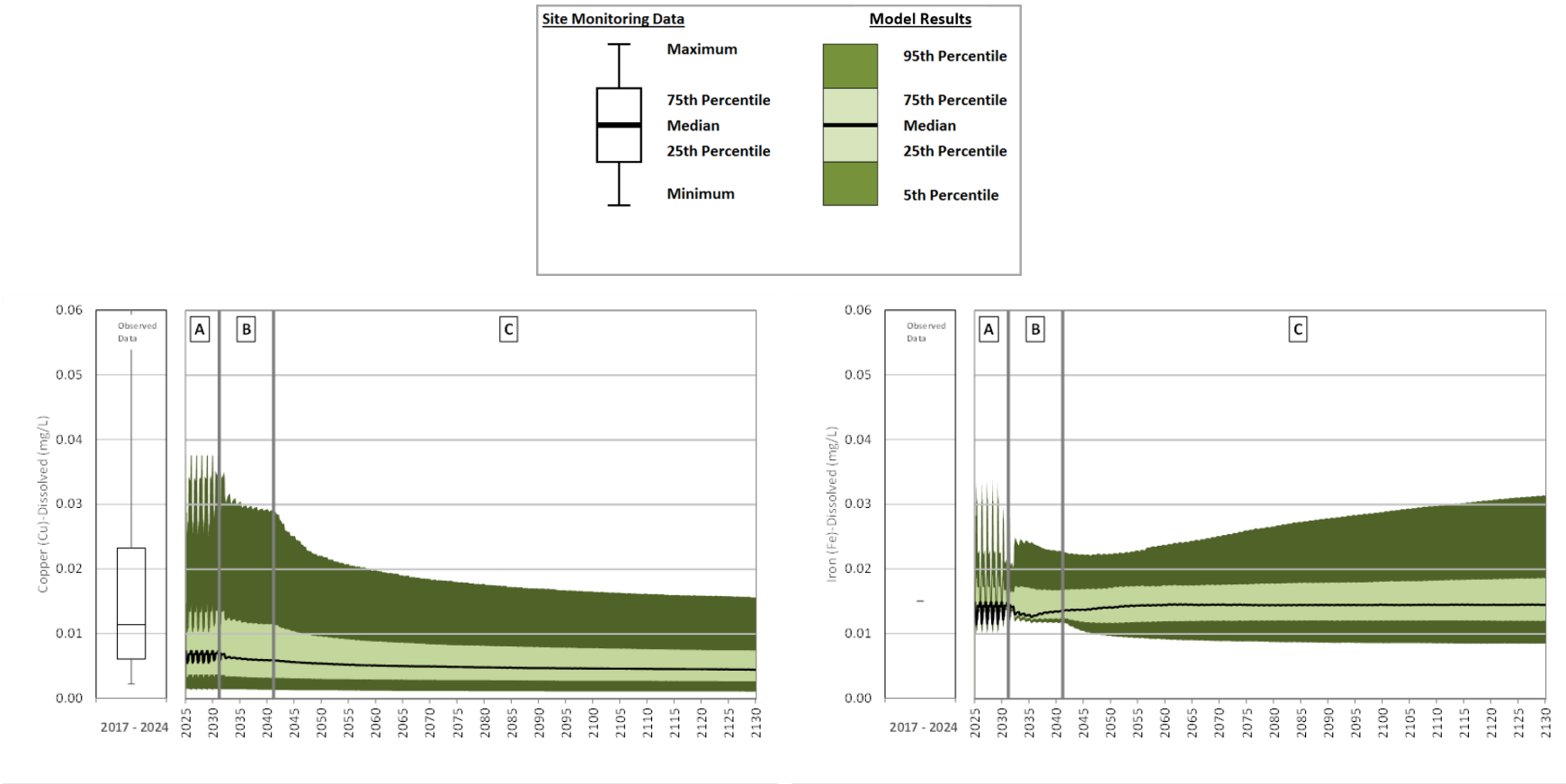
Figure 30: Predicted Nitrate and Total Phosphorus Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

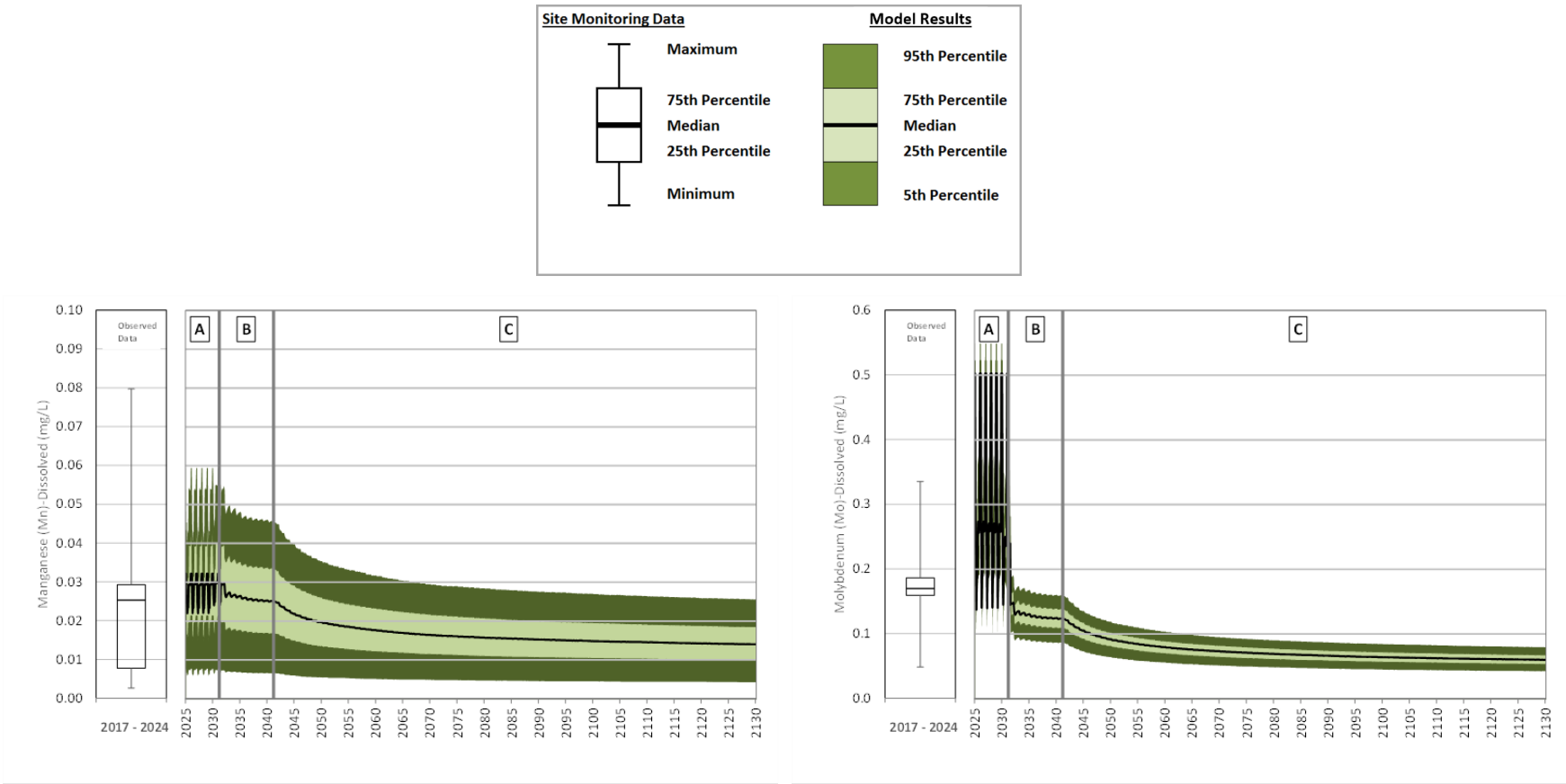
Figure 31: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

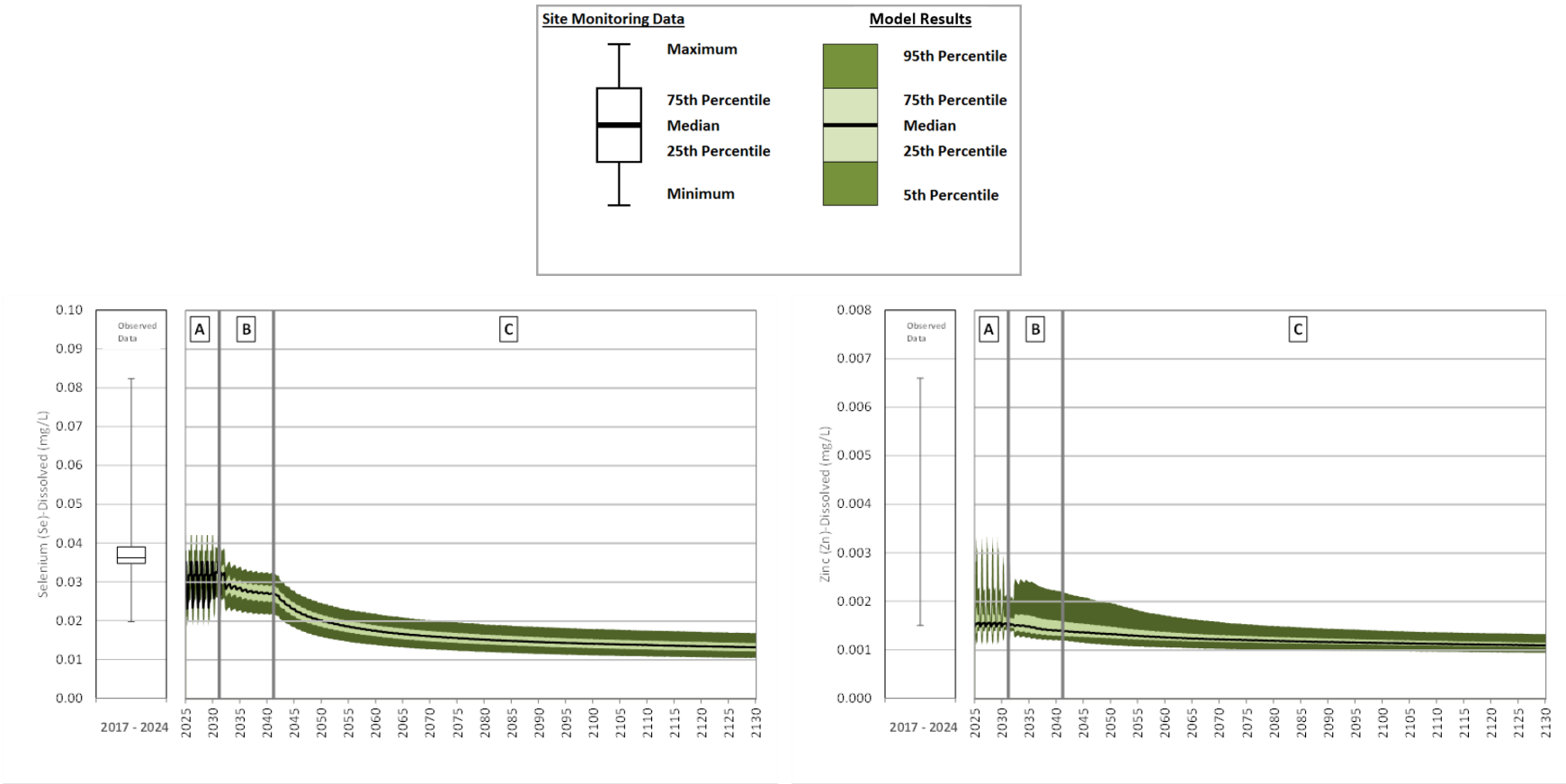
Figure 32: Predicted Dissolved Copper and Dissolved Iron Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

Figure 33: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: Changes in concentrations in the Springer-Cariboo Pit from operations to closure and post-closure are due to remediation of the catchment areas and filling of the pit lake.

Figure 34: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the Springer-Cariboo Pit – Operations, Closure and Post-closure

4.4 Mine Drainage Creek Sump

The MDCS receives drainage from undisturbed and disturbed areas, haul roads, and RDSs in its catchment area. Discharge from the MDCS is directed to the PETBP (and eventually treatment) during operations and closure and is discharge is assumed to be directed to Bootjack Lake during post-closure.

Time series plots for key parameters in the MDCS for closure and post-closure are shown in Figures 35 to 40. Maximum of median and 95th percentile predictions are presented in Table 13.

For most parameters, predicted peak concentrations in the MDCS occur during operations, and then decrease as disturbed areas, haul roads, and RDS areas are reclaimed (Figures 35 to 40). Concentrations are highest during operations for most parameters because RDS and haul road runoff is assigned the NAG water quality input until reclamation, which will occur throughout closure. Water qualities from these facilities are predicted to return to the undisturbed water quality (Table 7). Predicted water quality reaches steady state 10 years after the start of post-closure, after all watershed areas have been reclaimed.

Seasonal peak concentrations during winter are driven by seepage from the Haul Road and RDS areas. During winter months, when precipitation occurs as snowfall, seepage represents a high proportion of the total flow to the MDCS and causes concentrations of parameters to peak.

Some parameters are predicted to have higher concentrations in post-closure than closure. These parameters have higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to NAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more inflows to the MDCS, which causes concentrations of parameters, such as aluminum, to increase from closure to post-closure.

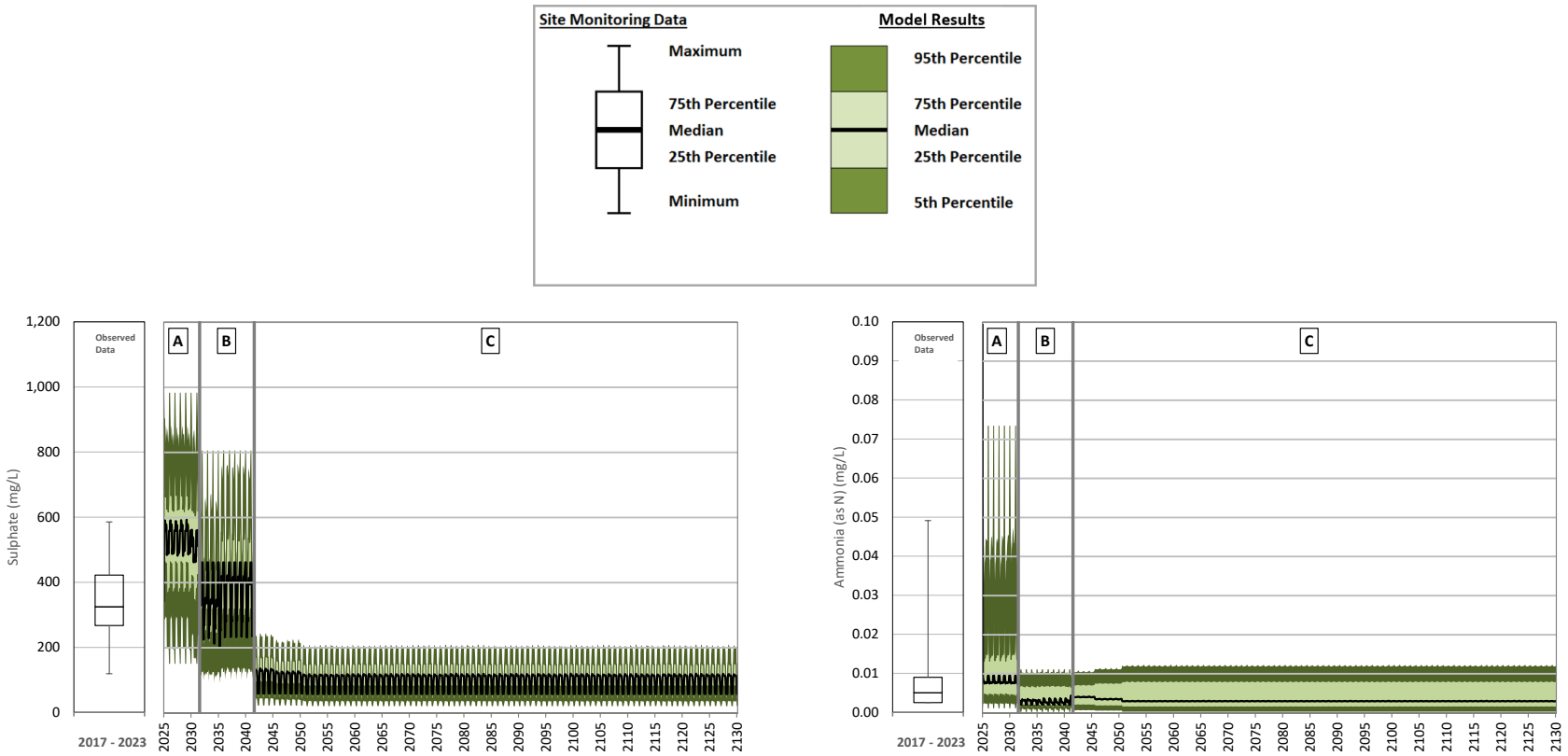
Table 13: Predicted Maximum Concentrations in the Mine Drainage Creek Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	746	1097	582	941	304	497	243	363
Total Dissolved Solids	mg/L	1099	1626	854	1388	438	704	349	518
Major Ions									
Calcium	mg/L	231	344	180	292	89	150	67	100
Chloride	mg/L	2.3	6.3	1.7	3.9	2.3	8.1	2.3	8.2
Fluoride	mg/L	0.16	0.33	0.11	0.2	0.085	0.16	0.08	0.16
Magnesium	mg/L	41	58	32	52	20	30	18	27
Potassium	mg/L	2.2	4.6	1.5	2.4	1.2	1.6	1.2	1.6
Sodium	mg/L	17	37	12	20	8.7	13	8.3	12
Sulphate	mg/L	597	990	465	811	179	348	121	213
Nutrients									
Ammonia	mg/L (as N)	0.0096	0.074	0.0044	0.011	0.0044	0.012	0.0031	0.012
Nitrate	mg/L (as N)	5.9	38	0.69	7.9	0.12	0.78	0.038	0.45
Nitrite	mg/L (as N)	0.0073	0.087	0.00076	0.0057	0.00044	0.0023	0.00042	0.0024
Total Phosphorus	mg/L	0.024	0.041	0.018	0.03	0.022	0.033	0.022	0.033
Total Metals									
Aluminum	mg/L	0.47	0.53	0.48	0.62	0.077	0.37	0.074	0.37
Antimony	mg/L	0.00023	0.00052	0.00016	0.00043	0.000075	0.00014	0.000052	0.000092
Arsenic	mg/L	0.00074	0.00095	0.00077	0.001	0.00089	0.0016	0.00089	0.0016
Barium	mg/L	0.041	0.12	0.028	0.051	0.017	0.027	0.014	0.021
Beryllium	mg/L	0.000048	0.000049	0.000048	0.000049	0.000037	0.000041	0.00003	0.000032
Boron	mg/L	0.06	0.13	0.047	0.099	0.029	0.044	0.024	0.038
Cadmium	mg/L	0.00005	0.00026	0.000025	0.00014	0.000016	0.000052	0.000014	0.000044
Chromium	mg/L	0.00073	0.00088	0.00075	0.0011	0.00084	0.0017	0.00084	0.0017
Cobalt	mg/L	0.00048	0.0015	0.00034	0.00075	0.000059	0.00031	0.000059	0.00027
Copper	mg/L	0.015	0.17	0.014	0.16	0.0046	0.008	0.0034	0.007
Iron	mg/L	0.49	0.6	0.5	0.61	0.13	0.57	0.13	0.57
Lead	mg/L	0.00014	0.00015	0.00014	0.00016	0.00003	0.00013	0.00003	0.00013
Lithium	mg/L	0.0022	0.006	0.0015	0.0042	0.001	0.002	0.001	0.0019
Manganese	mg/L	0.1	1.2	0.035	0.27	0.015	0.11	0.014	0.081
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.0000051	0.0000053	0.0000051	0.0000053
Molybdenum	mg/L	0.1	0.22	0.07	0.16	0.027	0.063	0.019	0.039
Nickel	mg/L	0.0011	0.0024	0.0012	0.0018	0.00088	0.0019	0.00089	0.0019
Selenium	mg/L	0.054	0.13	0.026	0.086	0.01	0.032	0.0068	0.021
Silver	mg/L	0.0000046	0.000015	0.0000046	0.00002	0.0000039	0.000024	0.0000036	0.000025

Table 13: Predicted Maximum Concentrations in the Mine Drainage Creek Sump during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Strontium	mg/L	1.6	2.9	0.93	1.7	0.48	0.74	0.38	0.67
Thallium	mg/L	0.000005	0.0000067	0.000005	0.0000067	0.0000051	0.0000053	0.0000051	0.0000053
Tin	mg/L	0.000042	0.00011	0.00004	0.00012	0.00003	0.000033	0.00003	0.000032
Titanium	mg/L	0.021	0.024	0.02	0.022	0.0017	0.0024	0.0017	0.0024
Uranium	mg/L	0.0012	0.0022	0.00086	0.0019	0.00066	0.0012	0.00068	0.0012
Vanadium	mg/L	0.0016	0.0019	0.0017	0.0021	0.00071	0.0014	0.00071	0.0014
Zinc	mg/L	0.0063	0.012	0.0071	0.017	0.0023	0.0059	0.00098	0.0032
Dissolved Metals									
Aluminum	mg/L	0.02	0.076	0.032	0.17	0.044	0.24	0.041	0.24
Antimony	mg/L	0.00021	0.00038	0.00014	0.00029	0.000075	0.00014	0.000052	0.000092
Arsenic	mg/L	0.00047	0.00069	0.0005	0.00077	0.00084	0.0015	0.00084	0.0015
Barium	mg/L	0.039	0.11	0.026	0.043	0.017	0.025	0.014	0.019
Beryllium	mg/L	0.000048	0.000049	0.000048	0.000049	0.000037	0.000041	0.00003	0.000032
Boron	mg/L	0.056	0.097	0.043	0.069	0.029	0.042	0.024	0.036
Cadmium	mg/L	0.000047	0.00021	0.000023	0.000095	0.000014	0.000044	0.000013	0.000036
Chromium	mg/L	0.00033	0.00049	0.00035	0.00074	0.00072	0.0012	0.00072	0.0012
Cobalt	mg/L	0.0002	0.0012	0.00005	0.00046	0.000059	0.00019	0.000059	0.00015
Copper	mg/L	0.0077	0.026	0.007	0.016	0.0042	0.0064	0.0031	0.0054
Iron	mg/L	0.041	0.15	0.052	0.16	0.078	0.35	0.078	0.36
Lead	mg/L	0.000027	0.000039	0.000025	0.000051	0.00003	0.000066	0.00003	0.000066
Lithium	mg/L	0.002	0.0051	0.0013	0.0032	0.001	0.0018	0.001	0.0018
Manganese	mg/L	0.079	1.1	0.014	0.25	0.011	0.082	0.01	0.058
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.0000051	0.0000053	0.0000051	0.0000053
Molybdenum	mg/L	0.1	0.2	0.069	0.14	0.027	0.062	0.019	0.039
Nickel	mg/L	0.00056	0.0018	0.00061	0.0013	0.0008	0.0016	0.00081	0.0016
Selenium	mg/L	0.054	0.12	0.026	0.08	0.01	0.031	0.0068	0.02
Silicon	mg/L	6.6	7.8	5.7	6.9	6.0	8.2	6.0	8.3
Silver	mg/L	0.0000046	0.0000077	0.0000046	0.000012	0.0000039	0.000017	0.0000036	0.000017
Strontium	mg/L	1.6	2.6	0.92	1.3	0.48	0.73	0.38	0.65
Thallium	mg/L	0.000005	0.000005	0.000005	0.000005	0.0000051	0.0000053	0.0000051	0.0000053
Tin	mg/L	0.000042	0.000045	0.00004	0.000046	0.00003	0.000033	0.00003	0.000032
Titanium	mg/L	0.0022	0.0046	0.0016	0.0027	0.0017	0.0024	0.0017	0.0024
Uranium	mg/L	0.0012	0.0019	0.00083	0.0016	0.00066	0.0012	0.00067	0.0012
Vanadium	mg/L	0.00042	0.00073	0.00049	0.00086	0.00053	0.00091	0.00053	0.00091
Zinc	mg/L	0.0037	0.0094	0.0045	0.015	0.0023	0.0059	0.00098	0.0032

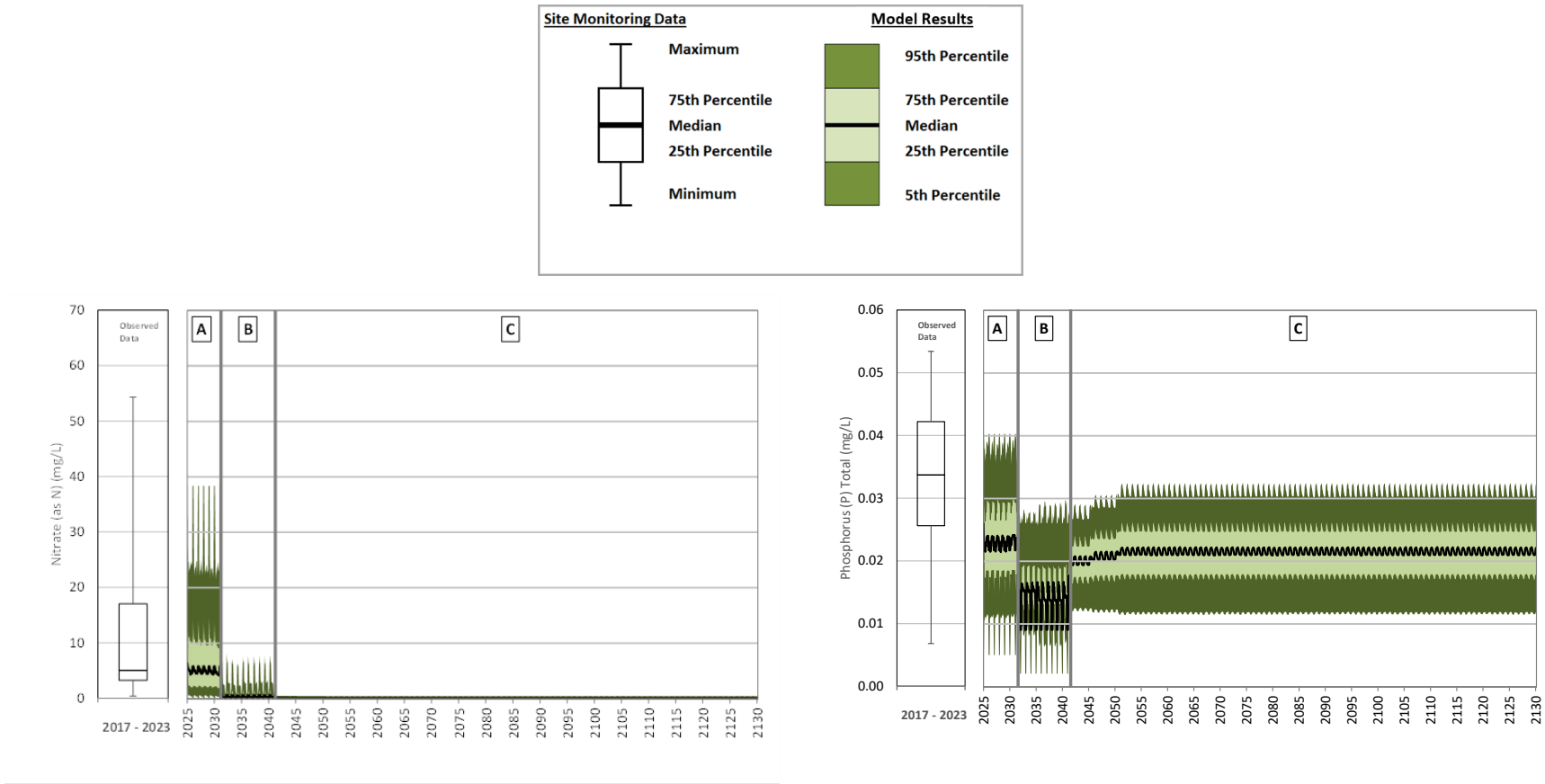
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

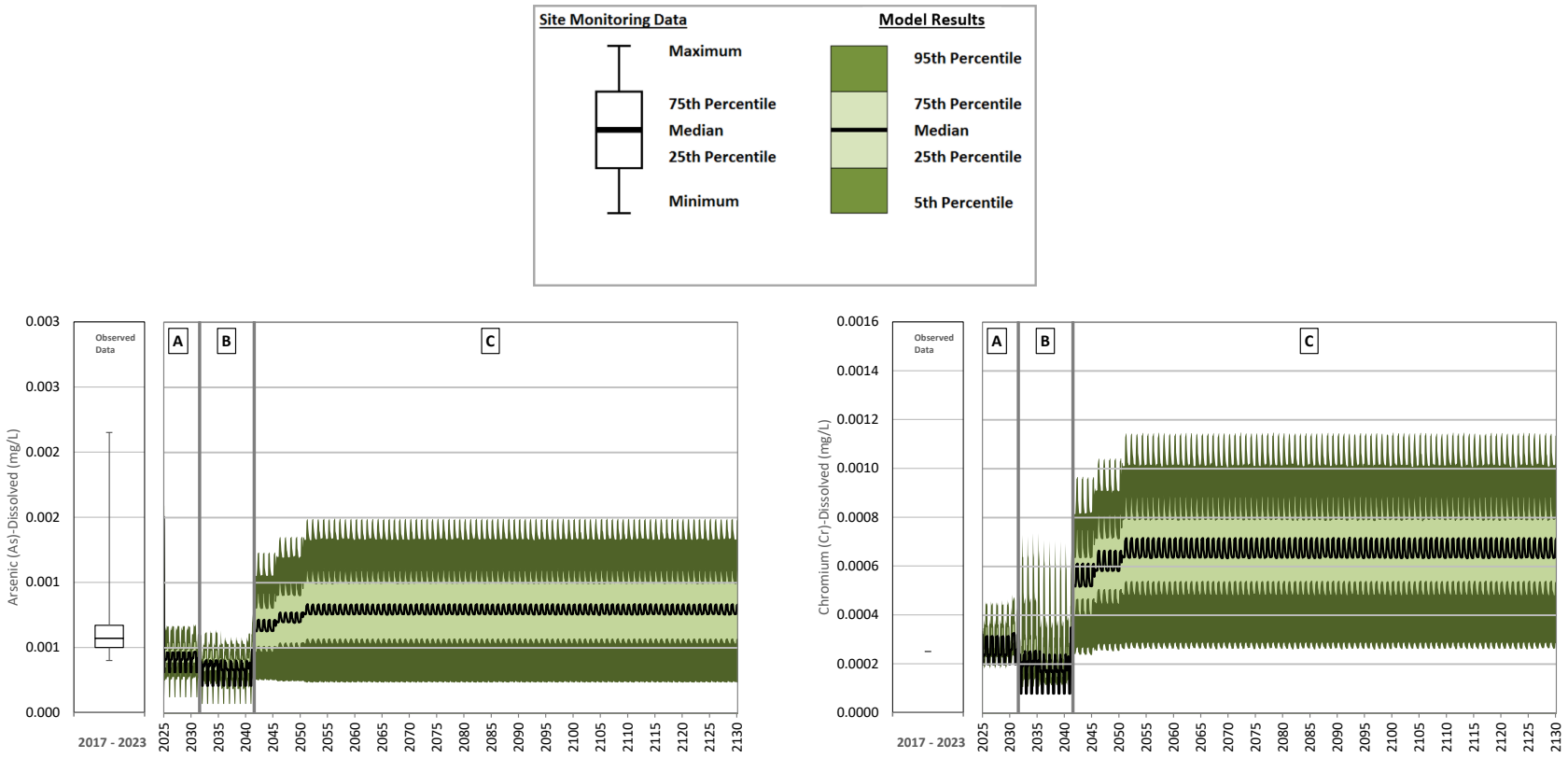
Figure 35: Predicted Sulphate and Total Ammonia Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

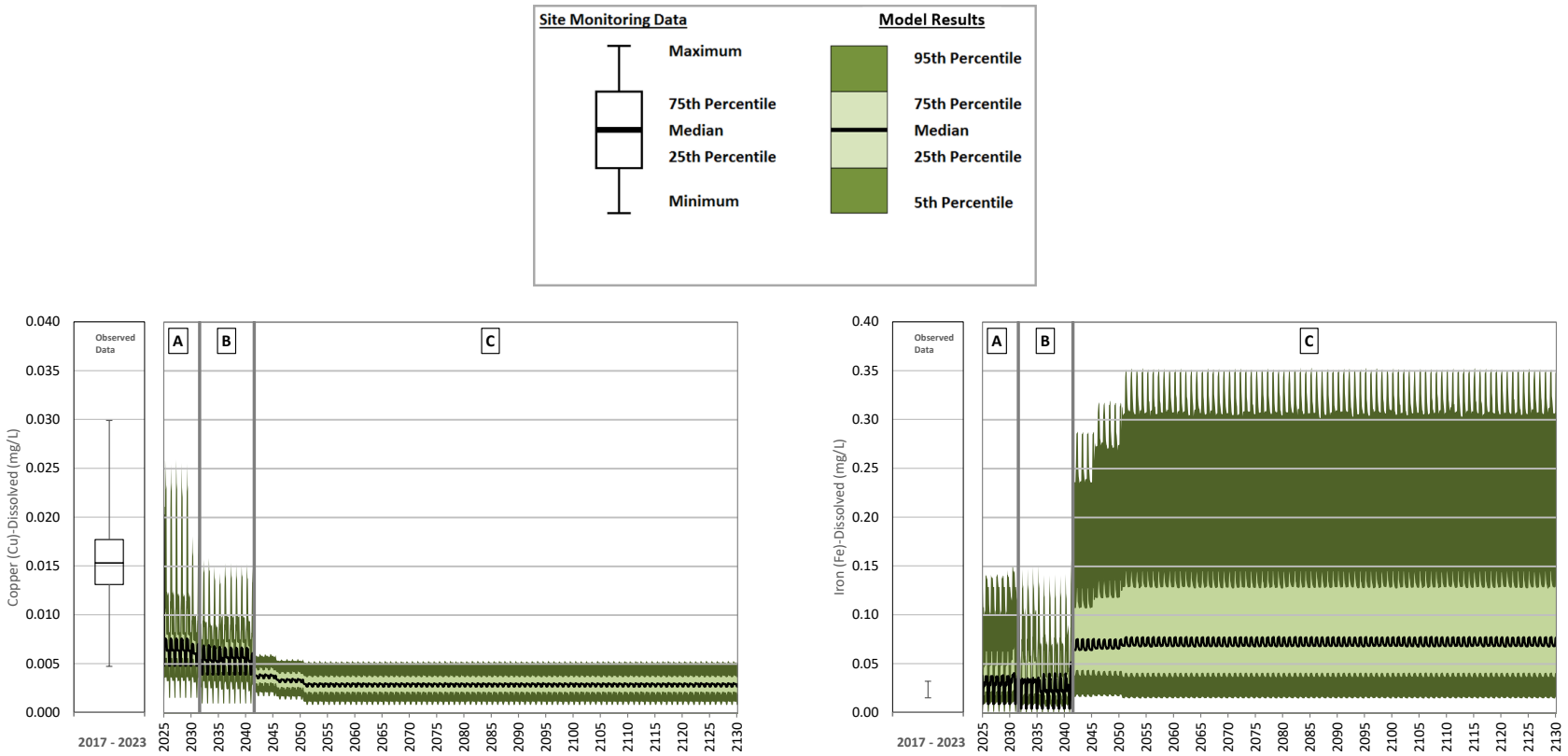
Figure 36: Predicted Nitrate and Total Phosphorus Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

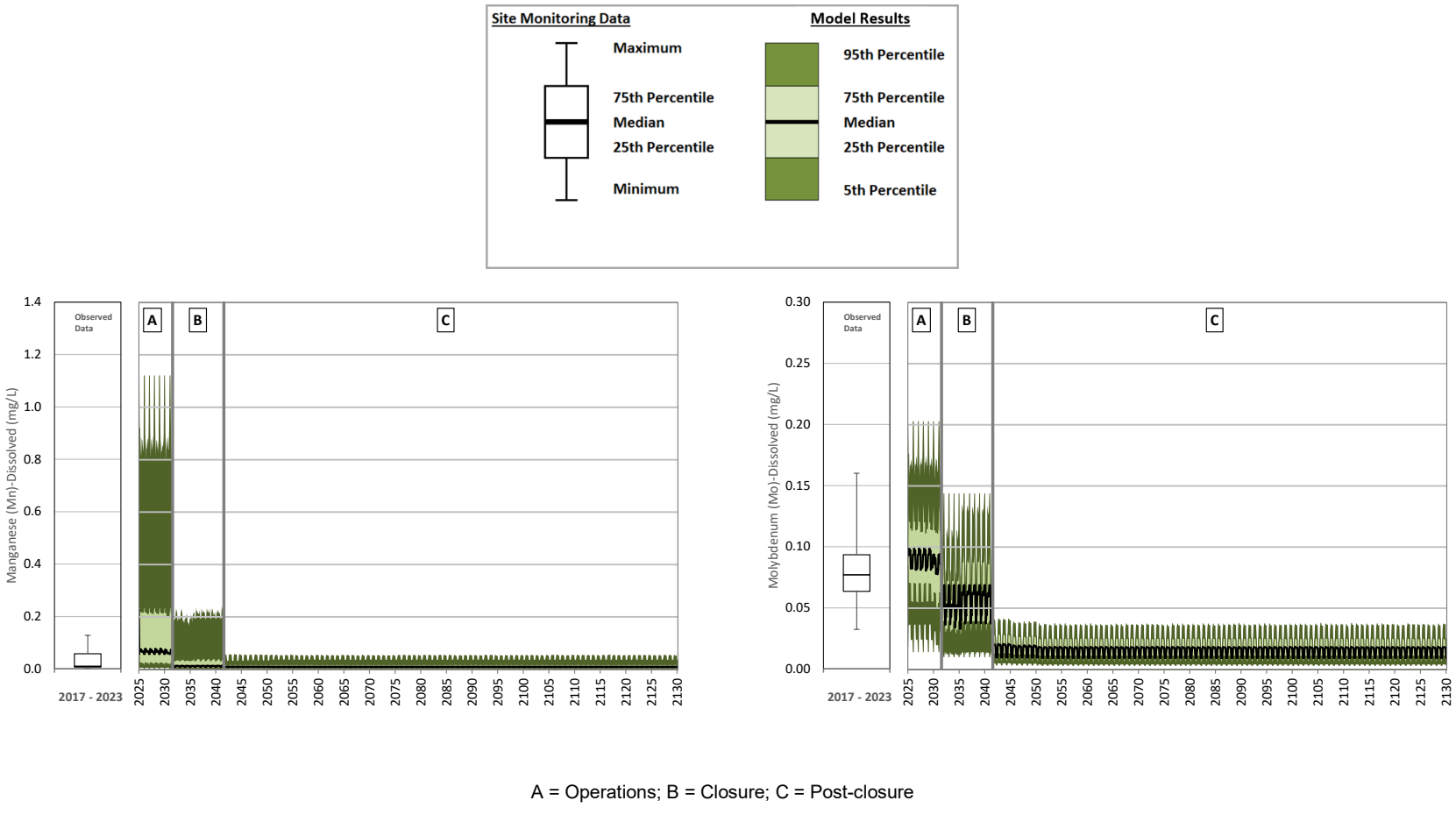
Figure 37: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

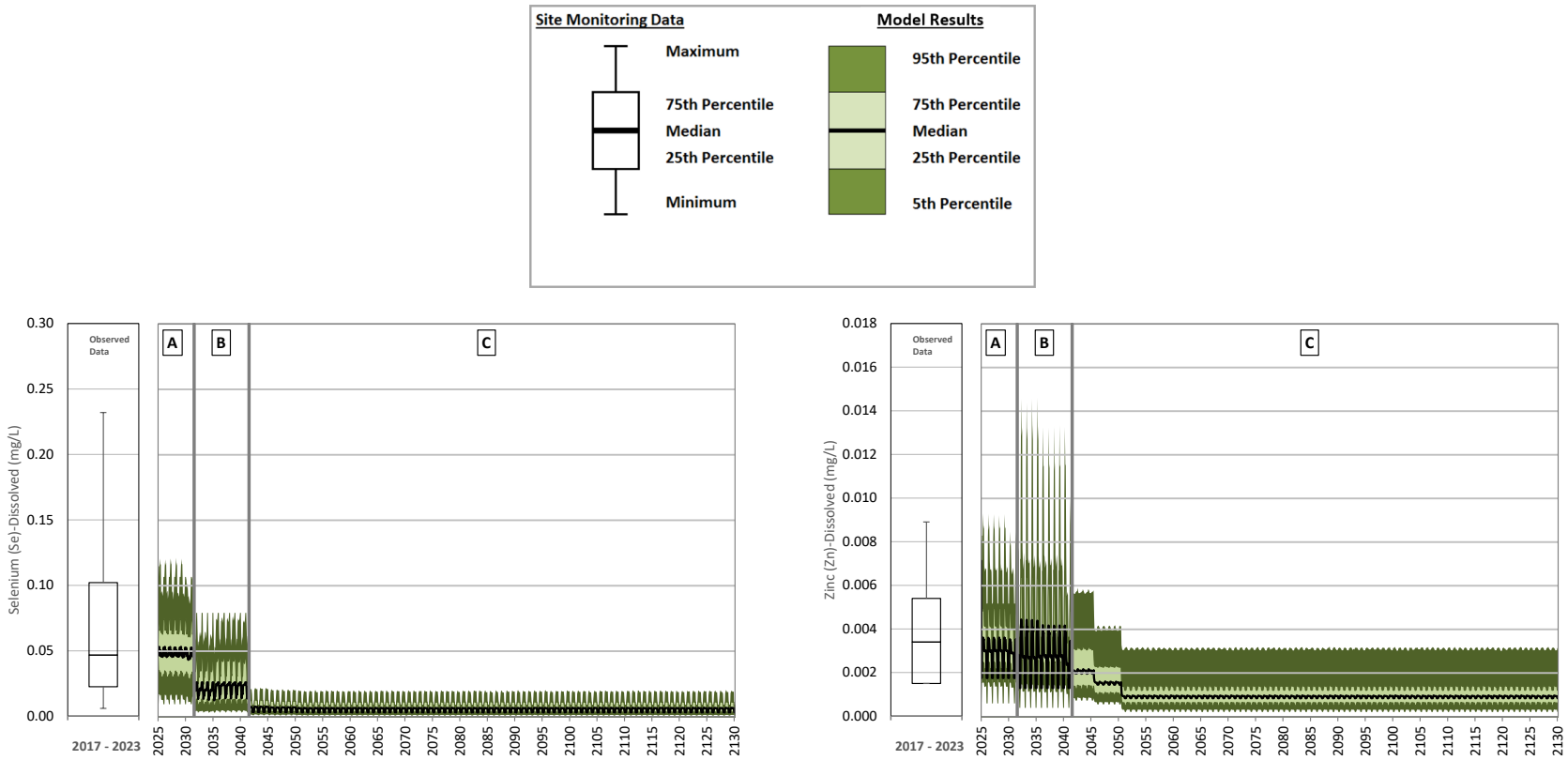
Figure 38: Predicted Dissolved Copper and Dissolved Iron Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 39: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 40: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the Mine Drainage Creek Sump – Operations, Closure and Post-closure

4.5 Wight Pit

During operations and closure, Wight Pit will still be used to store excess site water during freshet. During post-closure, Wight Pit will no longer be used for freshet storage and will be allowed to fill. From the SWWBM, Wight Pit is projected to start overflowing in 2045 under the 50th and 90th percentile results, and in 2044 under the 99.5th percentile results. Overflow from Wight Pit during post-closure is assumed as direct environmental discharge to Polley Lake. Reclamation of the disturbed areas and haul roads is assumed to occur during closure. Runoff water quality from these facilities is predicted to return to undisturbed water quality.

Time series plots for key parameters in Wight Pit for operations, closure and post-closure are shown in Figures 41 to 46. Maximum of median and 95th percentile predictions are presented in Table 14.

Predicted concentrations of key parameters in Wight Pit are generally stable 10 years after the start of post-closure (Figures 41 to 46). Concentrations of key parameters decrease through early post-closure after the pit has filled and is flushed with runoff from reclaimed disturbed areas and haul roads in the Wight Pit catchment area.

Some parameters are predicted to have increasing concentrations before reaching a steady-state in post-closure (for example, dissolved copper). The increase in concentration for these parameters is caused by either:

a) Higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to NAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more inflows into Wight Pit.

b) Increased proportions of the total inflows to Wight Pit from pit wall runoff that is assigned the Wight Pit wall runoff during post-closure.

Table 14: Predicted Maximum Concentrations Wight Pit during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	691	872	579	765	213	374	171	335
Total Dissolved Solids	mg/L	1048	1319	890	1155	312	484	246	406
Major Ions									
Calcium	mg/L	222	284	184	246	67	108	55	96
Chloride	mg/L	9.0	10	4.0	11	2.1	11	1.9	11
Fluoride	mg/L	0.59	0.73	0.39	0.54	0.23	0.37	0.22	0.35
Magnesium	mg/L	33	40	29	36	11	25	8.2	23
Potassium	mg/L	4.5	5.2	3.0	4.4	0.85	1.8	0.65	1.3
Sodium	mg/L	31	35	24	31	18	31	17	30
Sulphate	mg/L	588	778	502	665	141	230	96	179
Nutrients									
Ammonia	mg/L (as N)	0.04	0.061	0.016	0.046	0.0046	0.033	0.0031	0.031
Nitrate	mg/L (as N)	4.9	11	2.7	9.7	0.45	2.8	0.21	1.2
Nitrite	mg/L (as N)	0.028	0.035	0.014	0.026	0.0027	0.017	0.0011	0.015
Total Phosphorus	mg/L	0.021	0.025	0.014	0.029	0.015	0.029	0.014	0.028
Total Metals									
Aluminum	mg/L	0.5	0.52	0.47	0.5	0.042	0.17	0.042	0.16
Antimony	mg/L	0.00089	0.0011	0.0008	0.0011	0.00011	0.00022	0.000084	0.00016
Arsenic	mg/L	0.0017	0.0019	0.0021	0.0038	0.0019	0.0037	0.0019	0.0037
Barium	mg/L	0.041	0.053	0.033	0.058	0.019	0.051	0.018	0.051
Beryllium	mg/L	0.000072	0.000077	0.000072	0.000078	0.000051	0.000052	0.000053	0.000054
Boron	mg/L	0.18	0.28	0.2	0.38	0.19	0.36	0.19	0.35
Cadmium	mg/L	0.00021	0.00053	0.00014	0.0004	0.000014	0.000047	0.000011	0.000029
Chromium	mg/L	0.00072	0.00077	0.00064	0.0010	0.00032	0.0012	0.00033	0.0012
Cobalt	mg/L	0.00077	0.0011	0.00051	0.00089	0.000048	0.0004	0.000042	0.00036
Copper	mg/L	0.028	0.18	0.017	0.17	0.0029	0.0083	0.0026	0.0053
Iron	mg/L	0.49	0.53	0.48	0.61	0.072	0.38	0.072	0.38
Lead	mg/L	0.00016	0.00017	0.00014	0.00015	0.000024	0.000094	0.000024	0.000094
Lithium	mg/L	0.0085	0.011	0.0061	0.0088	0.0028	0.0043	0.0026	0.0041
Manganese	mg/L	0.22	0.4	0.1	0.31	0.027	0.31	0.022	0.28
Mercury	mg/L	0.0000047	0.0000047	0.0000046	0.0000048	0.0000032	0.0000034	0.0000033	0.0000034

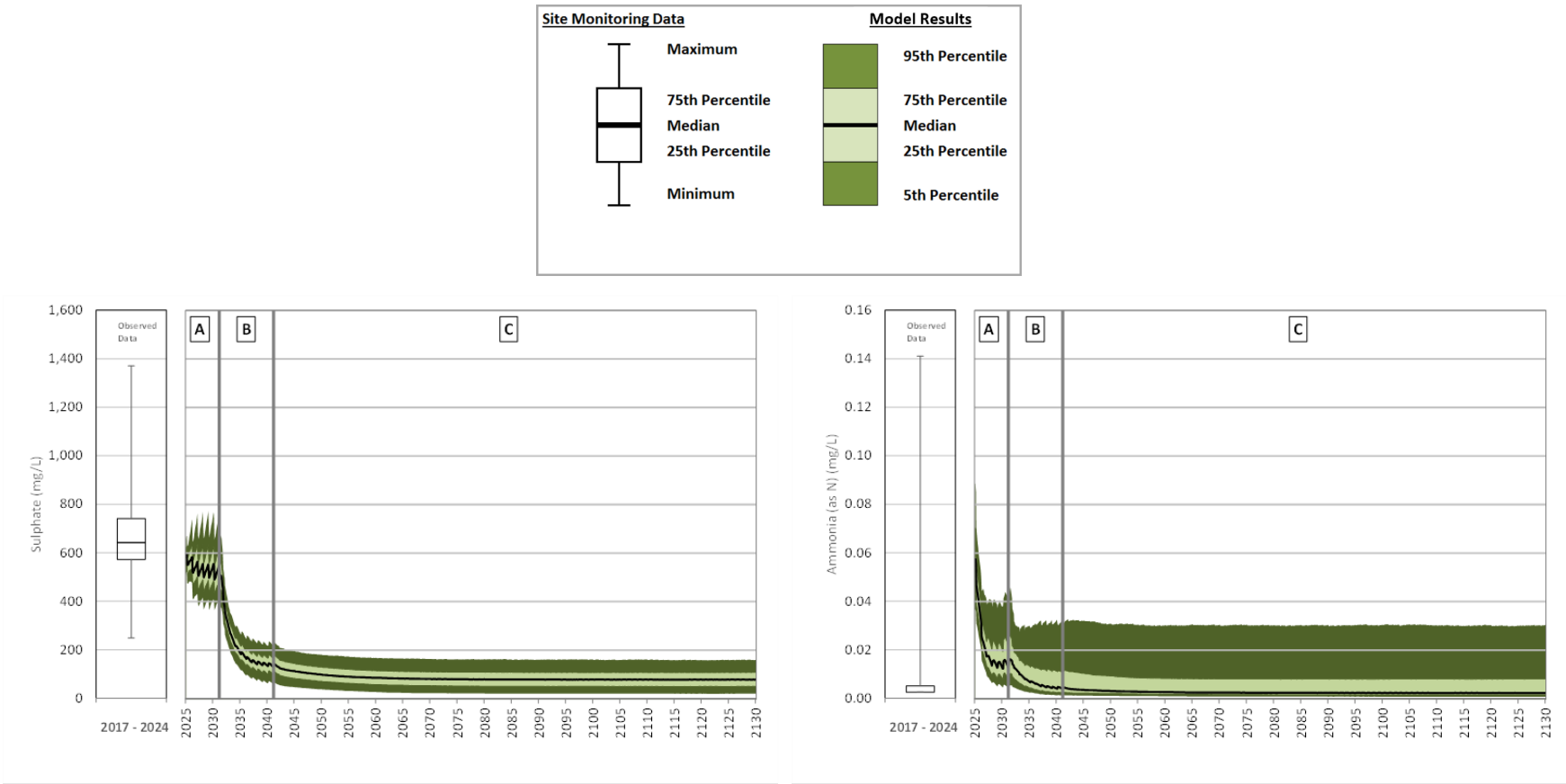
Table 14: Predicted Maximum Concentrations Wight Pit during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Molybdenum	mg/L	0.14	0.17	0.12	0.16	0.038	0.058	0.03	0.048
Nickel	mg/L	0.0014	0.002	0.0012	0.0019	0.00051	0.0012	0.00049	0.0012
Selenium	mg/L	0.039	0.072	0.026	0.065	0.0052	0.024	0.0023	0.01
Silver	mg/L	0.000011	0.000019	0.0000049	0.000014	0.0000046	0.000013	0.0000046	0.000014
Strontium	mg/L	4.3	7.3	3.2	5.8	0.45	0.86	0.28	0.63
Thallium	mg/L	0.0000098	0.000021	0.0000078	0.000016	0.000005	0.0000051	0.0000051	0.0000052
Tin	mg/L	0.000064	0.00014	0.00004	0.00011	0.000025	0.000042	0.000024	0.000041
Titanium	mg/L	0.025	0.026	0.023	0.024	0.0041	0.0044	0.0039	0.0041
Uranium	mg/L	0.0024	0.0039	0.002	0.0032	0.00044	0.0011	0.00037	0.0011
Vanadium	mg/L	0.0027	0.0029	0.0019	0.0031	0.00066	0.0024	0.00065	0.0024
Zinc	mg/L	0.017	0.05	0.014	0.035	0.003	0.007	0.003	0.0072
Dissolved Metals									
Aluminum	mg/L	0.051	0.063	0.013	0.045	0.0094	0.034	0.0086	0.031
Antimony	mg/L	0.00087	0.00099	0.00078	0.00094	0.00011	0.00022	0.000084	0.00016
Arsenic	mg/L	0.0015	0.0016	0.0018	0.0035	0.0019	0.0036	0.0019	0.0035
Barium	mg/L	0.039	0.045	0.031	0.049	0.019	0.049	0.017	0.049
Beryllium	mg/L	0.000072	0.000077	0.000072	0.000078	0.000051	0.000052	0.000053	0.000054
Boron	mg/L	0.18	0.25	0.19	0.35	0.19	0.36	0.19	0.35
Cadmium	mg/L	0.00021	0.00048	0.00014	0.00035	0.000013	0.000039	0.0000095	0.000021
Chromium	mg/L	0.00033	0.00038	0.00024	0.0006	0.0002	0.00064	0.00021	0.00066
Cobalt	mg/L	0.00048	0.00079	0.00022	0.0006	0.000048	0.00028	0.000042	0.00024
Copper	mg/L	0.021	0.034	0.01	0.019	0.0025	0.0067	0.0022	0.0037
Iron	mg/L	0.04	0.076	0.025	0.16	0.02	0.16	0.02	0.17
Lead	mg/L	0.00005	0.000055	0.000024	0.000031	0.000024	0.000029	0.000024	0.000029
Lithium	mg/L	0.0083	0.0097	0.0059	0.0079	0.0028	0.0041	0.0026	0.0039
Manganese	mg/L	0.2	0.38	0.082	0.29	0.023	0.28	0.018	0.25
Mercury	mg/L	0.0000047	0.0000047	0.0000046	0.0000048	0.0000032	0.0000034	0.0000033	0.0000034
Molybdenum	mg/L	0.14	0.16	0.12	0.15	0.038	0.058	0.03	0.048
Nickel	mg/L	0.00085	0.0015	0.00065	0.0013	0.00043	0.0009	0.00041	0.00084
Selenium	mg/L	0.039	0.066	0.025	0.059	0.0052	0.024	0.0023	0.01
Silicon	mg/L	7.5	8.2	7.1	9.5	7.3	9.5	7.4	9.6
Silver	mg/L	0.000011	0.000012	0.0000049	0.0000068	0.0000046	0.000006	0.0000046	0.0000062
Strontium	mg/L	4.3	6.9	3.2	5.4	0.44	0.84	0.27	0.61

Table 14: Predicted Maximum Concentrations Wight Pit during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Thallium	mg/L	0.0000098	0.000019	0.0000078	0.000015	0.000005	0.0000051	0.0000051	0.0000052
Tin	mg/L	0.000064	0.000073	0.00004	0.000042	0.000025	0.000042	0.000024	0.000041
Titanium	mg/L	0.0057	0.007	0.004	0.0054	0.0041	0.0044	0.0039	0.0041
Uranium	mg/L	0.0024	0.0036	0.002	0.0029	0.00044	0.0011	0.00037	0.0011
Vanadium	mg/L	0.0015	0.0017	0.00067	0.0019	0.00048	0.0019	0.00047	0.0019
Zinc	mg/L	0.015	0.047	0.011	0.033	0.003	0.007	0.003	0.0072

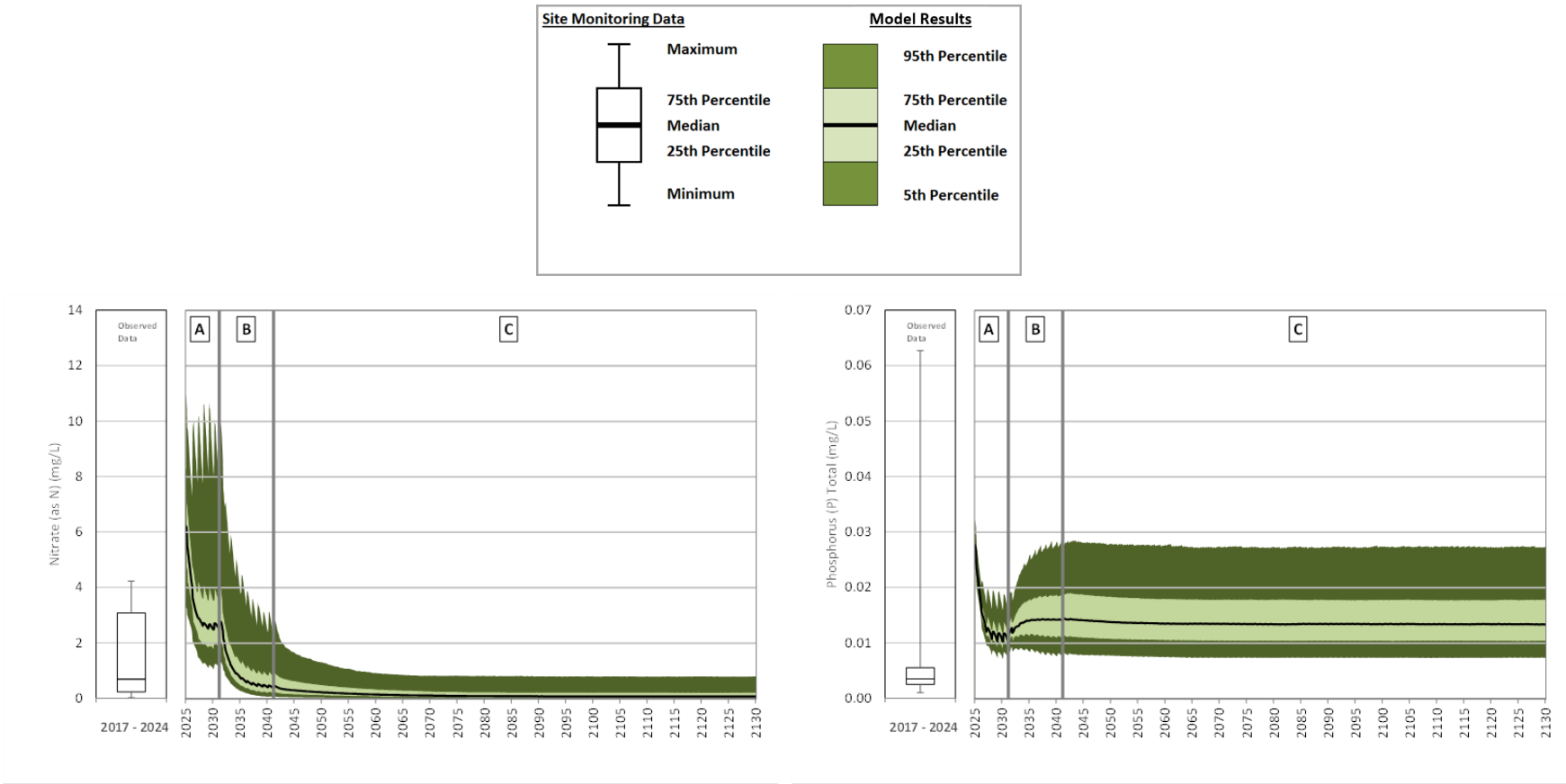
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

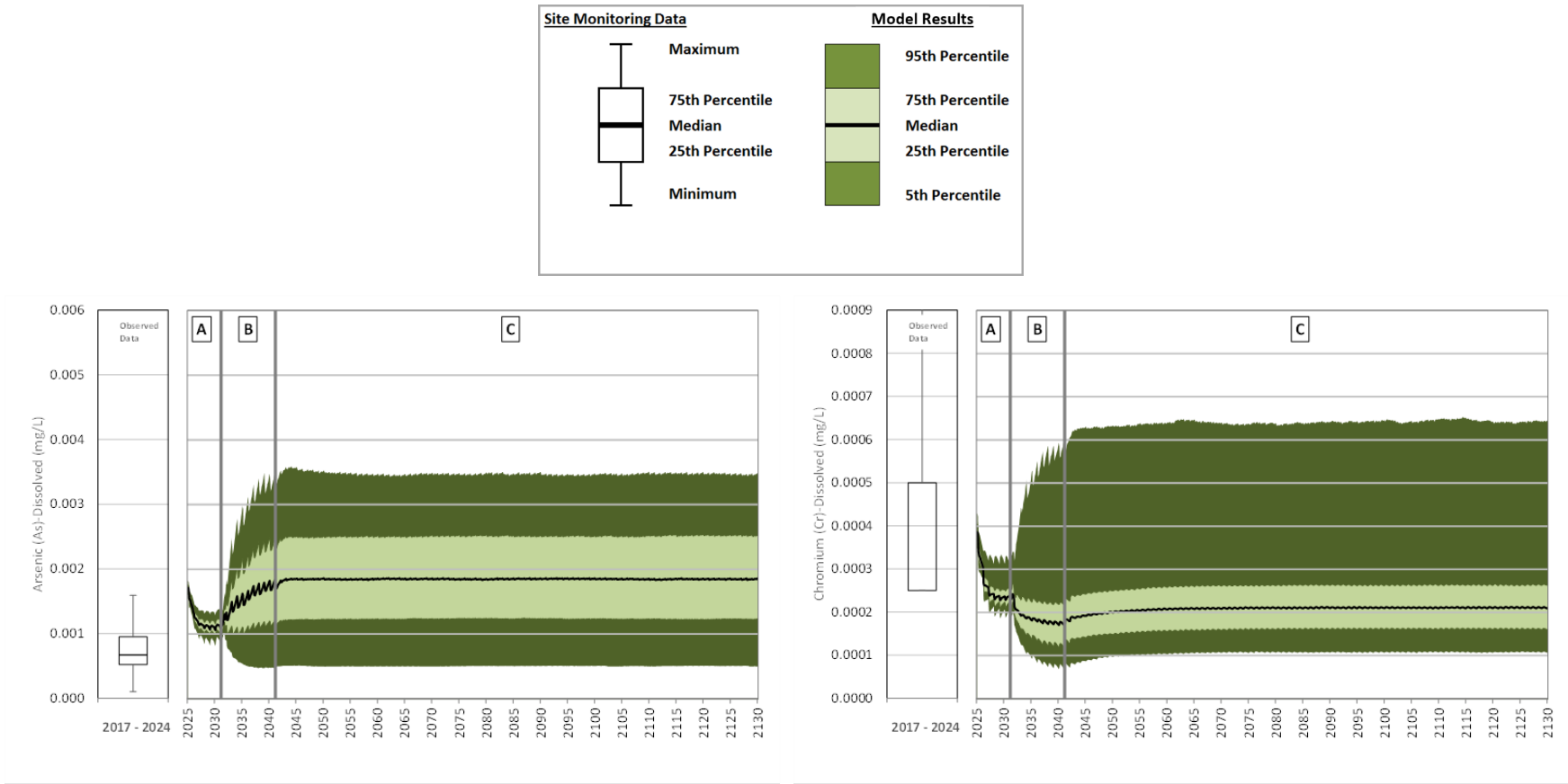
Figure 41: Predicted Sulphate and Total Ammonia Concentrations in Wight Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

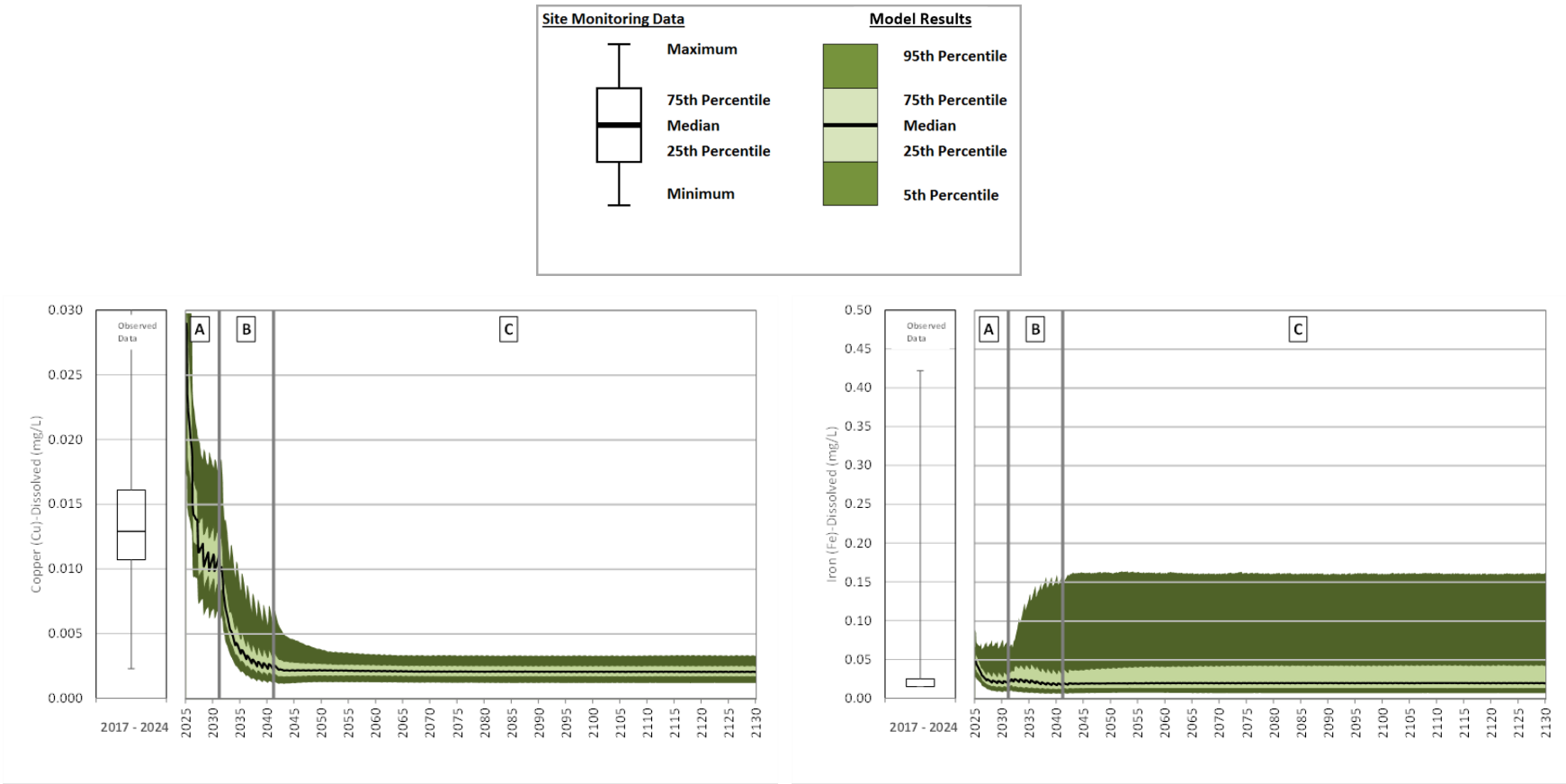
Figure 42: Predicted Nitrate and Total Phosphorus Concentrations in Wight Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

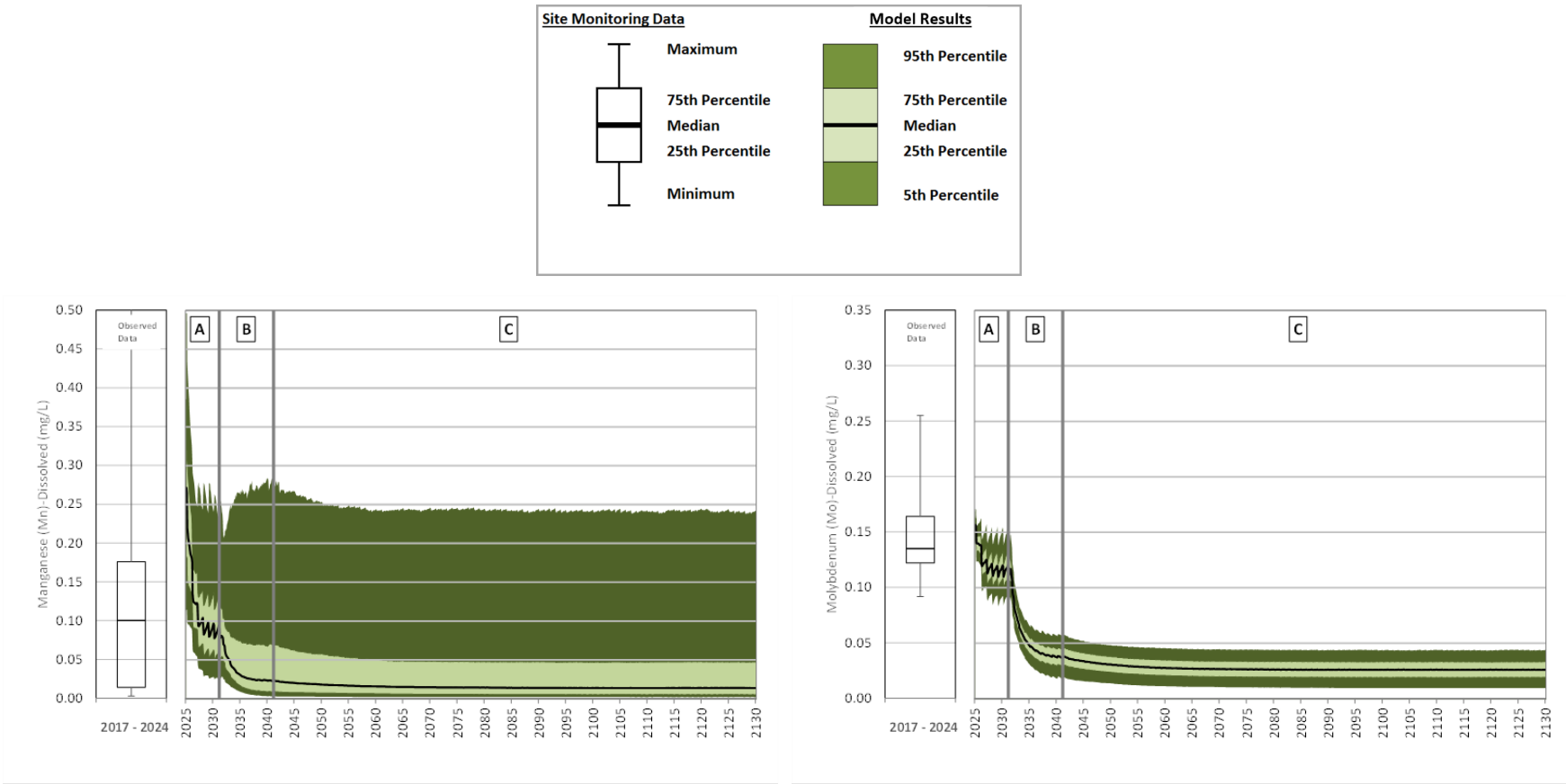
Figure 43: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in Wight Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

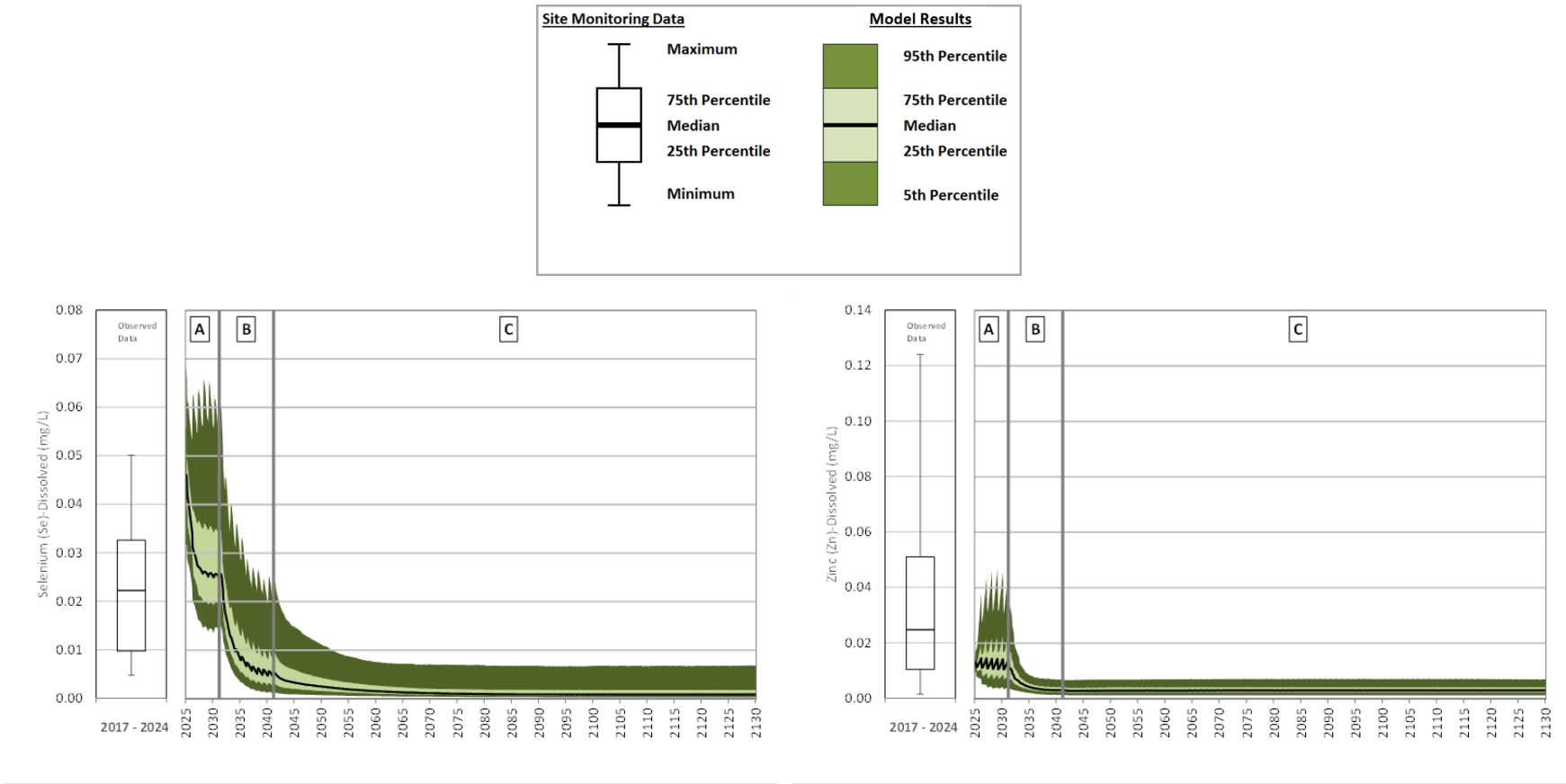
Figure 44: Predicted Dissolved Copper and Dissolved Iron Concentrations in Wight Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 45: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in Wight Pit – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 46: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in Wight Pit – Operations, Closure and Post-closure

4.6 Long Ditch

In closure, the Long Ditch continues to receive flow from the SERDS Ditch and overflow from Bootjack Creek Sump (via SERDS Ditch). Discharge from the Long Ditch will be directed to the CCS (and eventually the PETBP and treatment) during operations and closure, and assumed directed to Polley Lake in post-closure.
The combined catchment area for the Long Ditch, the SERDS Ditch, and Bootjack Creek includes the SERDS RDS, NEZ RDS, and East RDS along with haul roads, disturbed areas, and undisturbed catchment area. Tailings co-disposal to the SERDS location will include a soil cover during closure that will remediate runoff from the tailings deposition area which runs off into SERDS Ditch. However, seepage water quality from the SERDS tailings is assumed to remain unchanged through closure and post-closure. The proportion of seepage assigned tailings water quality is calculated based on the total proportions of tailings relative to waste rock deposited (4.7% tailings and 95.3% waste rock; Sections 2.5.2 and 2.6.2.3).

Time series plots for key parameters in Long Ditch for closure and post-closure are shown in Figures 47 to 52 for the climate change module results and in Figures 47 to 52. Maximum of median and 95th percentile predictions are presented in Table 15.

Peak concentrations in the Long Ditch are predicted to occur during operations, representing runoff and seepage from un-reclaimed RDS areas within the combined catchment area for the Long Ditch, the SERDS Ditch, and Bootjack Creek (Figures 47 to 52). These facilities are reclaimed throughout closure, at which point runoff is assigned undisturbed water quality (Table 7). Most parameter concentrations in the Long Ditch are predicted to decrease through closure, reaching steady state conditions 10 years after the start of post-closure.

Seasonal peak concentrations in winter are driven by seepage from the RDS area within the watershed which is assigned the NAG water quality in perpetuity. During winter months, when precipitation occurs as snowfall, RDS seepage represents a higher proportion of the total flow to the Long Ditch and causes concentrations to peak.

Some parameters are predicted to have higher concentrations in post-closure than closure. These parameters have higher concentrations in the statistical distributions assigned to undisturbed runoff water quality than the statistical distributions assigned to NAG waste rock water quality. As more areas are reclaimed on the Mine site, undisturbed runoff water quality is assigned to more inflows into Bootjack Creek Sump, SERDS Ditch, and Long Ditch which causes concentrations of some parameters, such as aluminum, to increase.

Table 15: Predicted Maximum Concentrations in the Long Ditch during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	681	848	533	739	336	497	342	509
Total Dissolved Solids	mg/L	1034	1261	790	1108	491	747	499	753
Major Ions									
Calcium	mg/L	218	268	165	229	95	141	97	146
Chloride	mg/L	7.3	11	3.3	7.6	2.8	8.9	2.8	8.9
Fluoride	mg/L	0.52	0.65	0.31	0.43	0.13	0.27	0.13	0.27
Magnesium	mg/L	34	44	29	41	24	35	24	35
Potassium	mg/L	4.1	8.0	2.3	3.7	1.3	1.8	1.3	1.8
Sodium	mg/L	29	43	20	25	9.6	14	9.7	14
Sulphate	mg/L	582	733	426	606	212	350	216	353
Nutrients									
Ammonia	mg/L (as N)	0.034	0.09	0.012	0.031	0.004	0.012	0.0041	0.012
Nitrate	mg/L (as N)	4.9	18	1.8	12	0.43	4.6	0.44	4.8
Nitrite	mg/L (as N)	0.024	0.057	0.0099	0.02	0.00059	0.0031	0.00059	0.0031
Total Phosphorus	mg/L	0.019	0.029	0.016	0.029	0.025	0.037	0.025	0.037
Total Metals									
Aluminum	mg/L	0.49	0.51	0.48	0.55	0.077	0.38	0.077	0.38
Antimony	mg/L	0.0029	0.004	0.00056	0.00082	0.000078	0.00021	0.000079	0.00022
Arsenic	mg/L	0.0052	0.0071	0.0015	0.0025	0.00097	0.0018	0.00097	0.0018
Barium	mg/L	0.04	0.058	0.029	0.049	0.017	0.025	0.017	0.025
Beryllium	mg/L	0.000067	0.000071	0.00006	0.000064	0.000032	0.000034	0.000032	0.000034
Boron	mg/L	0.16	0.25	0.13	0.25	0.029	0.044	0.029	0.044
Cadmium	mg/L	0.00018	0.00043	0.0001	0.00029	0.000026	0.00012	0.000026	0.00013
Chromium	mg/L	0.00069	0.00078	0.0007	0.0009	0.00089	0.0018	0.00089	0.0018
Cobalt	mg/L	0.0007	0.0012	0.00046	0.0011	0.000073	0.00073	0.000073	0.00076
Copper	mg/L	0.025	0.18	0.015	0.17	0.0053	0.02	0.0053	0.021
Iron	mg/L	0.49	0.52	0.49	0.58	0.14	0.6	0.14	0.6
Lead	mg/L	0.00016	0.00016	0.00014	0.00015	0.000035	0.00014	0.000035	0.00014
Lithium	mg/L	0.0078	0.011	0.0047	0.0071	0.0014	0.0037	0.0015	0.0037
Manganese	mg/L	0.19	0.46	0.085	0.41	0.019	0.32	0.019	0.33
Mercury	mg/L	0.0000046	0.0000053	0.0000047	0.000005	0.0000056	0.0000056	0.0000056	0.0000056

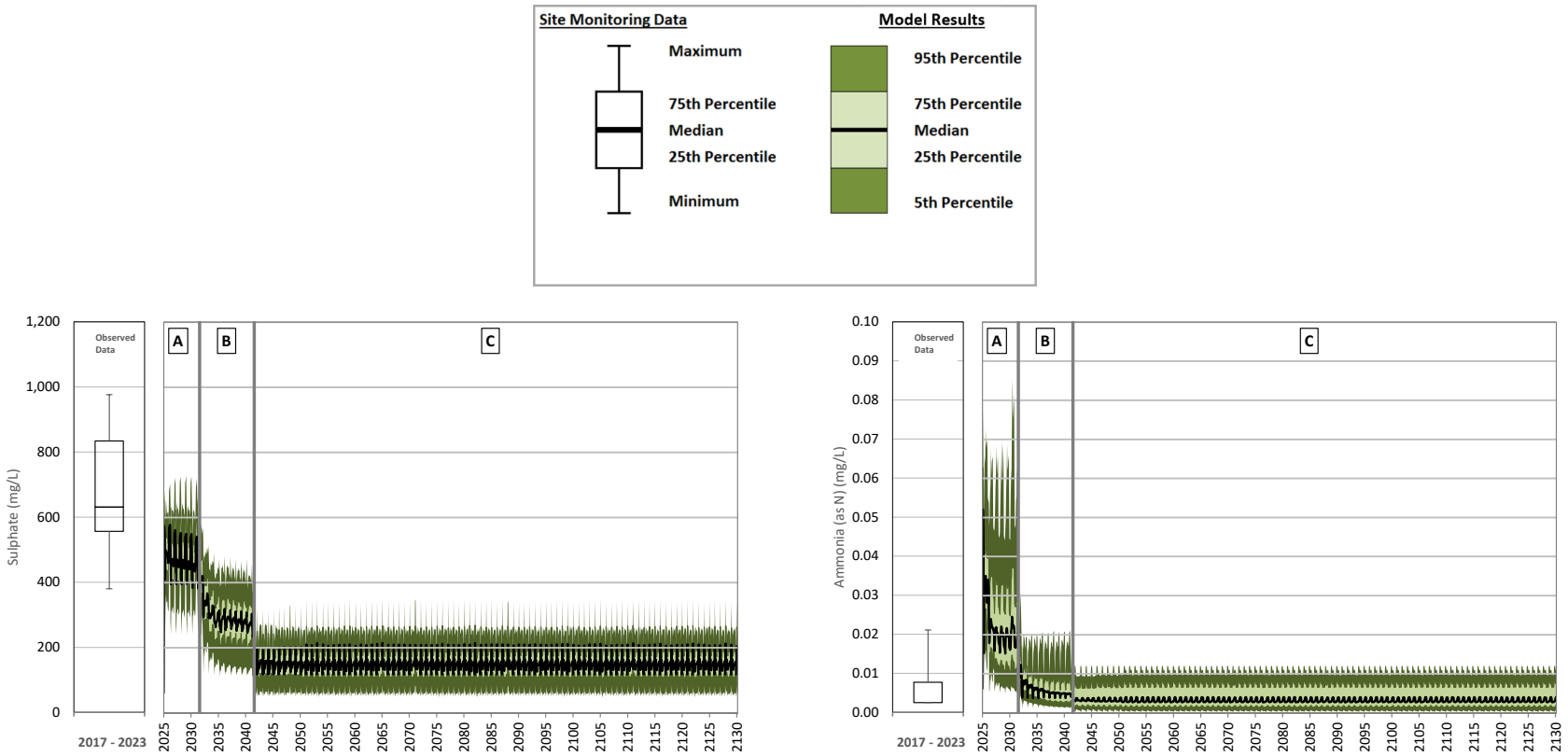
Table 15: Predicted Maximum Concentrations in the Long Ditch during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Molybdenum	mg/L	0.16	0.2	0.094	0.14	0.035	0.066	0.035	0.067
Nickel	mg/L	0.0013	0.0024	0.0012	0.0022	0.0011	0.0024	0.0011	0.0024
Selenium	mg/L	0.038	0.11	0.024	0.099	0.012	0.07	0.012	0.074
Silver	mg/L	0.0000092	0.000017	0.0000045	0.000015	0.0000038	0.000026	0.0000038	0.000026
Strontium	mg/L	3.8	6.1	2.5	4.2	1.0	1.8	1.0	1.9
Thallium	mg/L	0.0000088	0.000017	0.0000064	0.000012	0.0000056	0.0000056	0.0000056	0.0000056
Tin	mg/L	0.000058	0.00013	0.000036	0.00011	0.000032	0.000034	0.000032	0.000034
Titanium	mg/L	0.024	0.027	0.022	0.024	0.0029	0.0049	0.0029	0.0049
Uranium	mg/L	0.0022	0.0034	0.0016	0.0025	0.00092	0.0016	0.00092	0.0016
Vanadium	mg/L	0.0024	0.0027	0.0018	0.0025	0.00078	0.0015	0.00078	0.0015
Zinc	mg/L	0.015	0.039	0.011	0.025	0.0022	0.0058	0.0017	0.0058
Dissolved Metals									
Aluminum	mg/L	0.037	0.058	0.025	0.1	0.044	0.25	0.044	0.25
Antimony	mg/L	0.0029	0.0038	0.00054	0.00068	0.000078	0.00021	0.000079	0.00022
Arsenic	mg/L	0.005	0.0068	0.0013	0.0023	0.00092	0.0016	0.00092	0.0016
Barium	mg/L	0.038	0.05	0.027	0.041	0.016	0.023	0.017	0.023
Beryllium	mg/L	0.000067	0.000071	0.00006	0.000064	0.000032	0.000034	0.000032	0.000034
Boron	mg/L	0.16	0.22	0.13	0.22	0.029	0.042	0.029	0.042
Cadmium	mg/L	0.00018	0.00038	0.0001	0.00024	0.000024	0.00012	0.000024	0.00012
Chromium	mg/L	0.00029	0.00039	0.0003	0.0005	0.00077	0.0012	0.00077	0.0012
Cobalt	mg/L	0.00041	0.00088	0.00017	0.00078	0.000073	0.00061	0.000073	0.00064
Copper	mg/L	0.018	0.028	0.008	0.024	0.0049	0.019	0.005	0.019
Iron	mg/L	0.035	0.073	0.041	0.13	0.084	0.38	0.084	0.38
Lead	mg/L	0.000042	0.000047	0.000026	0.000039	0.000035	0.000074	0.000035	0.000074
Lithium	mg/L	0.0076	0.01	0.0045	0.0061	0.0014	0.0035	0.0015	0.0036
Manganese	mg/L	0.17	0.44	0.064	0.39	0.015	0.3	0.015	0.31
Mercury	mg/L	0.0000046	0.0000053	0.0000047	0.000005	0.0000056	0.0000056	0.0000056	0.0000056
Molybdenum	mg/L	0.16	0.19	0.094	0.13	0.035	0.065	0.035	0.067
Nickel	mg/L	0.00078	0.0018	0.00065	0.0017	0.00099	0.002	0.00099	0.002
Selenium	mg/L	0.038	0.11	0.024	0.093	0.012	0.07	0.012	0.074
Silicon	mg/L	7.0	7.6	6.4	7.9	6.7	9.1	6.7	9.1
Silver	mg/L	0.0000092	0.00001	0.0000045	0.0000081	0.0000038	0.000018	0.0000038	0.000018
Strontium	mg/L	3.8	5.8	2.5	3.9	1.0	1.8	1.0	1.8
Thallium	mg/L	0.0000088	0.000016	0.0000064	0.000011	0.0000056	0.0000056	0.0000056	0.0000056

Table 15: Predicted Maximum Concentrations in the Long Ditch during Operations, Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Tin	mg/L	0.000058	0.000064	0.000036	0.000041	0.000032	0.000034	0.000032	0.000034
Titanium	mg/L	0.0053	0.0077	0.0035	0.0053	0.0029	0.0049	0.0029	0.0049
Uranium	mg/L	0.0022	0.0031	0.0015	0.0022	0.00091	0.0015	0.00092	0.0016
Vanadium	mg/L	0.0012	0.0016	0.00057	0.0013	0.00061	0.0010	0.00061	0.0010
Zinc	mg/L	0.012	0.037	0.008	0.022	0.0022	0.0058	0.0017	0.0058

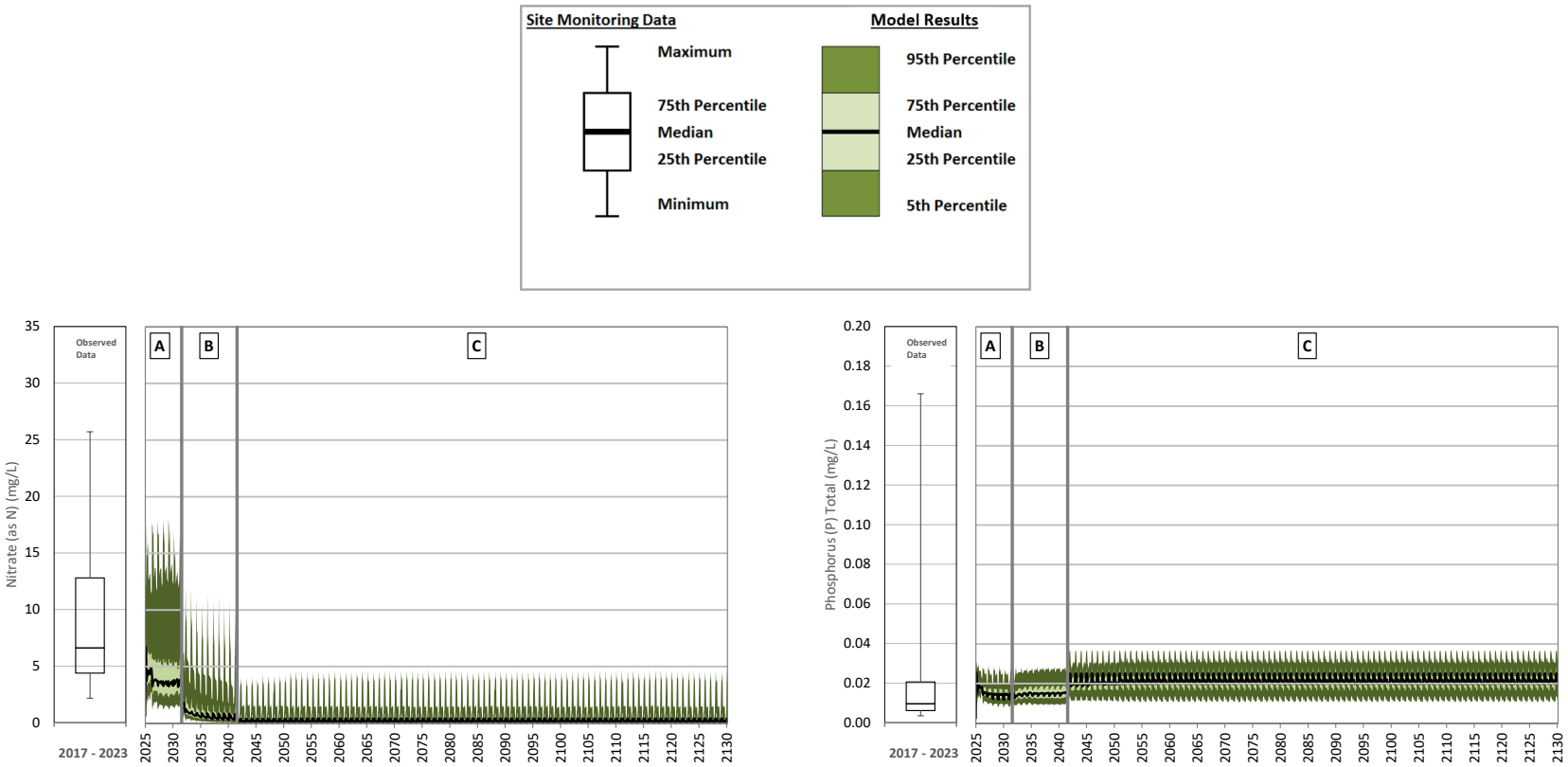
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

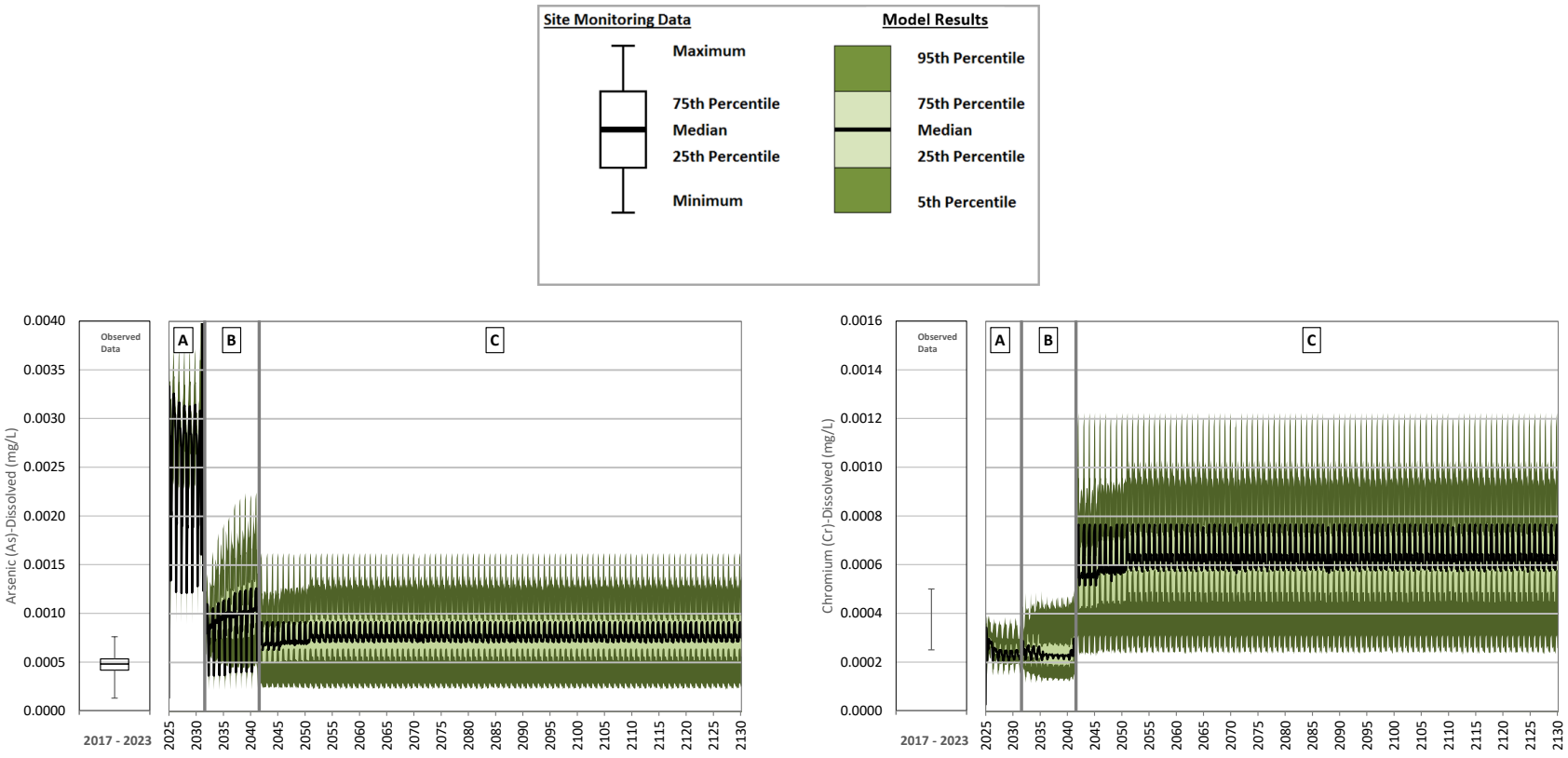
Figure 47: Predicted Sulphate and Total Ammonia Concentrations in Long Ditch – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

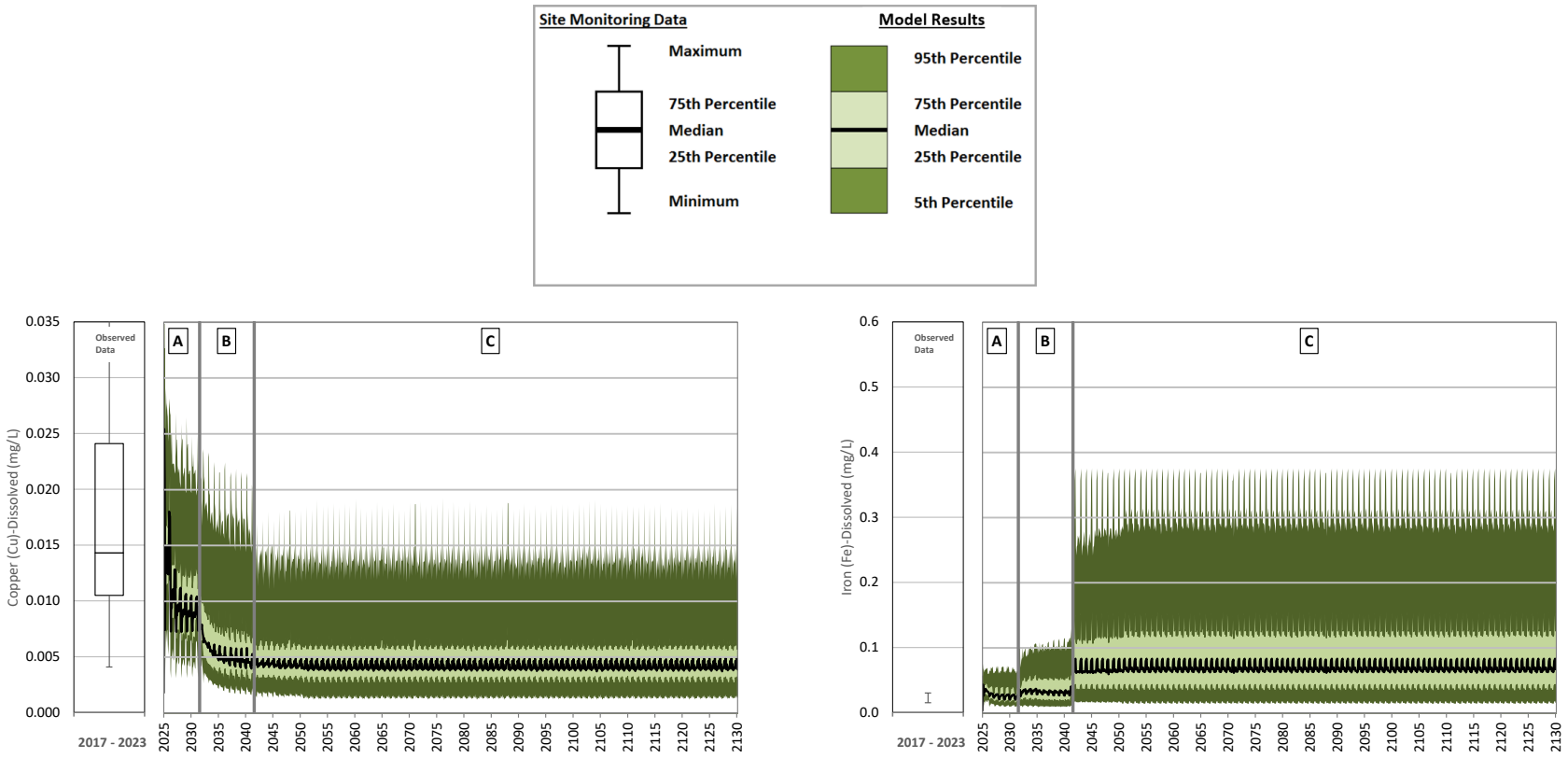
Figure 48: Predicted Nitrate and Total Phosphorus Concentrations in Long Ditch – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

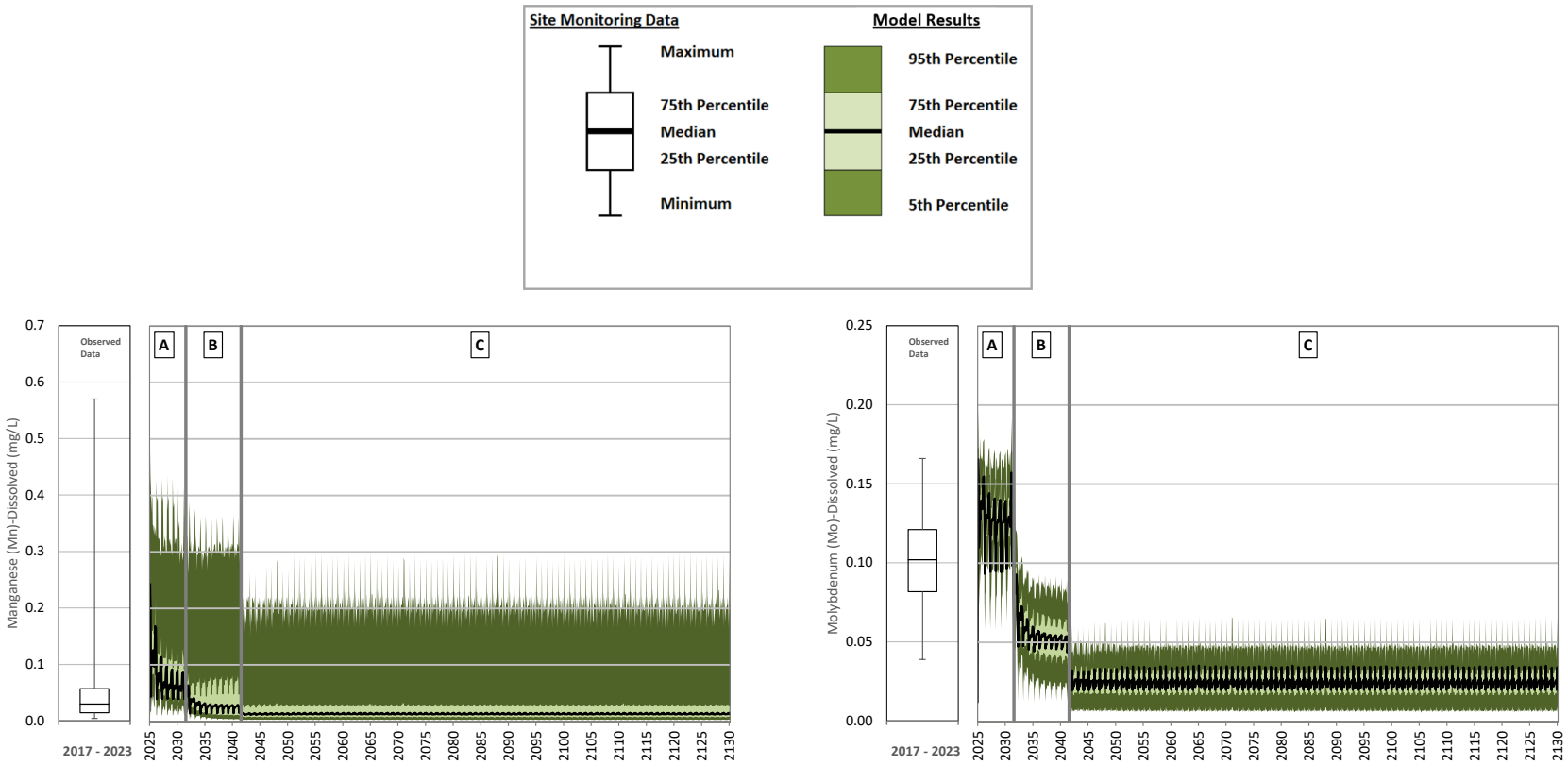
Figure 49: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in Long Ditch – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

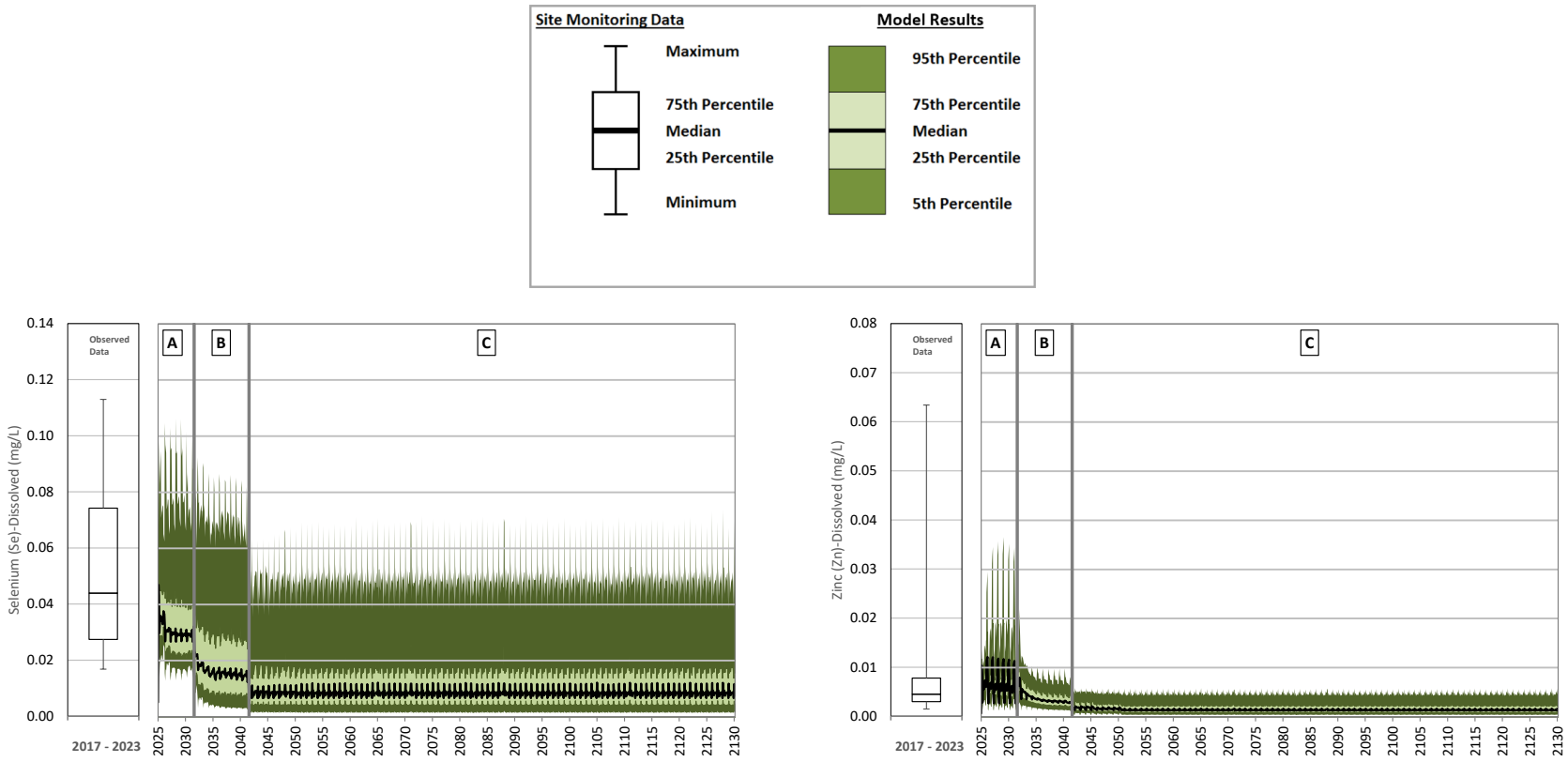
Figure 50: Predicted Dissolved Copper and Dissolved Iron Concentrations in Long Ditch – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 51: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in Long Ditch – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure 52: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in Long Ditch – Operations, Closure and Post-closure

4.7 South Embankment Seepage Collection Pond

The SWWBM assumes that the SESCP has a smaller catchment area and receives a moderate percentage of TSF seepage in closure. The SESCP transfers flows to the MESCP (and eventually to the PETBP and treatment) all through operations, closure, and post-closure until long term post-closure (2051), when it is assumed to overflow directly to the headwaters area of Edney Creek (water quality allowing). Time series plots for key parameters in SESCP for operations, closure and post-closure are shown in Figures 53 to 58. Maximum of median and 95th percentile predictions are presented in Table 16.

For most parameters, the predicted peak concentrations in the SESCP occur during operations and then decrease as areas are reclaimed during closure and post-closure. Water quality is predicted to reach steady-state conditions by 2074, after the TSF surface has been reclaimed and saturated proportions of seepage from the TSF are predicted to no longer change. Because the saturated TSF seepage is assumed to be the same water quality as the TSF beach, impoundment, and embankment areas, the change in SESCP concentrations is coincident with the change in parameter concentrations in the TSF beach and impoundment.

The assigned TSF beach, impoundment and embankment water quality changes from the TSF supernatant input to undisturbed water quality during the closure period. This causes the decrease in concentration in the TSF. As TSF concentrations decrease, concentrations in the SESCP decrease due to saturated seepage from the TSF. The increase in concentrations from 2031 to 2051 is due to the increasing proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility. While the range in predicted concentrations is considered reasonable, the timing of this transition is uncertain because the amount of time it may take to flush process water from the tailings is unknown.

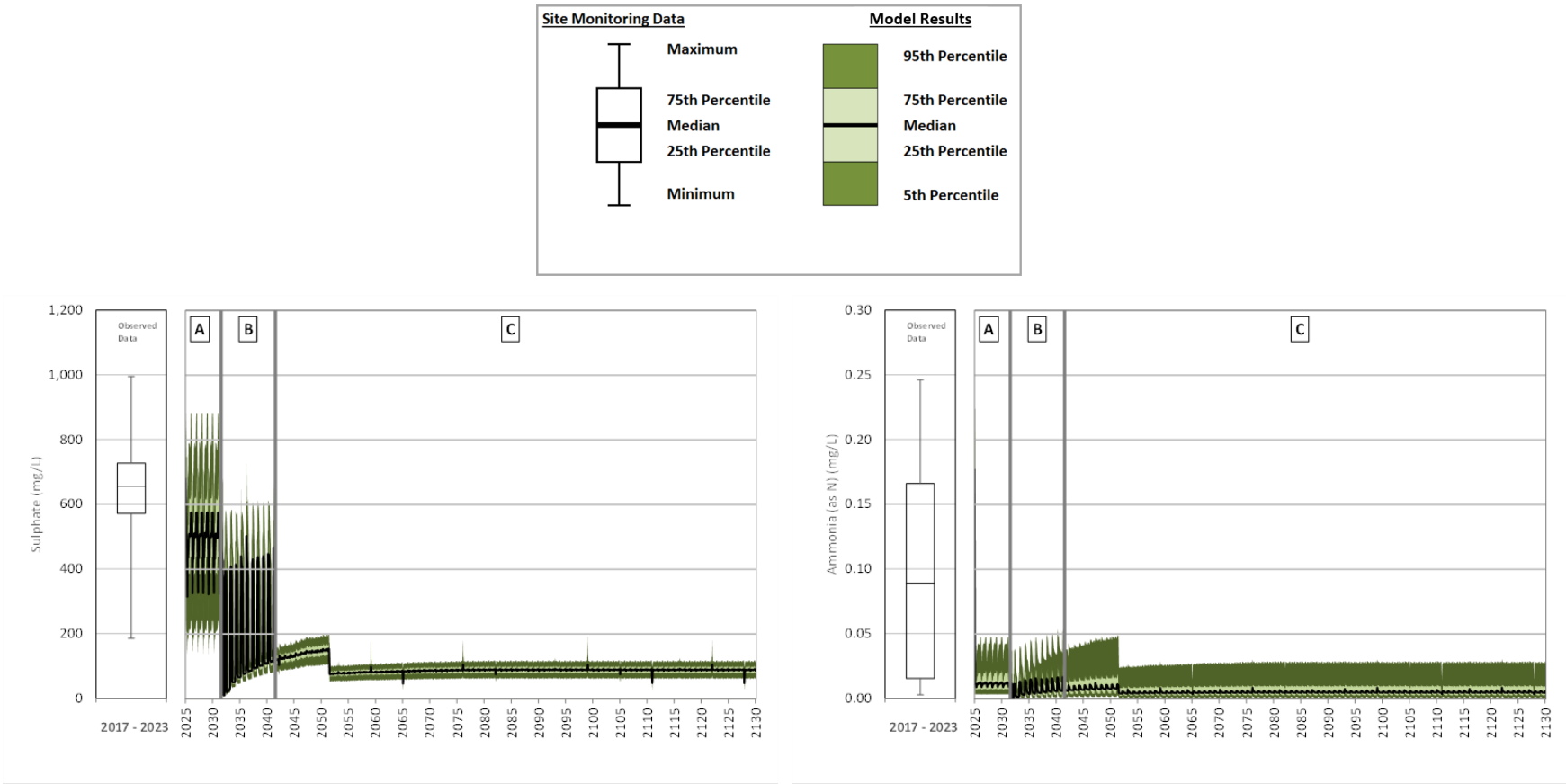
Table 16: Predicted Maximum Concentrations in the South Embankment Seepage Collection Pond during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	734	1102	620	912	272	537	267	399
Total Dissolved Solids	mg/L	1068	1620	938	1374	443	922	426	615
Major Ions									
Calcium	mg/L	218	320	185	267	75	152	79	117
Chloride	mg/L	5.2	9.9	8.2	12	7.3	11	4.6	6.5
Fluoride	mg/L	0.32	0.42	0.39	0.48	0.27	0.45	0.2	0.26
Magnesium	mg/L	46	73	38	59	20	38	17	26
Potassium	mg/L	1.7	2.5	3.9	4.8	4.1	5.0	2.4	3.0
Sodium	mg/L	16	24	29	37	27	34	17	21
Sulphate	mg/L	579	889	507	749	156	530	106	192
Nutrients									
Ammonia	mg/L (as N)	0.013	0.048	0.017	0.054	0.012	0.049	0.0085	0.031
Nitrate	mg/L (as N)	2.1	7.0	2.0	5.6	0.69	3.4	0.55	2.0
Nitrite	mg/L (as N)	0.0064	0.018	0.0097	0.036	0.0056	0.042	0.0039	0.025
Total Phosphorus	mg/L	0.013	0.024	0.013	0.024	0.014	0.025	0.0075	0.013
Total Metals									
Aluminum	mg/L	0.47	0.55	0.46	0.49	0.041	0.17	0.044	0.19
Antimony	mg/L	0.00025	0.00041	0.00026	0.00046	0.00013	0.00029	0.00012	0.00017
Arsenic	mg/L	0.00073	0.00089	0.00097	0.0011	0.00082	0.0011	0.00047	0.00065
Barium	mg/L	0.032	0.048	0.036	0.052	0.026	0.041	0.018	0.025
Beryllium	mg/L	0.0001	0.0001	0.000083	0.000096	0.00004	0.000071	0.000036	0.000037
Boron	mg/L	0.041	0.085	0.06	0.1	0.051	0.068	0.032	0.041
Cadmium	mg/L	0.0002	0.00035	0.00014	0.00028	0.000028	0.000088	0.00004	0.000094
Chromium	mg/L	0.00091	0.0011	0.00086	0.00096	0.00052	0.00097	0.00031	0.00079
Cobalt	mg/L	0.0004	0.0005	0.00041	0.00049	0.00012	0.0003	0.000072	0.00023
Copper	mg/L	0.025	0.18	0.02	0.17	0.0045	0.011	0.0056	0.01
Iron	mg/L	0.5	0.57	0.49	0.52	0.079	0.27	0.071	0.28
Lead	mg/L	0.00016	0.00017	0.00016	0.00016	0.000036	0.00011	0.000018	0.000085
Lithium	mg/L	0.0097	0.016	0.0082	0.013	0.0027	0.0091	0.003	0.0051
Manganese	mg/L	0.032	0.074	0.086	0.15	0.079	0.18	0.048	0.11
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.0000025	0.0000025
Molybdenum	mg/L	0.29	0.45	0.26	0.4	0.22	0.32	0.11	0.16
Nickel	mg/L	0.0011	0.0013	0.0011	0.0012	0.00051	0.00089	0.00029	0.00067
Selenium	mg/L	0.11	0.19	0.082	0.15	0.0043	0.028	0.0036	0.010
Silver	mg/L	0.00001	0.000019	0.0000086	0.000018	0.0000051	0.000016	0.0000039	0.000012
Strontium	mg/L	4.8	7.2	3.7	5.8	0.79	1.8	1.0	2.0

Table 16: Predicted Maximum Concentrations in the South Embankment Seepage Collection Pond during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Thallium	mg/L	0.00001	0.000012	0.0000088	0.000011	0.0000077	0.0000082	0.000004	0.0000041
Tin	mg/L	0.0001	0.00017	0.000081	0.00016	0.000037	0.000067	0.000034	0.000036
Titanium	mg/L	0.028	0.029	0.023	0.027	0.0034	0.0059	0.0032	0.0038
Uranium	mg/L	0.004	0.0064	0.0031	0.0051	0.0011	0.0023	0.0012	0.002
Vanadium	mg/L	0.0017	0.0019	0.0017	0.0019	0.00069	0.0012	0.00044	0.00085
Zinc	mg/L	0.0071	0.012	0.0063	0.0097	0.0015	0.0041	0.0014	0.004
Dissolved Metals									
Aluminum	mg/L	0.021	0.093	0.0091	0.034	0.0084	0.042	0.011	0.056
Antimony	mg/L	0.00023	0.00027	0.00024	0.00032	0.00013	0.00029	0.00012	0.00017
Arsenic	mg/L	0.00046	0.00063	0.0007	0.00085	0.00077	0.00094	0.00042	0.00052
Barium	mg/L	0.03	0.04	0.034	0.043	0.026	0.04	0.017	0.023
Beryllium	mg/L	0.0001	0.0001	0.000083	0.000096	0.00004	0.000071	0.000036	0.000037
Boron	mg/L	0.037	0.055	0.056	0.07	0.051	0.066	0.032	0.039
Cadmium	mg/L	0.0002	0.0003	0.00014	0.00023	0.000026	0.00008	0.000039	0.000086
Chromium	mg/L	0.00052	0.00069	0.00046	0.00056	0.0004	0.00045	0.00019	0.00027
Cobalt	mg/L	0.00011	0.00021	0.00012	0.0002	0.00012	0.00018	0.000072	0.00011
Copper	mg/L	0.018	0.028	0.013	0.021	0.0042	0.0099	0.0052	0.0088
Iron	mg/L	0.047	0.11	0.035	0.068	0.027	0.049	0.019	0.063
Lead	mg/L	0.00005	0.000051	0.000041	0.00005	0.000036	0.00004	0.000018	0.000019
Lithium	mg/L	0.0095	0.015	0.008	0.012	0.0027	0.009	0.003	0.005
Manganese	mg/L	0.011	0.053	0.064	0.13	0.075	0.15	0.044	0.091
Mercury	mg/L	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.0000025	0.0000025
Molybdenum	mg/L	0.29	0.44	0.26	0.39	0.22	0.32	0.11	0.16
Nickel	mg/L	0.00054	0.00078	0.00054	0.00065	0.00043	0.00056	0.00021	0.00034
Selenium	mg/L	0.11	0.19	0.082	0.14	0.0043	0.028	0.0036	0.0099
Silicon	mg/L	5.2	6.9	4.9	6.7	5.1	6.5	2.6	3.3
Silver	mg/L	0.00001	0.000011	0.0000086	0.00001	0.0000051	0.0000088	0.0000039	0.0000044
Strontium	mg/L	4.7	6.8	3.7	5.4	0.79	1.8	1.0	1.9
Thallium	mg/L	0.00001	0.00001	0.0000088	0.0000097	0.0000077	0.0000082	0.000004	0.0000041
Tin	mg/L	0.0001	0.0001	0.000081	0.000094	0.000037	0.000067	0.000034	0.000036
Titanium	mg/L	0.0086	0.0099	0.0046	0.0076	0.0034	0.0059	0.0032	0.0038
Uranium	mg/L	0.004	0.0061	0.0031	0.0048	0.0011	0.0022	0.0012	0.002
Vanadium	mg/L	0.00052	0.0007	0.00052	0.00065	0.00052	0.00069	0.00026	0.00037
Zinc	mg/L	0.0045	0.0092	0.0037	0.0071	0.0015	0.0041	0.0014	0.004

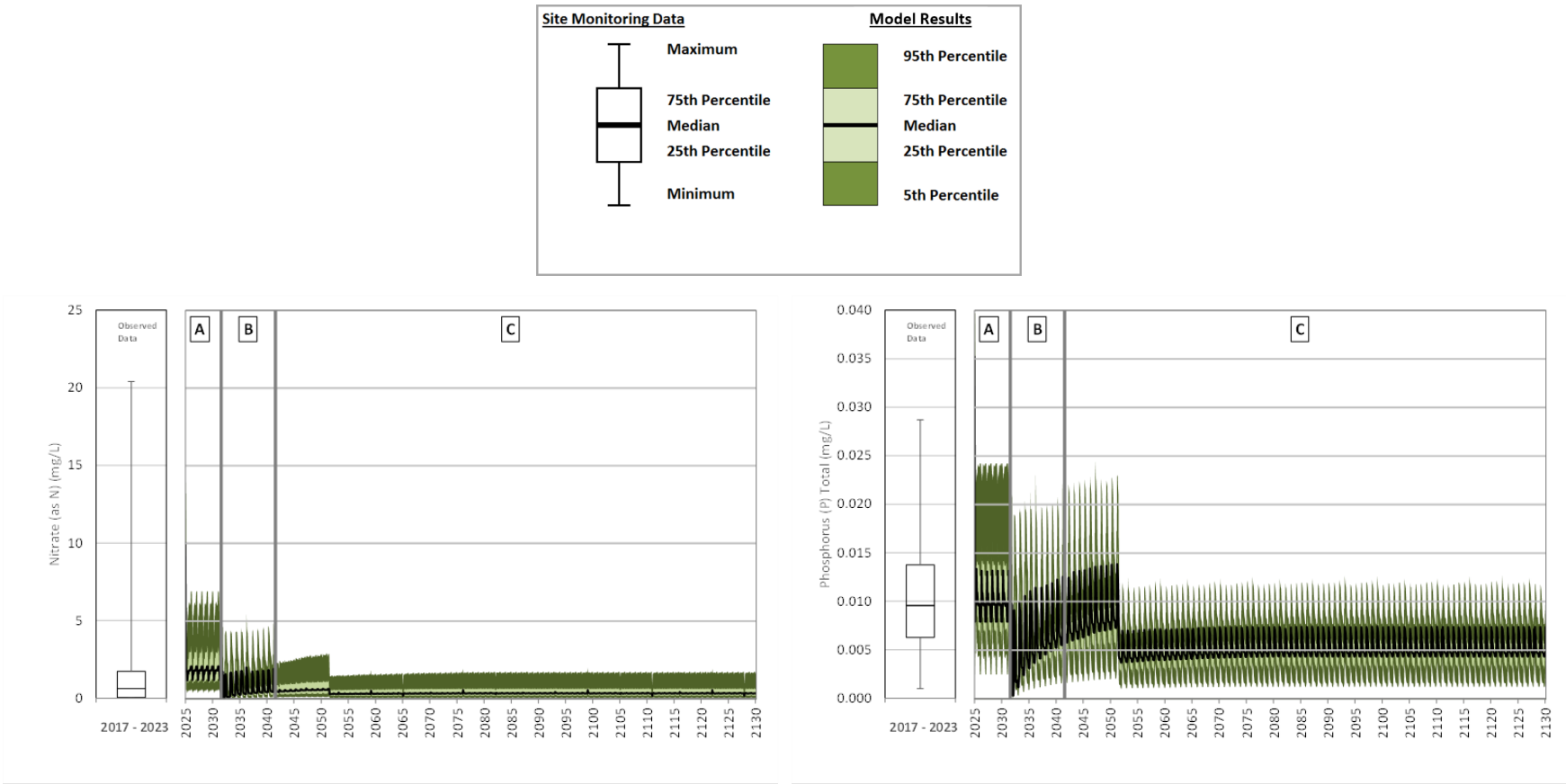
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

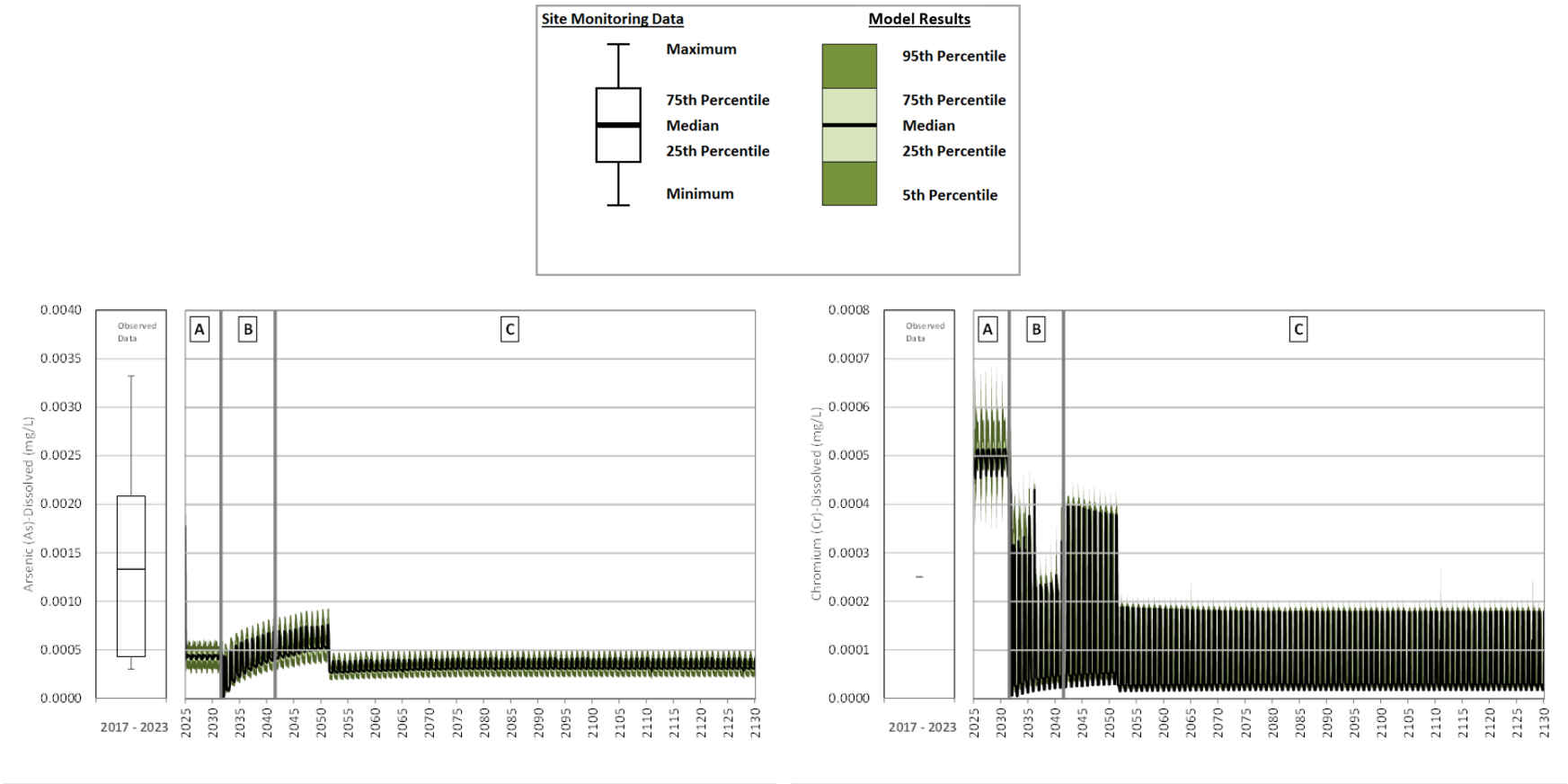
Figure 53: Predicted Sulphate and Total Ammonia Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

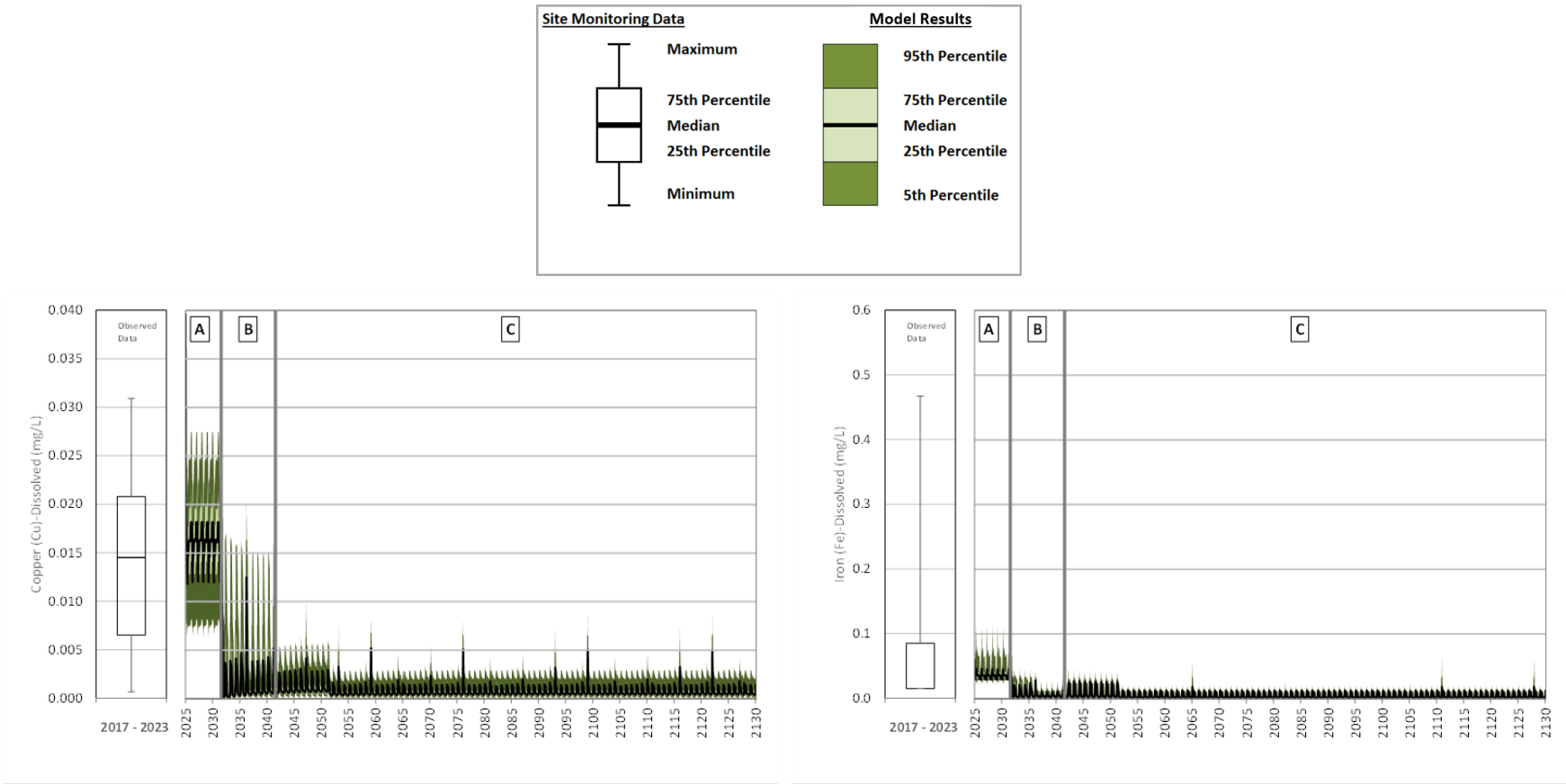
Figure 54: Predicted Nitrate and Total Phosphorus Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

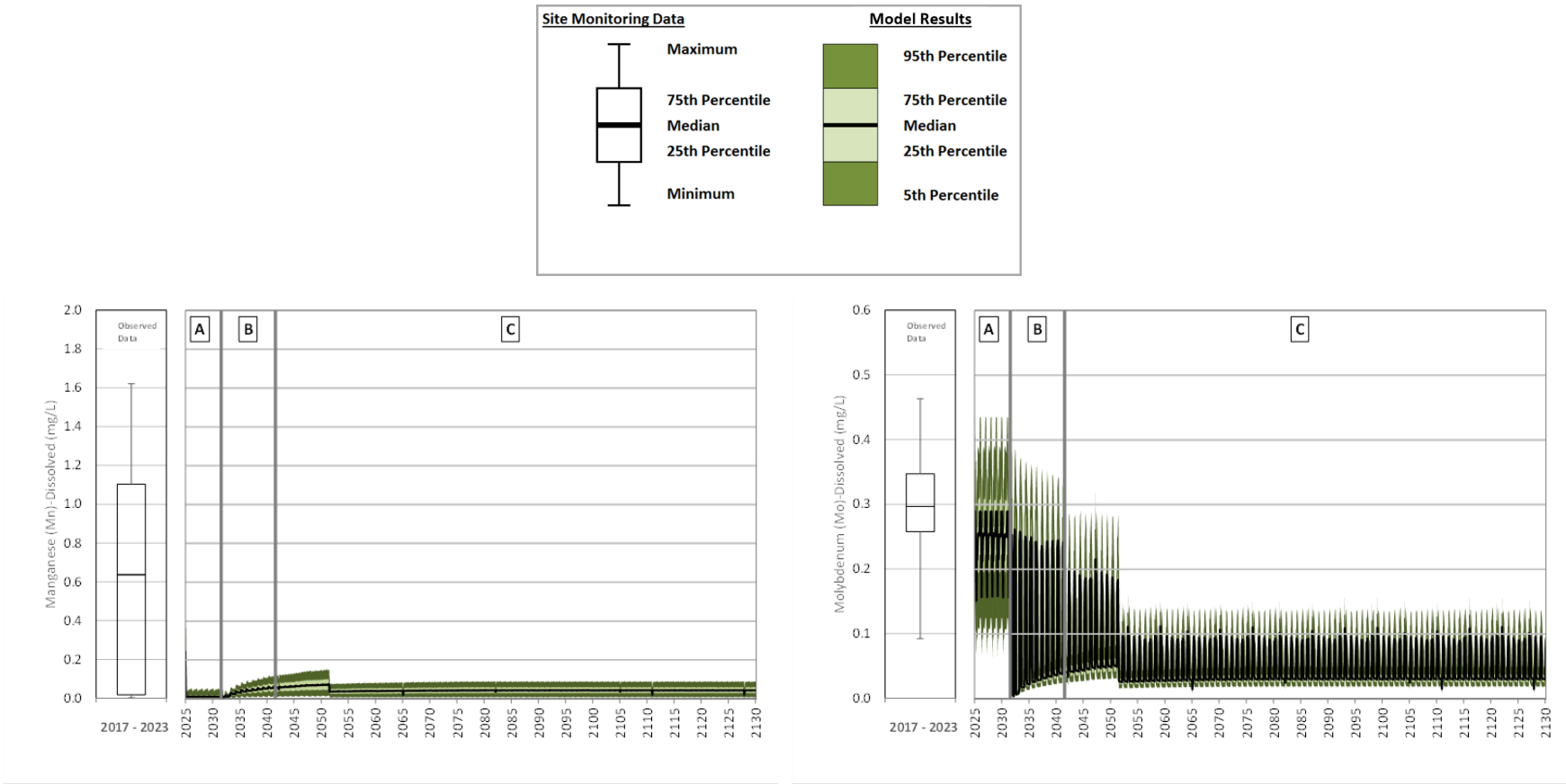
Figure 55: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

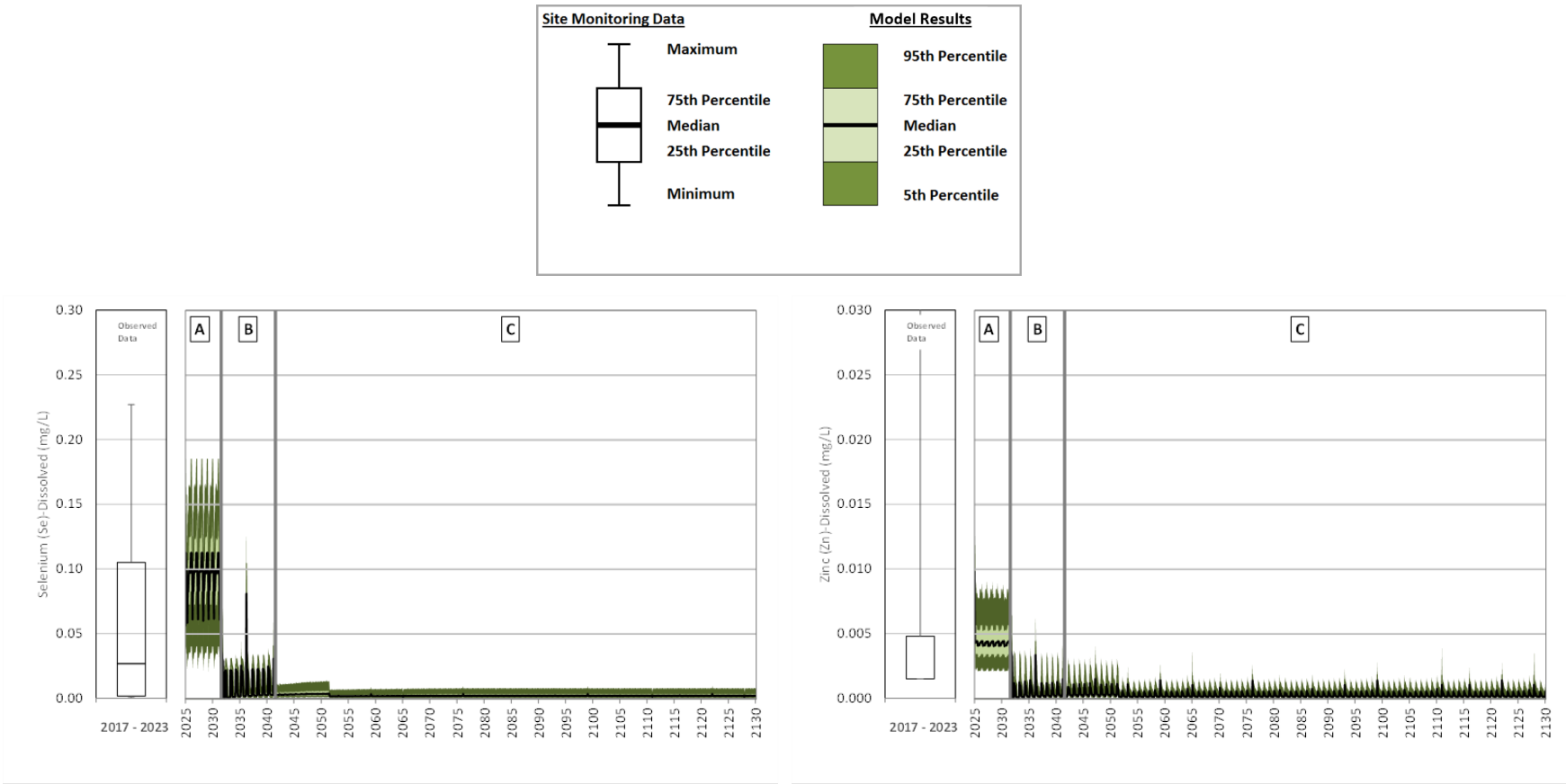
Figure 56: Predicted Dissolved Copper and Dissolved Iron Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

Figure 57: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2074 when the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility reaches a steady state.

Figure 58: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the South Embankment Seepage Collection Pond – Operations, Closure and Post-closure

4.8 Main Embankment Seepage Collection Pond

The SWWBM assumes that the MESCP received runoff from the TSF area and undisturbed catchment area and receives moderate TSF seepage in closure. The MESCP transfers flows to the PETBP (and eventually to treatment) all through operations, closure, and post-closure until long term post-closure (2051), when it is assumed to overflow directly to the headwaters area of Edney Creek (water quality allowing). Time series plots for key parameters in MESCP for operations, closure and post-closure are shown in Figures 59 to 64. Maximum of median and 95th percentile predictions are presented in Table 17.

For most parameters, peak concentrations in the MESCP occur during operations, and then are predicted to decrease once mine site areas are reclaimed (Figures 59 to 64). Reclaimed areas of the TSF beach and impoundment are assigned an undisturbed water quality. The increase in concentration until 2051 for most parameters in the MESCP is caused by pumping from the SESCP. Pumping from the SESCP to the MESCP ends in 2051. Similar to the SESCP, the range in predicted concentrations is considered reasonable. However, the timing is uncertain because the amount of time it might take to flush process water from the tailings is unknown.

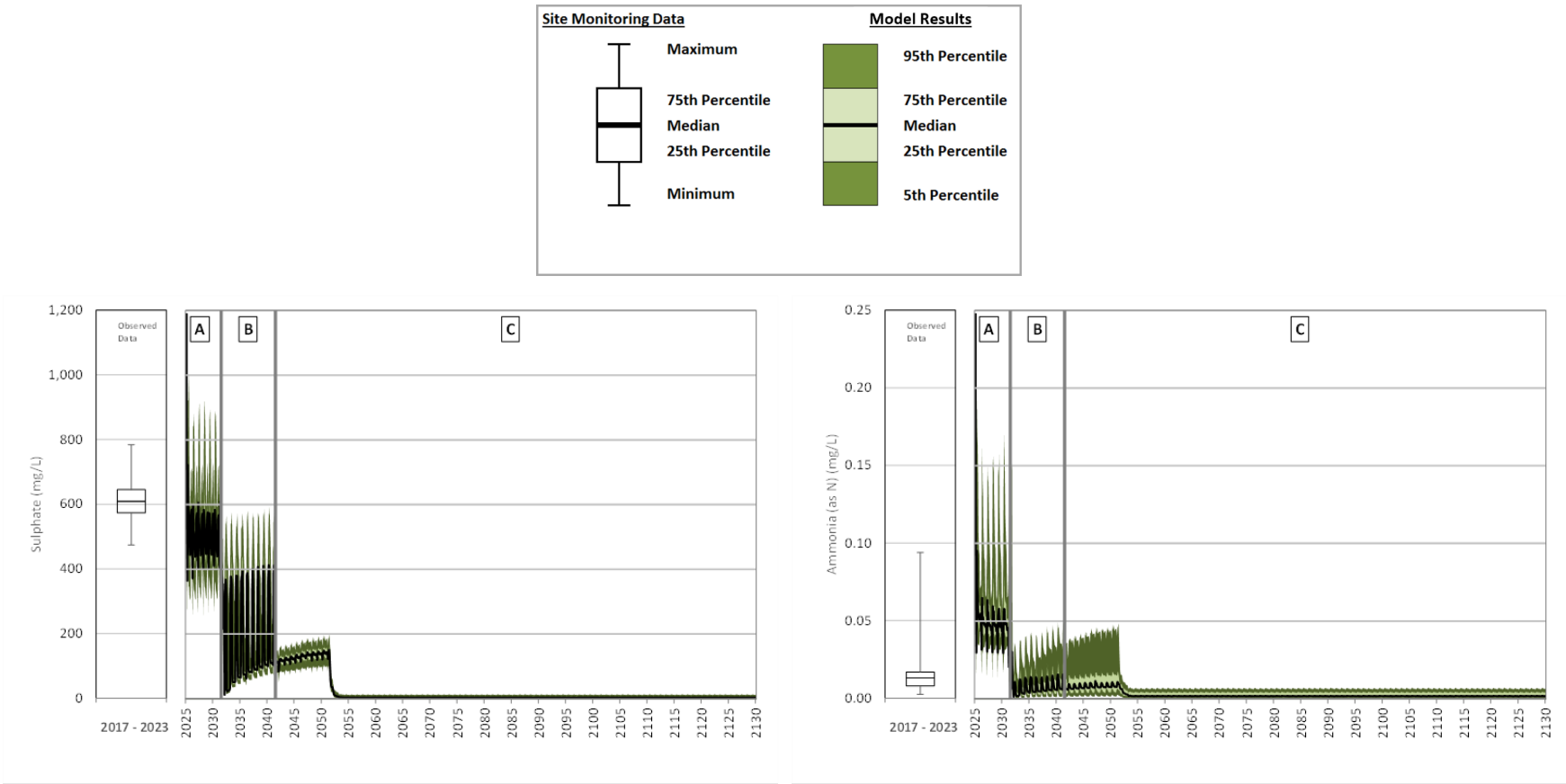
Table 17: Predicted Maximum Concentrations in the Main Embankment Seepage Collection Pond during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Physical Parameters									
Hardness[(a)]	mg $CaCO_3$/L	712	1077	448	652	293	539	187	300
Total Dissolved Solids	mg/L	1115	1692	745	1060	470	930	307	457
Major Ions									
Calcium	mg/L	220	333	139	198	81	155	52	79
Chloride	mg/L	18	31	8.8	14	7.1	11	6.2	11
Fluoride	mg/L	0.58	0.9	0.36	0.47	0.26	0.45	0.21	0.31
Magnesium	mg/L	40	60	25	38	22	37	14	25
Potassium	mg/L	10	18	5.6	9.6	3.9	5.0	3.3	4.7
Sodium	mg/L	60	100	32	49	25	34	22	30
Sulphate	mg/L	613	932	416	615	152	537	127	185
Nutrients									
Ammonia	mg/L (as N)	0.065	0.17	0.031	0.16	0.011	0.049	0.0092	0.041
Nitrate	mg/L (as N)	4.1	14	2.3	4.5	0.75	3.4	0.53	2.4
Nitrite	mg/L (as N)	0.081	0.15	0.041	0.084	0.0058	0.041	0.0042	0.035
Total Phosphorus	mg/L	0.021	0.034	0.014	0.025	0.015	0.024	0.022	0.032
Total Metals									
Aluminum	mg/L	0.48	0.54	0.47	0.52	0.048	0.21	0.072	0.35
Antimony	mg/L	0.0018	0.0027	0.00063	0.0013	0.00013	0.00028	0.000095	0.00019
Arsenic	mg/L	0.0029	0.0035	0.001	0.0014	0.00084	0.0011	0.001	0.0017
Barium	mg/L	0.051	0.08	0.034	0.052	0.025	0.041	0.018	0.029
Beryllium	mg/L	0.000081	0.00011	0.000063	0.000074	0.000051	0.000064	0.000025	0.000037
Boron	mg/L	0.12	0.19	0.06	0.11	0.046	0.067	0.04	0.057
Cadmium	mg/L	0.00019	0.00037	0.000056	0.00016	0.000031	0.000089	0.000019	0.00007
Chromium	mg/L	0.00081	0.001	0.00077	0.00094	0.00056	0.0011	0.00081	0.0016
Cobalt	mg/L	0.00059	0.001	0.00039	0.00046	0.00011	0.00028	0.000085	0.00027
Copper	mg/L	0.025	0.18	0.014	0.17	0.0055	0.012	0.003	0.0072
Iron	mg/L	0.49	0.54	0.48	0.52	0.088	0.31	0.13	0.54
Lead	mg/L	0.00016	0.00017	0.00015	0.00015	0.000033	0.00011	0.000028	0.00013
Lithium	mg/L	0.013	0.022	0.0071	0.012	0.0028	0.0092	0.0019	0.0032
Manganese	mg/L	0.14	0.35	0.082	0.14	0.077	0.17	0.064	0.16
Mercury	mg/L	0.0000065	0.000009	0.0000051	0.0000051	0.000005	0.0000051	0.0000048	0.0000071
Molybdenum	mg/L	0.27	0.4	0.41	0.84	0.18	0.31	0.057	0.22
Nickel	mg/L	0.0013	0.0023	0.0011	0.0015	0.00057	0.001	0.00083	0.0018
Selenium	mg/L	0.067	0.12	0.032	0.064	0.005	0.029	0.0032	0.012
Silver	mg/L	0.0000094	0.00002	0.0000065	0.000017	0.0000058	0.000017	0.0000034	0.000023
Strontium	mg/L	4.1	6	2.0	3.4	0.83	1.9	0.57	1.0
Thallium	mg/L	0.0000092	0.000015	0.0000071	0.0000095	0.0000071	0.0000076	0.0000048	0.0000072
Tin	mg/L	0.000073	0.00017	0.000055	0.00013	0.000047	0.00006	0.000024	0.000036
Titanium	mg/L	0.025	0.027	0.021	0.023	0.0038	0.0056	0.0023	0.0036
Uranium	mg/L	0.0029	0.0043	0.0015	0.0028	0.0012	0.0024	0.00073	0.0014

Table 17: Predicted Maximum Concentrations in the Main Embankment Seepage Collection Pond during Closure and Post-closure

Parameter	Units	Operations Period (January 2025 - July 2031)		Closure (August 2031 - July 2041)		Early Post-closure (August 2041 - July 2051)		Long Term Post-closure (August 2051 - January 2131)	
		Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations	Maximum of Median Predicted Concentrations	Maximum of 95th Percentile Predicted Concentrations
Vanadium	mg/L	0.0028	0.0039	0.0019	0.0029	0.00069	0.0012	0.00074	0.0014
Zinc	mg/L	0.012	0.027	0.0052	0.0096	0.0019	0.0048	0.00095	0.0032
Dissolved Metals									
Aluminum	mg/L	0.029	0.083	0.021	0.07	0.015	0.082	0.039	0.22
Antimony	mg/L	0.0017	0.0026	0.00061	0.0011	0.00013	0.00028	0.000095	0.00019
Arsenic	mg/L	0.0026	0.0033	0.00077	0.0011	0.00079	0.00097	0.00096	0.0015
Barium	mg/L	0.049	0.08	0.032	0.044	0.025	0.04	0.018	0.027
Beryllium	mg/L	0.000081	0.00011	0.000063	0.000074	0.000051	0.000064	0.000025	0.000037
Boron	mg/L	0.11	0.16	0.056	0.077	0.046	0.065	0.04	0.055
Cadmium	mg/L	0.00019	0.00032	0.000054	0.00011	0.000029	0.000081	0.000017	0.000062
Chromium	mg/L	0.00041	0.0006	0.00037	0.00054	0.00044	0.00055	0.00069	0.0011
Cobalt	mg/L	0.0003	0.00069	0.0001	0.00017	0.00011	0.00016	0.000085	0.00015
Copper	mg/L	0.018	0.029	0.007	0.02	0.0052	0.011	0.0027	0.0056
Iron	mg/L	0.038	0.09	0.029	0.073	0.036	0.093	0.074	0.33
Lead	mg/L	0.000044	0.00006	0.000031	0.00004	0.000033	0.000043	0.000028	0.000062
Lithium	mg/L	0.012	0.021	0.0069	0.011	0.0028	0.009	0.0019	0.0031
Manganese	mg/L	0.12	0.33	0.061	0.12	0.073	0.15	0.06	0.13
Mercury	mg/L	0.0000065	0.000009	0.0000051	0.0000051	0.000005	0.0000051	0.0000048	0.0000071
Molybdenum	mg/L	0.27	0.4	0.41	0.83	0.18	0.31	0.057	0.22
Nickel	mg/L	0.0008	0.0018	0.00052	0.00096	0.00049	0.0007	0.00075	0.0015
Selenium	mg/L	0.067	0.11	0.032	0.058	0.005	0.028	0.0031	0.012
Silicon	mg/L	6.9	10	4.9	6.2	5.1	6.4	5.8	8.6
Silver	mg/L	0.0000094	0.000012	0.0000065	0.0000096	0.0000058	0.00001	0.0000034	0.000016
Strontium	mg/L	4.1	6	1.9	3.1	0.83	1.9	0.56	0.98
Thallium	mg/L	0.0000092	0.000014	0.0000071	0.0000078	0.0000071	0.0000076	0.0000048	0.0000072
Tin	mg/L	0.000073	0.0001	0.000055	0.000063	0.000047	0.00006	0.000024	0.000036
Titanium	mg/L	0.0065	0.008	0.002	0.0037	0.0038	0.0056	0.0023	0.0036
Uranium	mg/L	0.0029	0.004	0.0015	0.0026	0.0012	0.0024	0.00073	0.0014
Vanadium	mg/L	0.0016	0.0027	0.00074	0.0017	0.00052	0.00069	0.00056	0.00092
Zinc	mg/L	0.0092	0.024	0.0026	0.007	0.0019	0.0048	0.00095	0.0032

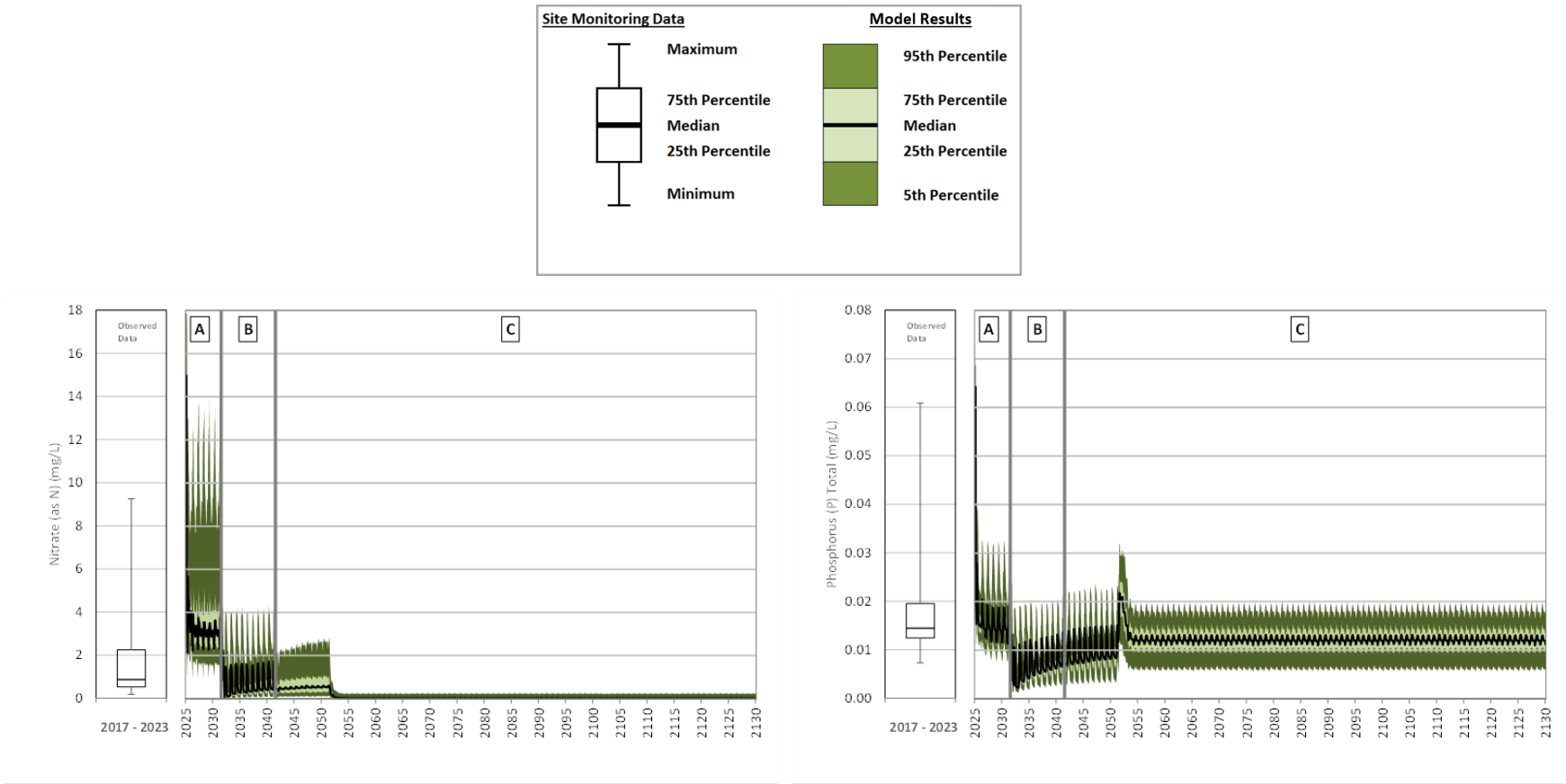
(a) Calculated based on predicted calcium and magnesium concentrations.



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

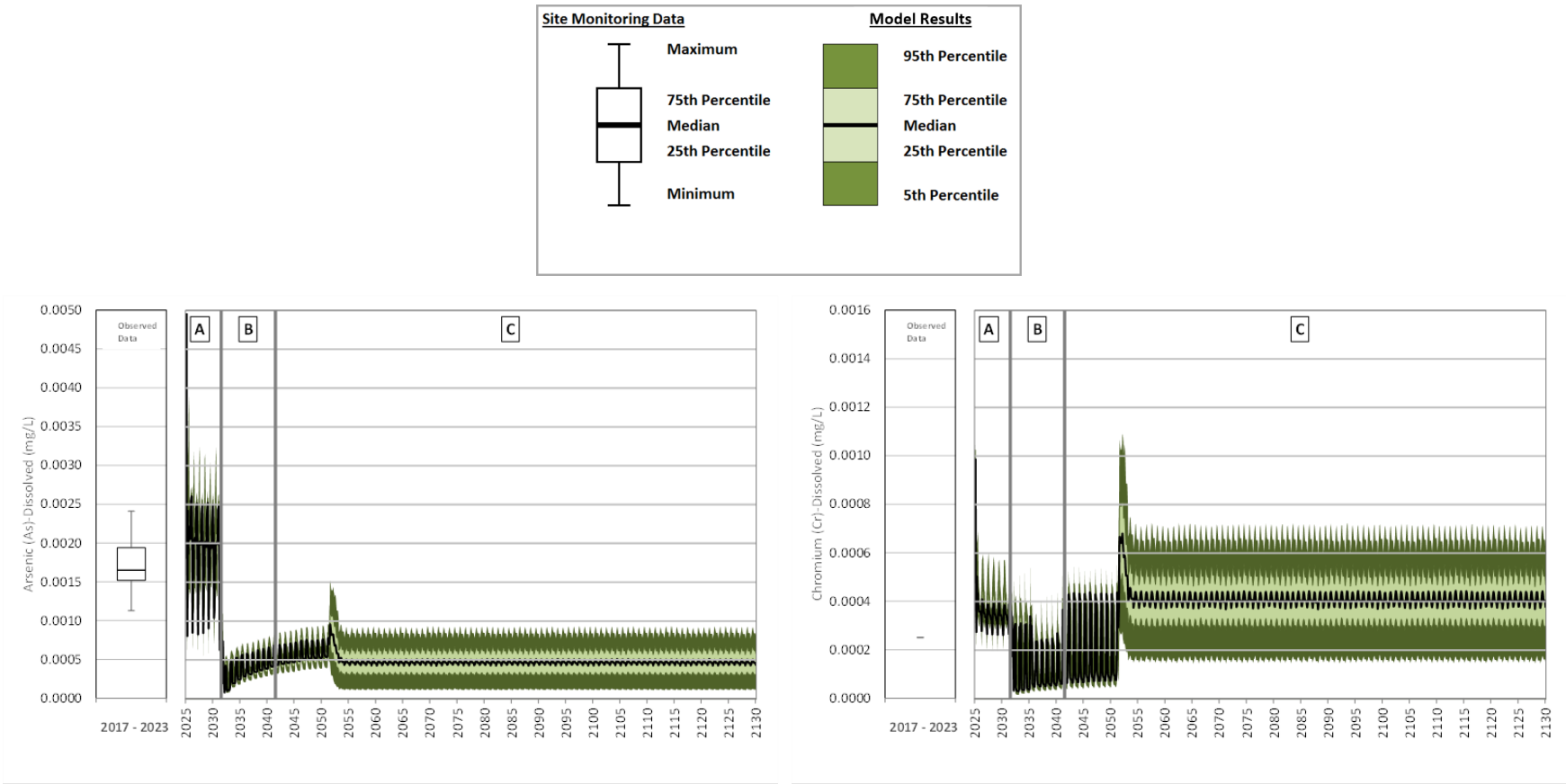
Figure 59: Predicted Sulphate and Total Ammonia Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

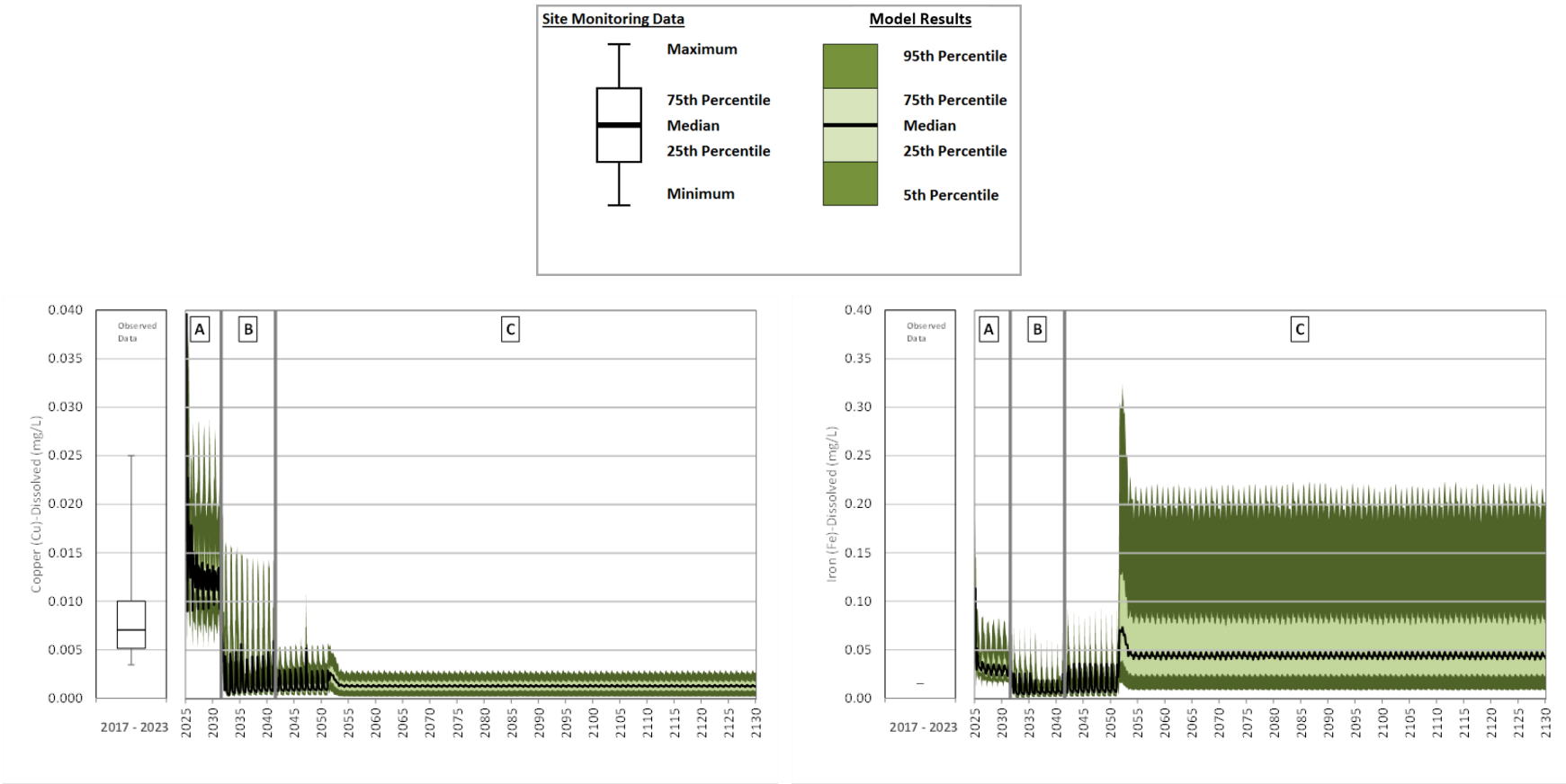
Figure 60: Predicted Nitrate and Total Phosphorus Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

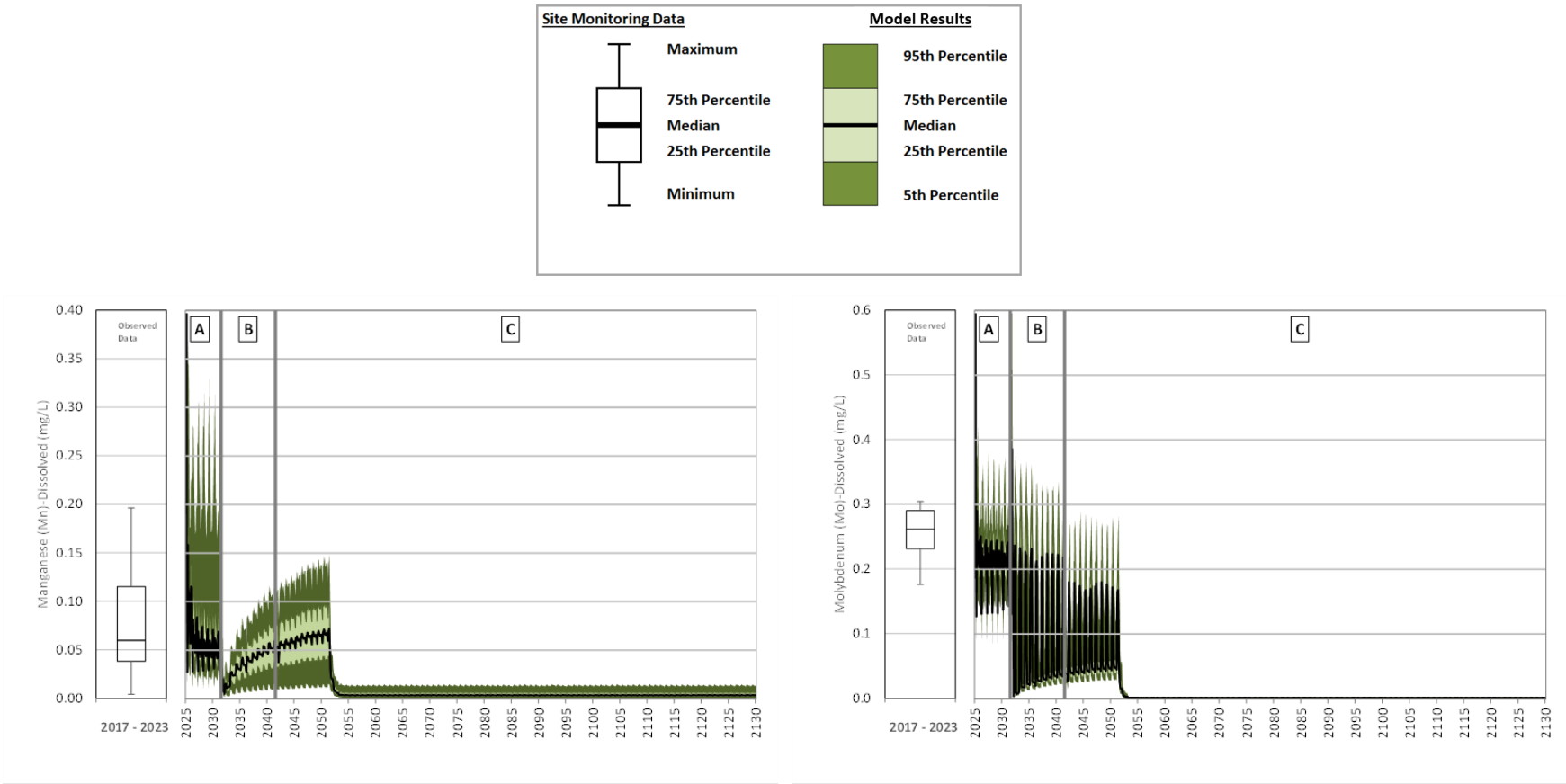
Figure 61: Predicted Dissolved Arsenic and Dissolved Chromium Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

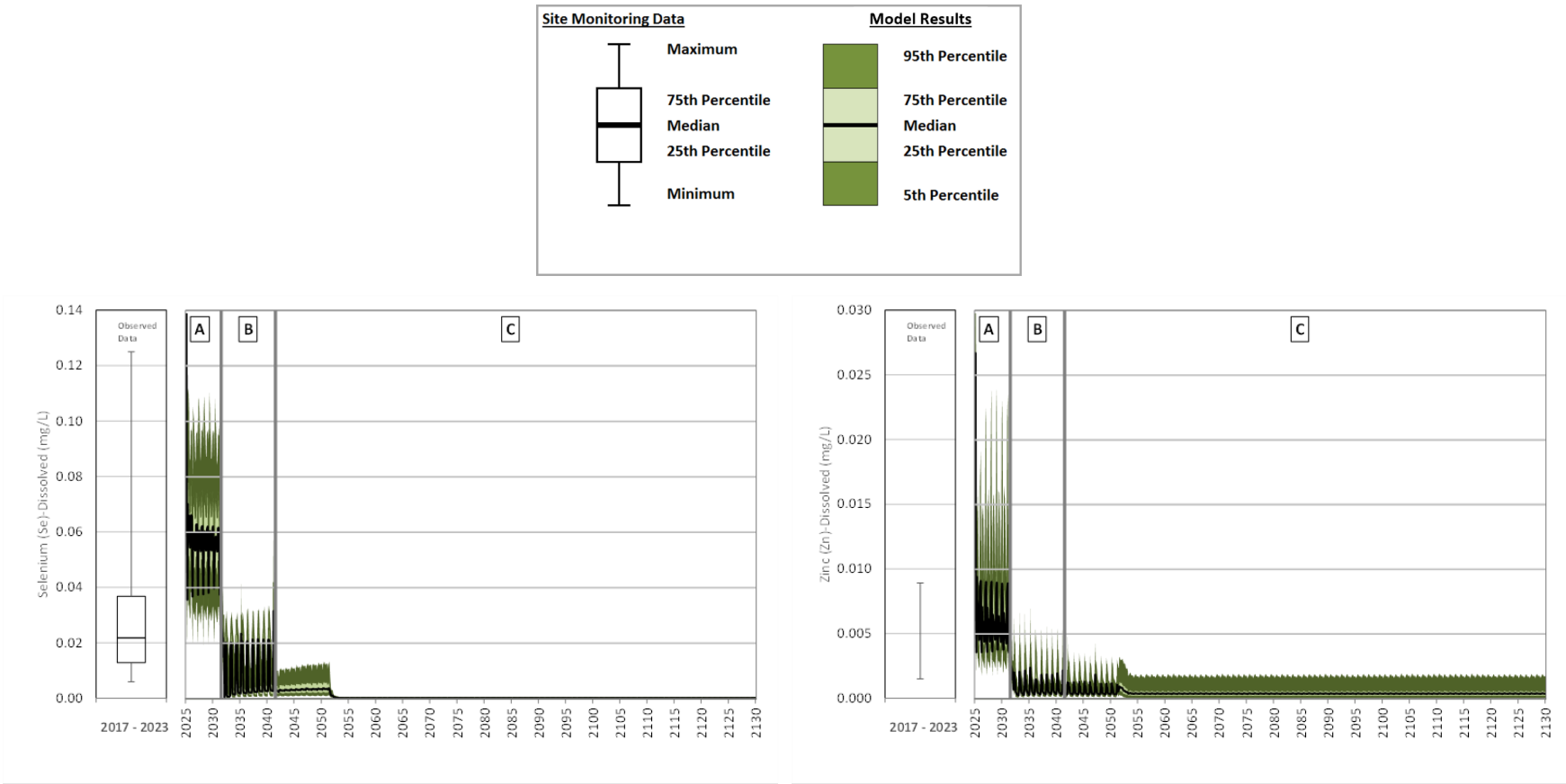
Figure 62: Predicted Dissolved Copper and Dissolved Iron Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

Figure 63: Predicted Dissolved Manganese and Dissolved Molybdenum Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into post-closure is caused by reclamation of mine site areas that are complete 10 years after the start of post-closure. Predicted concentrations reach a steady state by 2051 when pumping from the SESCP ends.

Figure 64: Predicted Dissolved Selenium and Dissolved Zinc Concentrations in the Main Embankment Seepage Collection Pond – Operations, Closure and Post-closure

5.0 SUMMARY

The GoldSim model that was developed for the 2020 WMP and updated for the 2023 WMP and the April 2025 WMP was updated to predict discharge water quality at the mine during operations, closure and post-closure was updated as part of the 2025 Water Management Plan for the TSF raise to 987 m. The model was linked to the updated SWWBM.

The updated model was calibrated against monitoring data from the mine site. During closure and post-closure, discharges from the mine will preferably be returned to their undisturbed watersheds, to the extent possible. Specifically, nine potential mine discharge locations are expected to eventually drain to Polley Lake, Bootjack Lake, Edney Creek, and Hazeltine Creek.

The updated predicted concentrations during operations, closure and post-closure in the mine site are similar to those presented in previous iterations of the SWWQM including the 2016 Long Term Water Management Plan (Golder 2016), the 2020 Water Management Plan (Golder 2020) the 2023 Water Management Plan (WSP 2024) and the April 2025 Water Management Plan (WSP 2025c). Changes in concentrations from operations to closure and post-closure are caused by reclamation of mine site areas that are complete during post-closure. Predicted concentrations reach a steady state during post-closure after reclamation of the mine site areas is complete and the Springer Expansion pit is filled. In general, the model predicted higher concentrations in the closure period, relative to the post-closure period for most parameters, except for parameters that are predicted to be higher in the assigned undisturbed runoff water quality than in the assigned disturbed, NAG or PAG waste rock water quality. Treatment and mitigation strategies during operations, closure and post-closure are addressed in the treatment section of the WMP (WSP 2025c).

6.0 CLOSURE

This report summarizes the reclamation and closure update of the SWWQM.

We trust this report satisfies your current requirements. Please contact the undersigned should you have any questions.

Signature Page

WSP Canada Inc.



Banamali Panigrahi, PhD
Water Quality Modeller



Steve Mitchell, BSc
Senior Water Quality Modeller

BP/SM/na/kk

https://wsponline.sharepoint.com/sites/gld-10023g/2025 deliverables1/ca0047730.8440 deliverables/002_issued/036-r-31191-water quality model report – tsf987/rev0/ca0047730.8440-036-r-rev0-31191-wmp water quality model report-28aug_25.docx

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APPENDIX A

Water Quality Model Calibration Results

Appendix A

Water Quality Model Calibration Results

Reference No. CA0047730.8440-036-R-Rev0-31191

August 2025

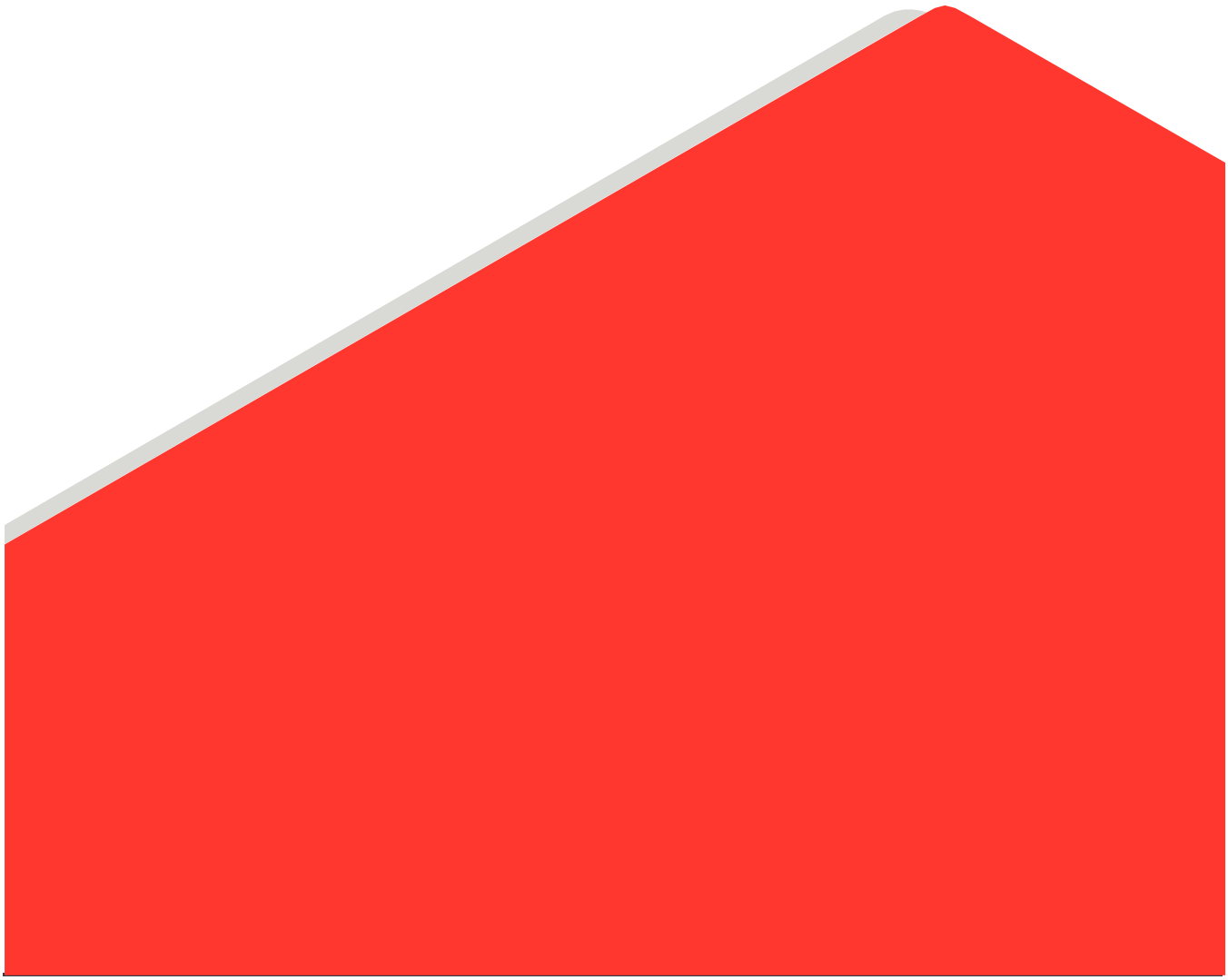


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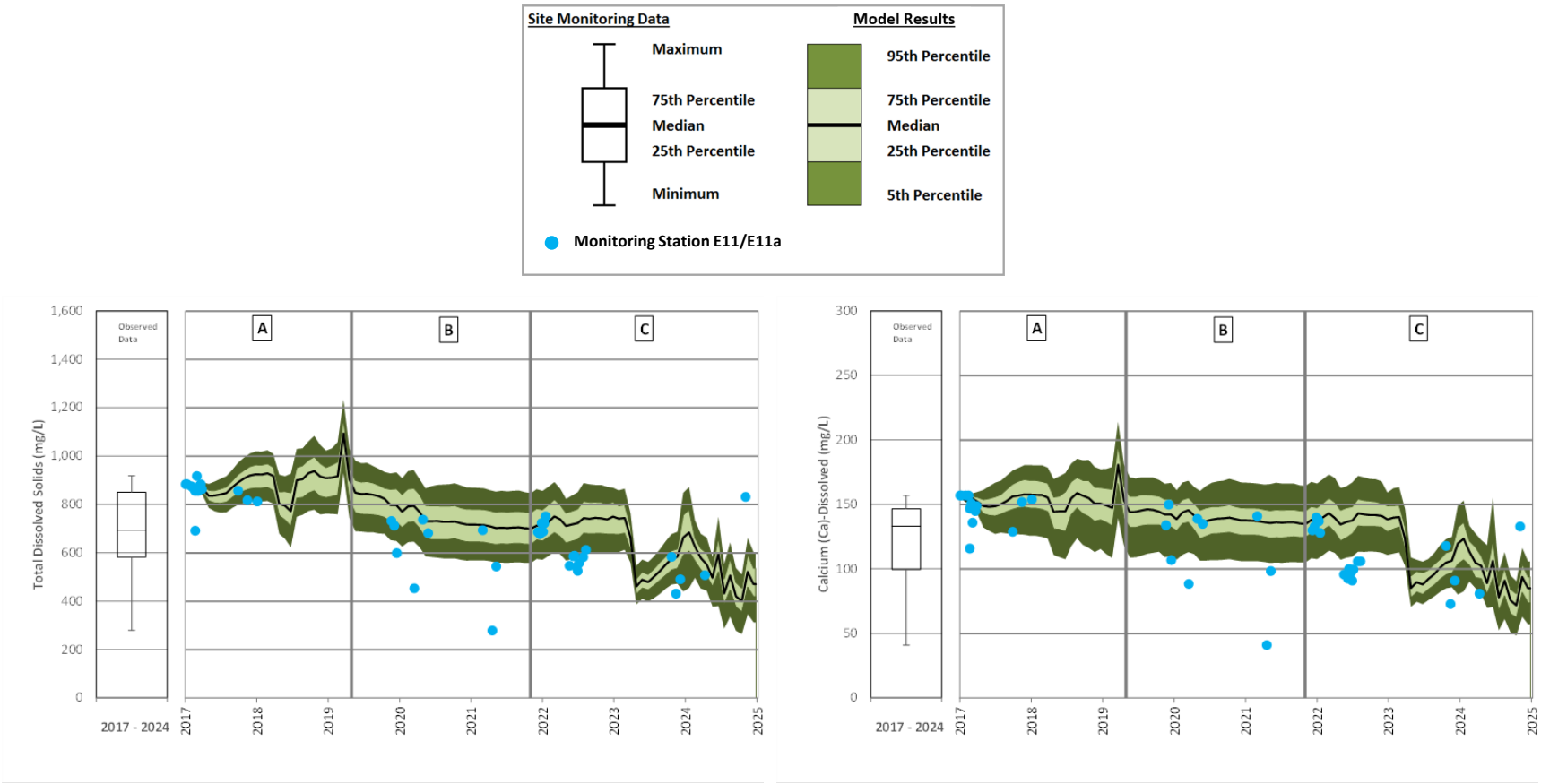
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Appendix A – Calibration Figures A1–A140

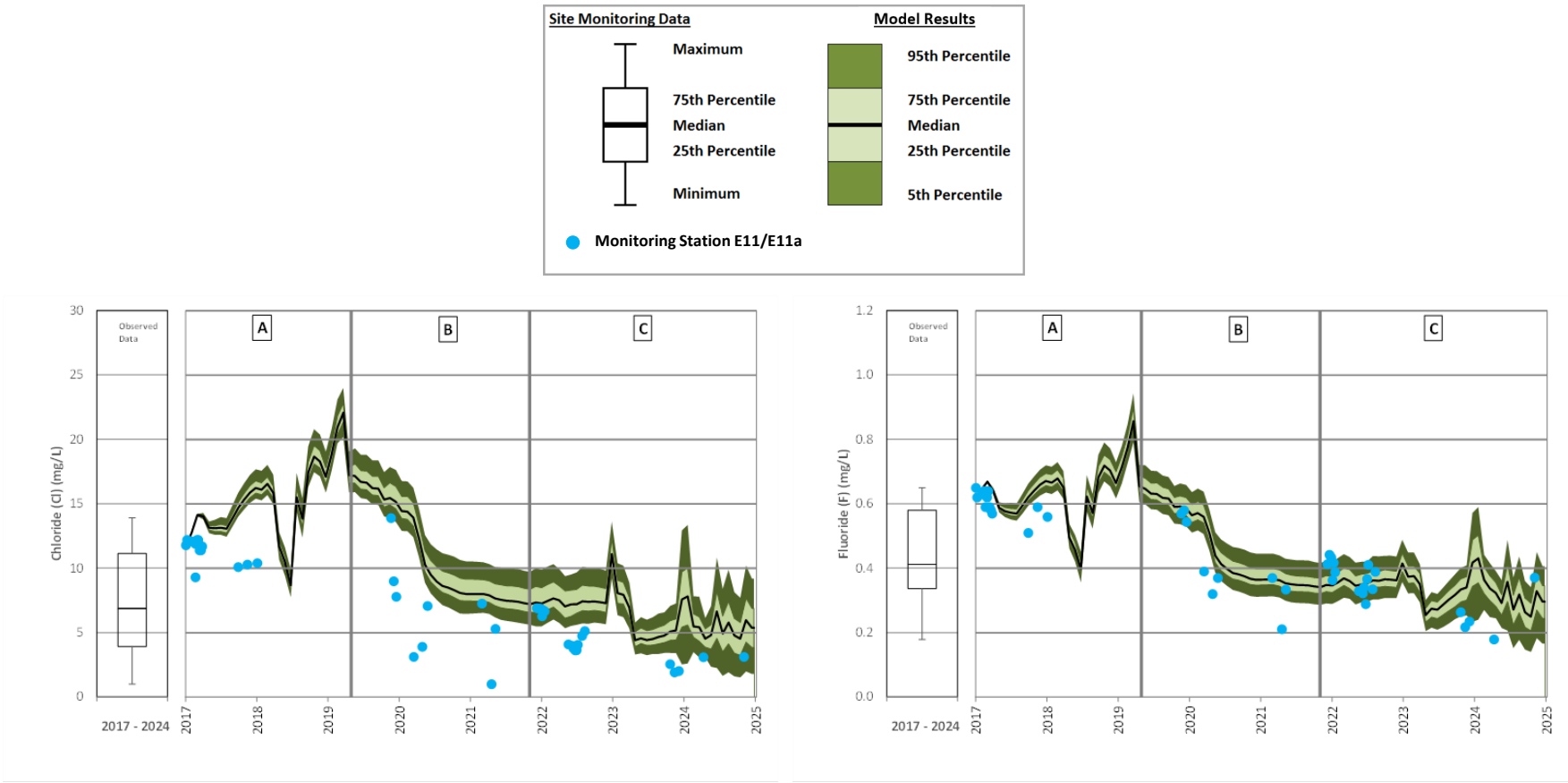
This attachment presents the water quality calibration Figures for Springer Pit, Cariboo Pit, Wight Pit, the Central Collection Sump, the Tailings Storage Facility, the Perimeter Embankment Till Borrow Pond and the Northwest Sump. The calibration period was from January 2017 to January 2023.

Springer Pit Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

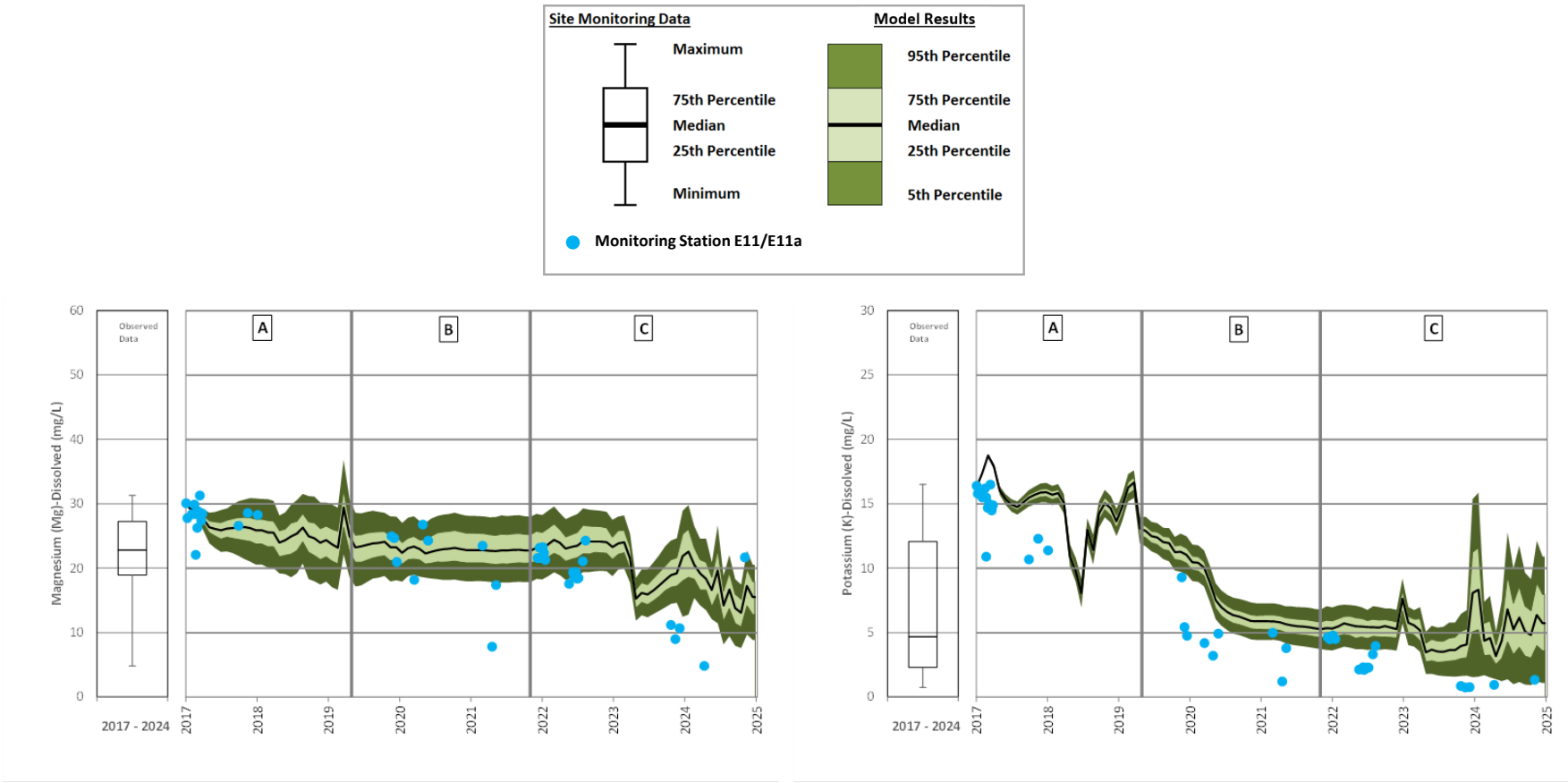
Figure A-1: Springer Pit Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Chloride and fluoride concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

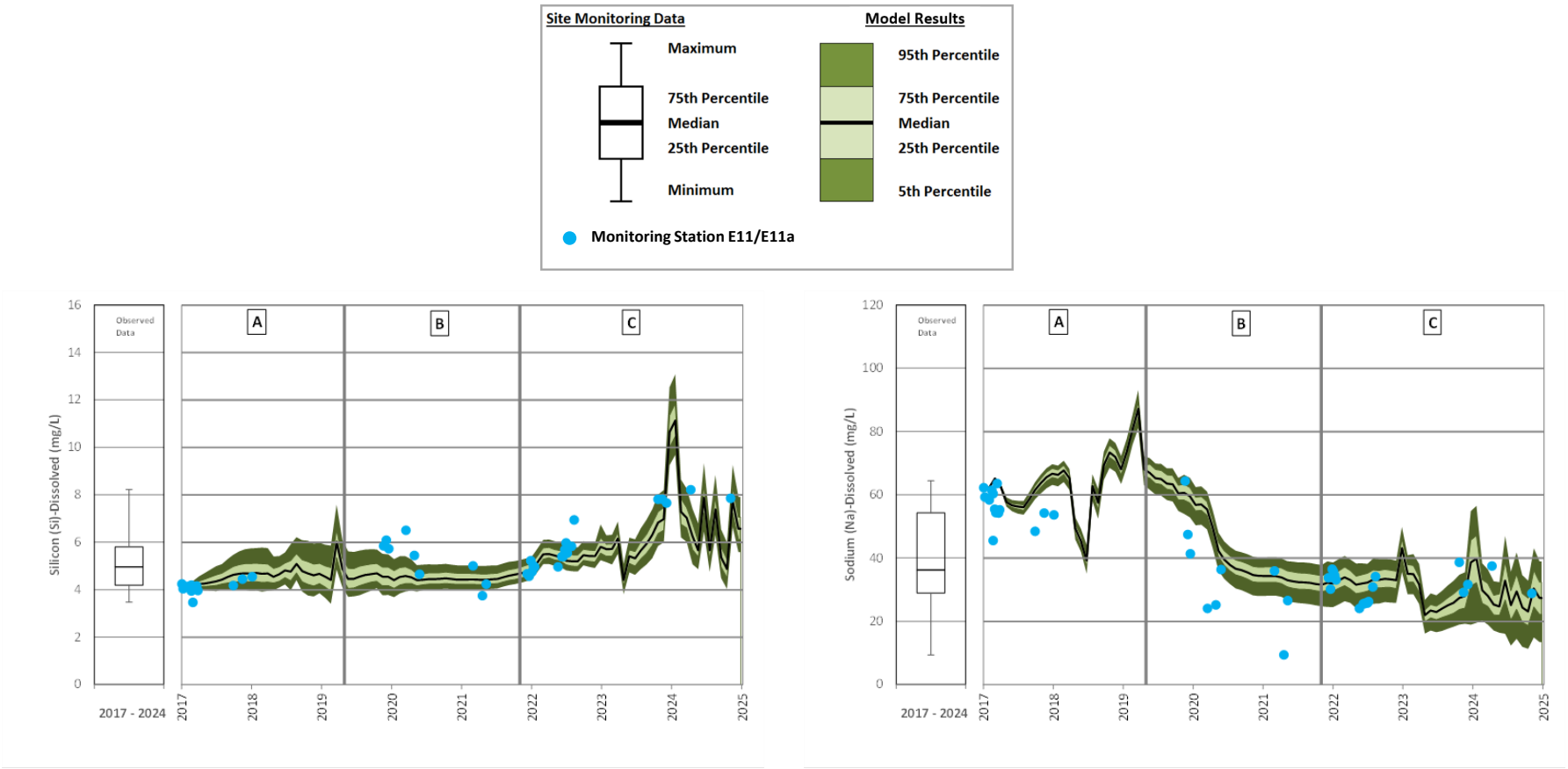
Figure A-2: Springer Pit Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Potassium concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

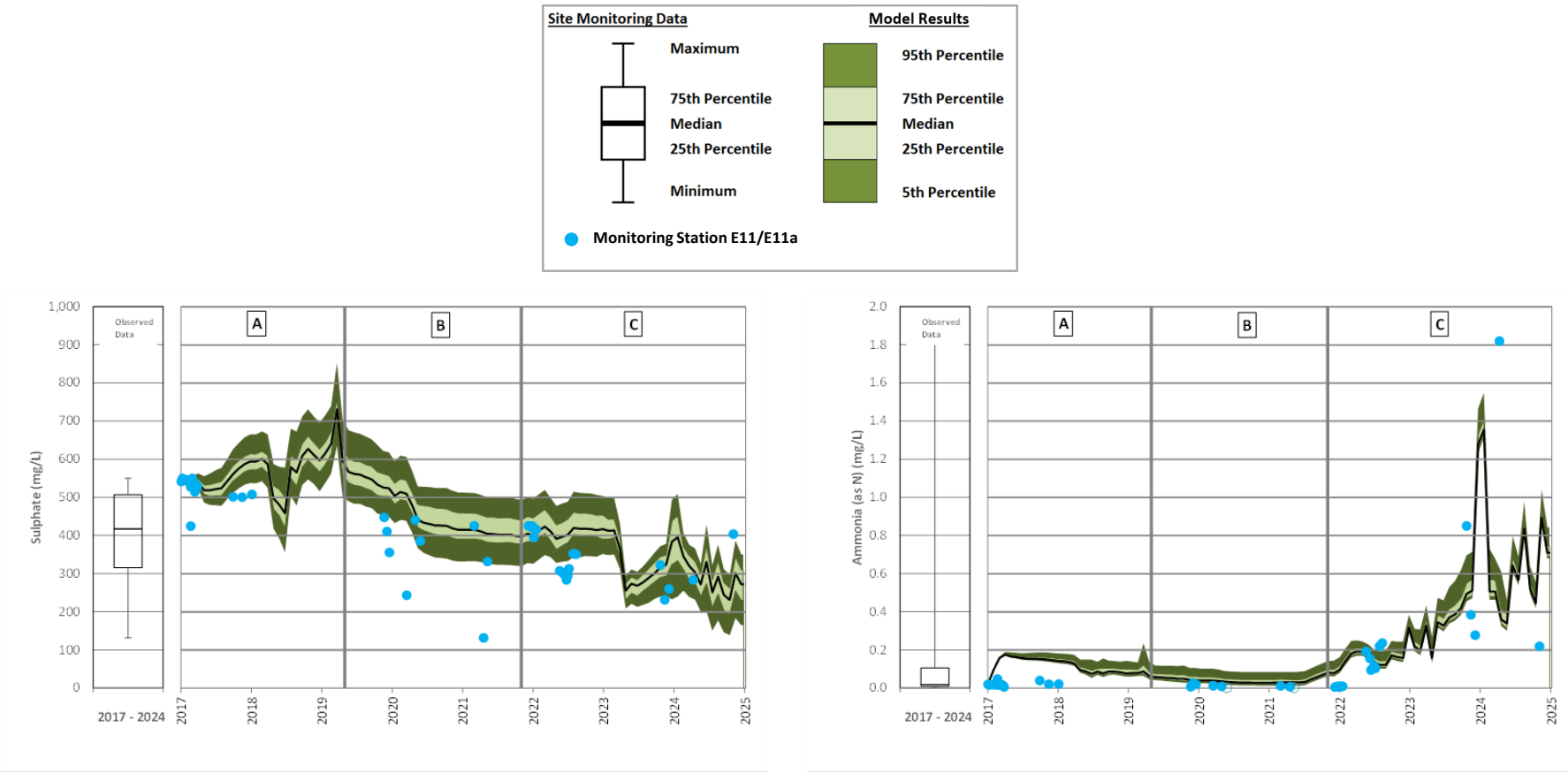
Figure A 3: Springer Pit Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Sodium concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in Tailings Storage Facility (TSF) that is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

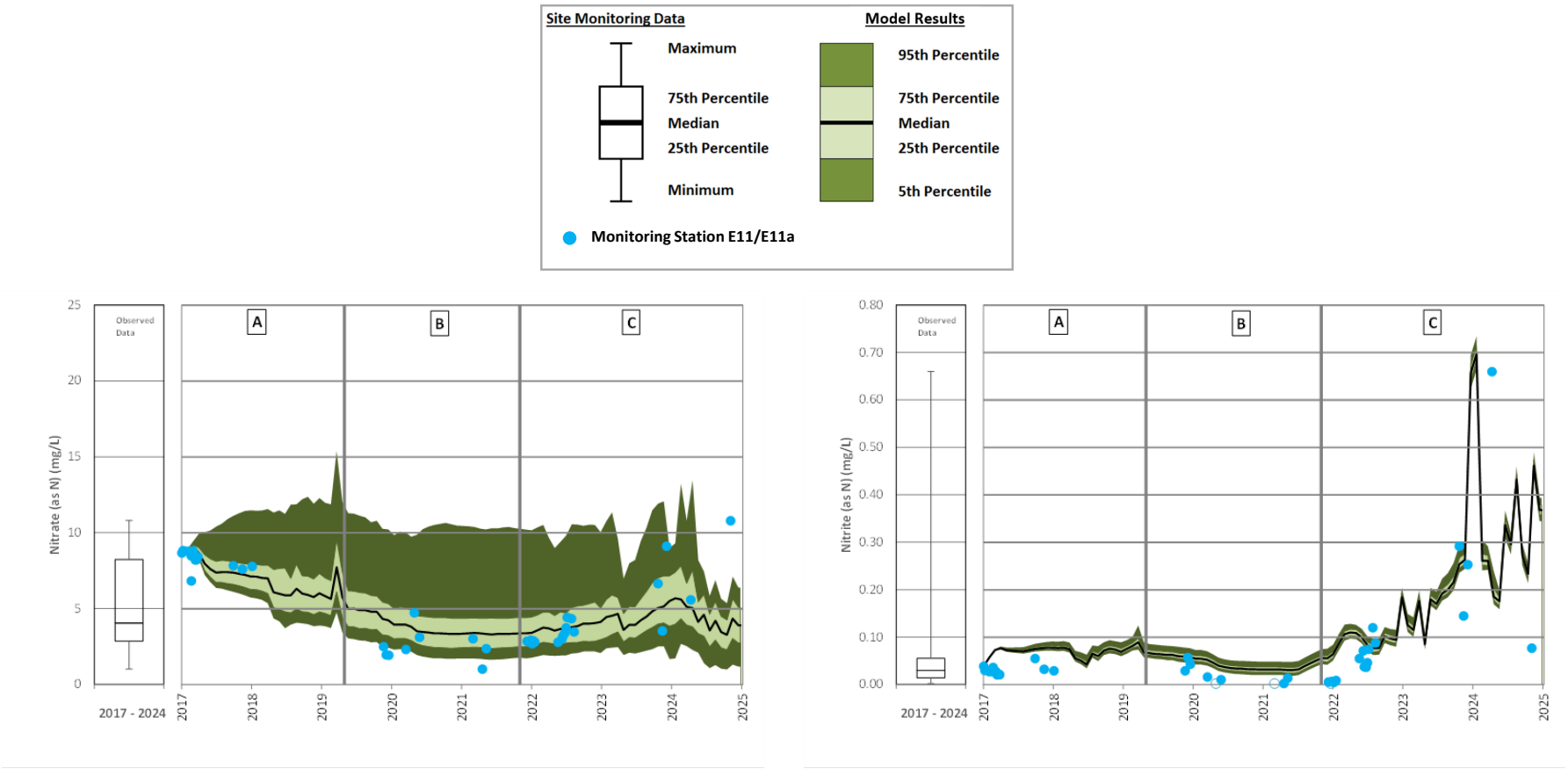
Figure A-4: Springer Pit Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Total ammonia concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

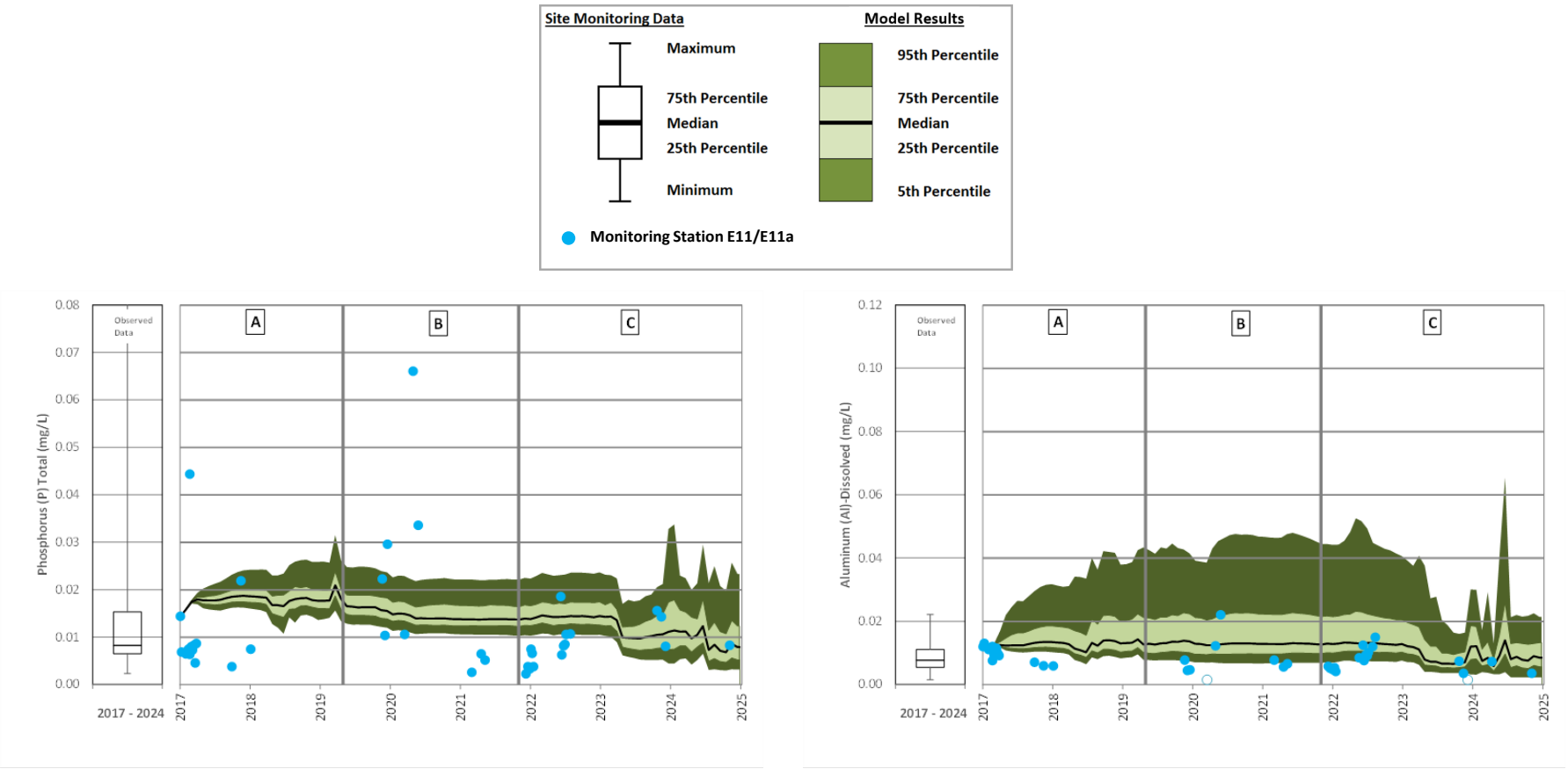
Figure A-5: Springer Pit Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations

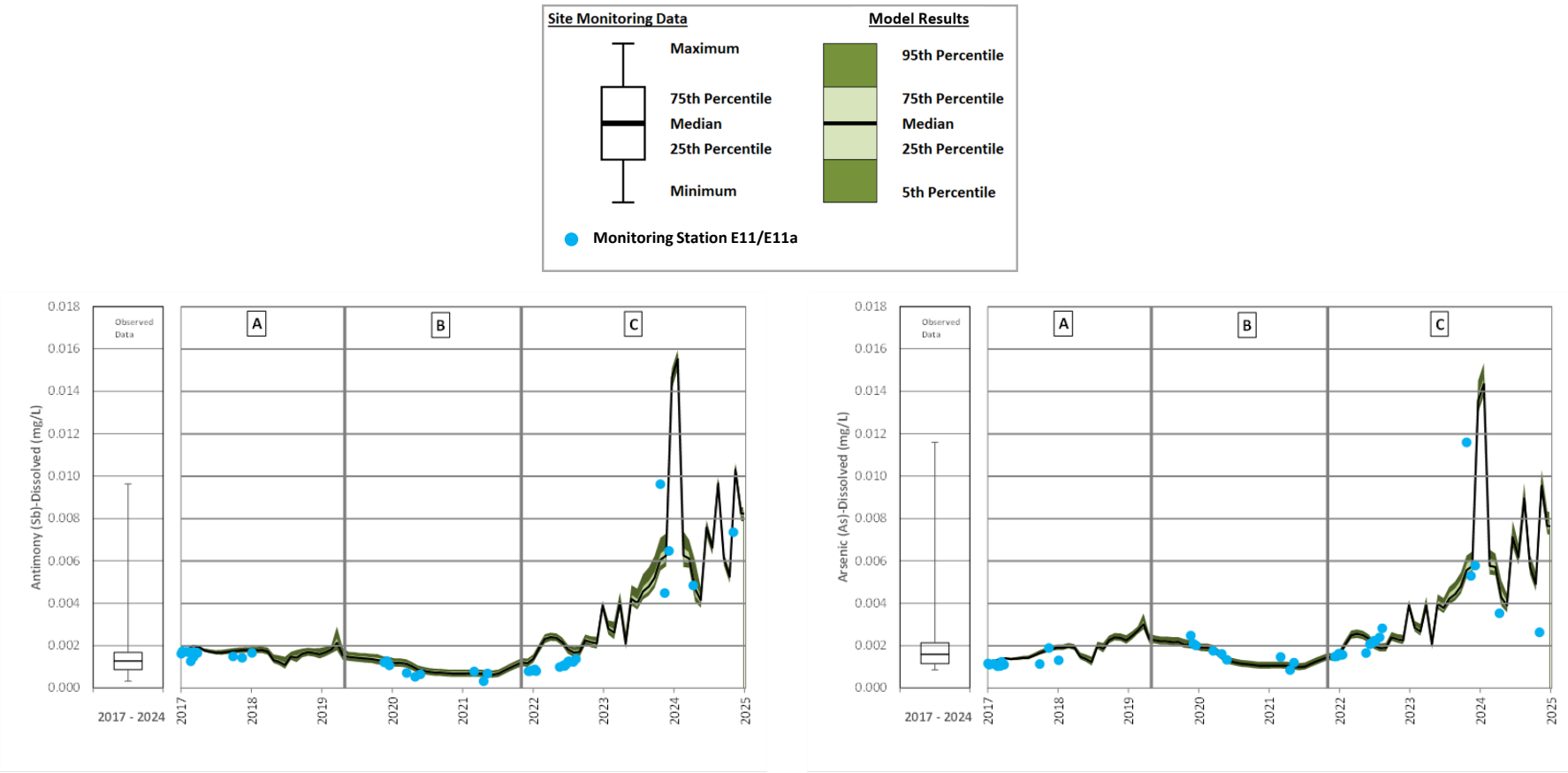
Note: Nitrite concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-6: Springer Pit Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations

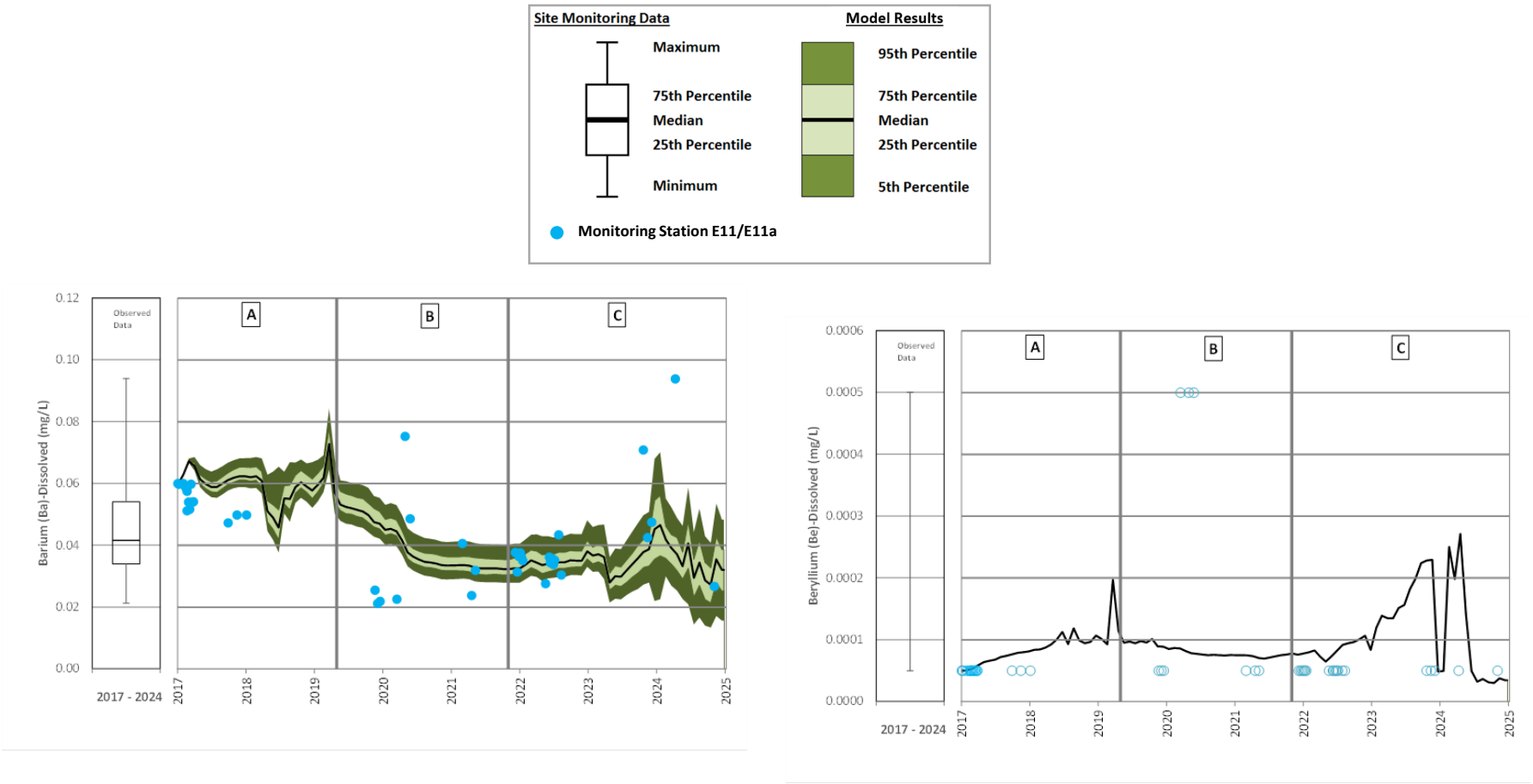
Figure A-7: Springer Pit Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Dissolved antimony and dissolved arsenic concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

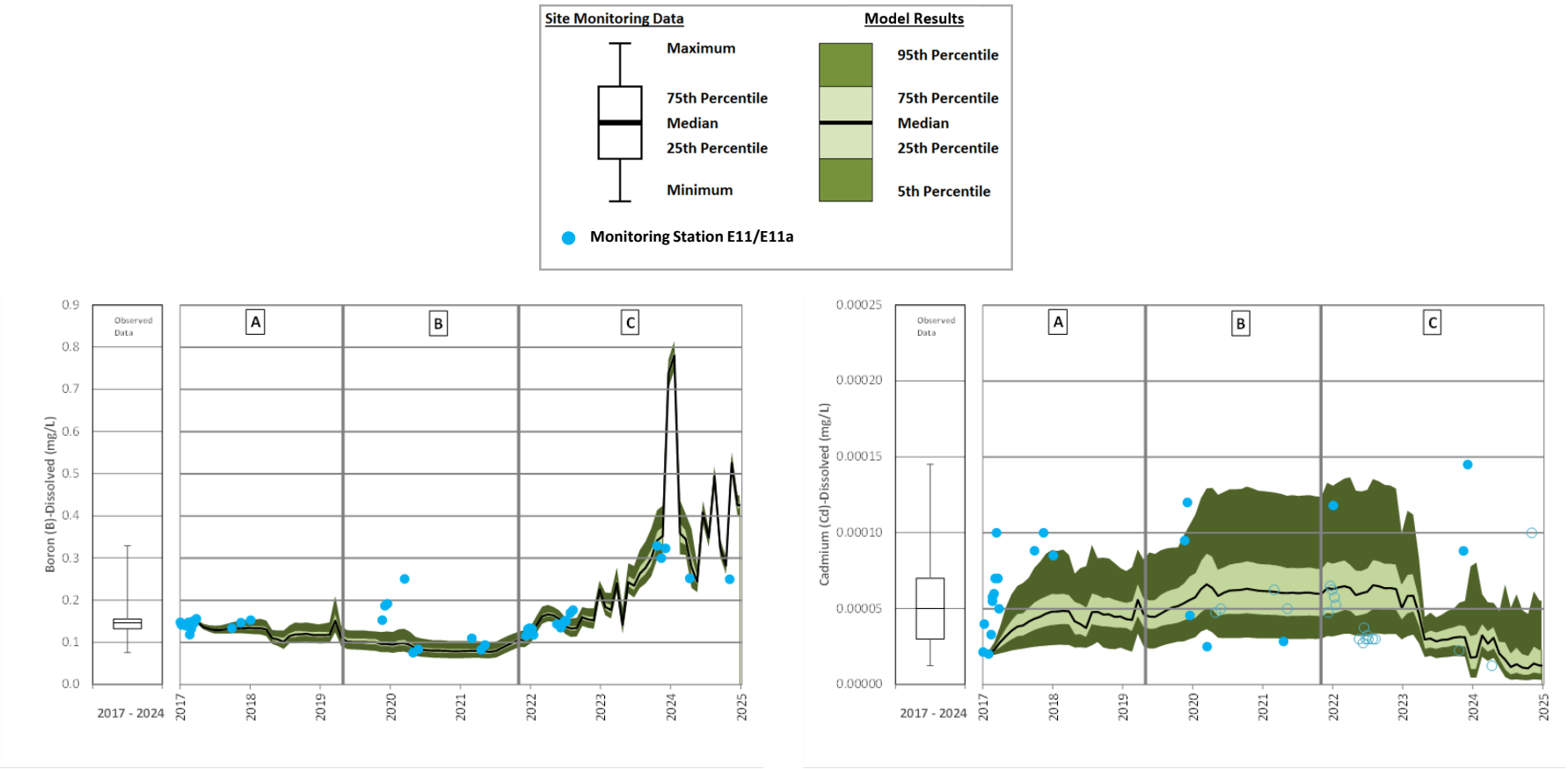
Figure A-8: Springer Pit Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved barium concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

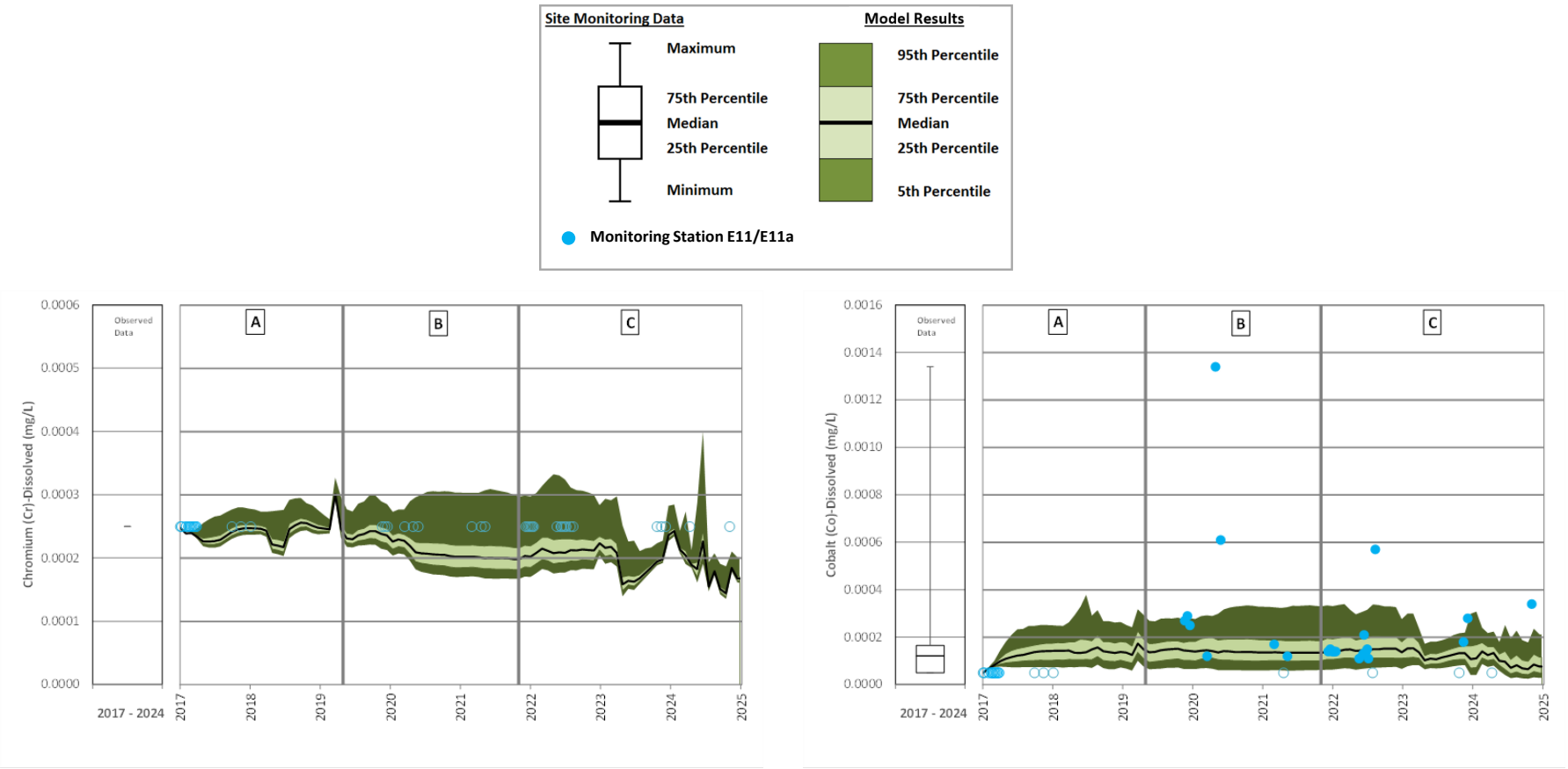
Figure A-9: Springer Pit Calibration – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

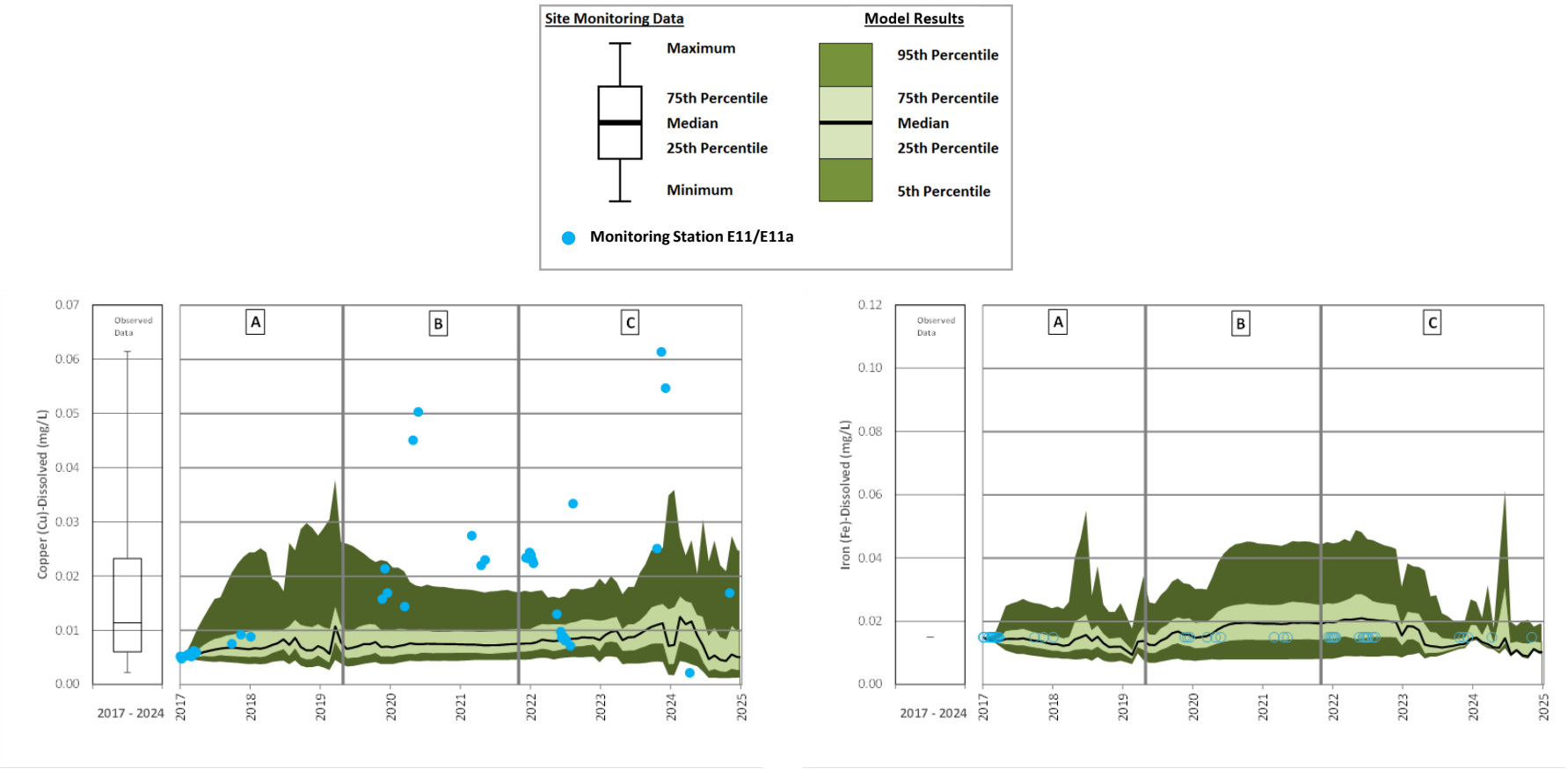
Note: Dissolved boron concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-10: Springer Pit Calibration – Dissolved Boron and Dissolved Cadmium



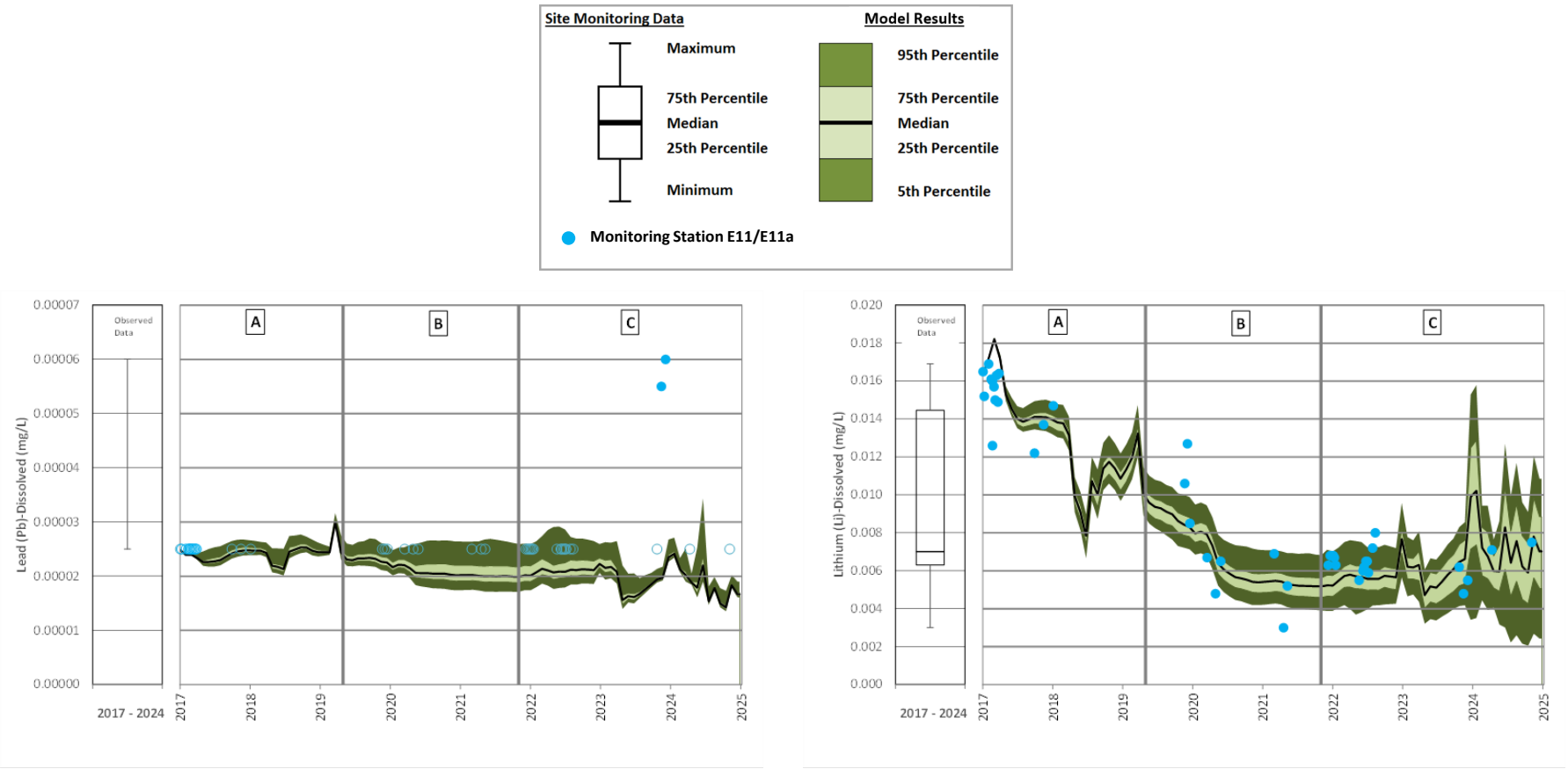
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-11: Springer Pit Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

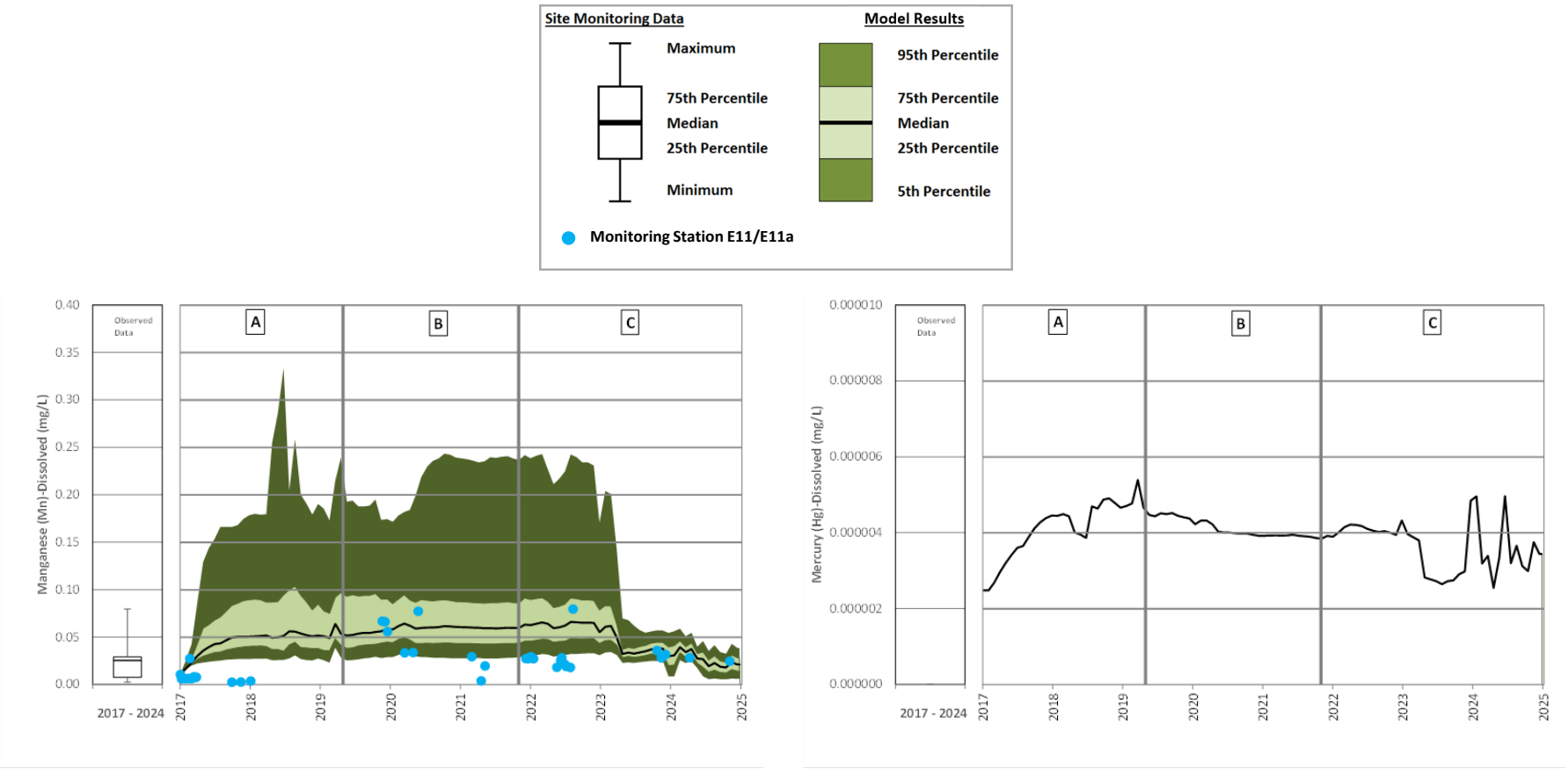
Figure A-12: Springer Pit Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

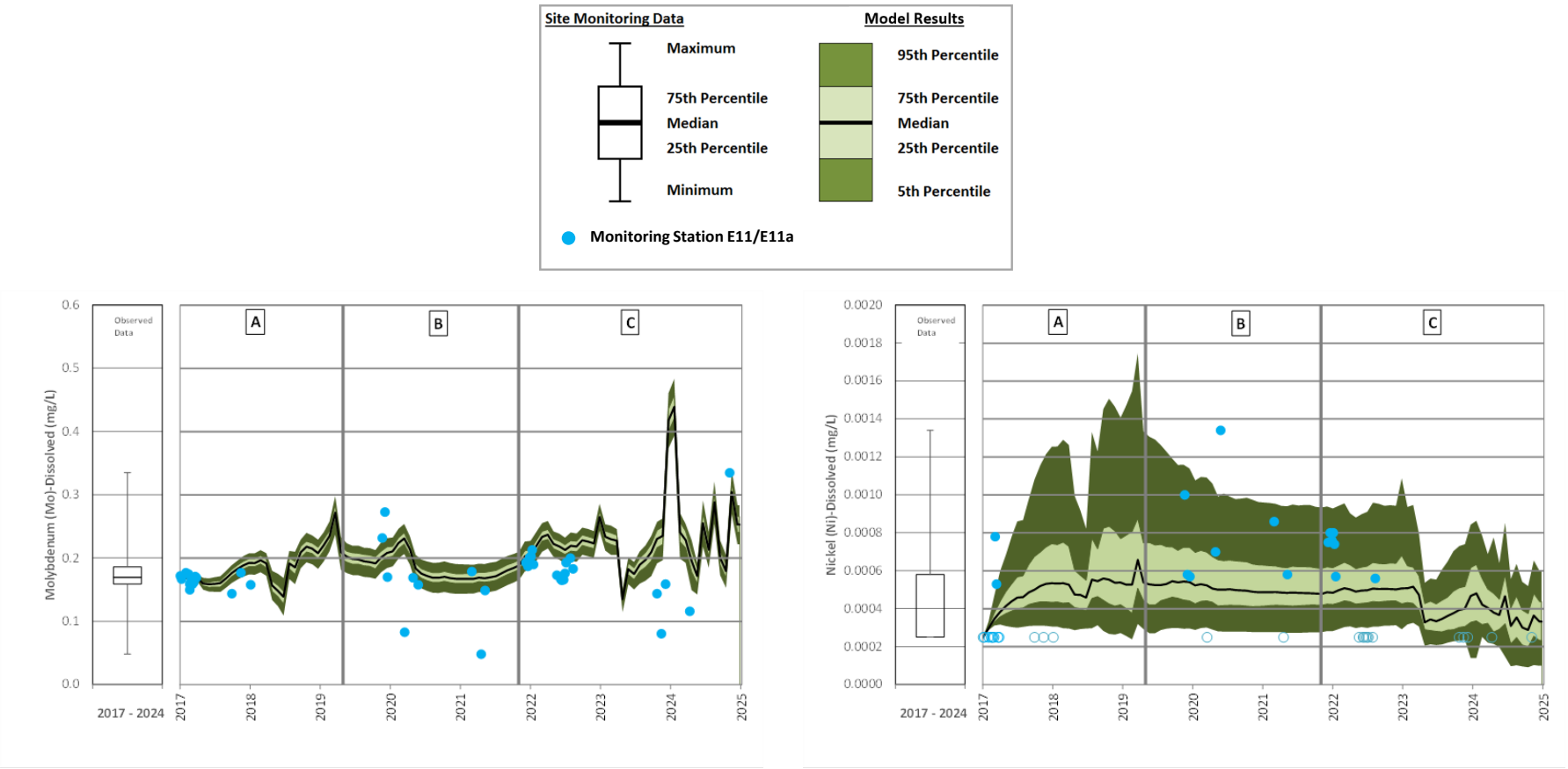
Note: Dissolved lithium concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-13: Springer Pit Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

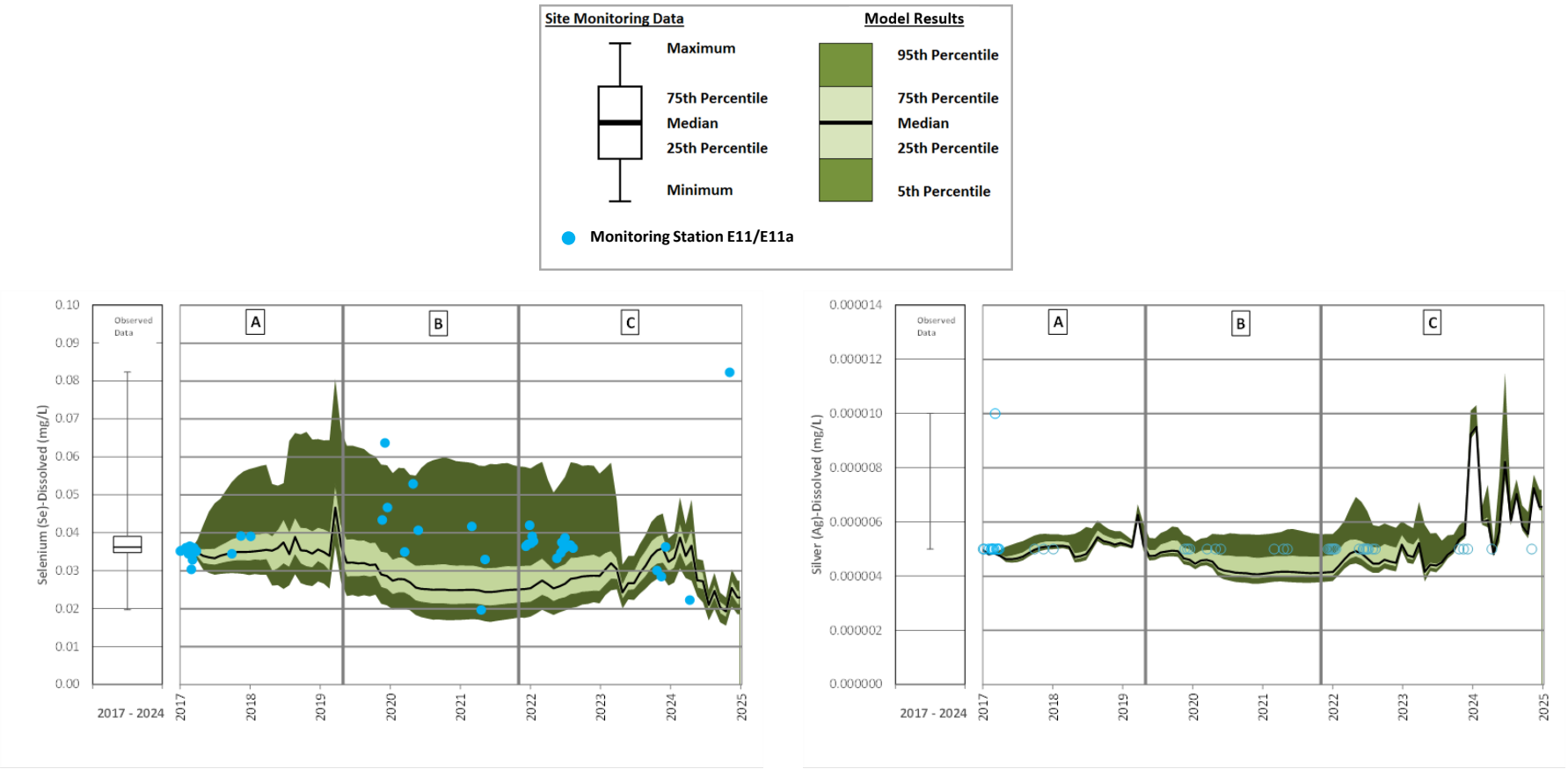
Figure A-14: Springer Pit Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

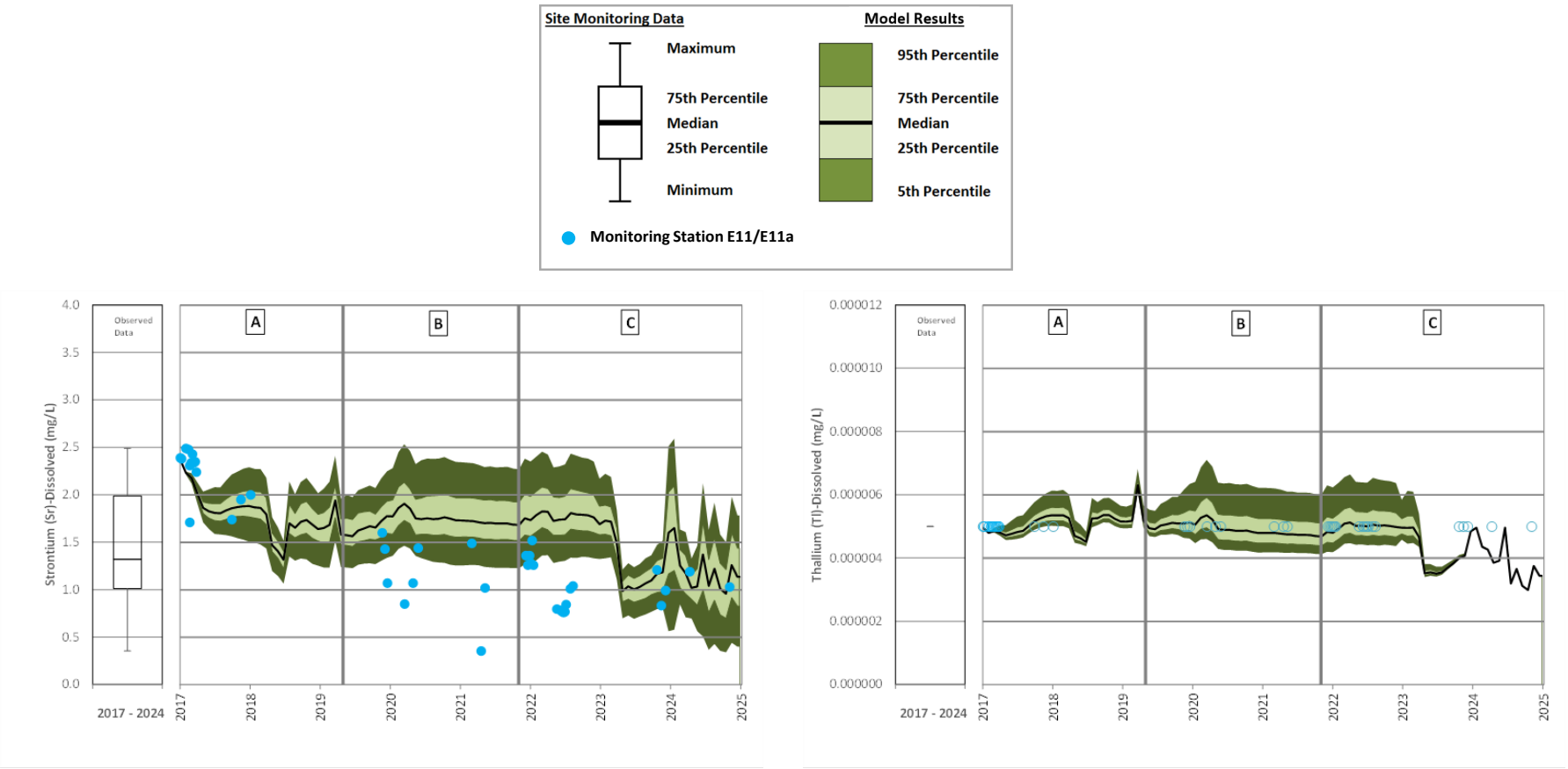
Note: Dissolved molybdenum concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-15: Springer Pit Calibration – Dissolved Molybdenum and Dissolved Nickel



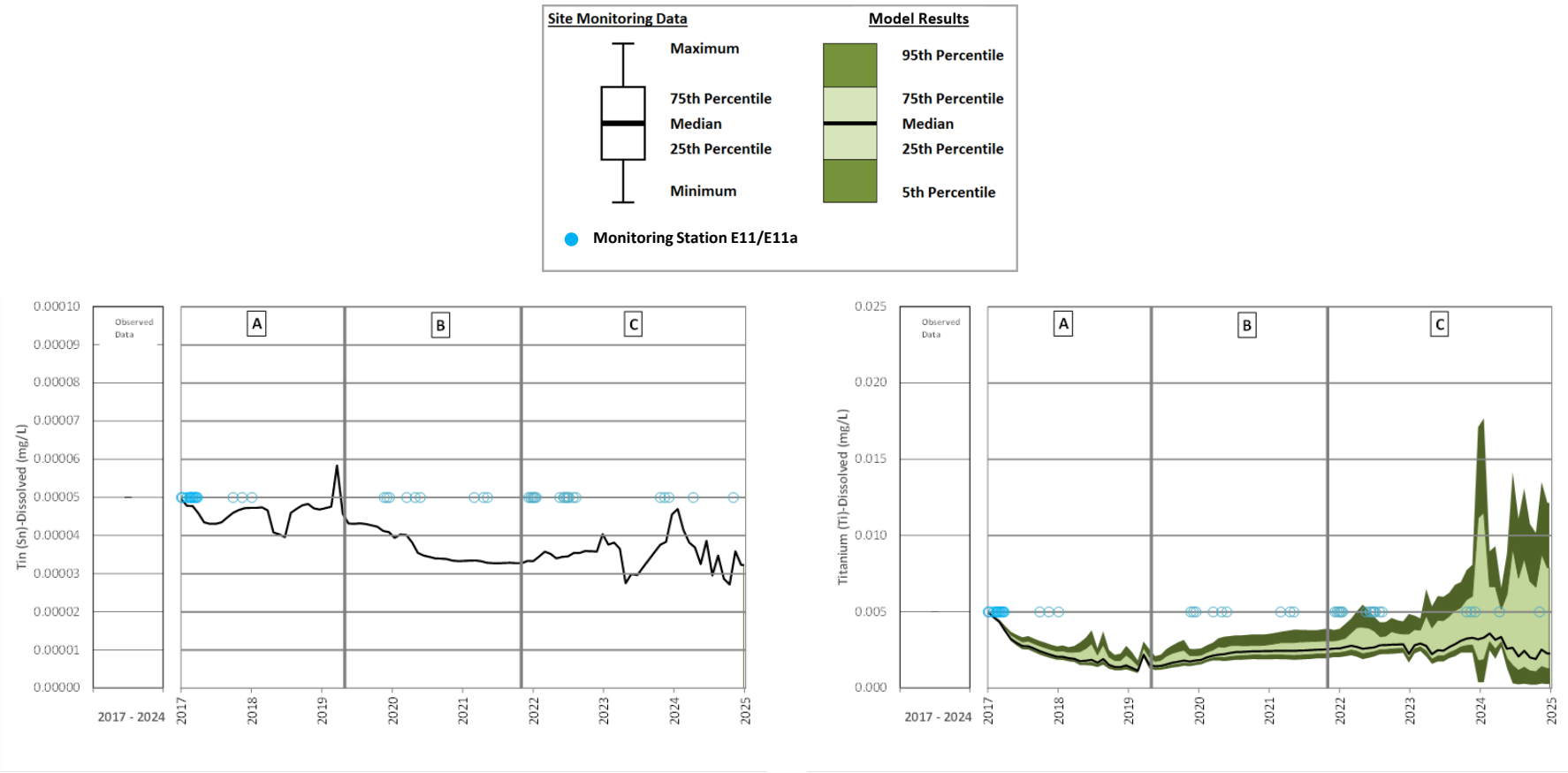
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-16: Springer Pit Calibration – Dissolved Selenium and Dissolved Silver



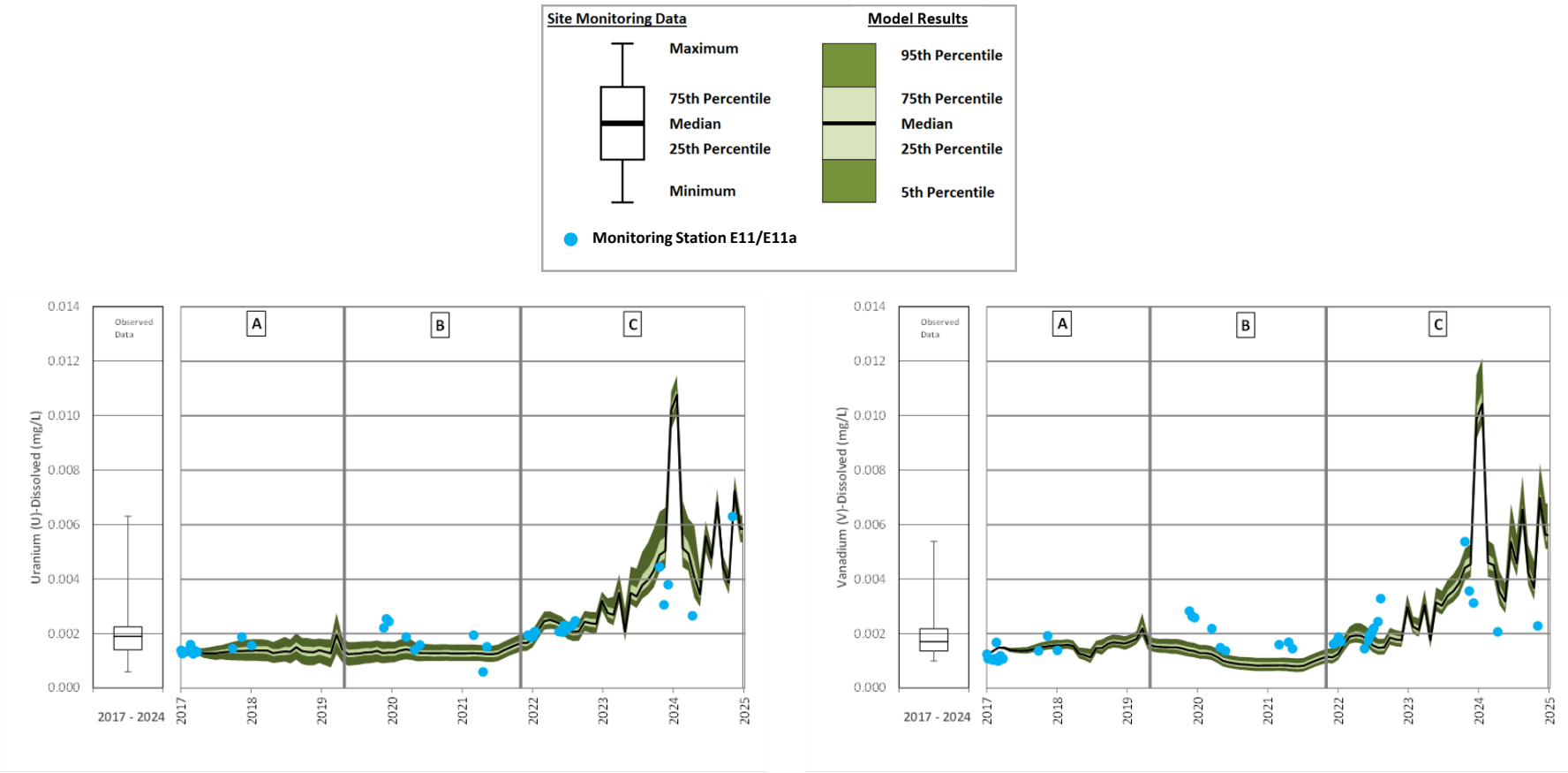
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-17: Springer Pit Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

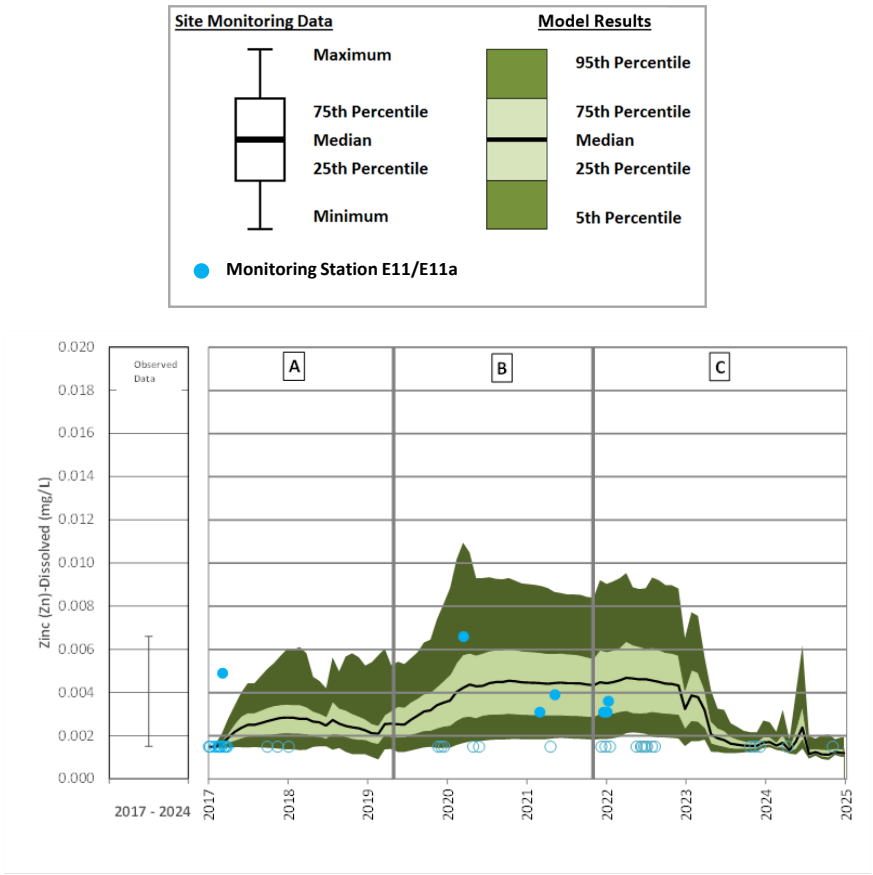
Figure A-18: Springer Pit Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Dissolved uranium and vanadium concentrations increase in Springer Pit at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to Springer Pit. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

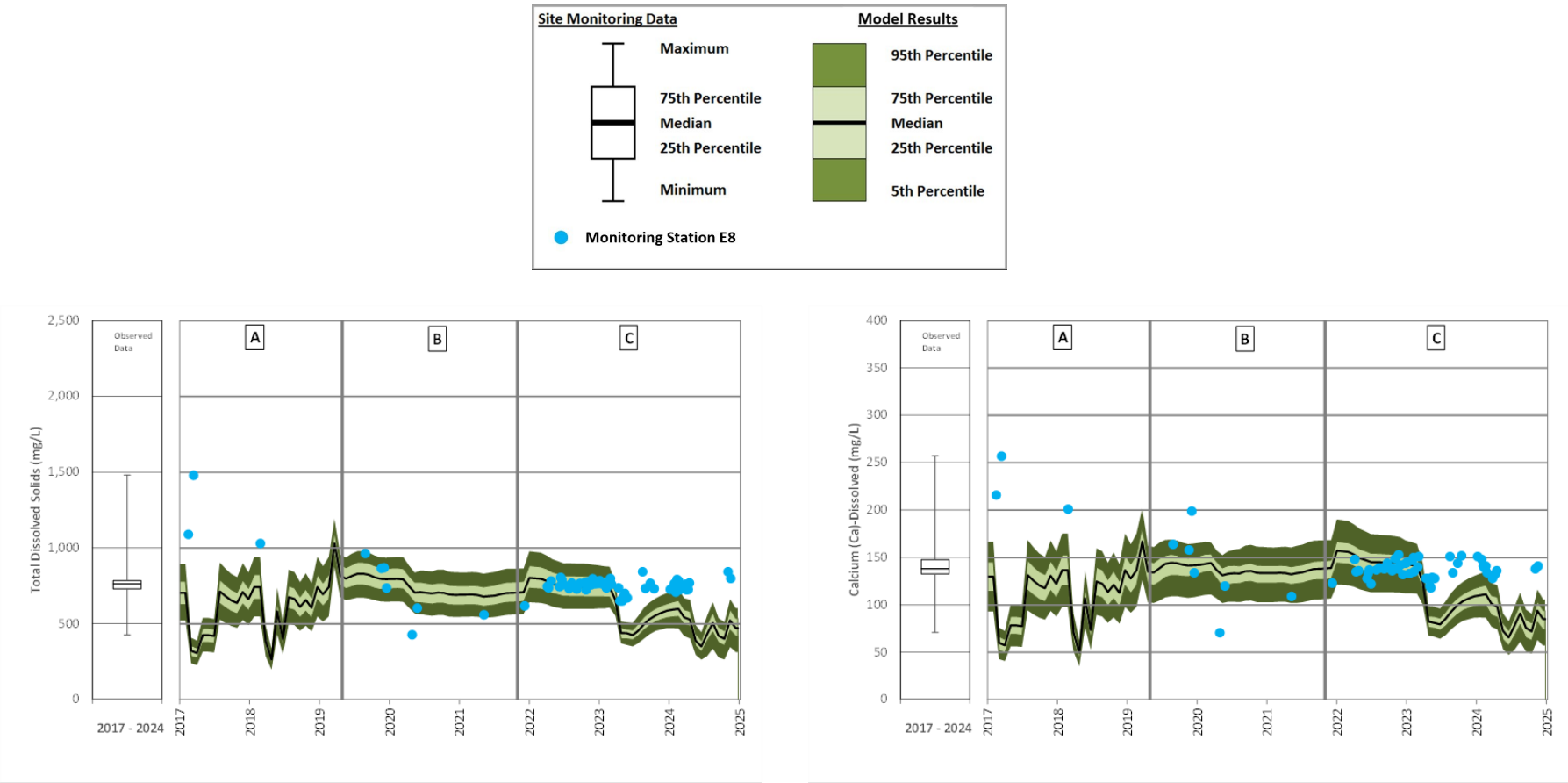
Figure A-19: Springer Pit Calibration – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-20: Springer Pit Calibration – Dissolved Zinc

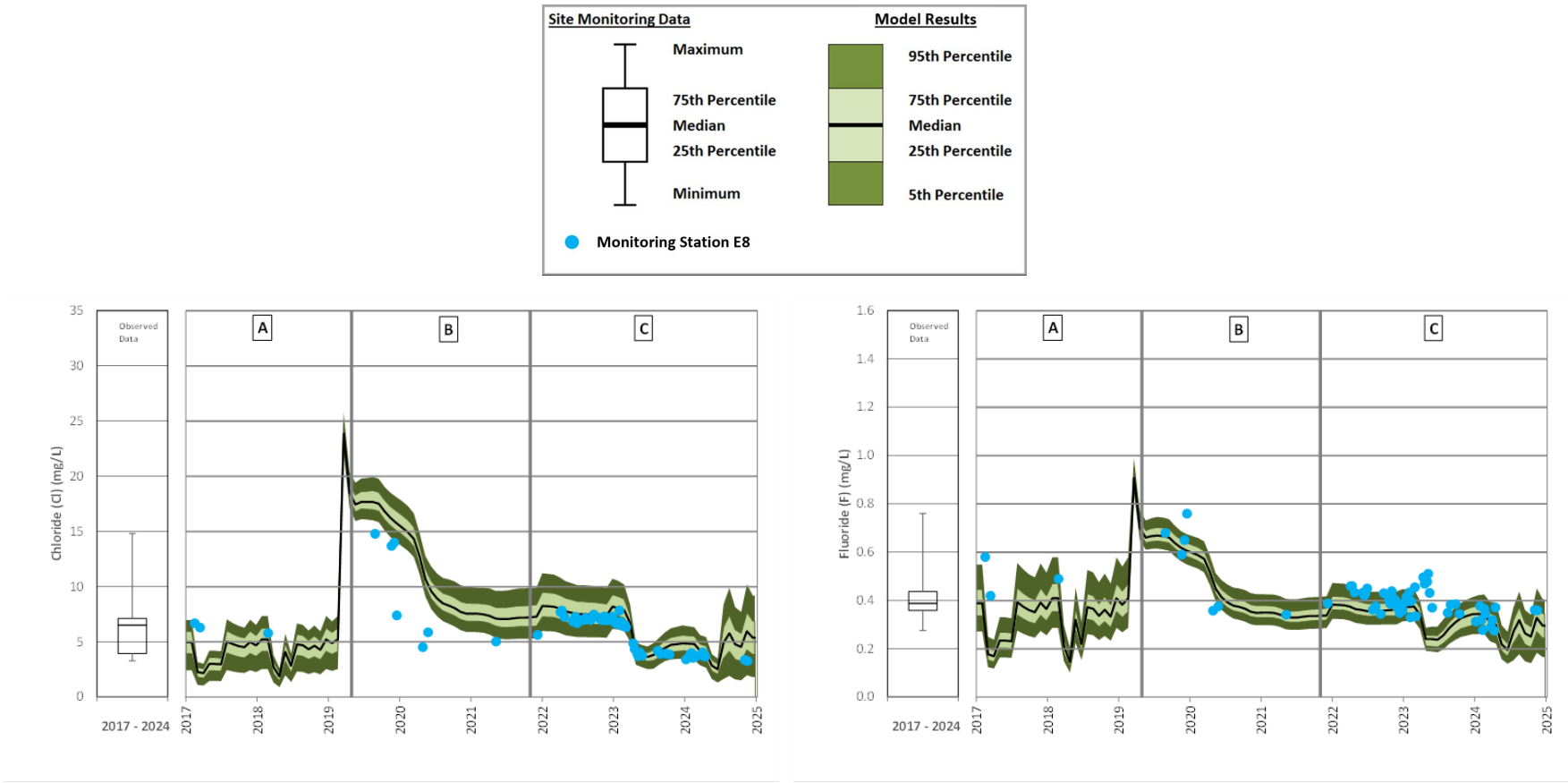
Cariboo Pit Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Total dissolved solids and calcium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

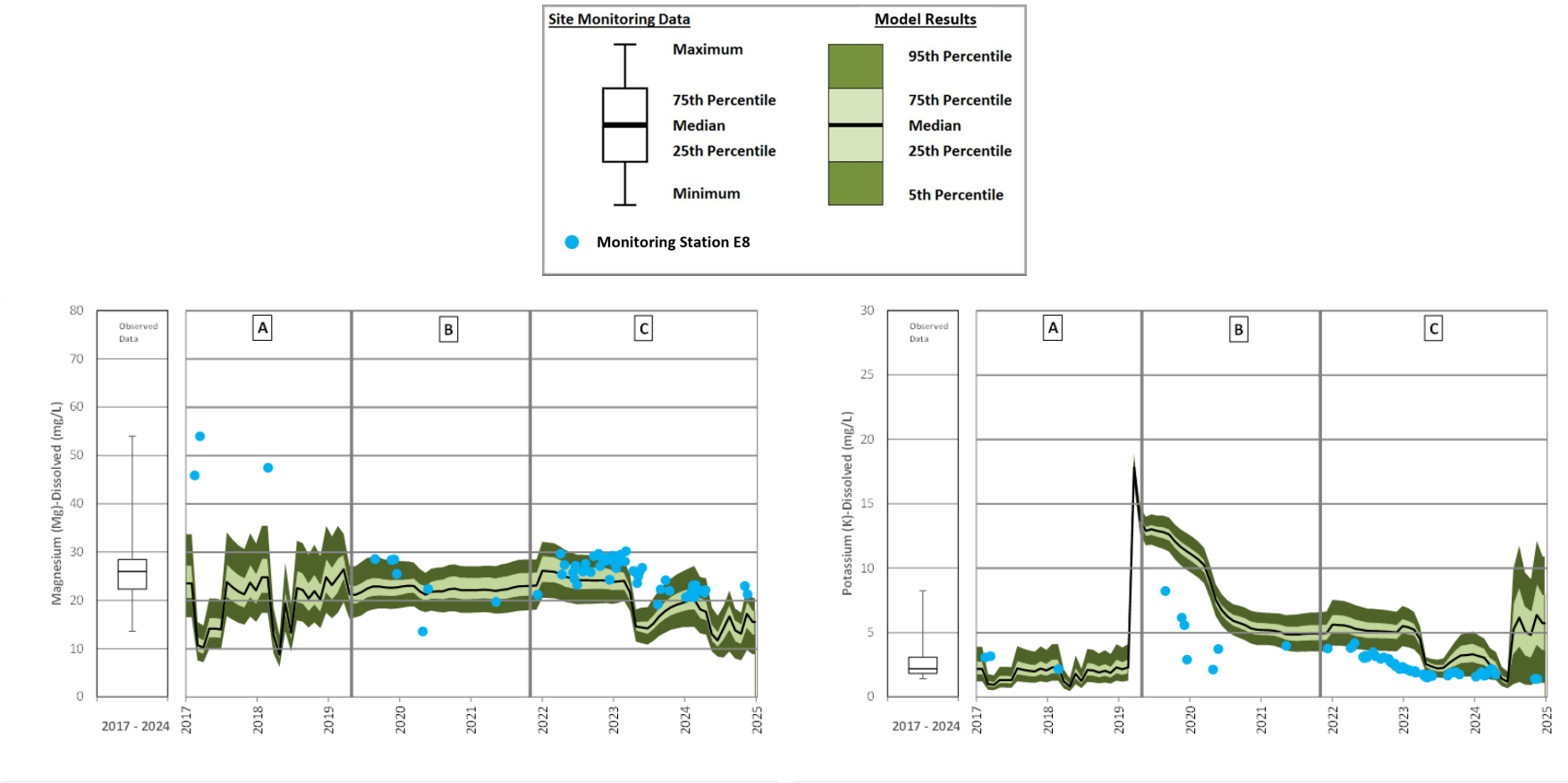
Figure A-21: Cariboo Pit Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Chloride and fluoride concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

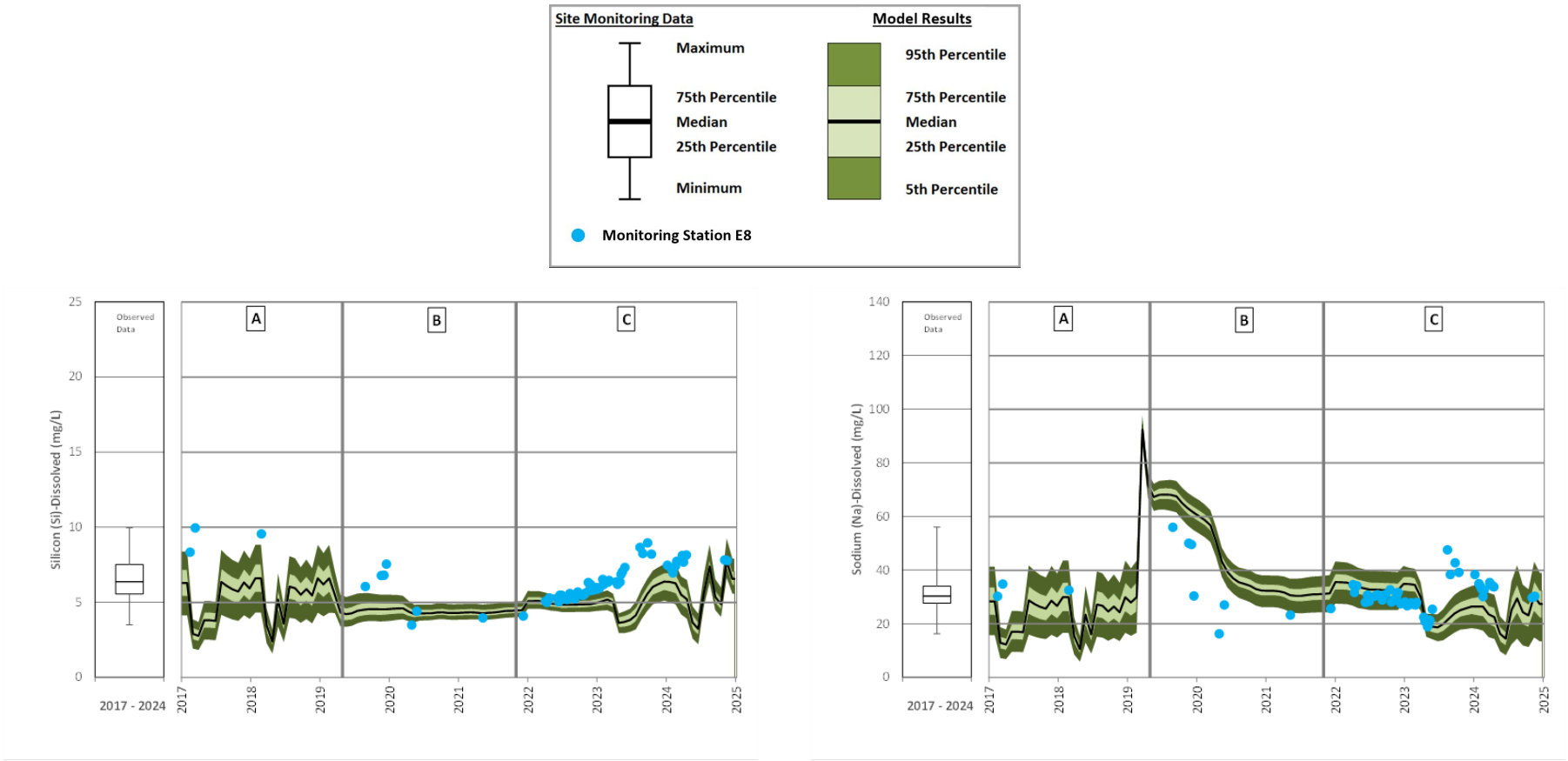
Figure A-22: Cariboo Pit Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Magnesium and potassium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit..

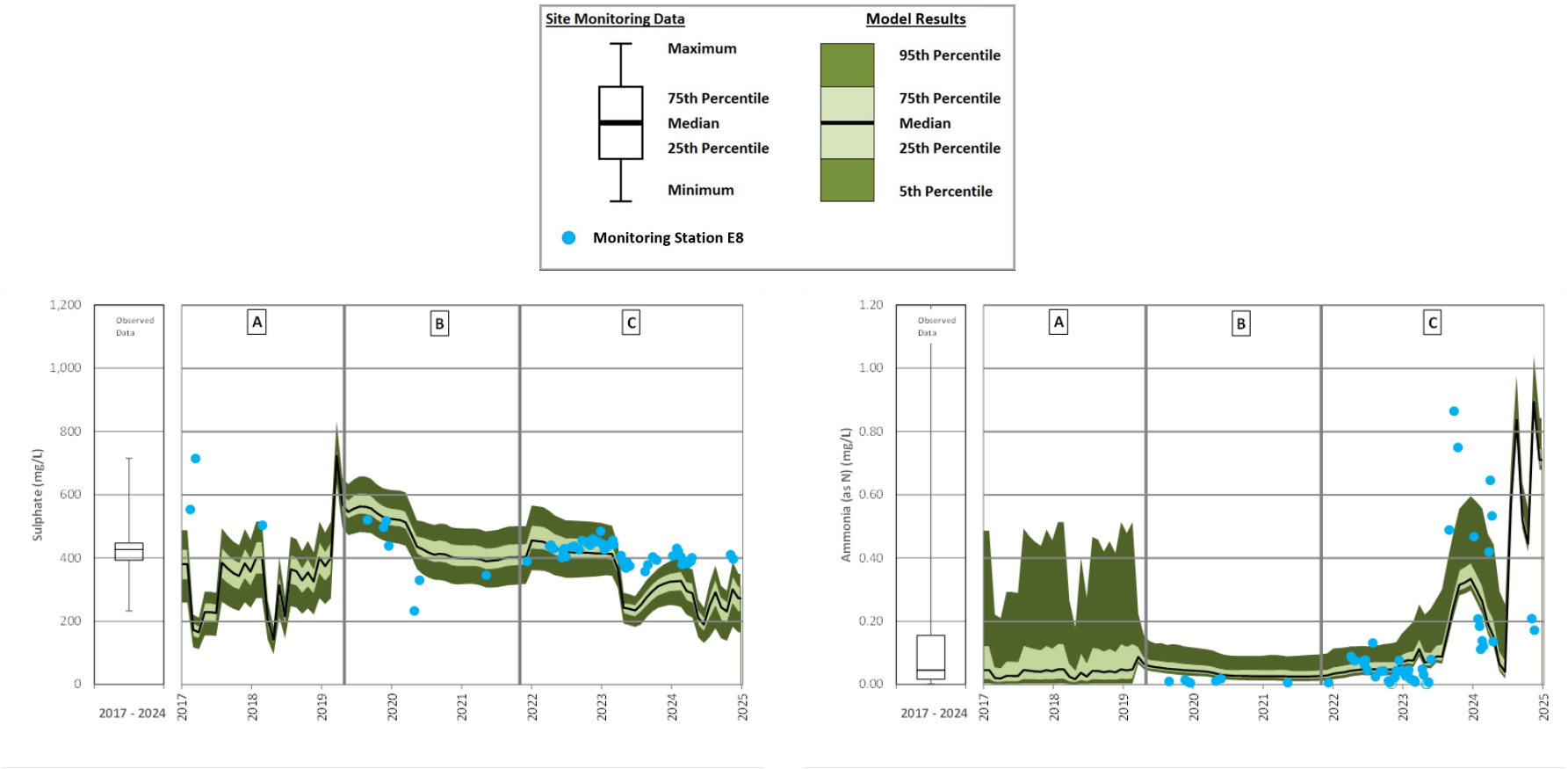
Figure A-23: Cariboo Pit Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Silicon and sodium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

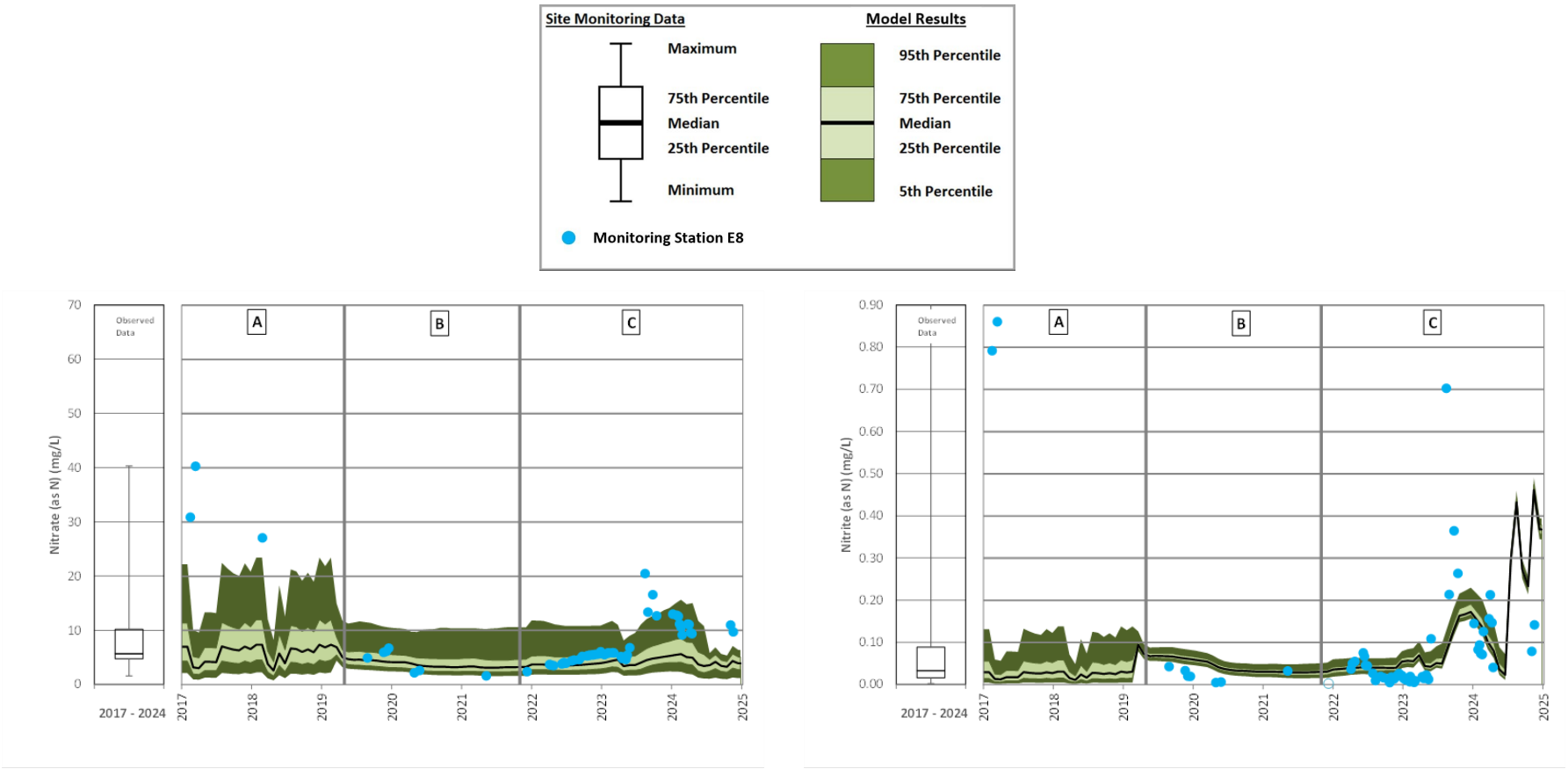
Figure A-24: Cariboo Pit Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Sulphate and total ammonia concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

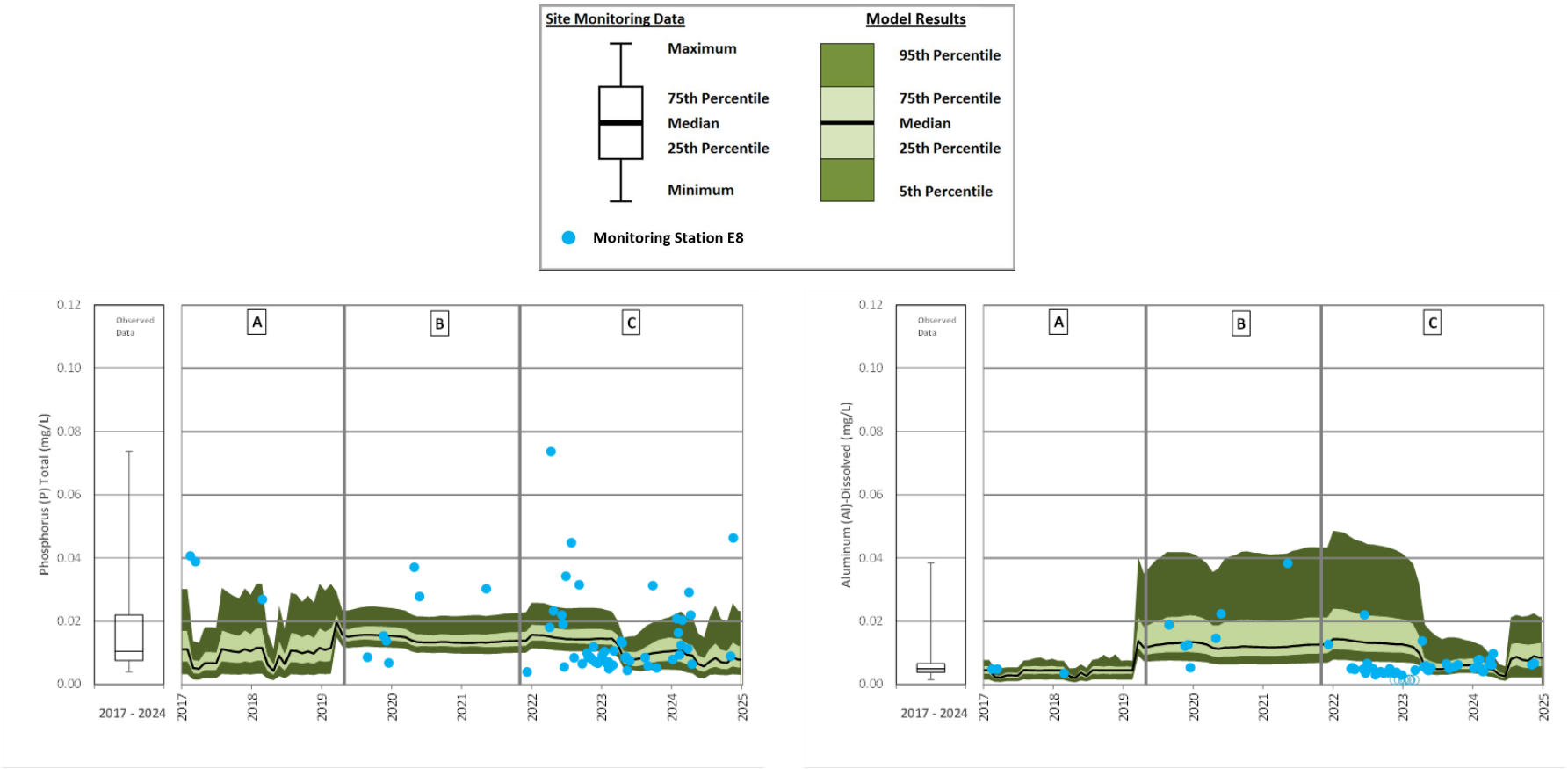
Figure A-25: Cariboo Pit Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Nitrate and nitrite concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

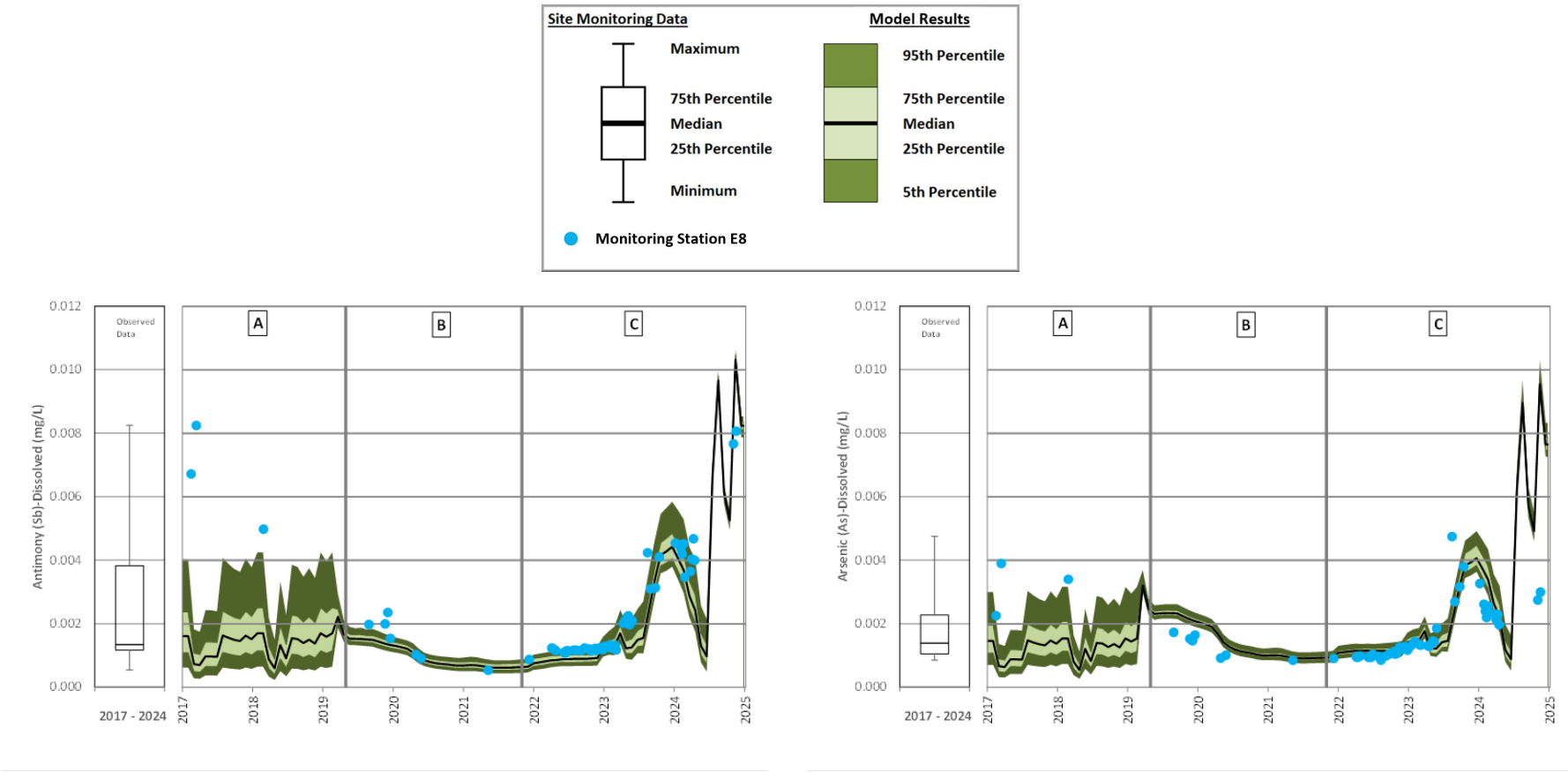
Figure A-26: Cariboo Pit Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Total phosphorus and dissolved aluminum concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

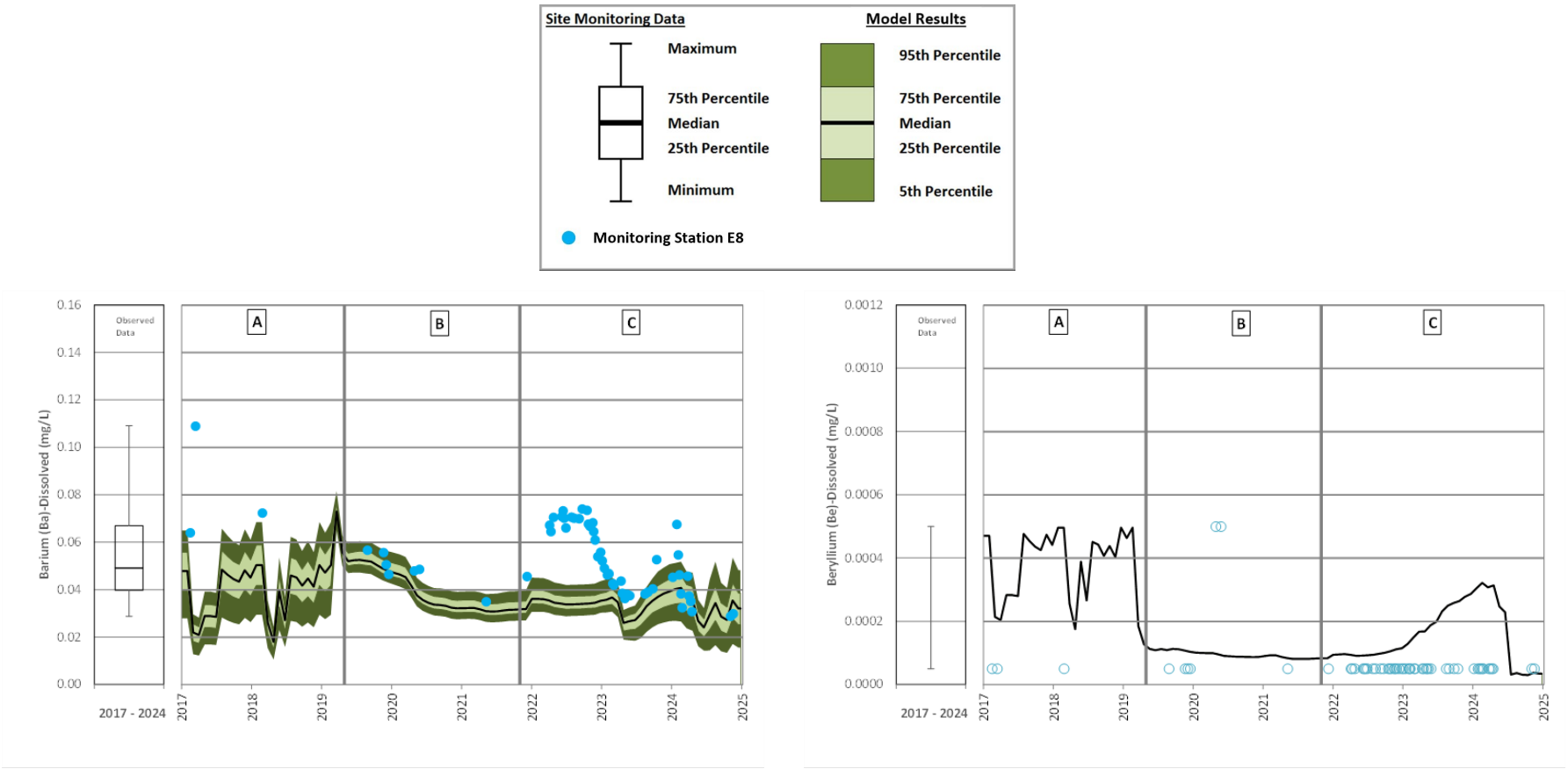
Figure A-27: Cariboo Pit Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

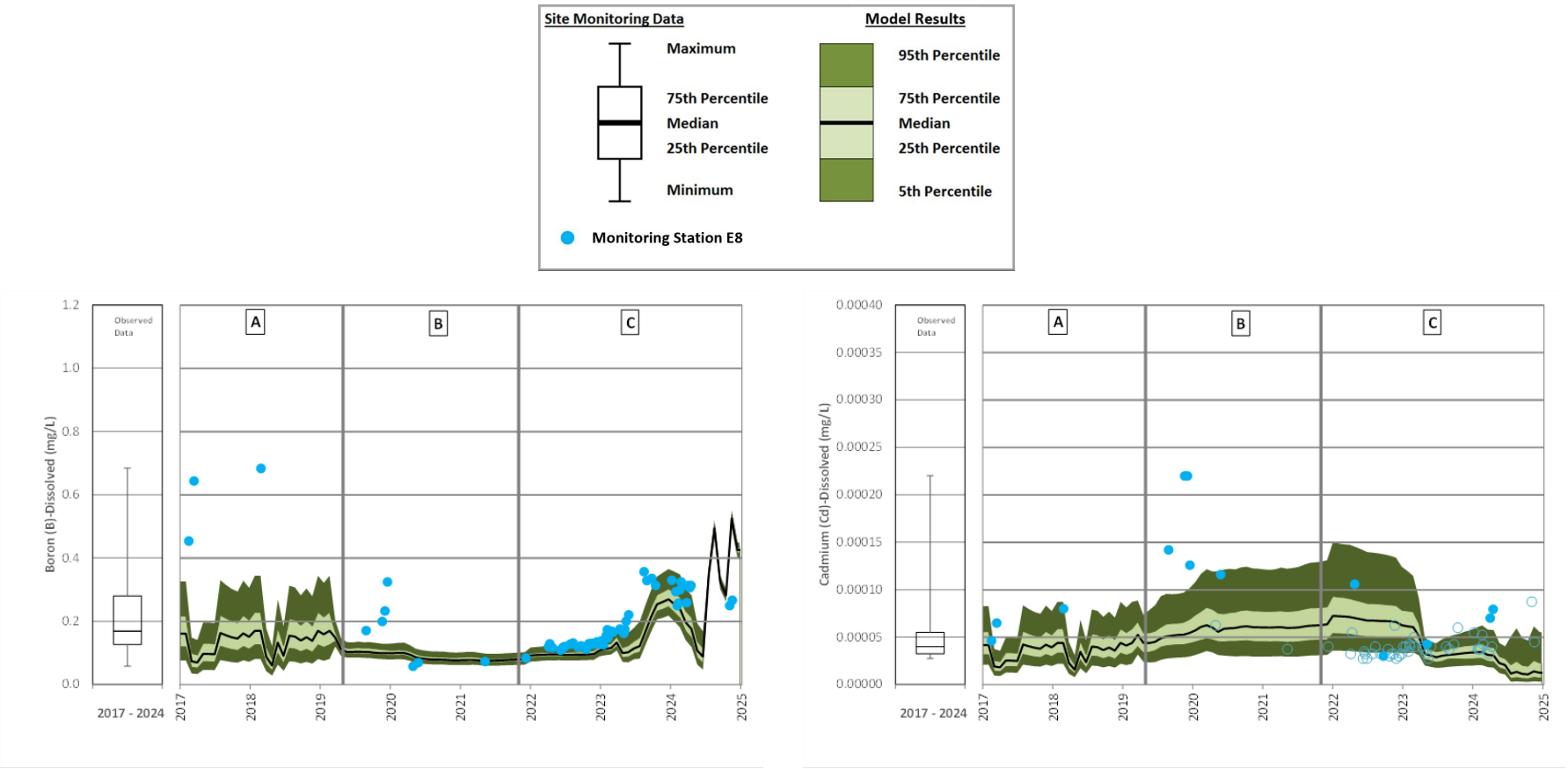
Figure A-28: Cariboo Pit Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved barium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

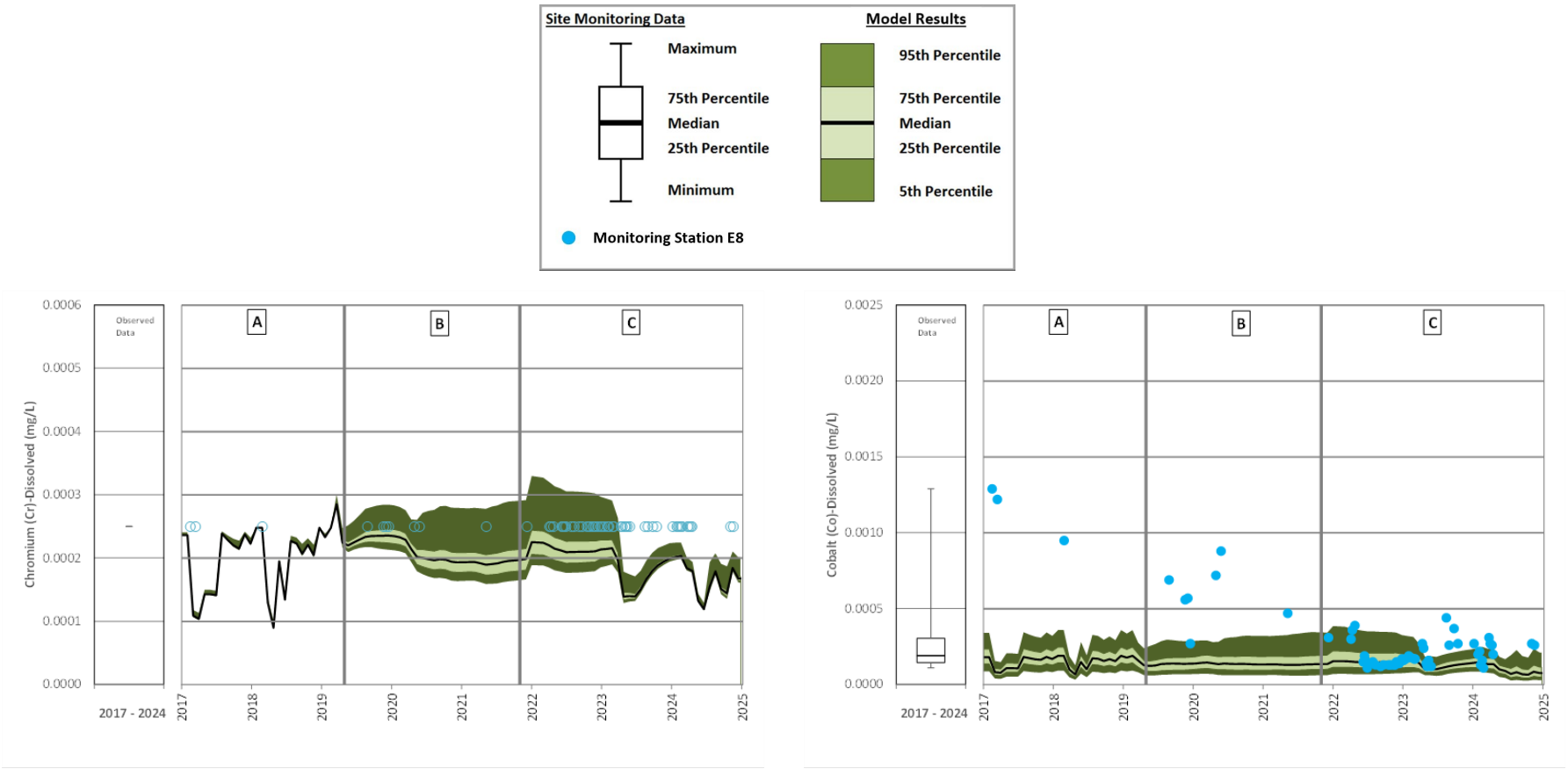
Figure A-29: Cariboo Pit Calibration – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved boron and dissolved cadmium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

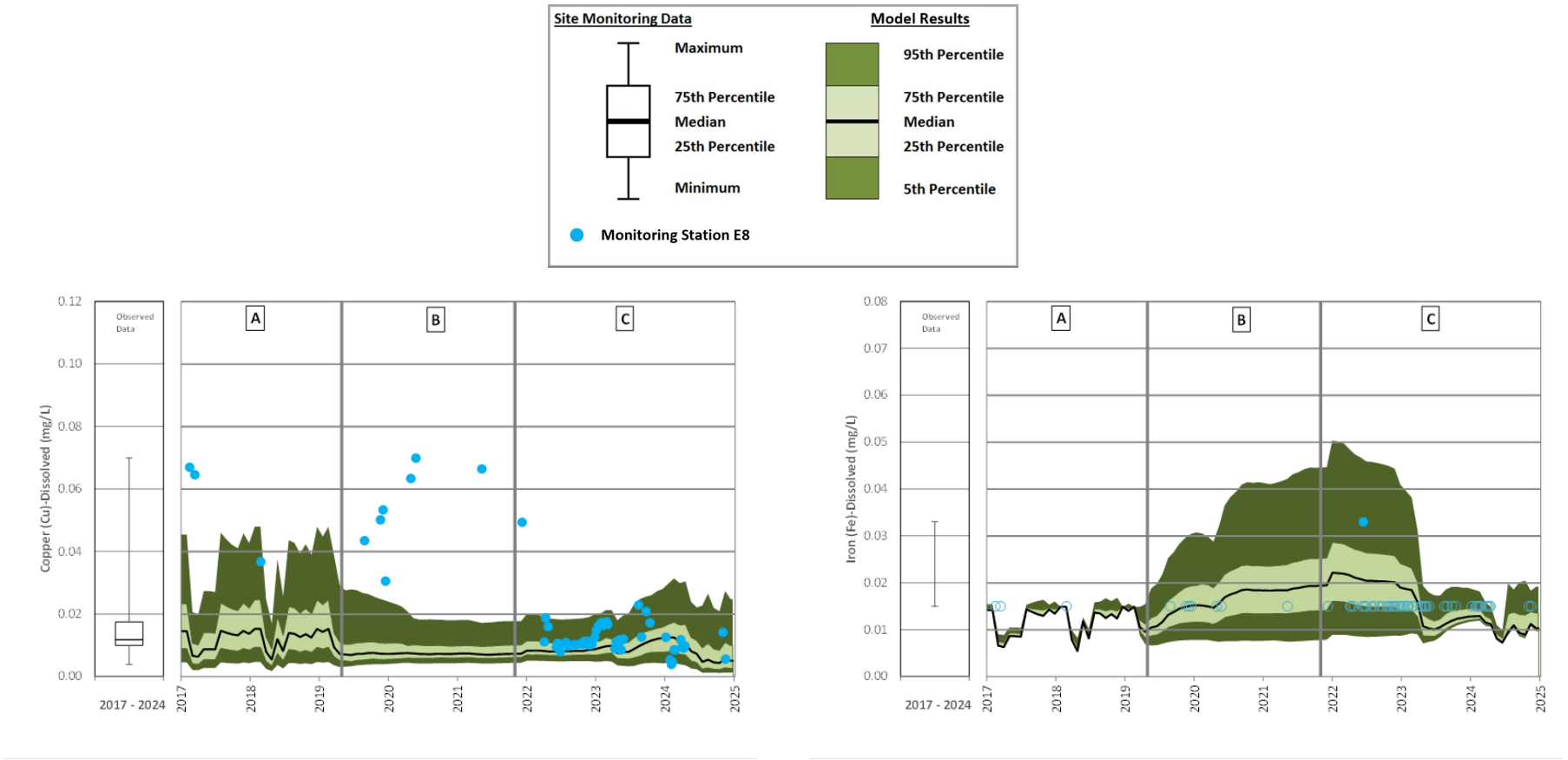
Figure A-30: Cariboo Pit Calibration – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved chromium and dissolved cobalt concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

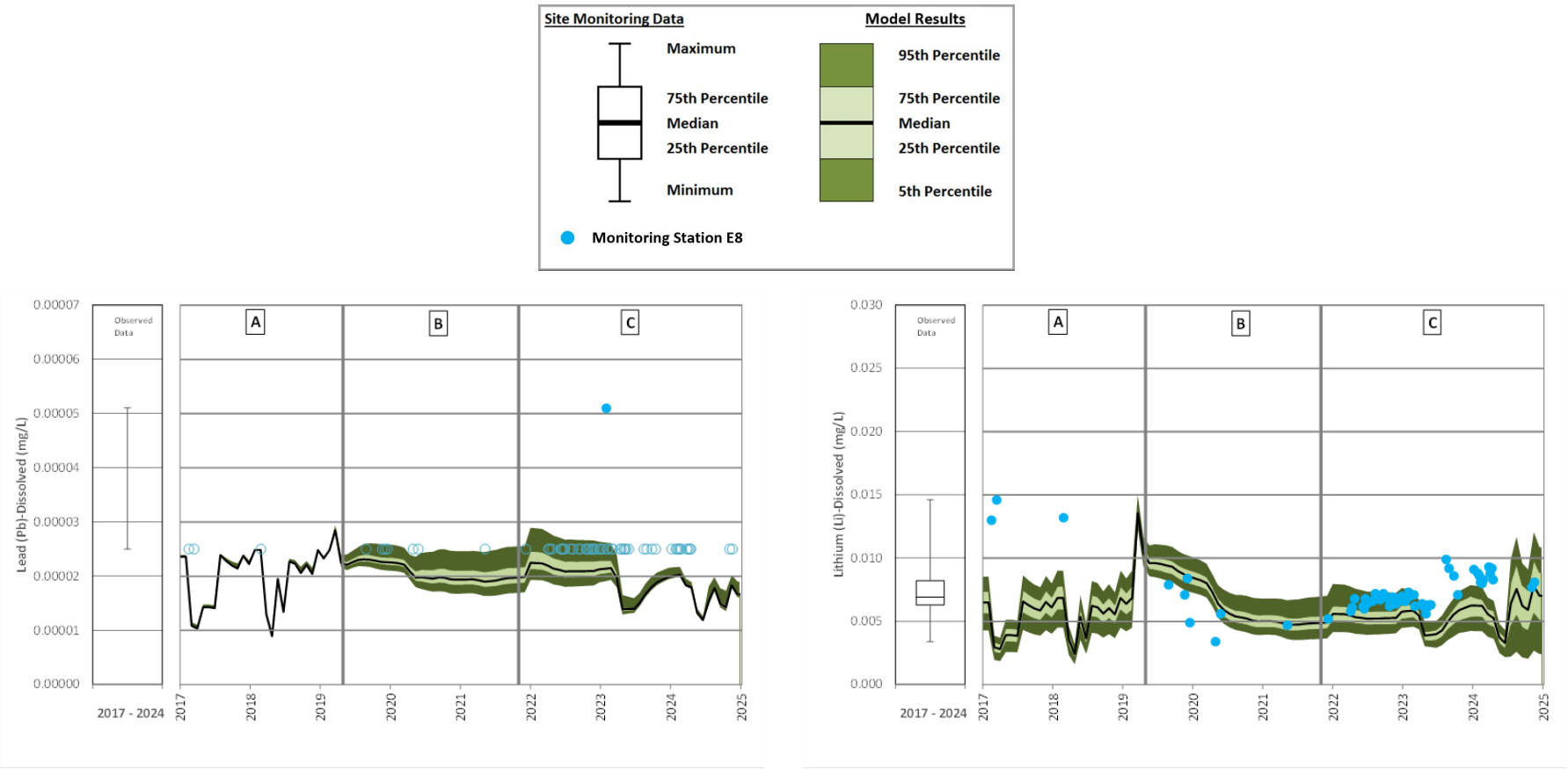
Figure A-31: Cariboo Pit Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved copper and dissolved iron concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

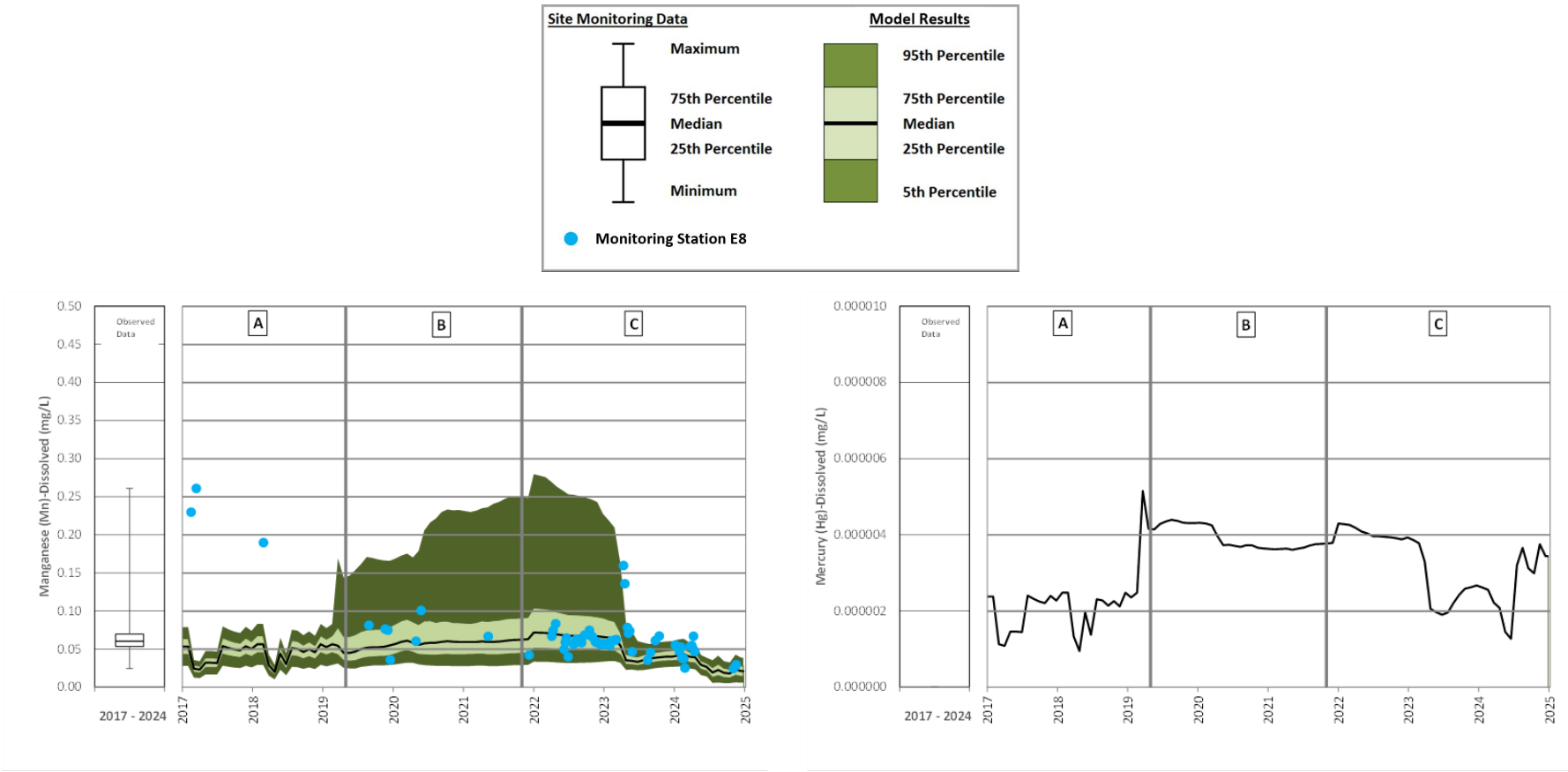
Figure A-32: Cariboo Pit Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved lead and dissolved lithium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

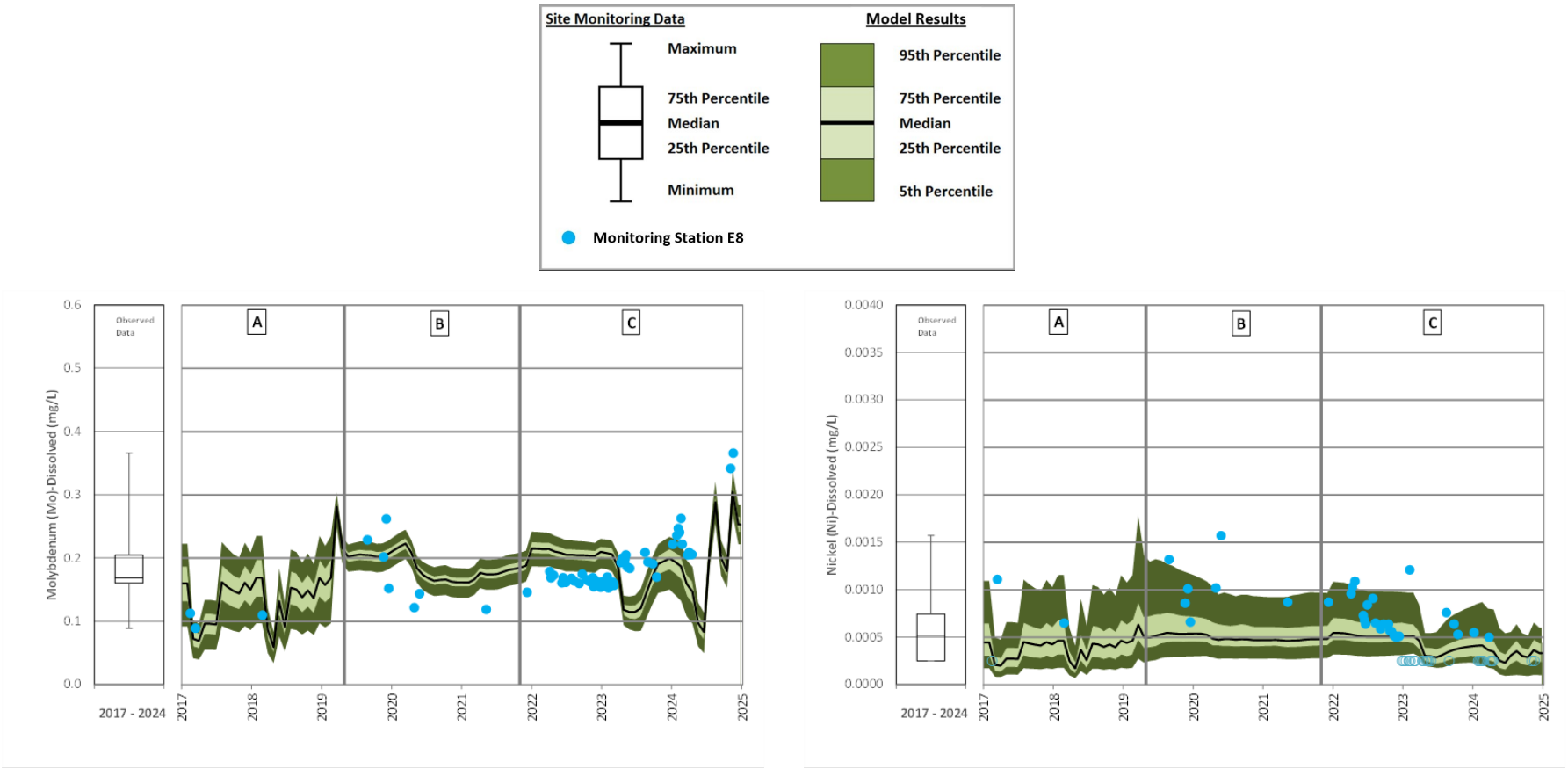
Figure A-33: Cariboo Pit Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved manganese concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

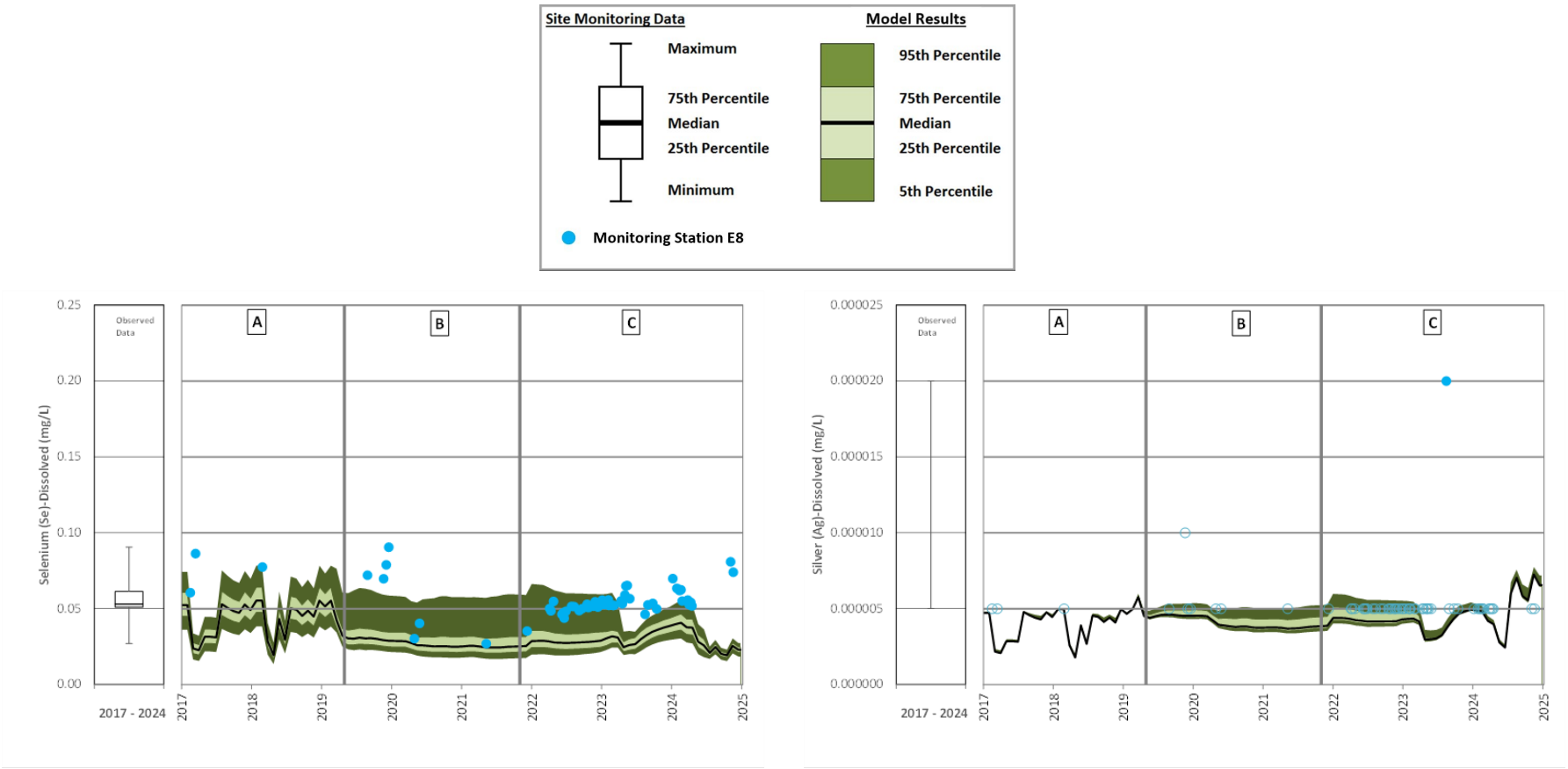
Figure A-34: Cariboo Pit Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved molybdenum and dissolved nickel concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

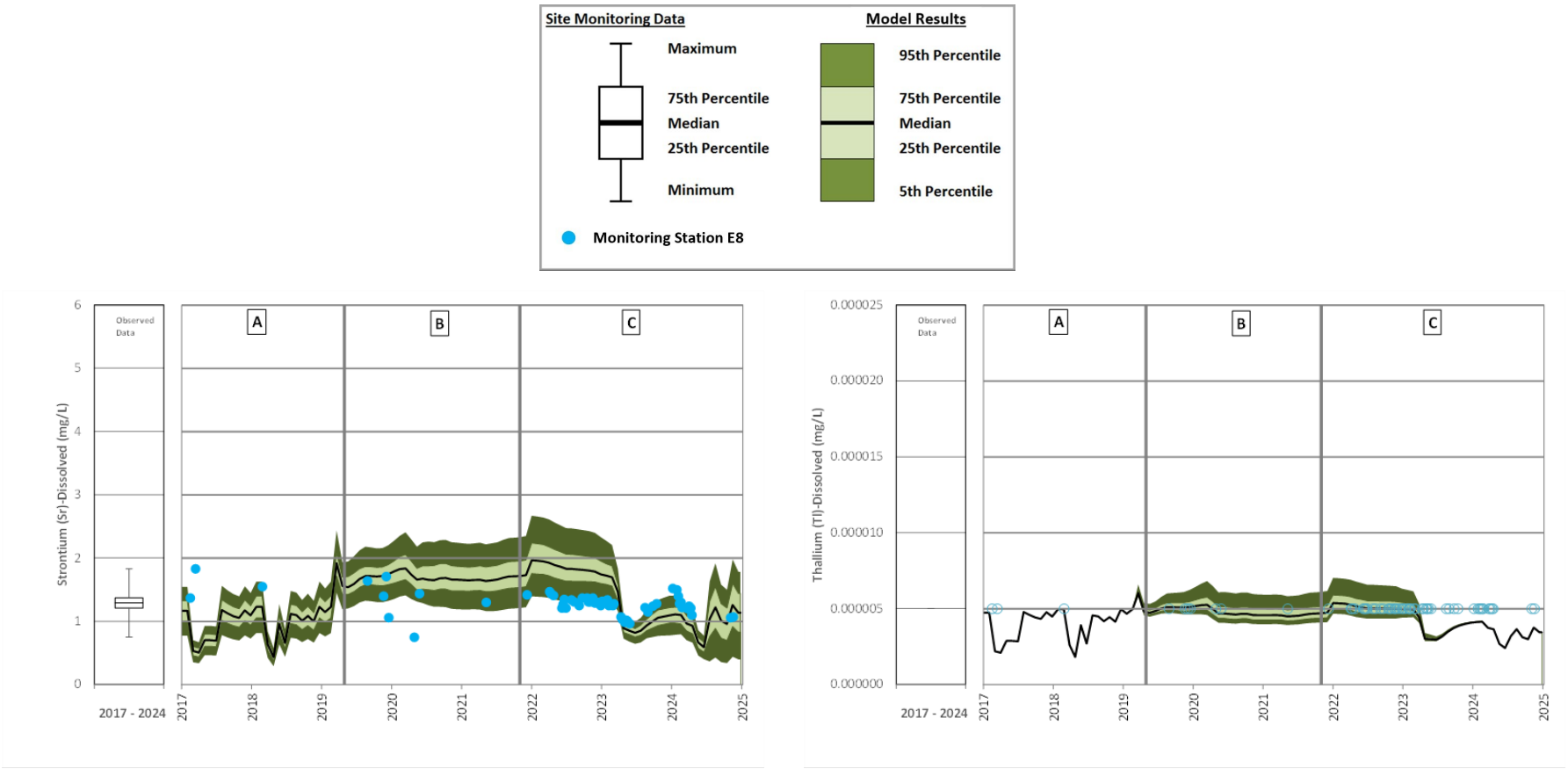
Figure A-35: Cariboo Pit Calibration – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved selenium and dissolved silver concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

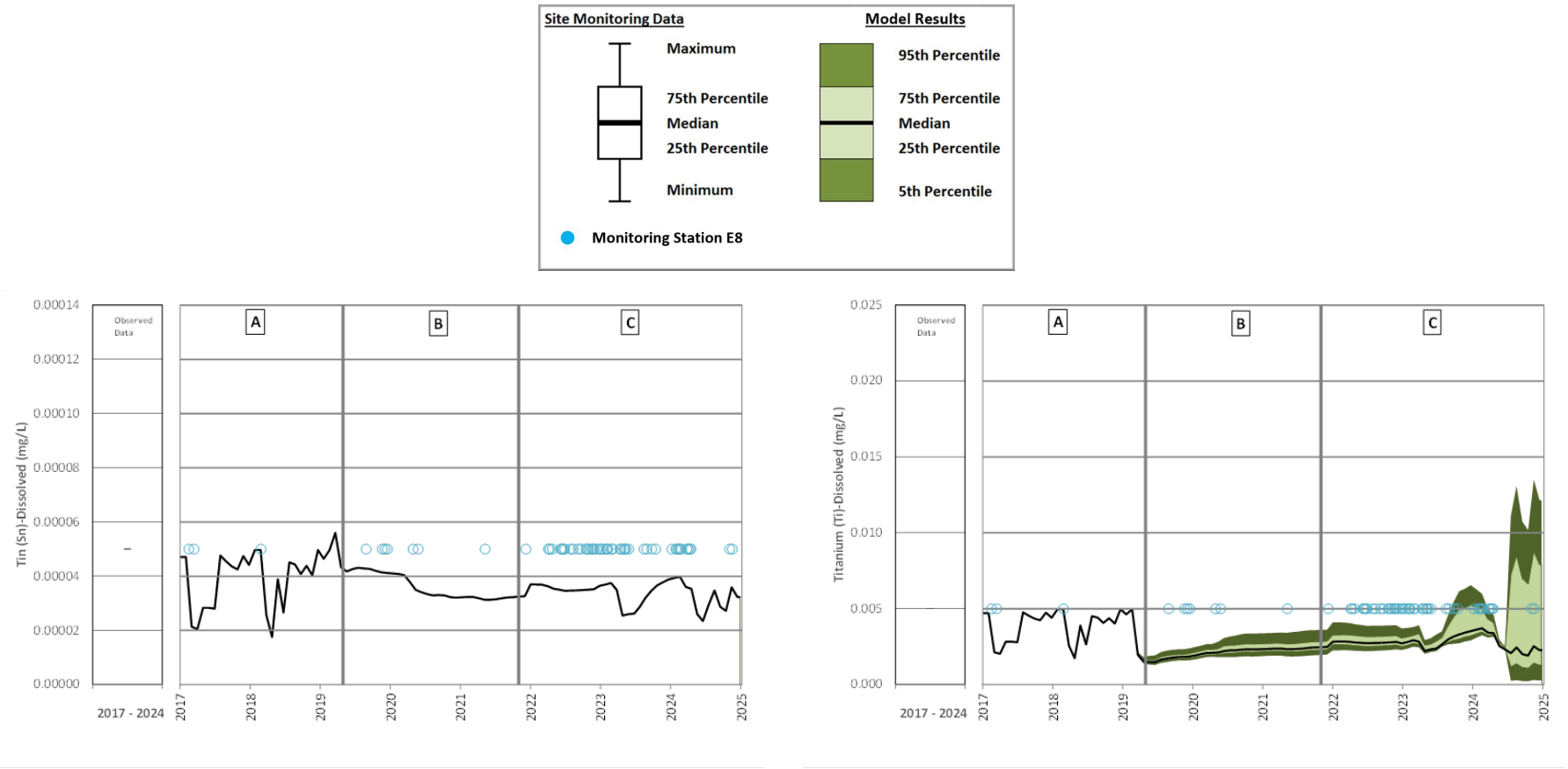
Figure A-36: Cariboo Pit Calibration – Dissolved Selenium and Dissolved Silver



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved strontium and dissolved thallium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

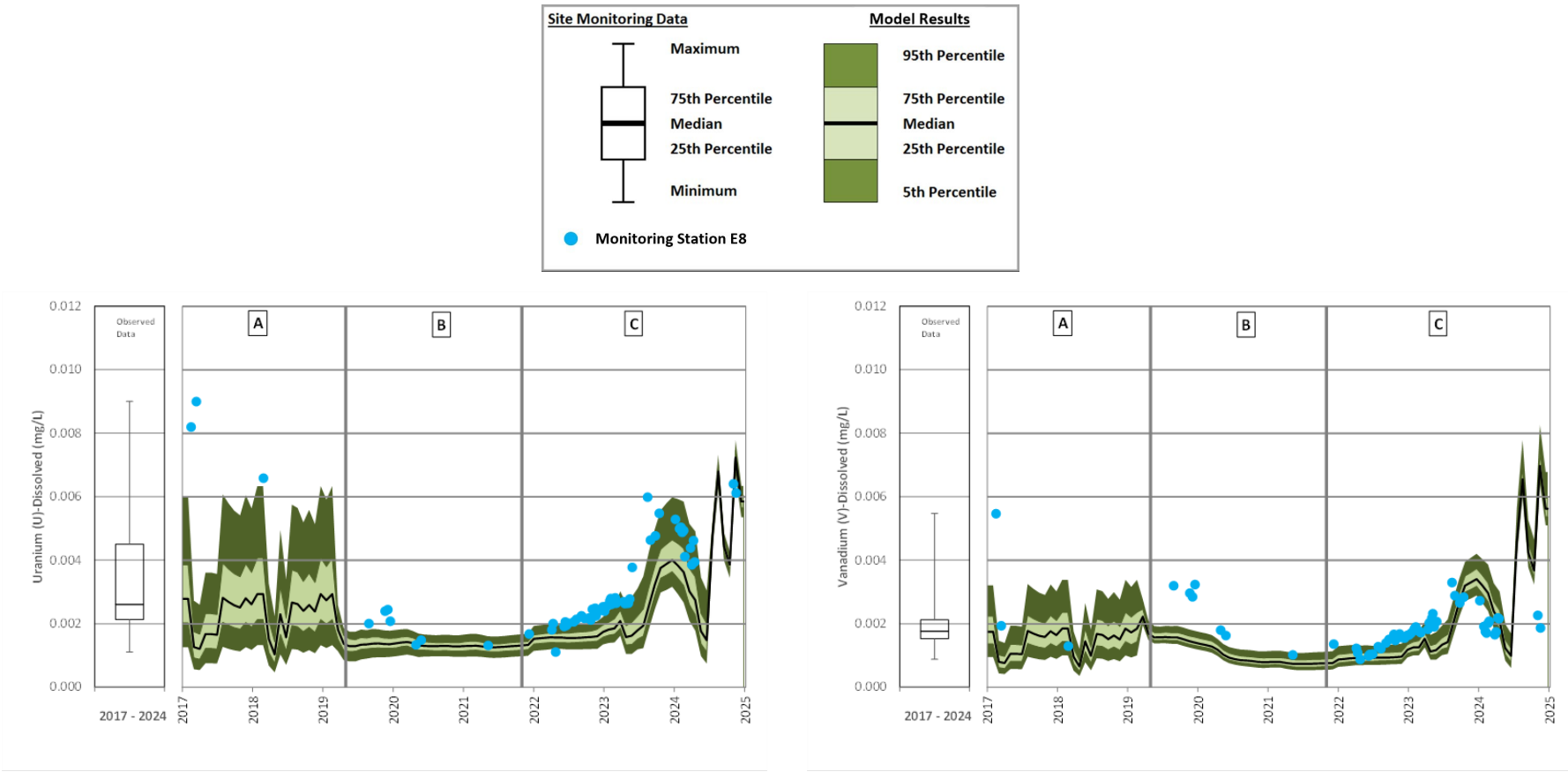
Figure A-37: Cariboo Pit Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved titanium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

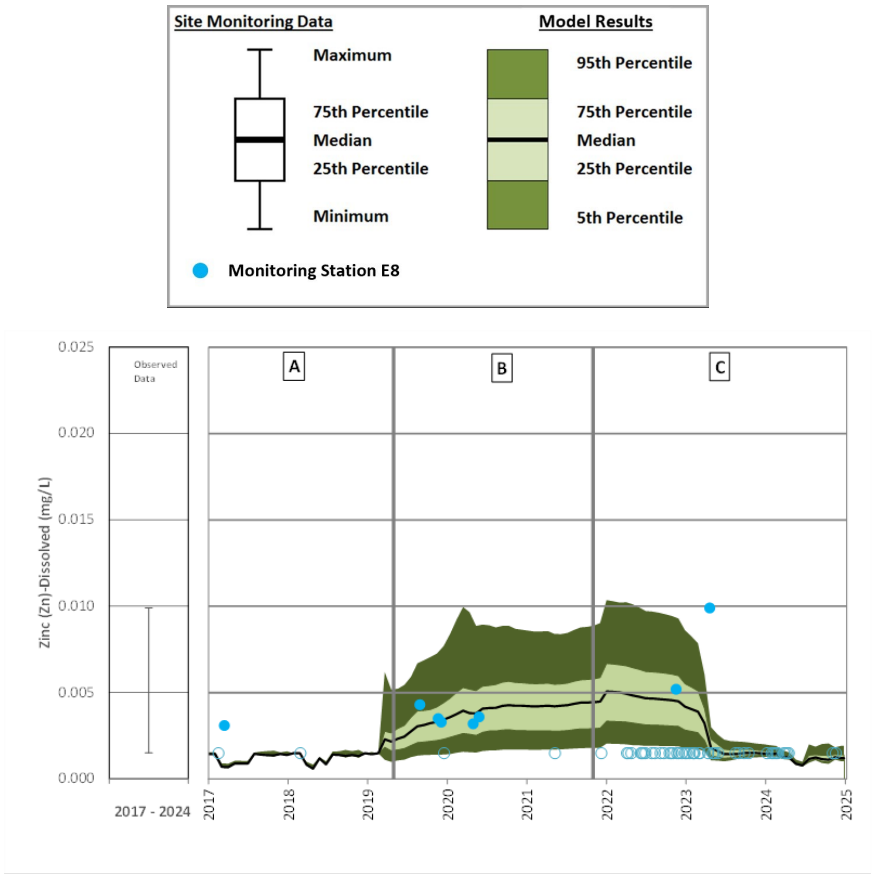
Figure A-38: Cariboo Pit Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved uranium and dissolved vanadium concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

Figure A-39: Cariboo Pit Calibration – Dissolved Uranium and Dissolved Vanadium

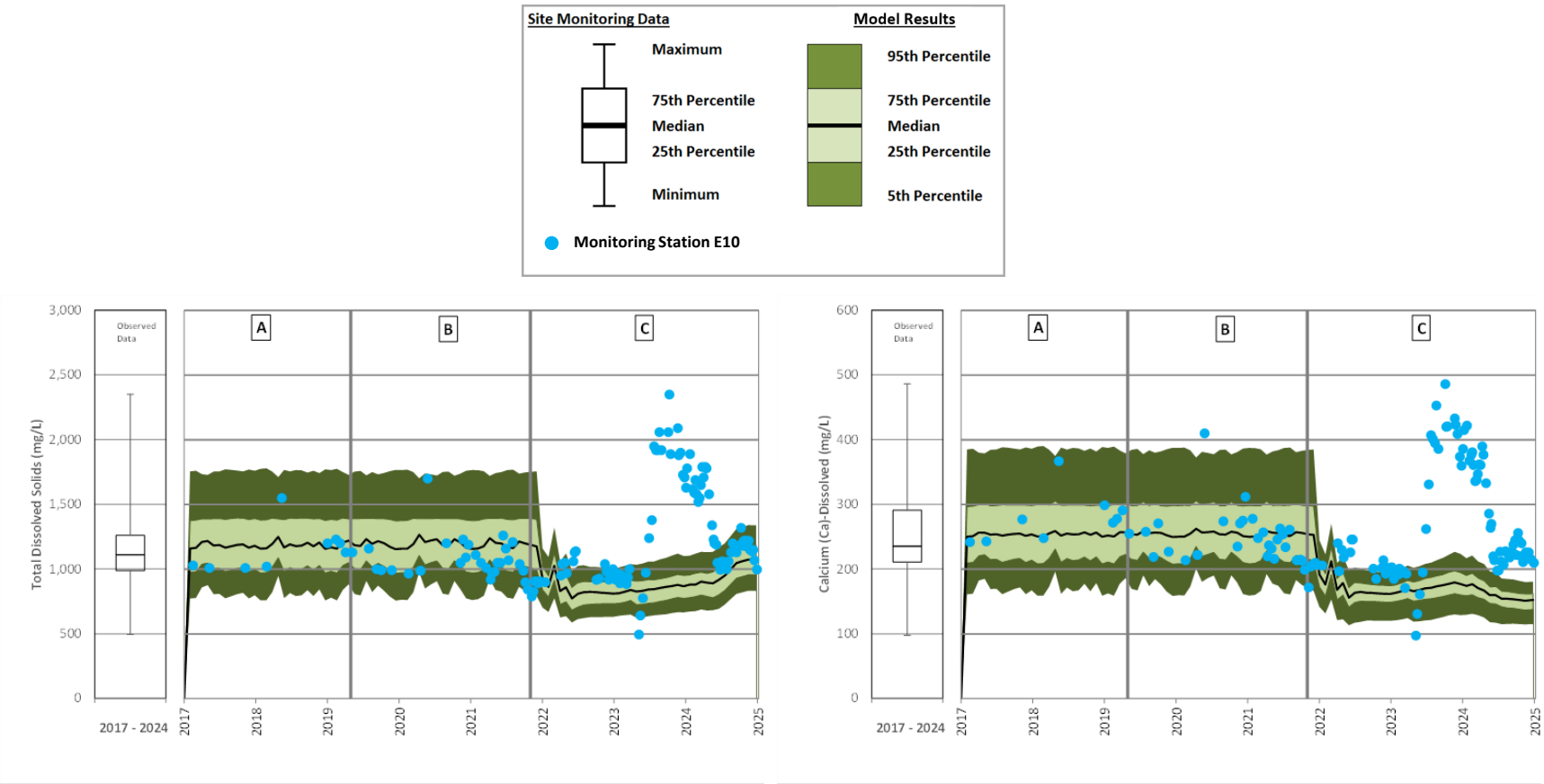


A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Cariboo Pit is a flow-through system until March 2019 when the Tailings Storage Facility (TSF) is pumped to Cariboo Pit. Dissolved zinc concentrations increase in 2022 because of pumping from Springer Pit to Cariboo Pit.

Figure A-40: Cariboo Pit Calibration – Dissolved Zinc

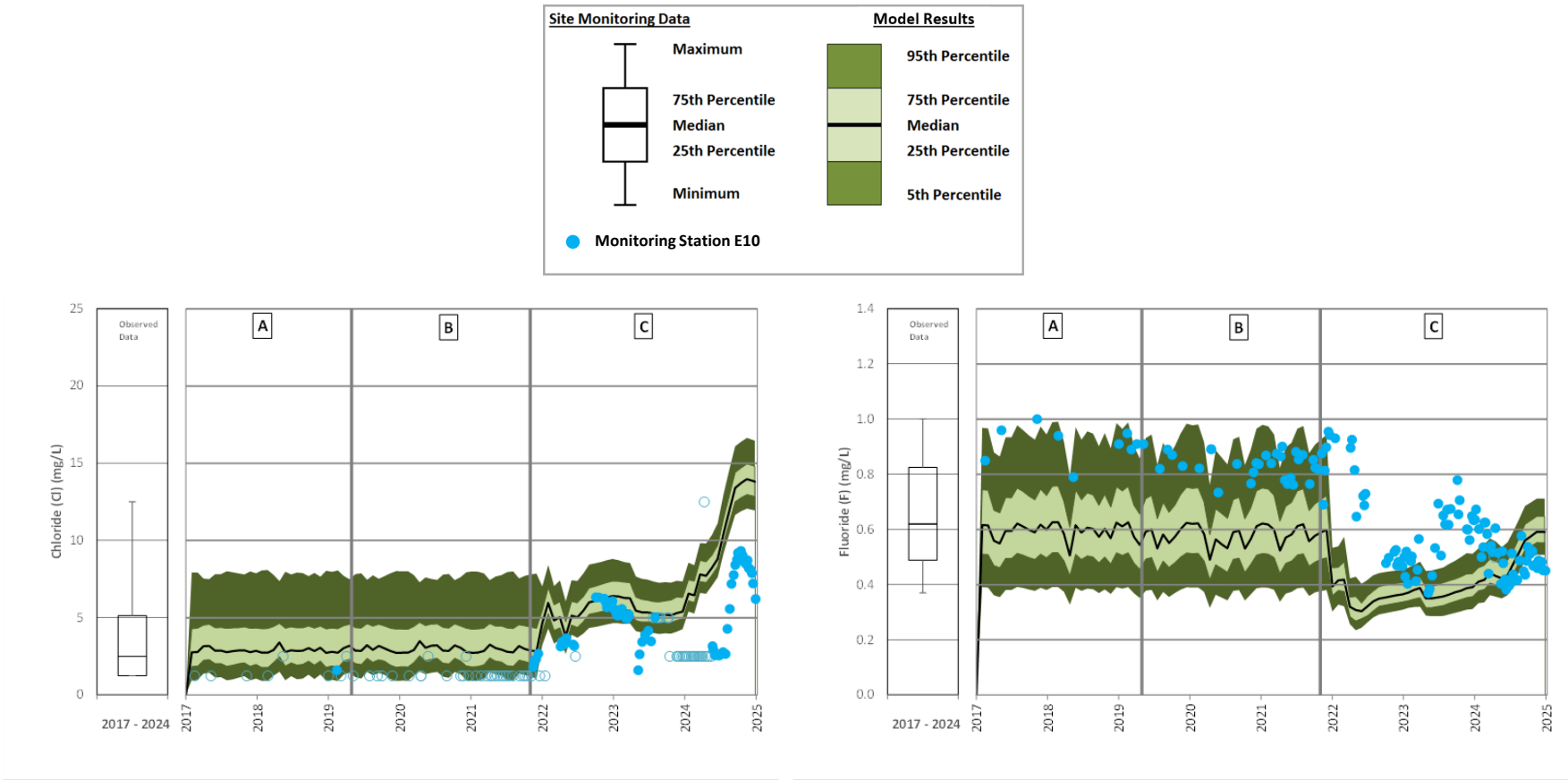
Wight Pit Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Total dissolved solids and calcium decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Total dissolved solids and calcium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for total dissolved solids and calcium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

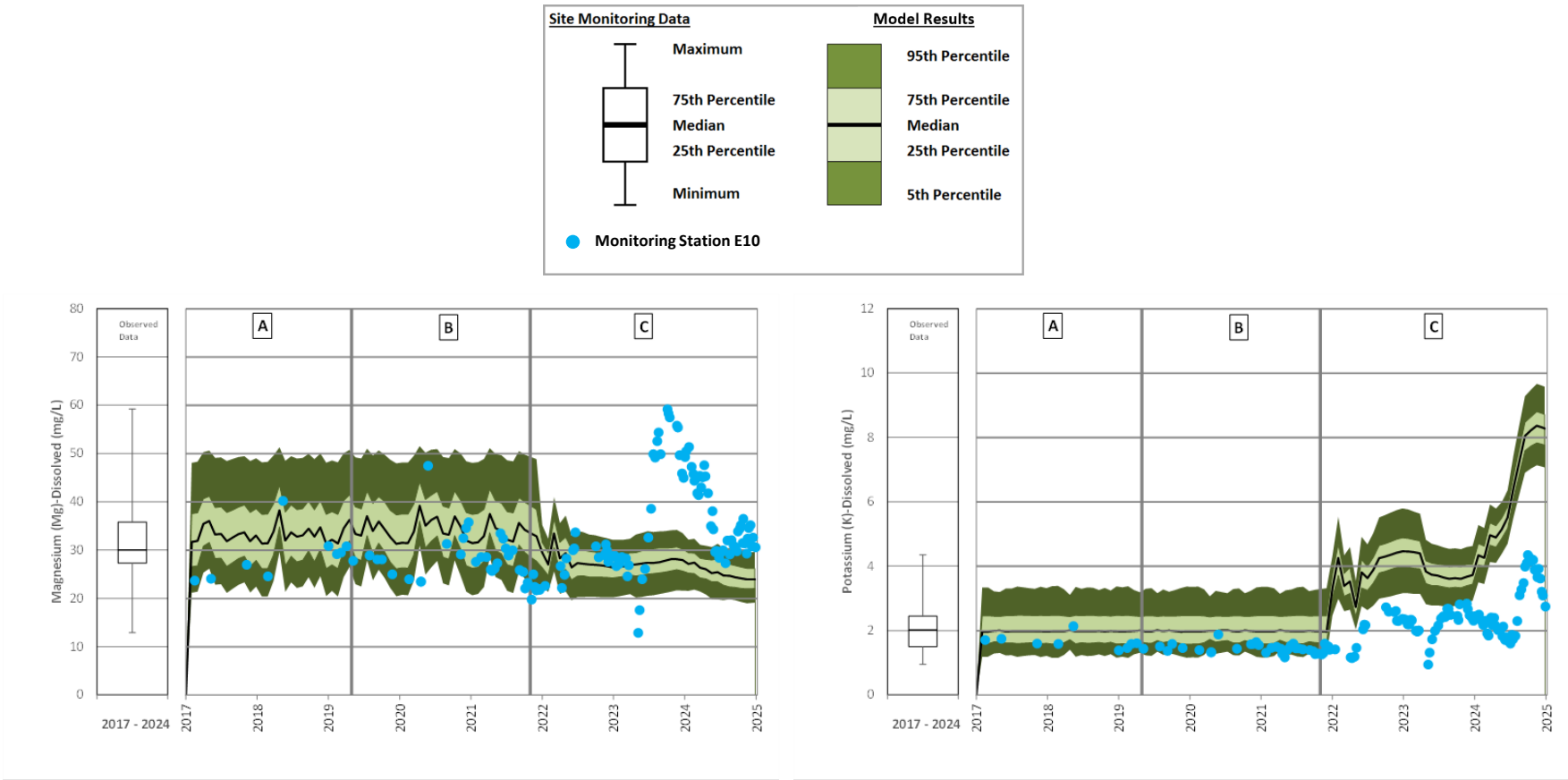
Figure A-41: Wight Pit Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Chloride concentrations increase in Wight Pit and fluoride concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Fluoride concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for fluoride is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

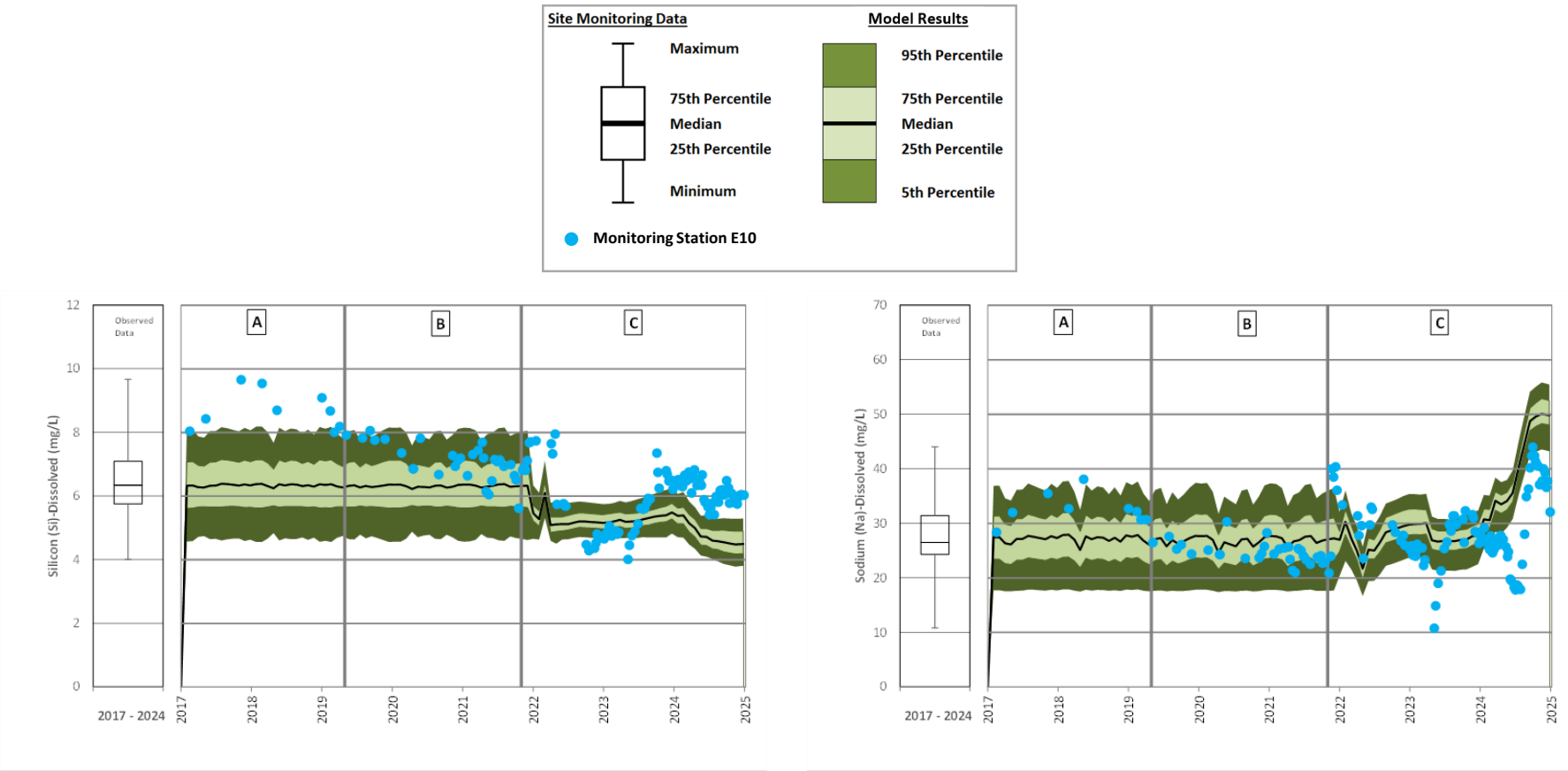
Figure A-42: Wight Pit Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Potassium concentrations increase in Wight Pit decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved magnesium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit.The source of the increased concentrations in the monitoring data for magnesium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

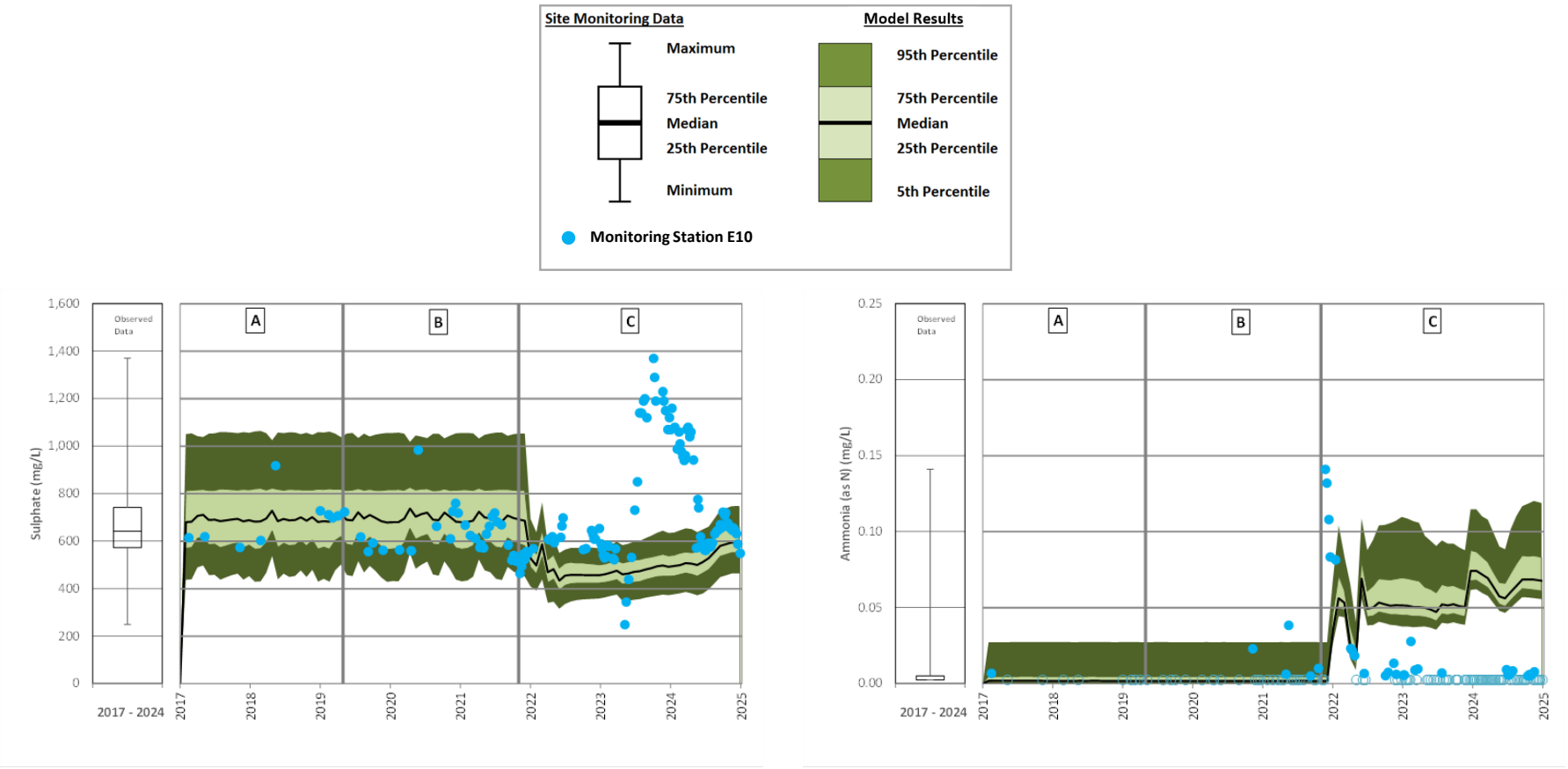
Figure A-43: Wight Pit Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Silicon concentrations decrease in Wight Pit and sodium concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

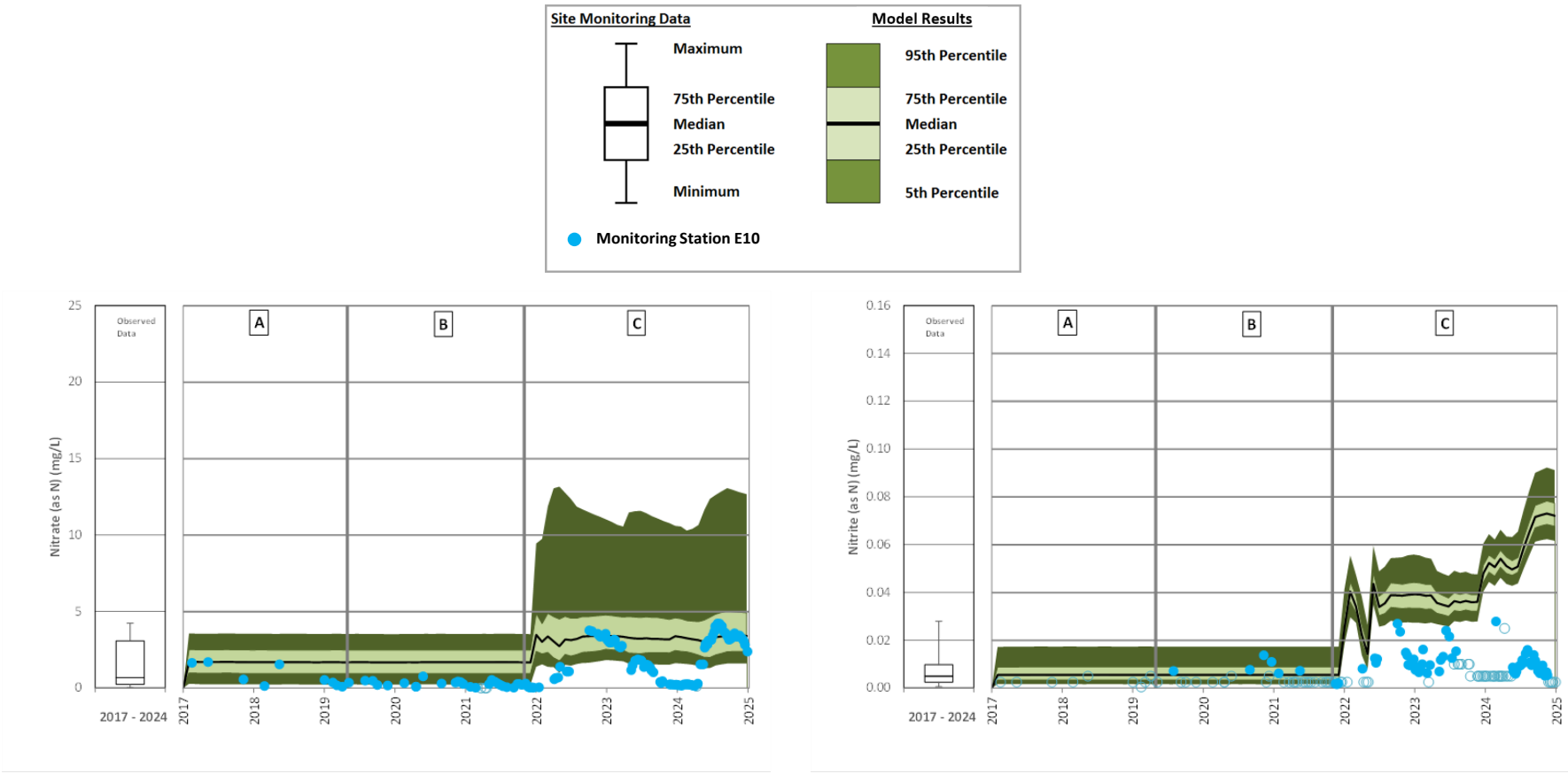
Figure A-44: Wight Pit Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Sulphate concentrations decrease in Wight Pit and total ammonia concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Sulphate concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for sulphate is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

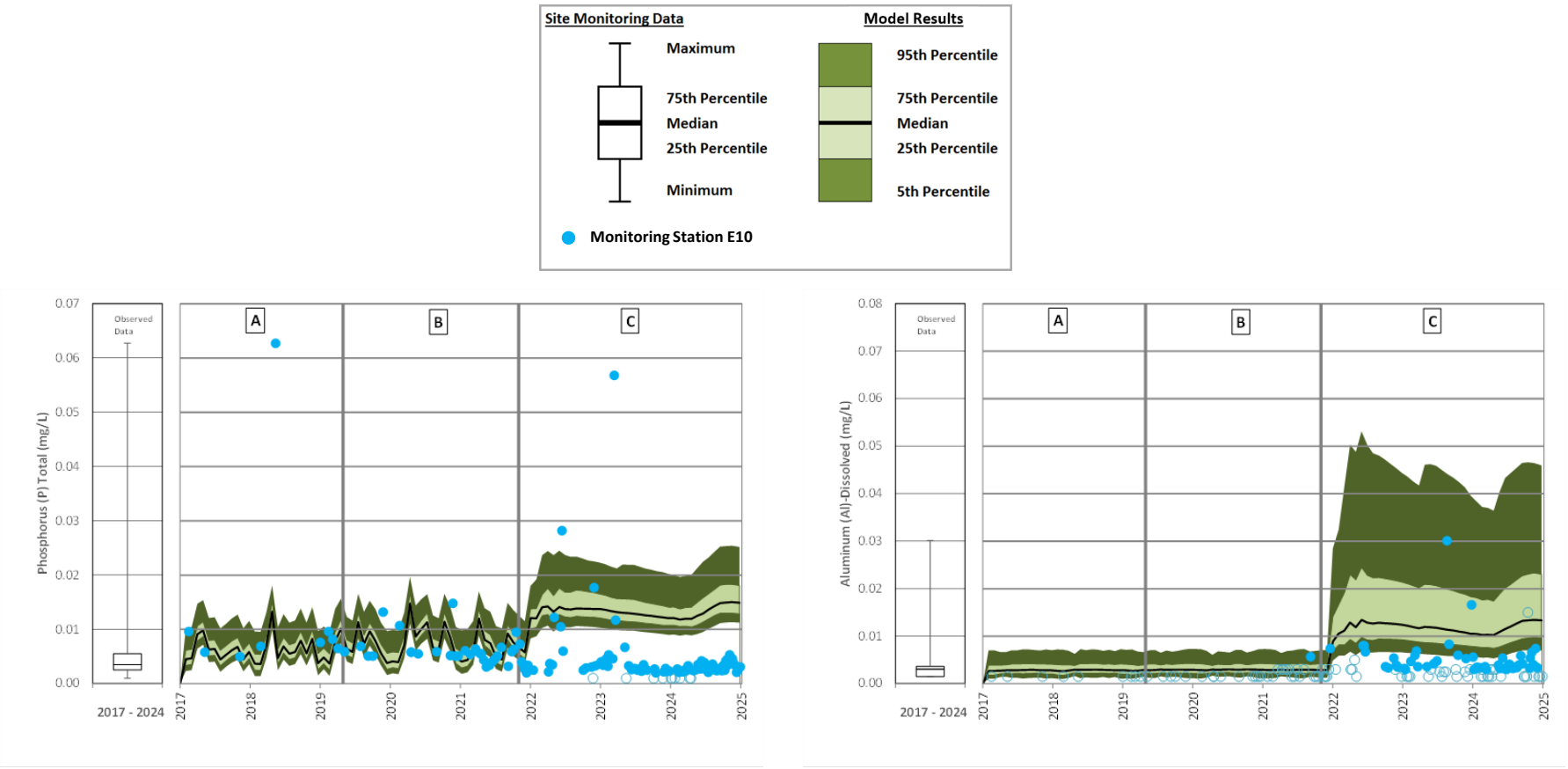
Figure A-45: Wight Pit Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Nitrate and nitrite concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

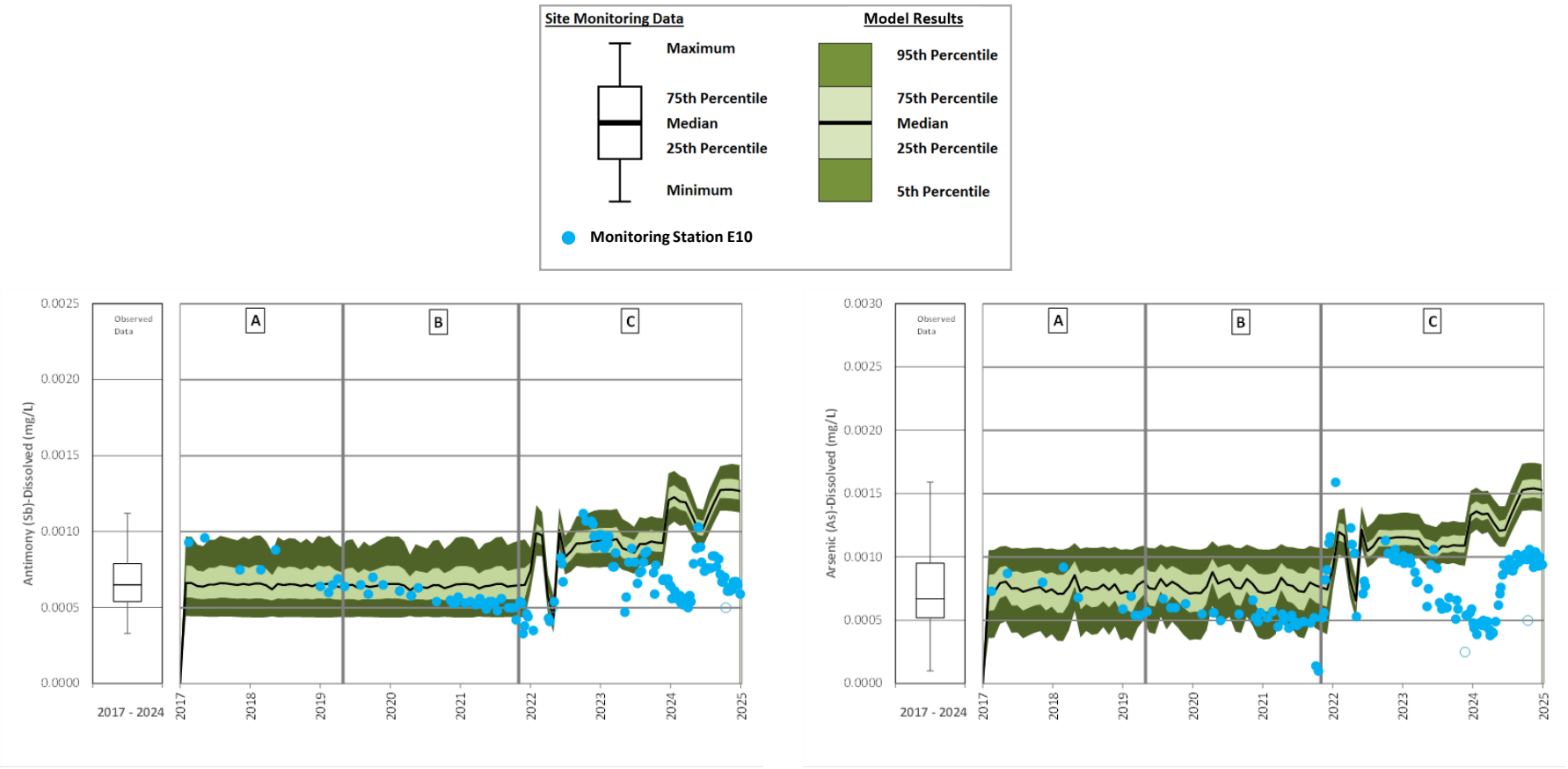
Figure A-46: Wight Pit Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Total phosphorus and dissolved aluminum concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

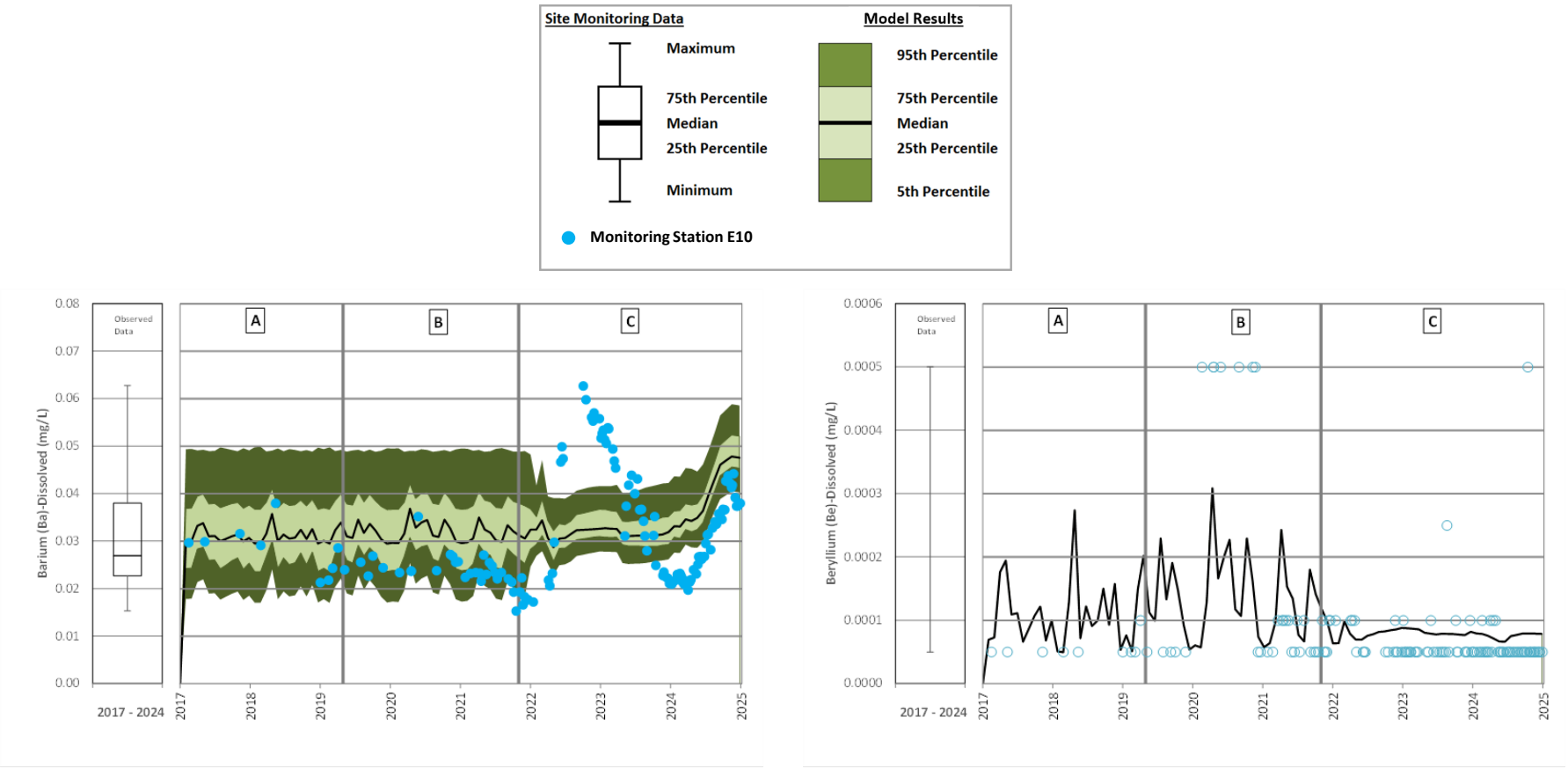
Figure A-47: Wight Pit Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved antimony and dissolved arsenic concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

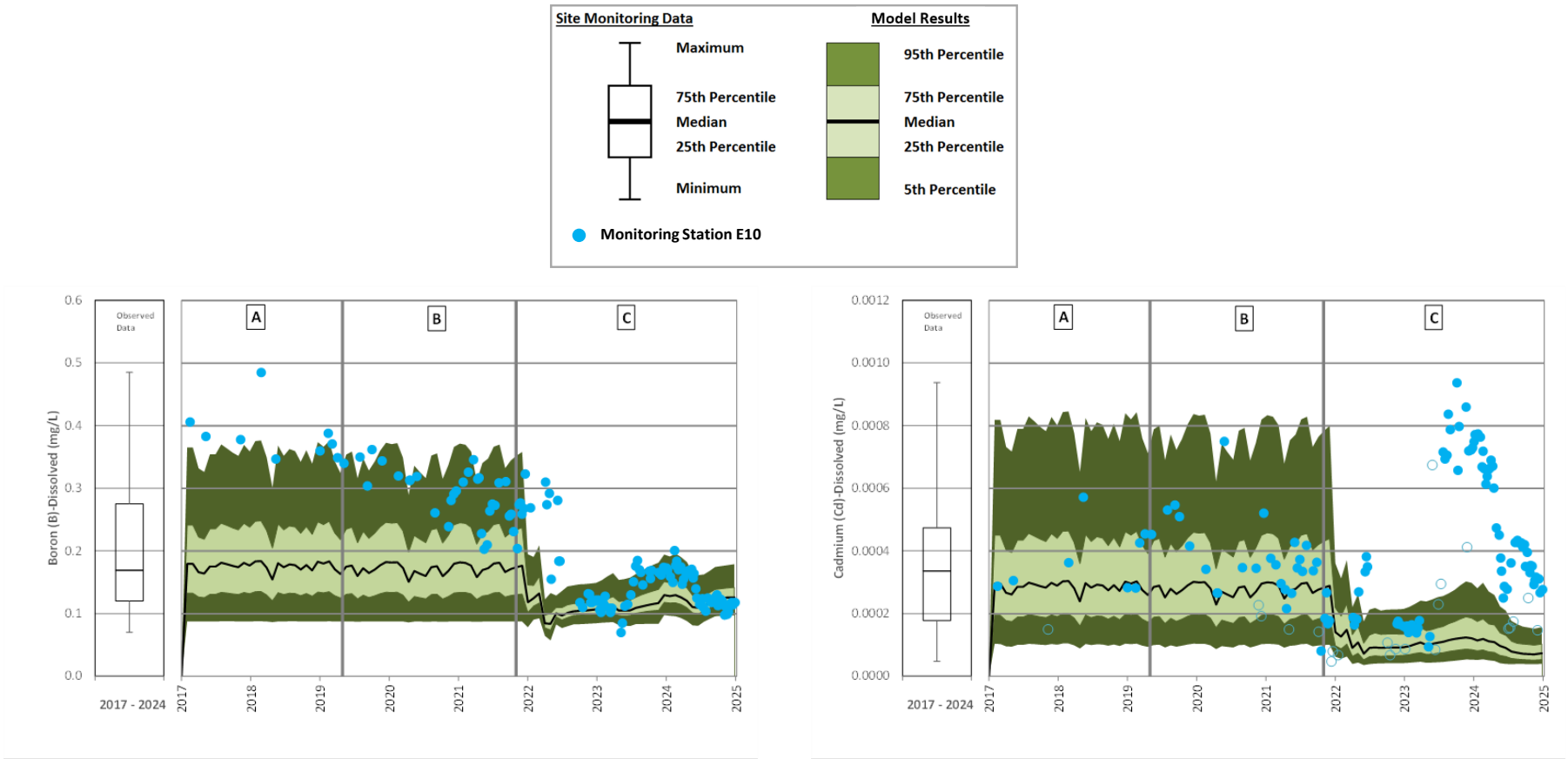
Figure A-48: Wight Pit Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved barium concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved barium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved barium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

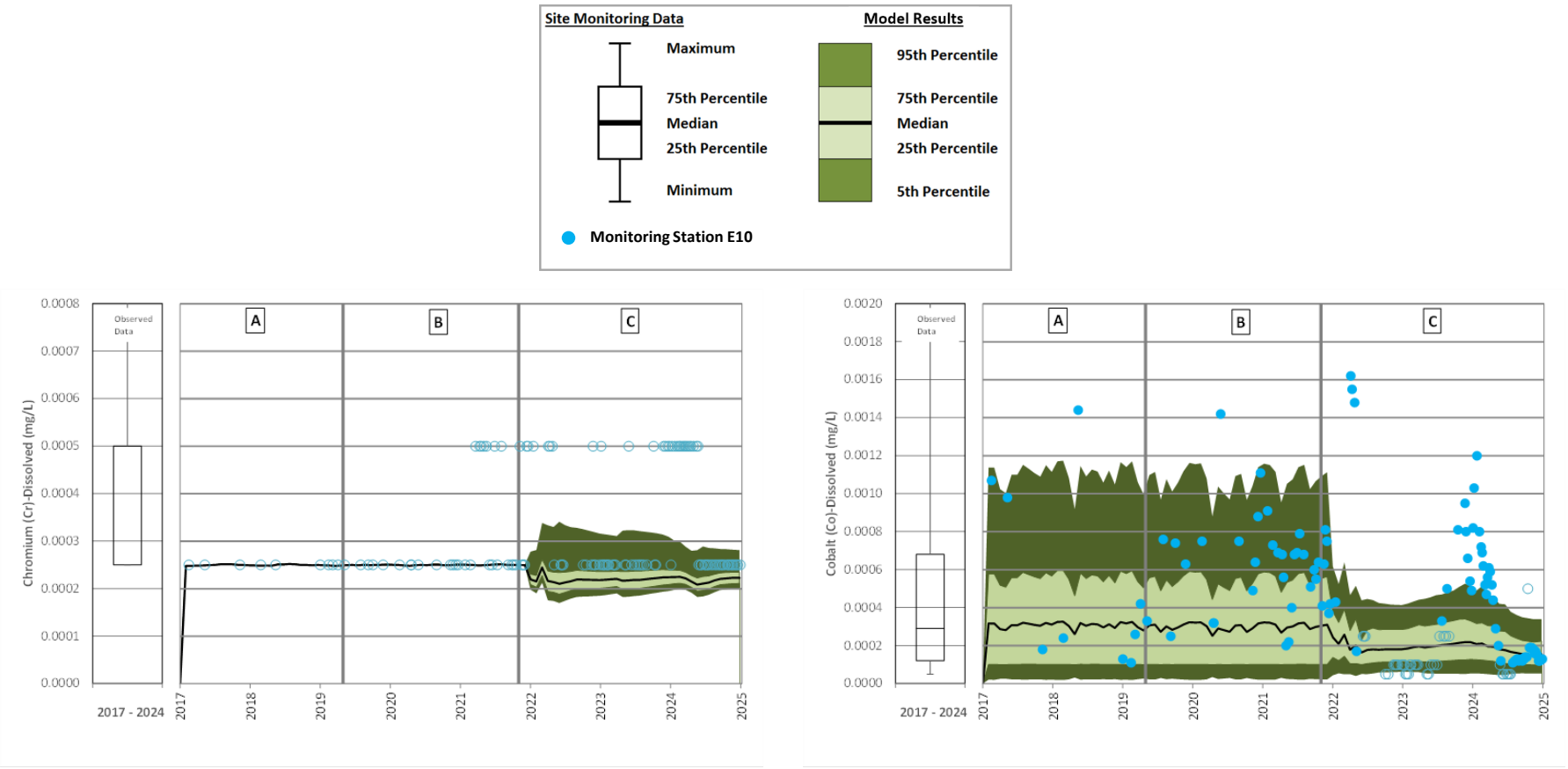
Figure A-49: Wight Pit Calibration – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved boron and dissolved cadmium concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved cadmium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved cadmium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

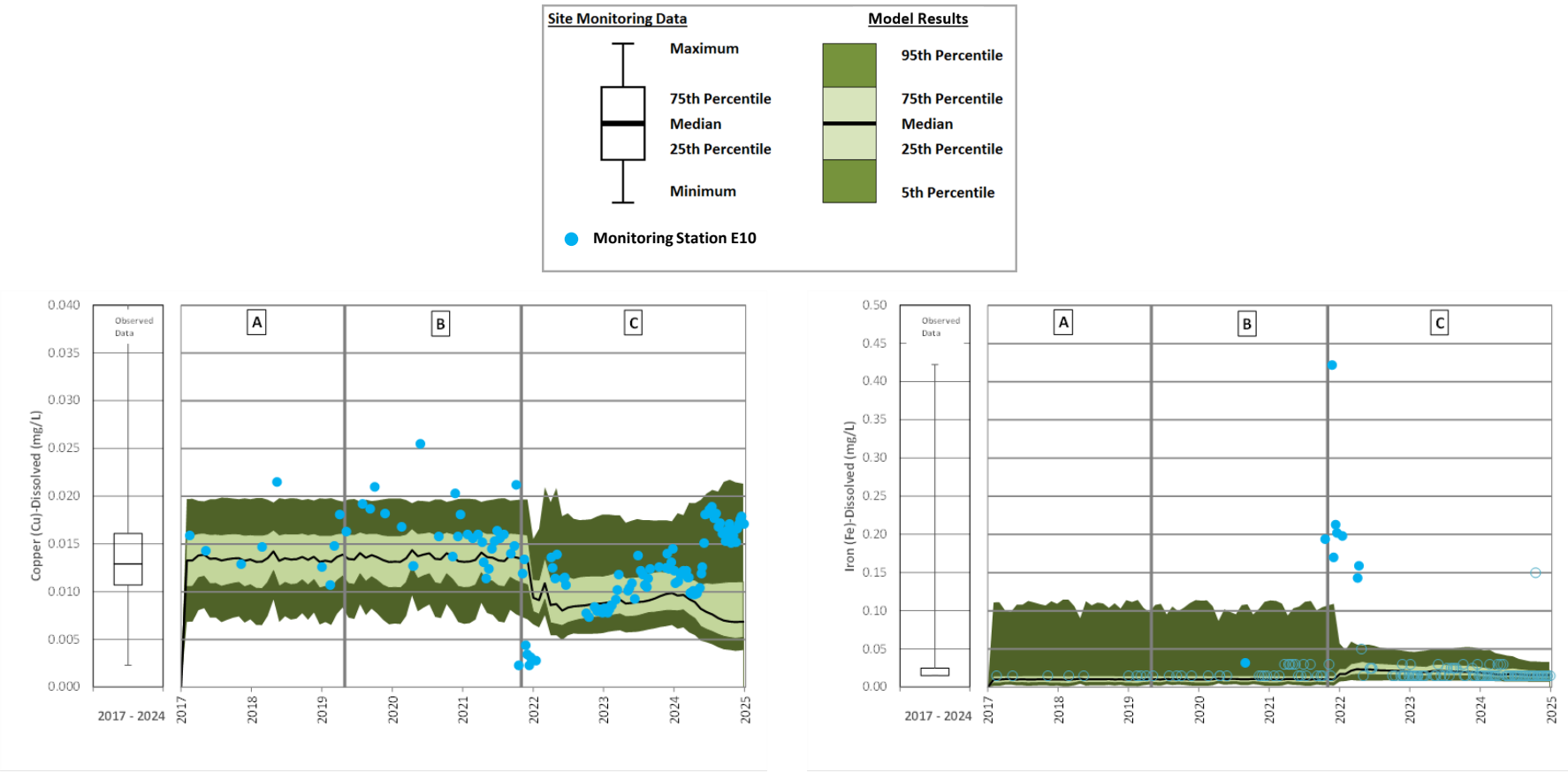
Figure A-50: Wight Pit Calibration – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved chromium concentrations increase in Wight Pit and dissolved cobalt concentrations decrease at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved cobalt concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved cobalt is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

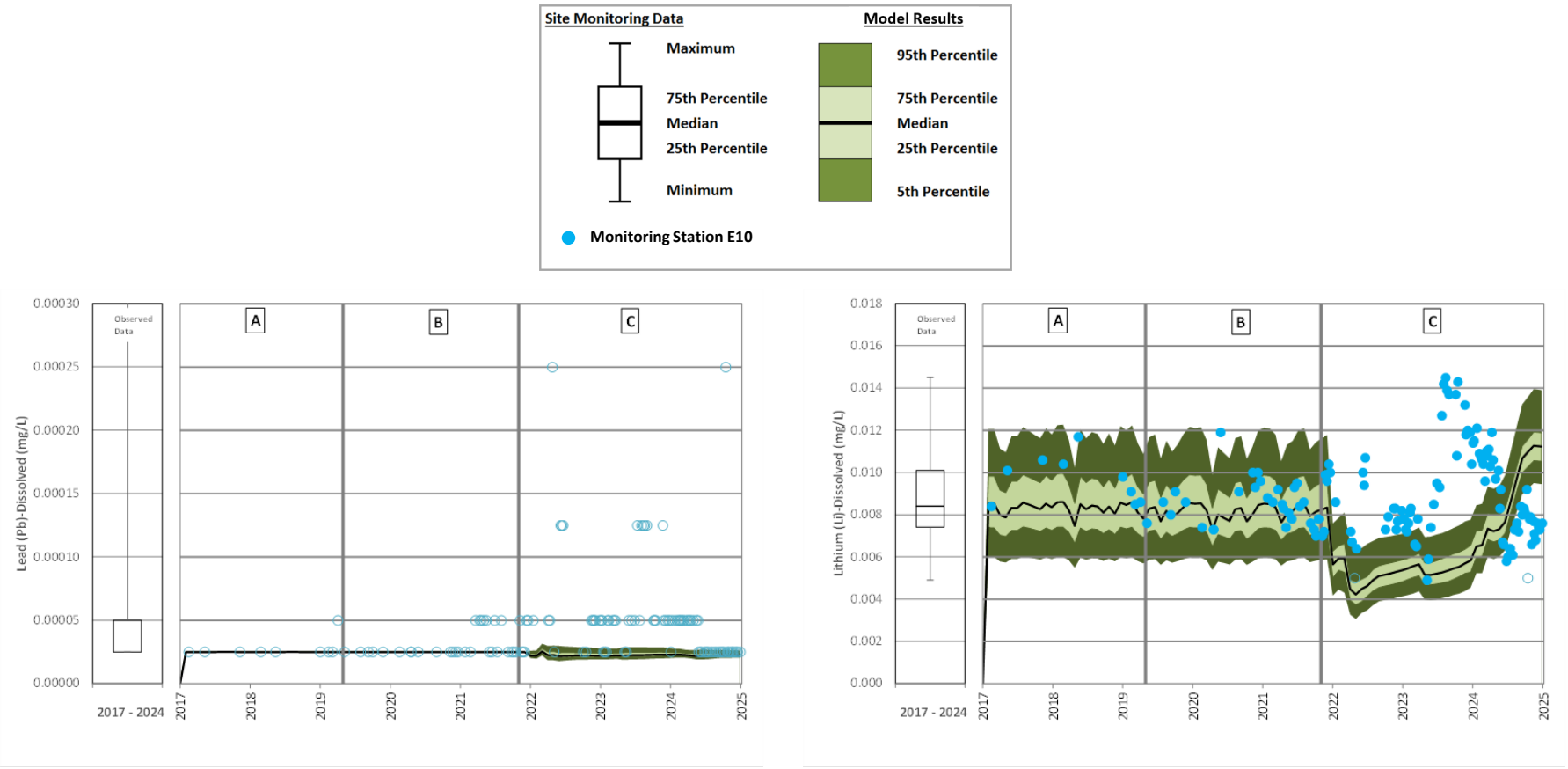
Figure A-51: Wight Pit Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved copper concentrations increase in Wight Pit and dissolved iron concentrations decrease at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

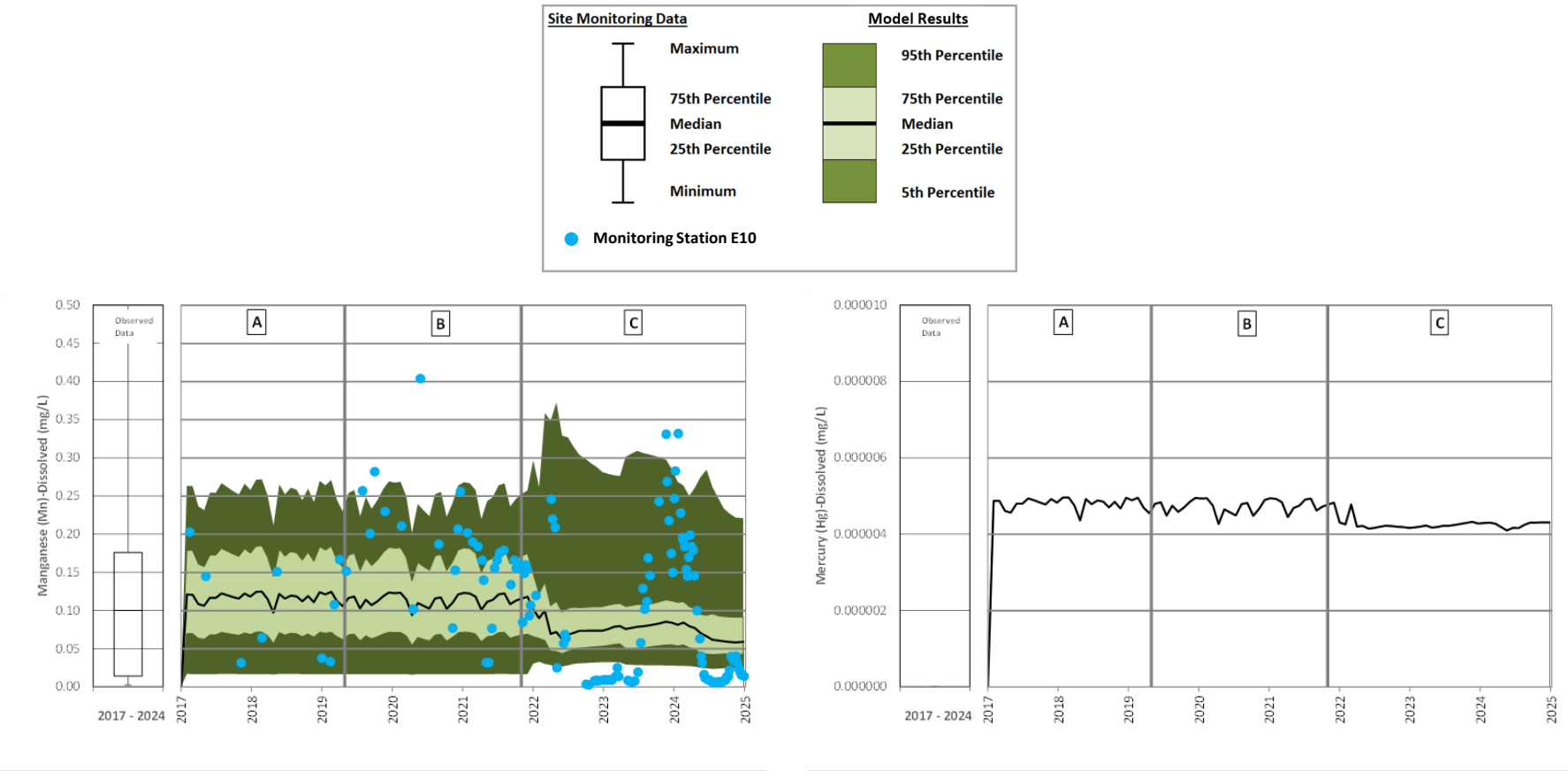
Figure A-52: Wight Pit Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved lithium concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved lithium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit.The source of the increased concentrations in the monitoring data for dissolved lithium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

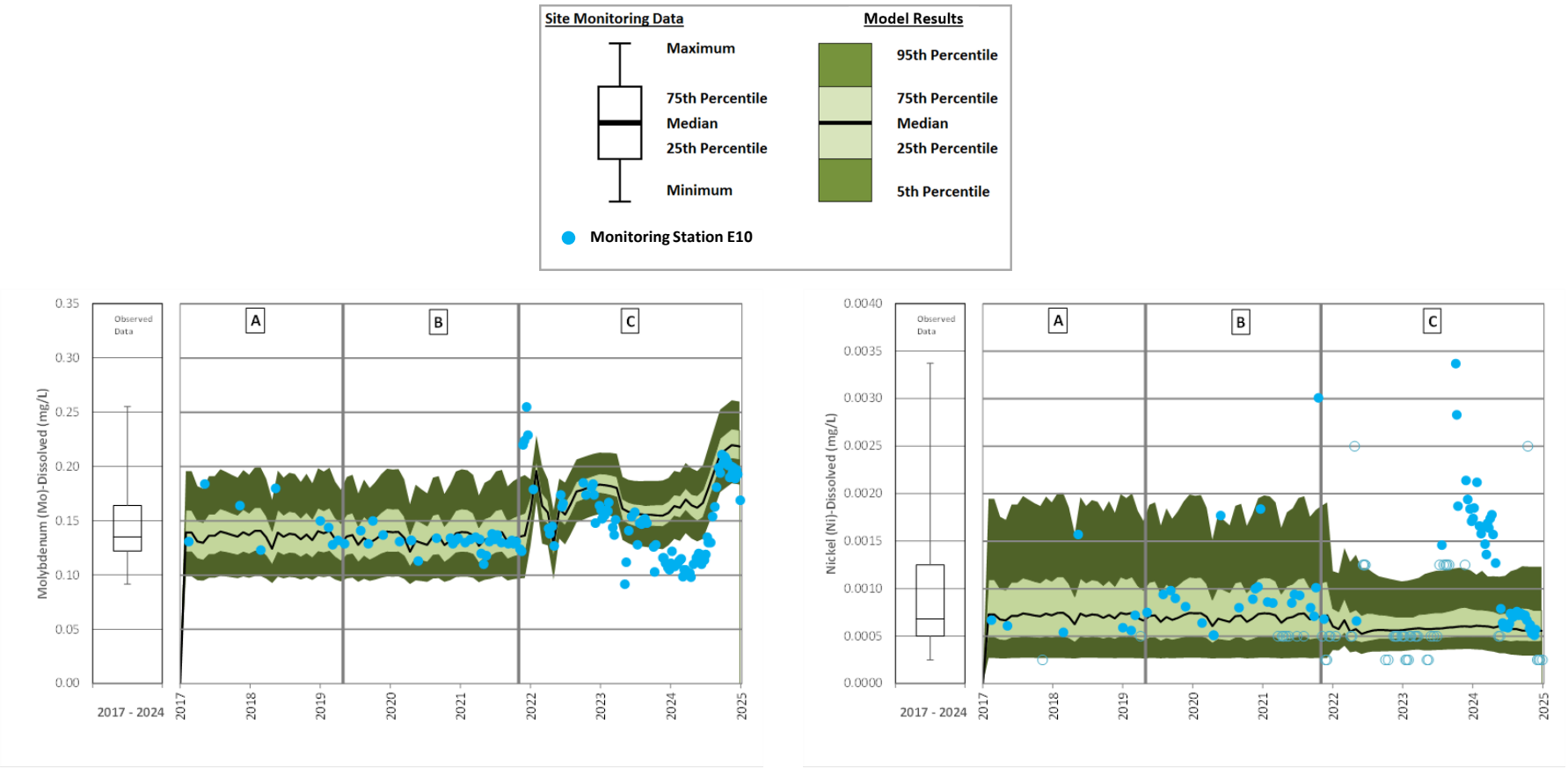
Figure A-53: Wight Pit Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Dissolved manganese concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

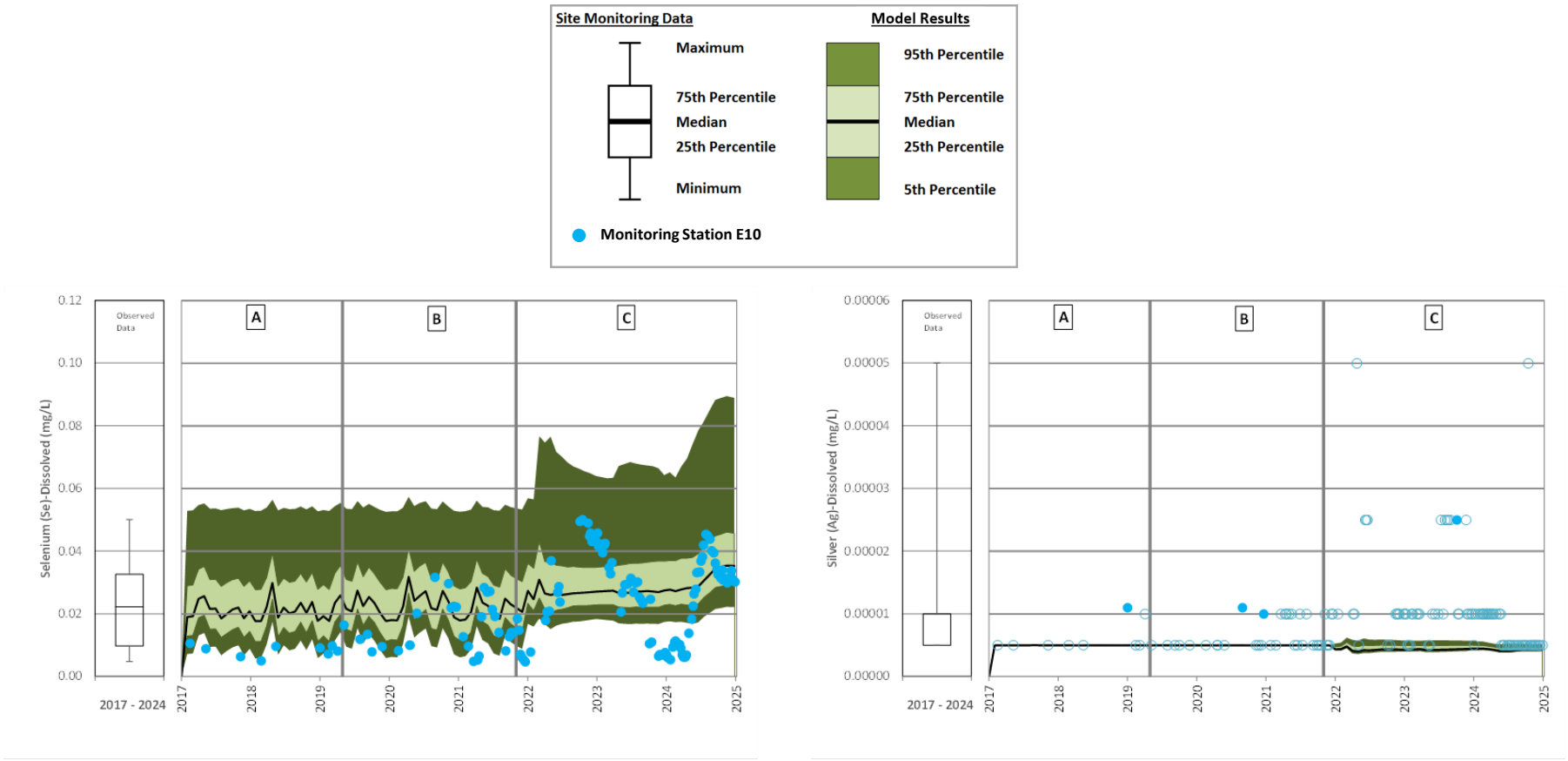
Figure A-54: Wight Pit Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved molybdenum concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved nickel concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved nickel is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

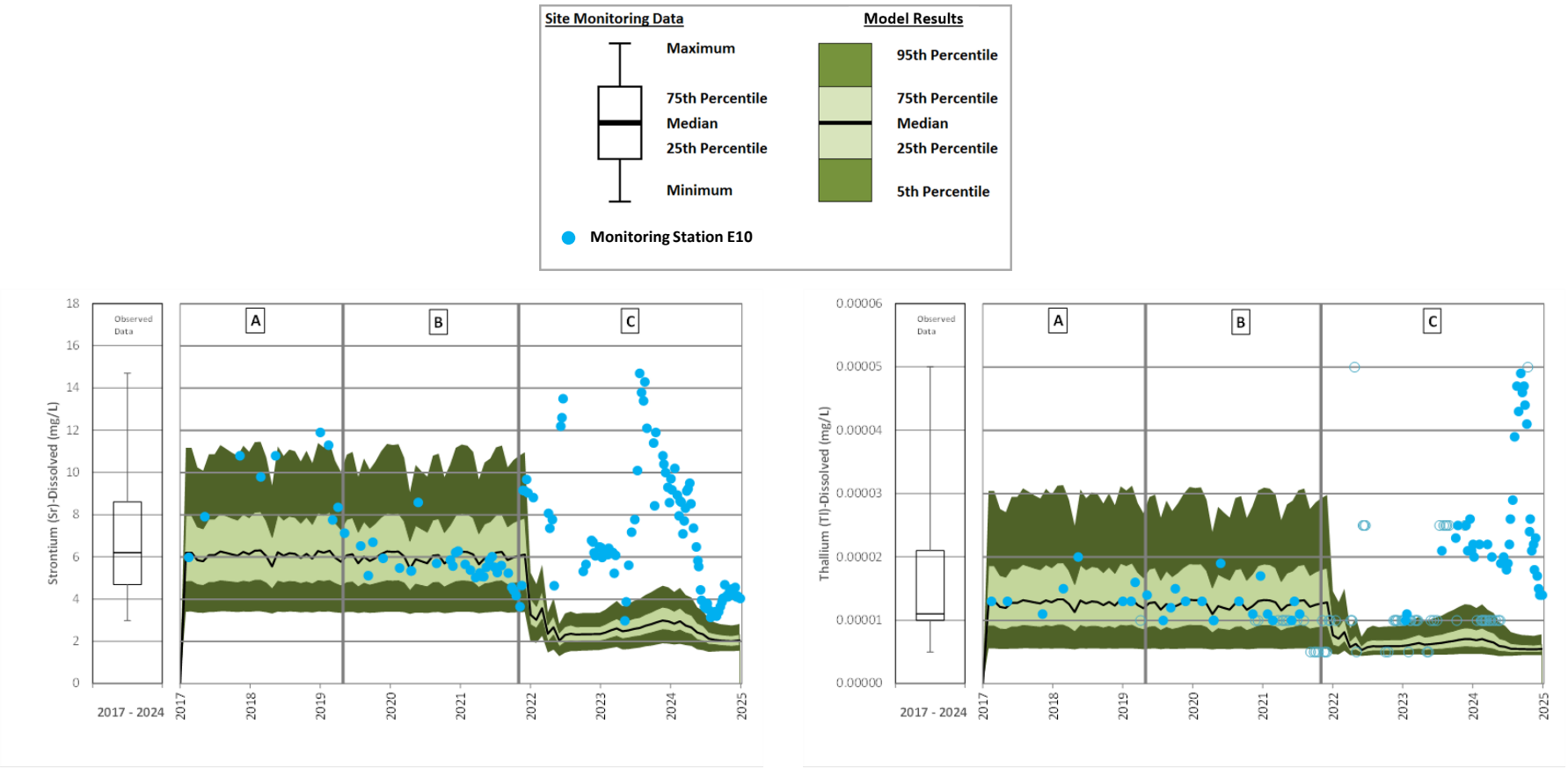
Figure A-55: Wight Pit Calibration – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved selenium concentrations increase in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit.

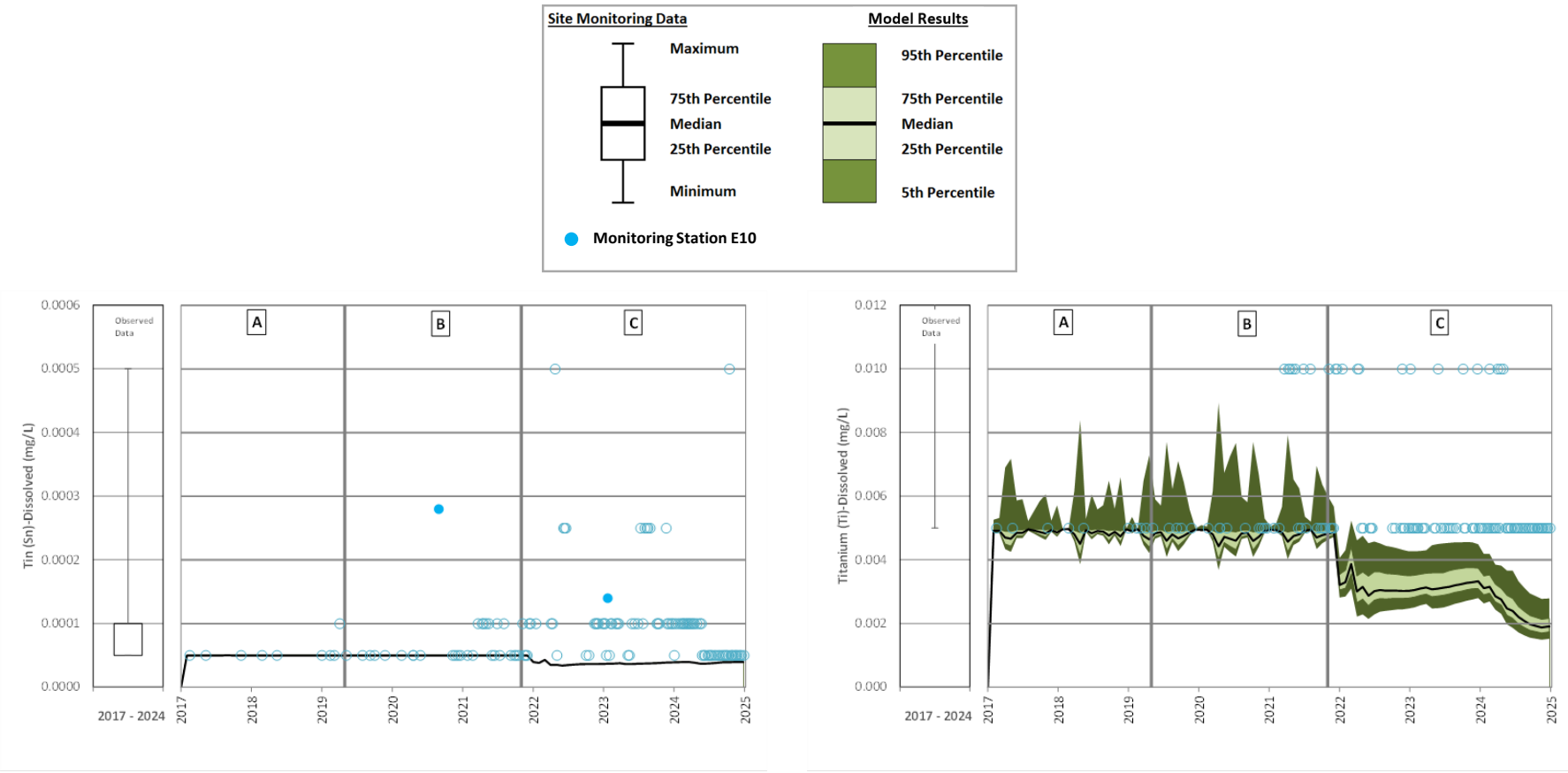
Figure A-56: Wight Pit Calibration – Dissolved Selenium and Dissolved Silver



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

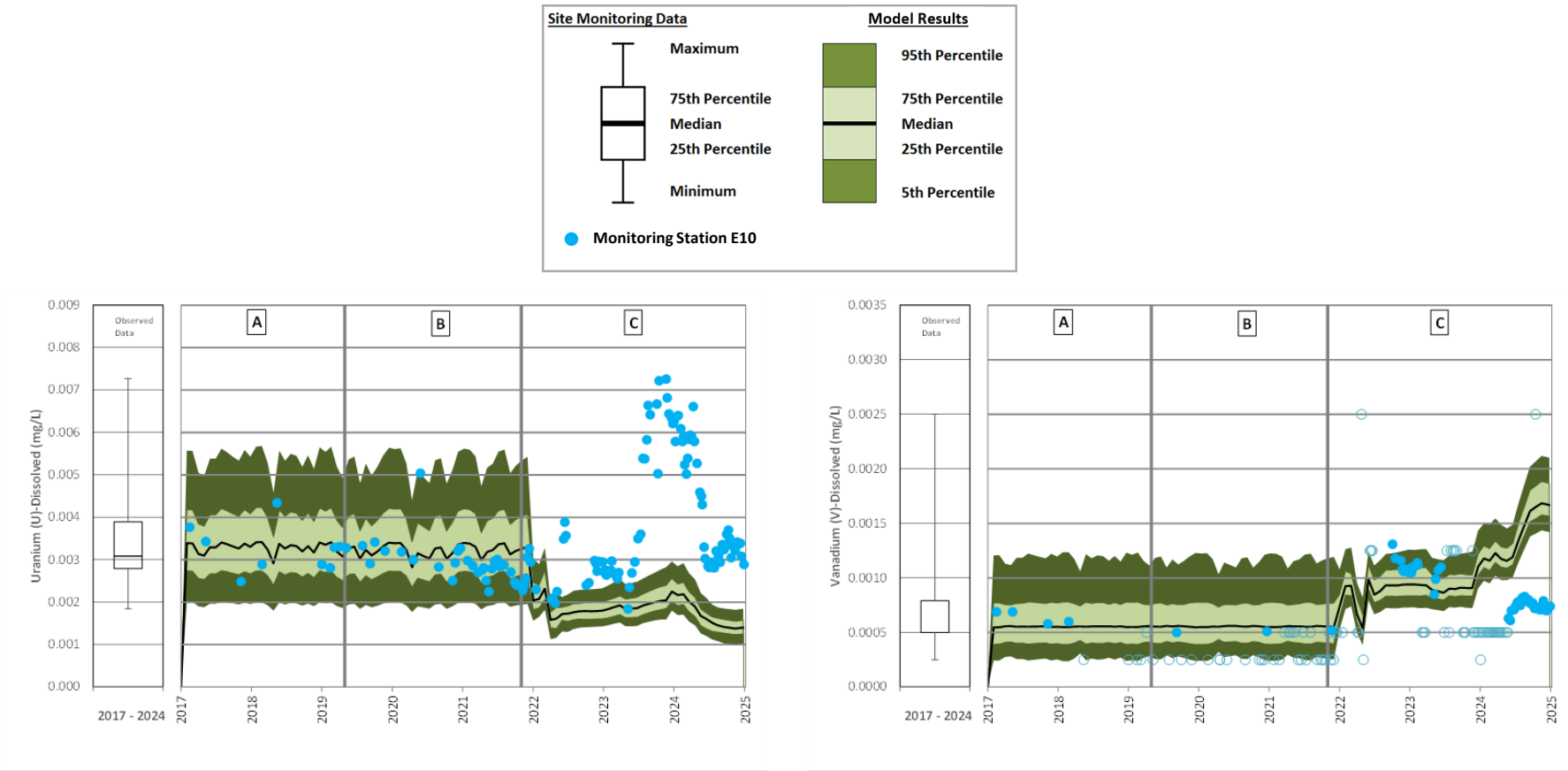
Note: Dissolved strontium and dissolved thallium concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved strontium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved strontium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure A-57: Wight Pit Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

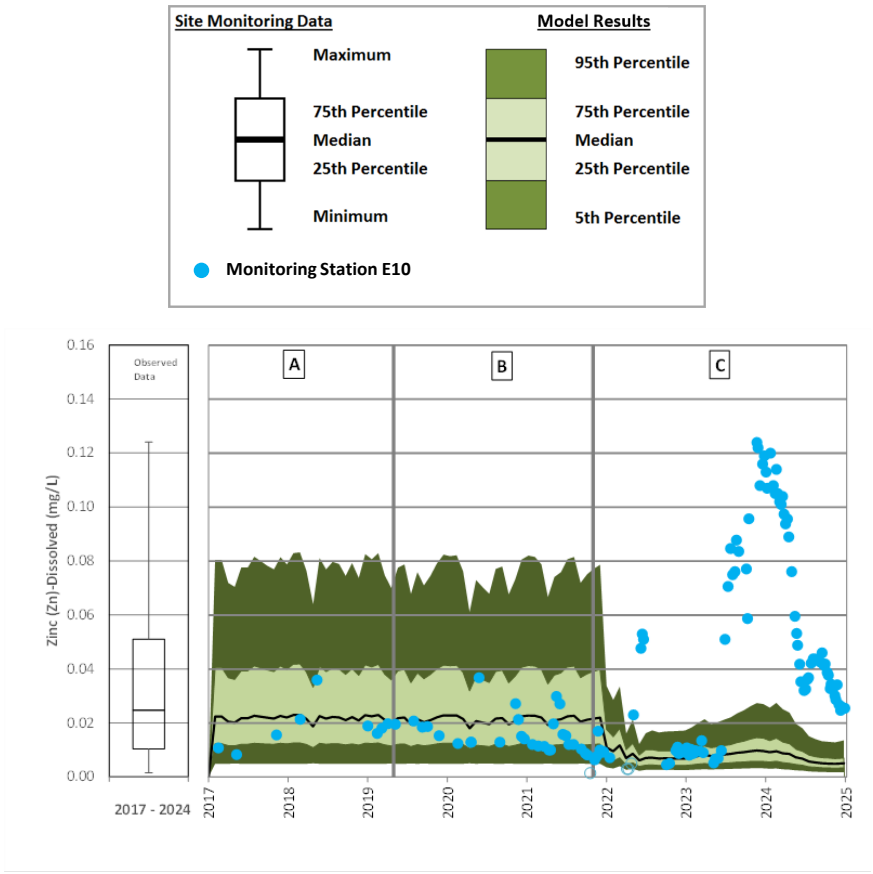
Figure A-58: Wight Pit Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved uranium concentrations decrease in Wight Pit and dissolved vanadium concentrations increase at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved uranium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved uranium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure A-59: Wight Pit Calibration – Dissolved Uranium and Dissolved Vanadium

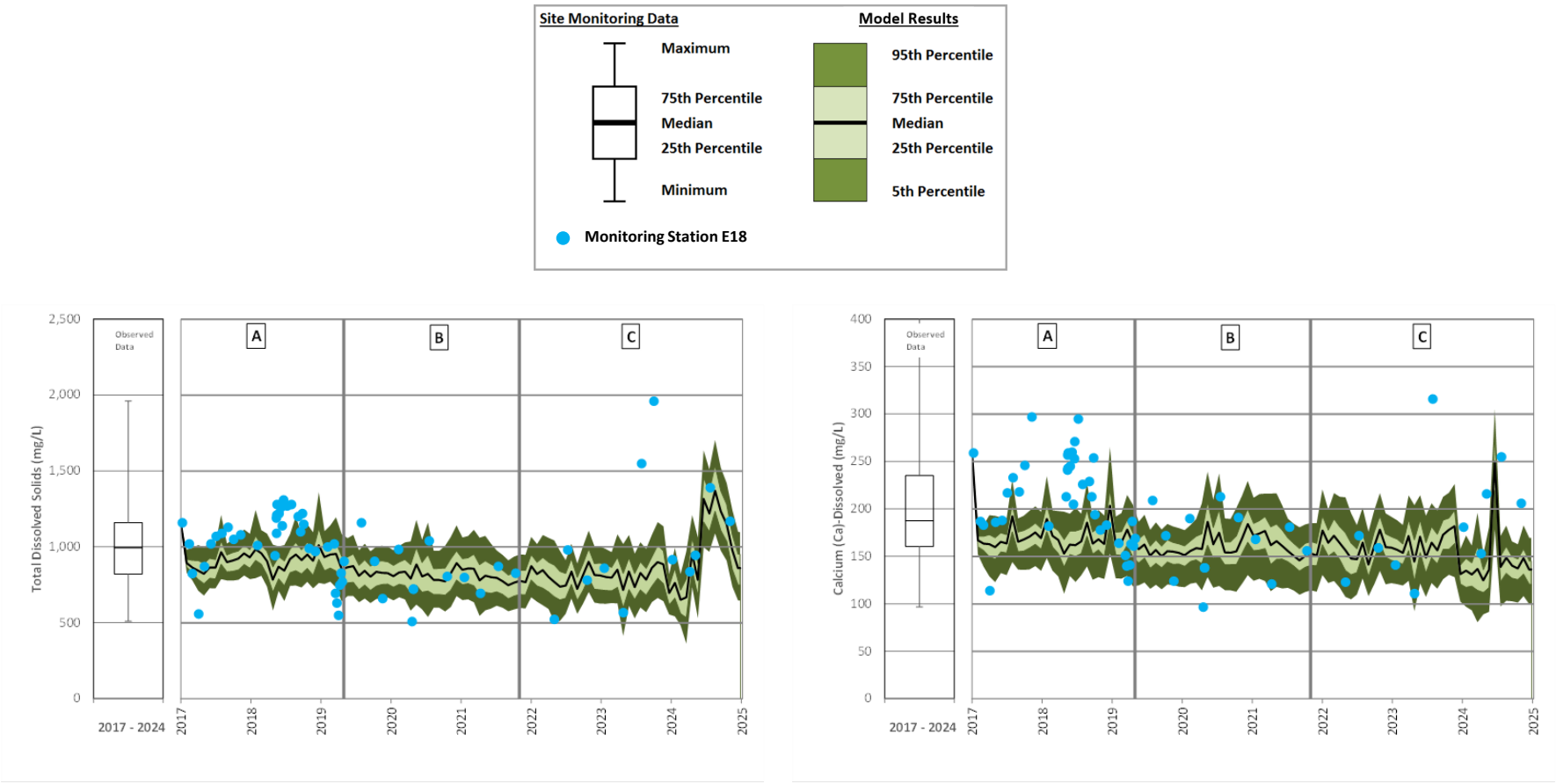


A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved zinc concentrations decrease in Wight Pit at the start of resumed operations because of pumping from the Tailings Storage Facility and from Cariboo Pit. Dissolved zinc concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in Wight Pit. The source of the increased concentrations in the monitoring data for dissolved zinc is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

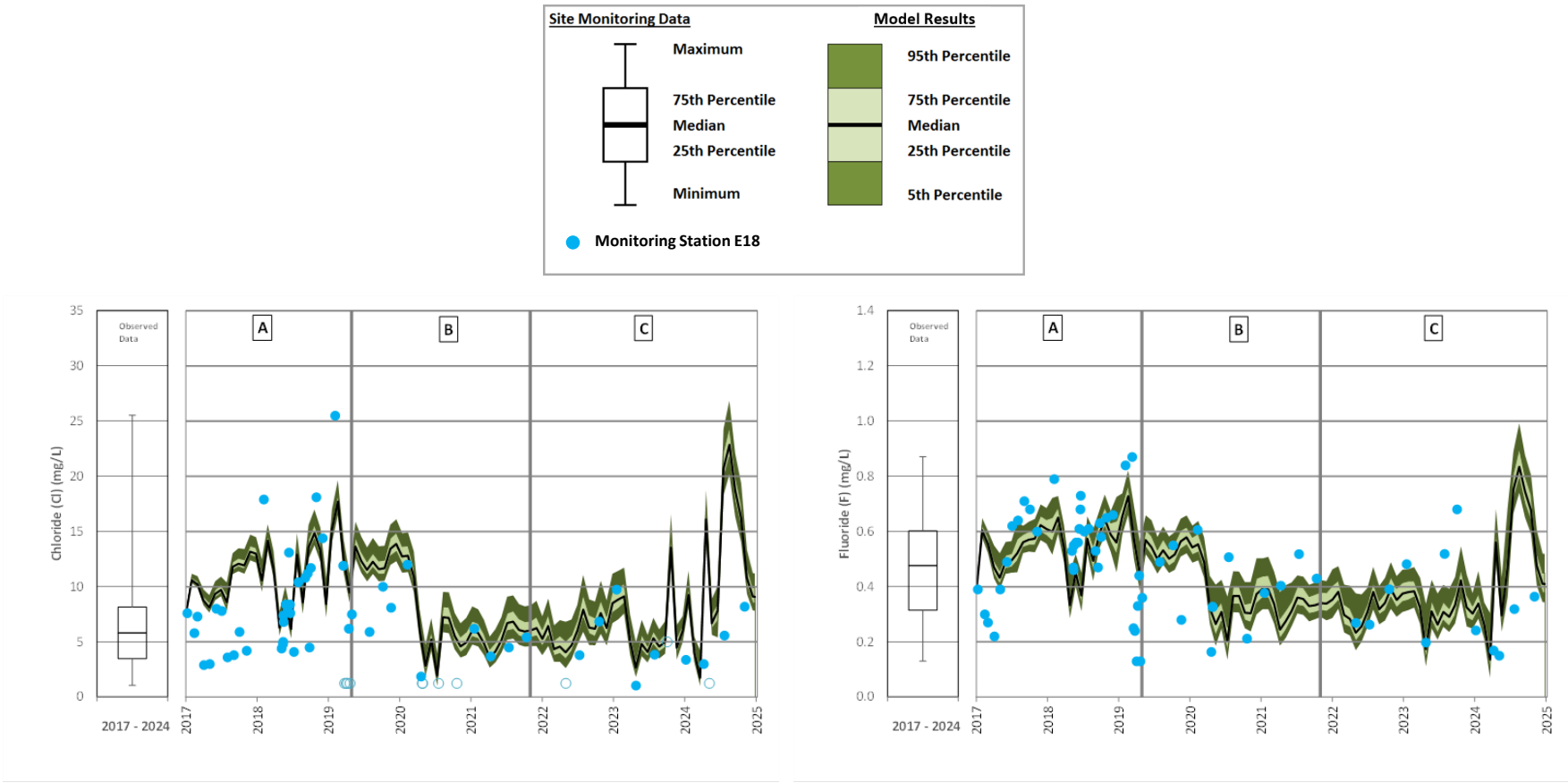
Figure A-60: Wight Pit Calibration – Dissolved Zinc

Central Collection Sump Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

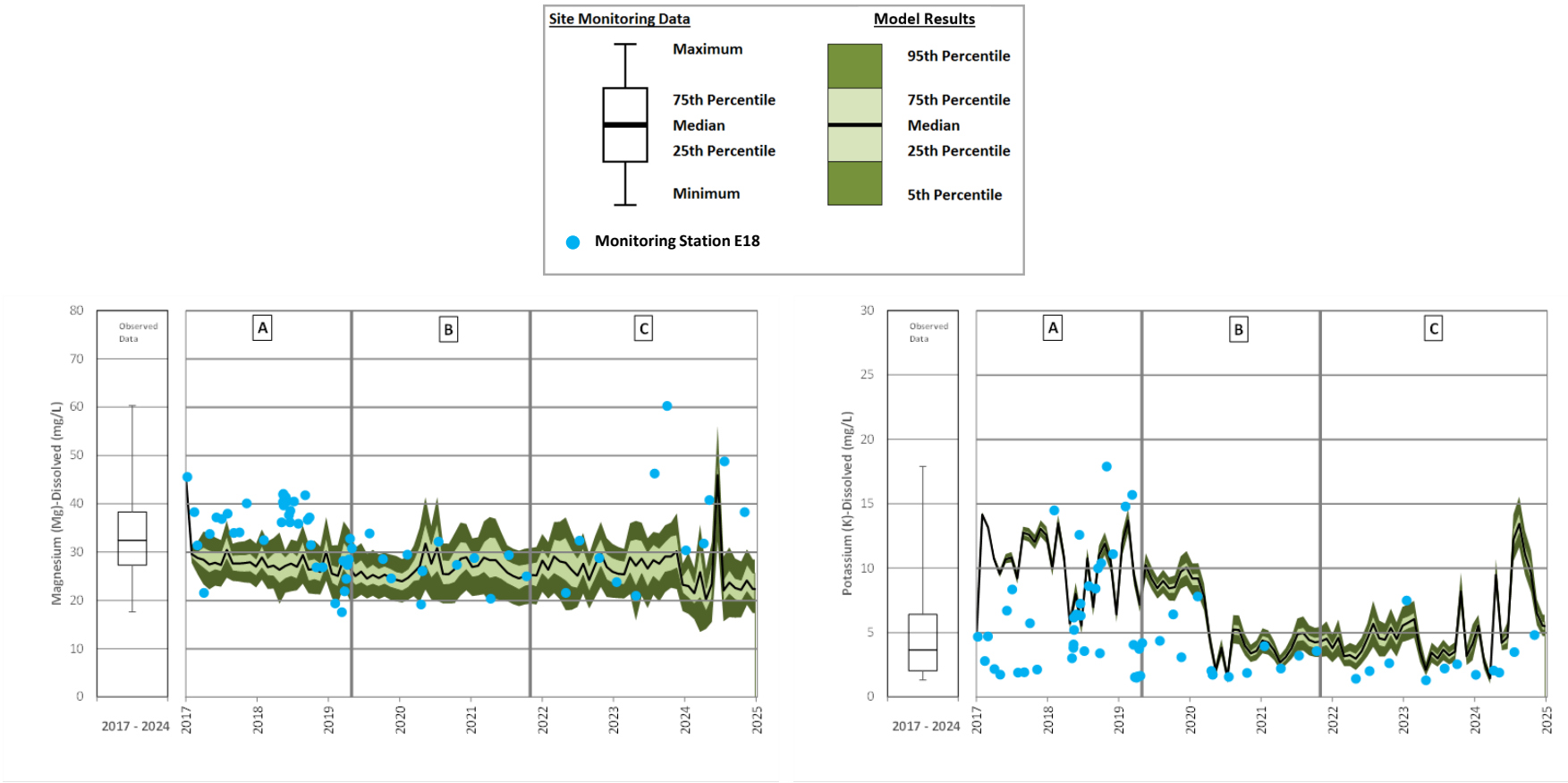
Figure A-61: Central Collection Sump Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Chloride and fluoride concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

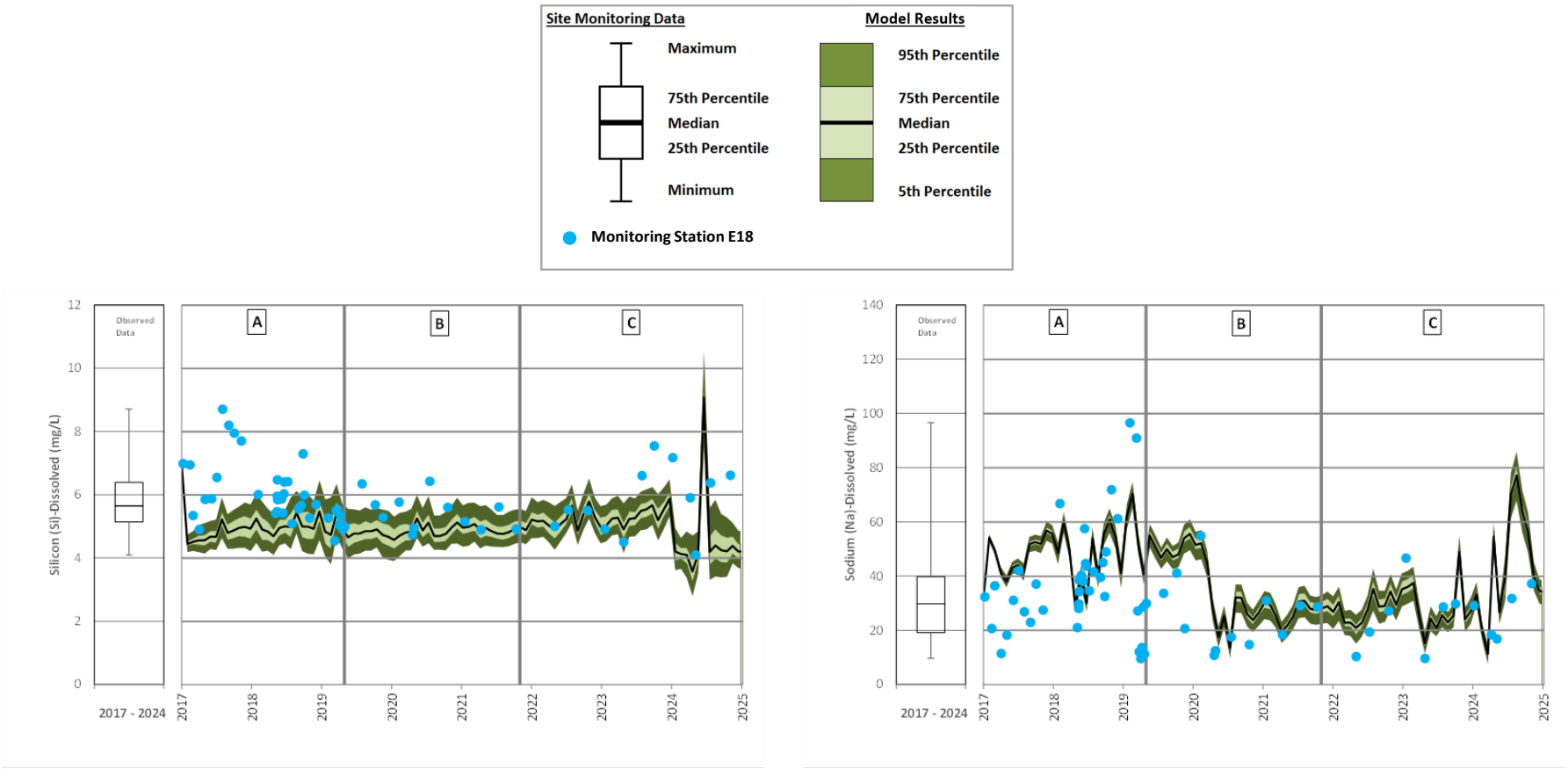
Figure A-62: Central Collection Sump Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Potassium concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

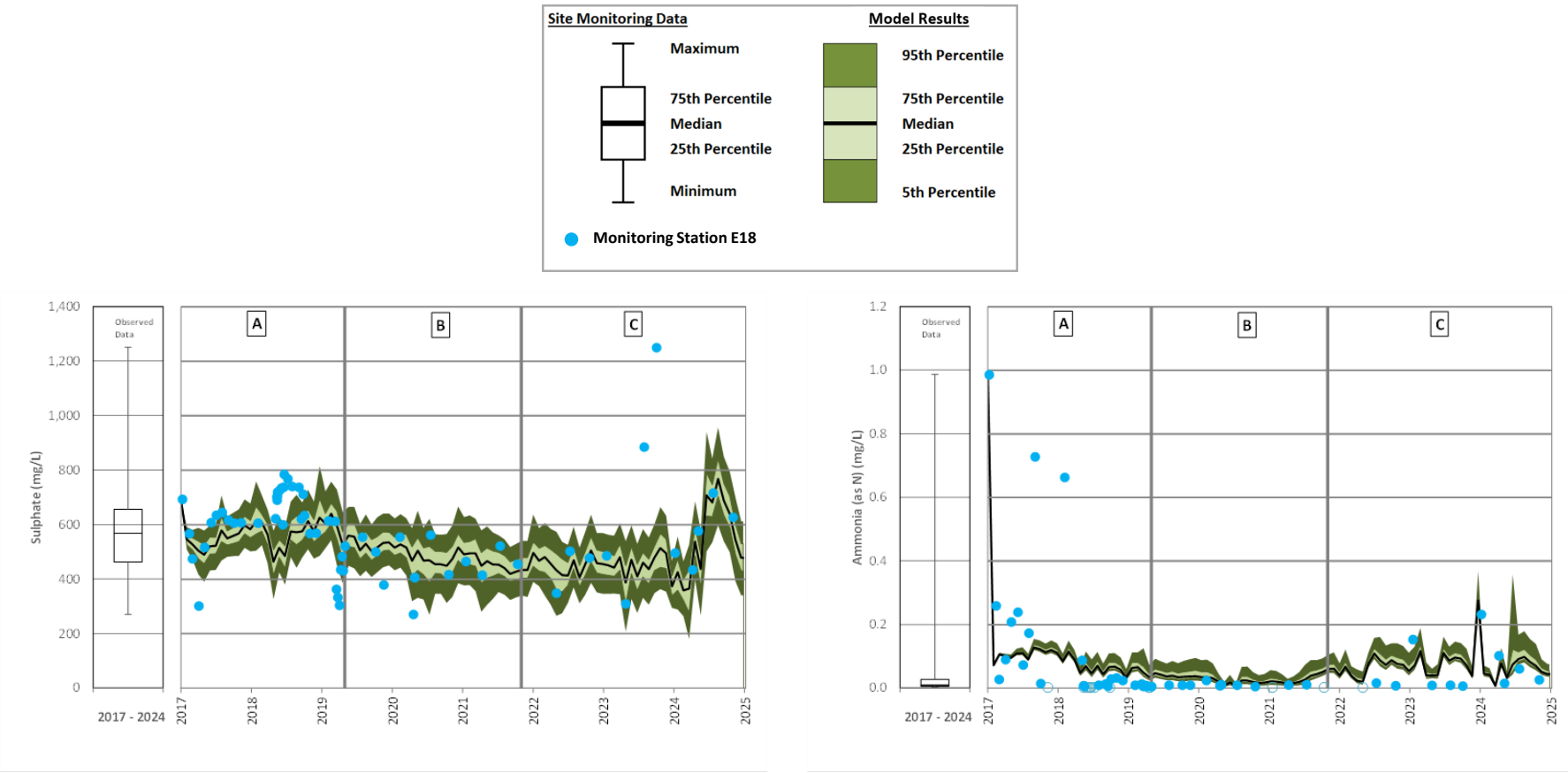
Figure A-63: Central Collection Sump Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Sodium concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

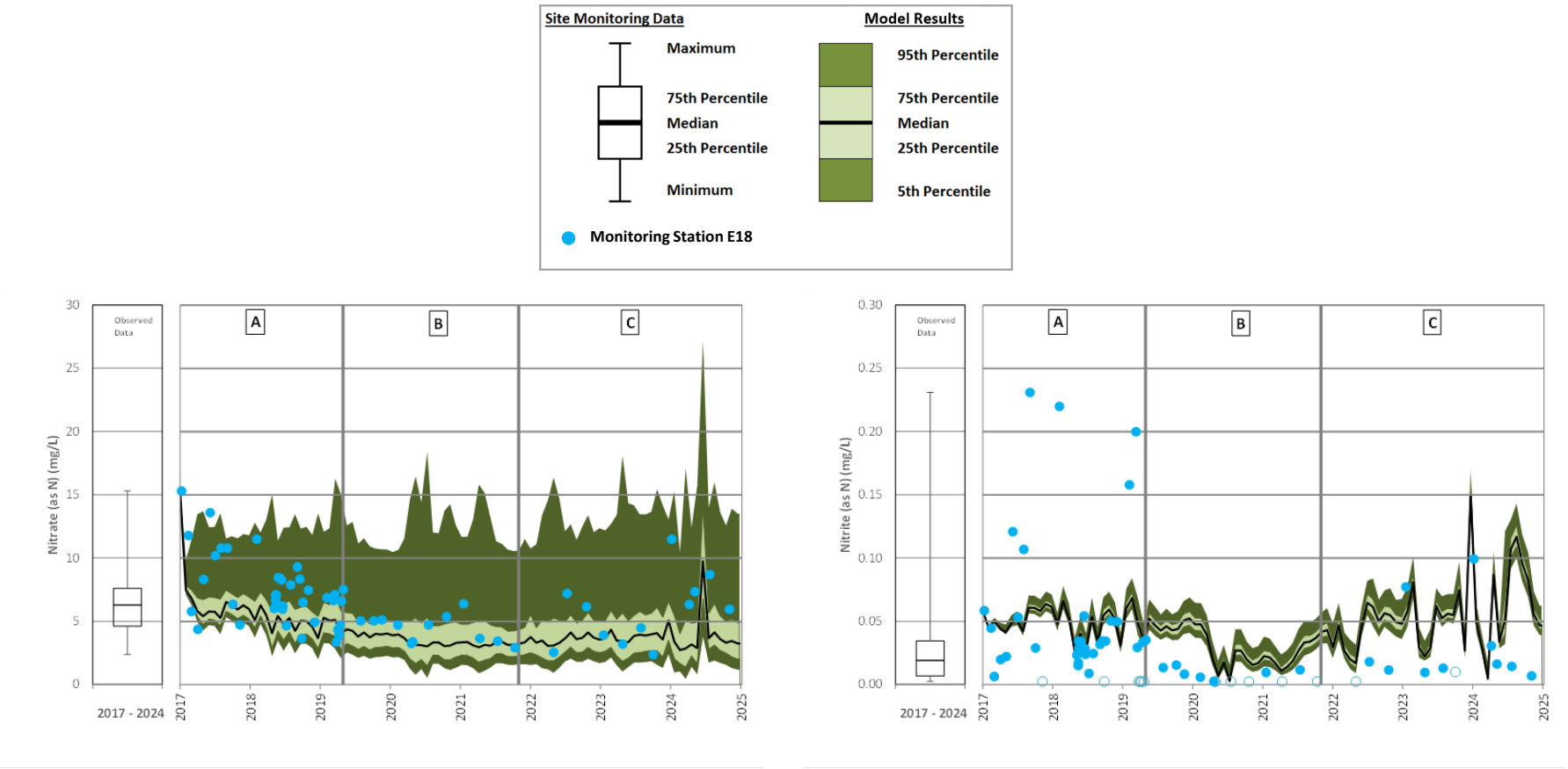
Figure A-64: Central Collection Sump Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Sulphate and total ammonia concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

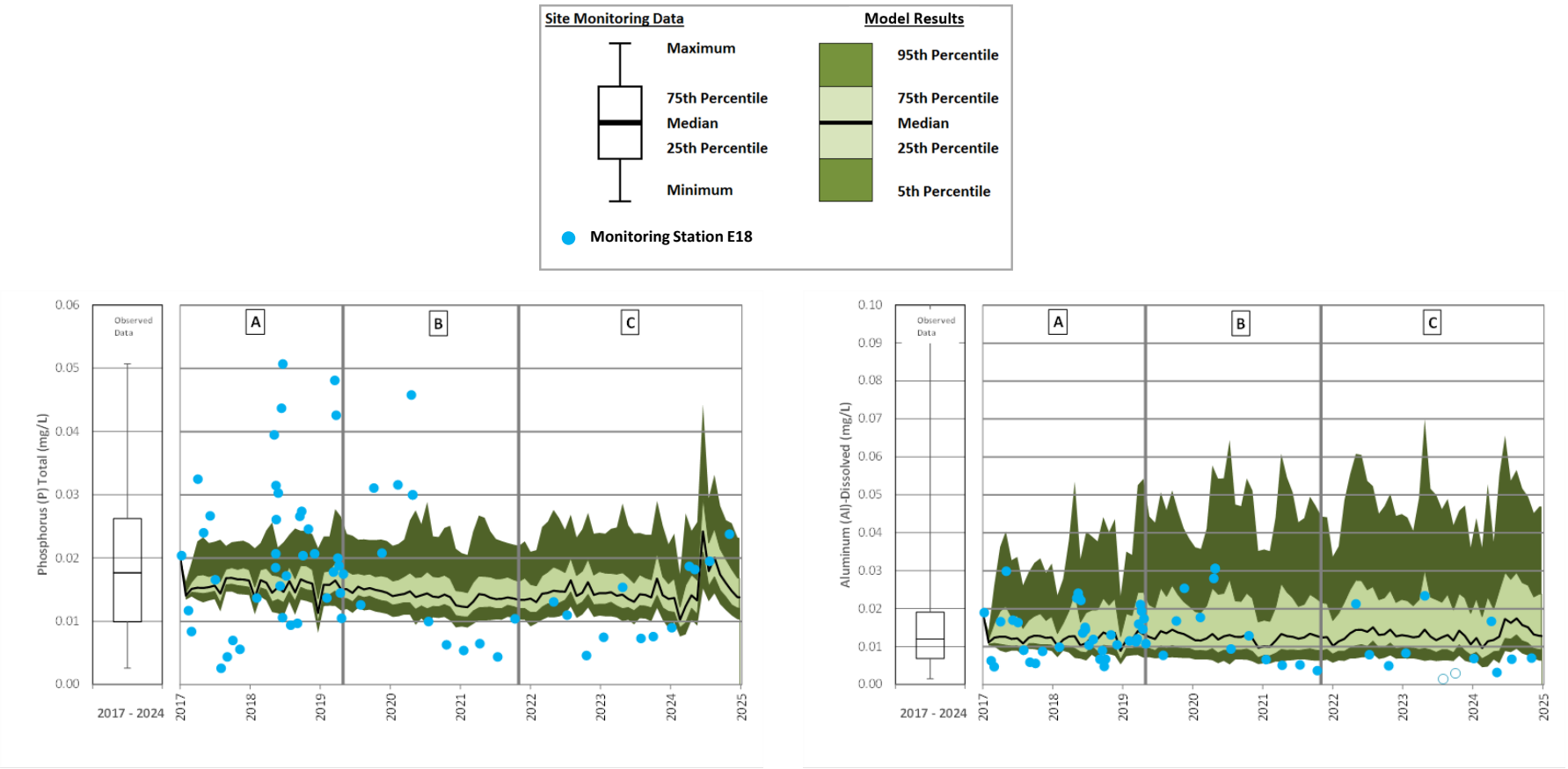
Figure A-65: Central Collection Sump Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

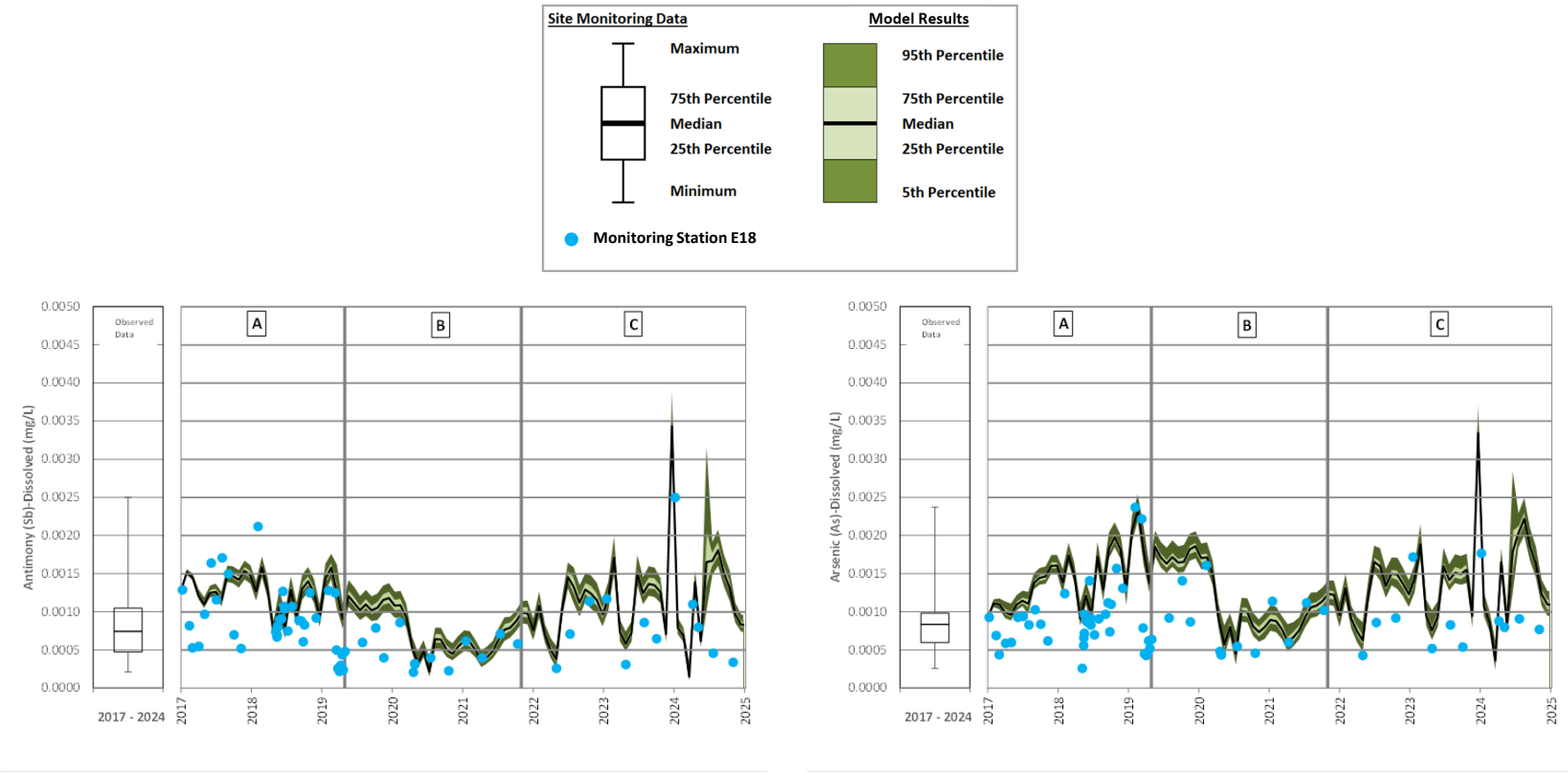
Note: Nitrite concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

Figure A-66: Central Collection Sump Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

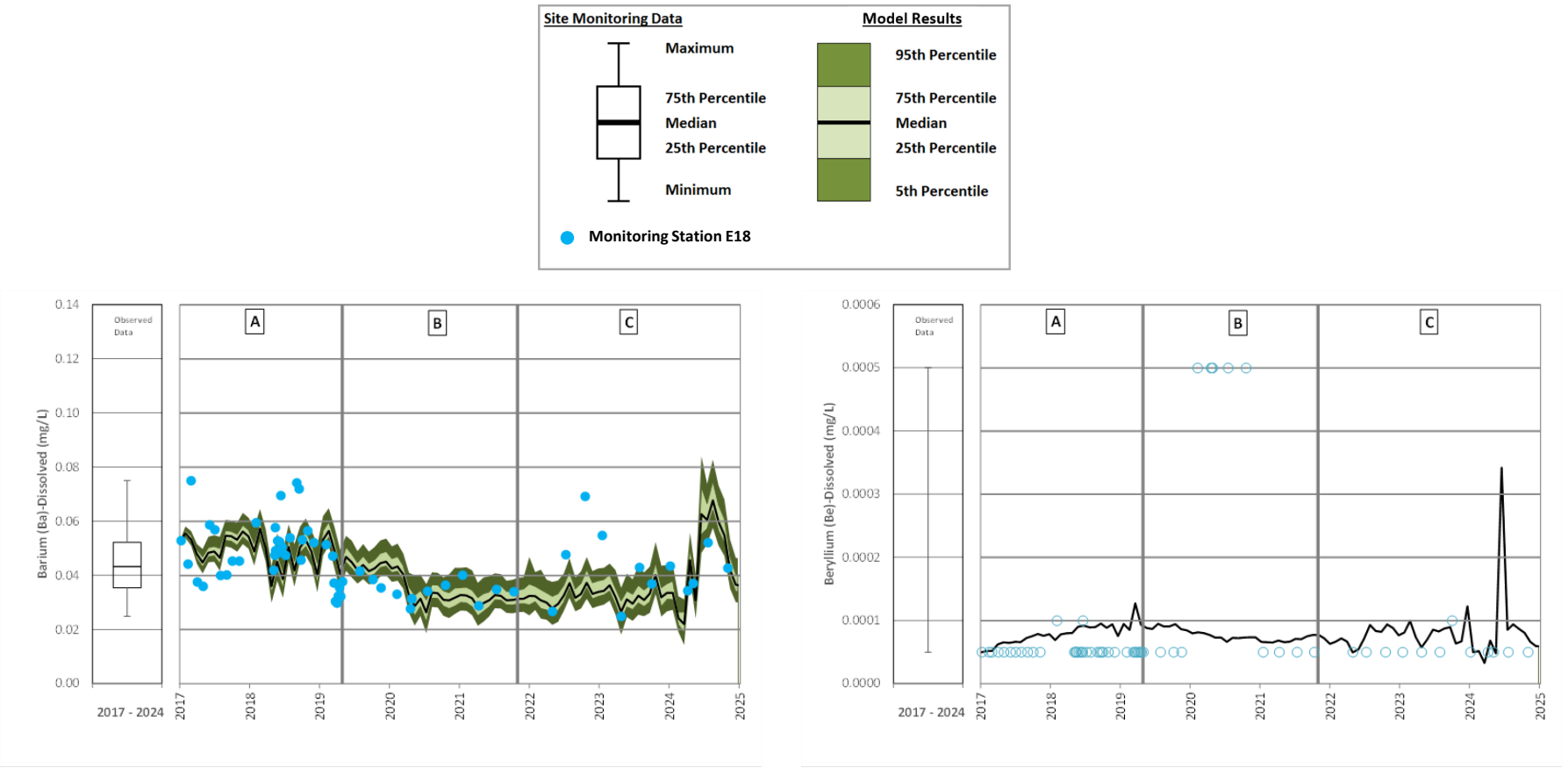
Figure A-67: Central Collection Sump Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Dissolved antimony and dissolved arsenic concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

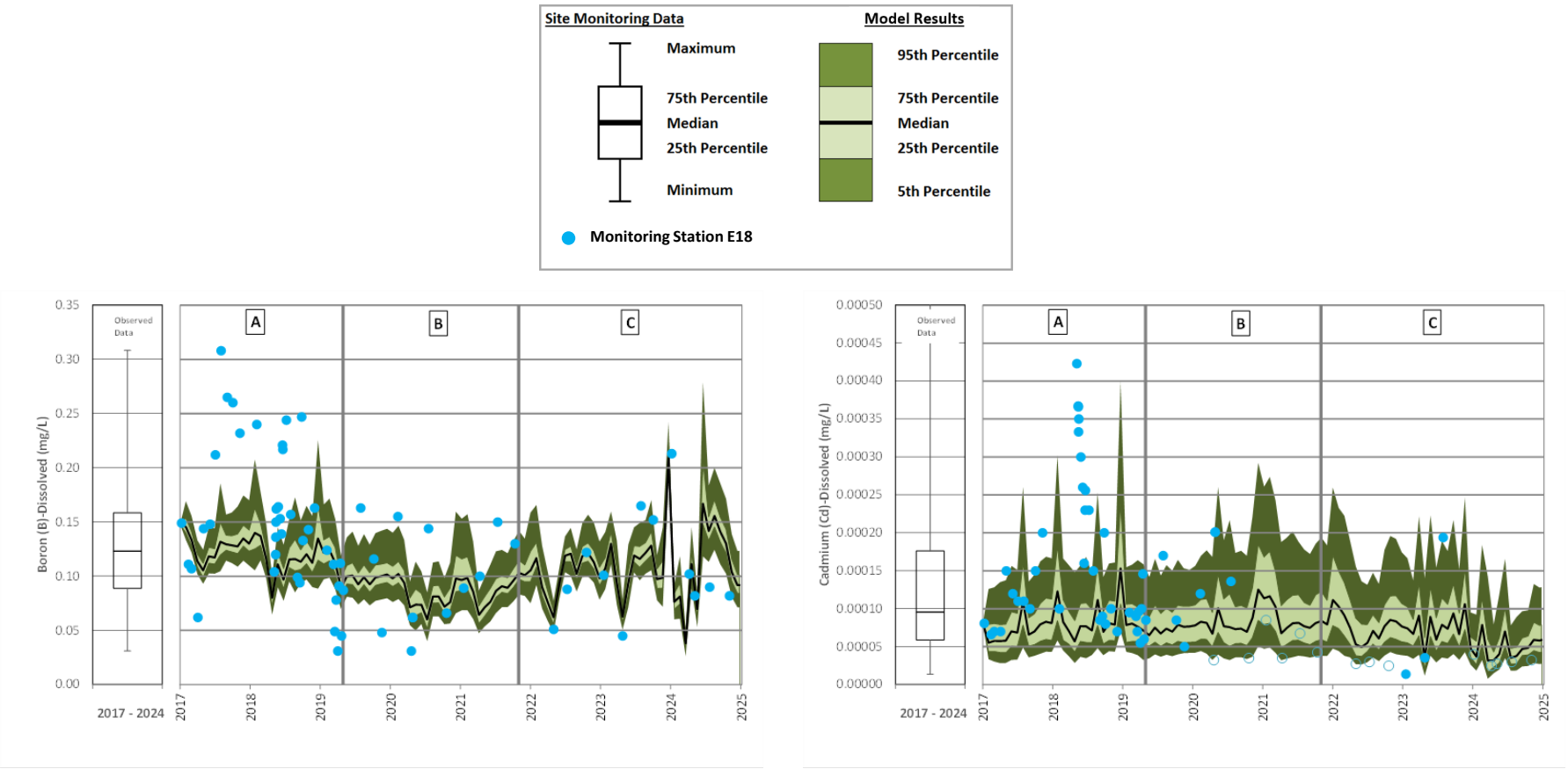
Figure A-68: Central Collection Sump Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved barium concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

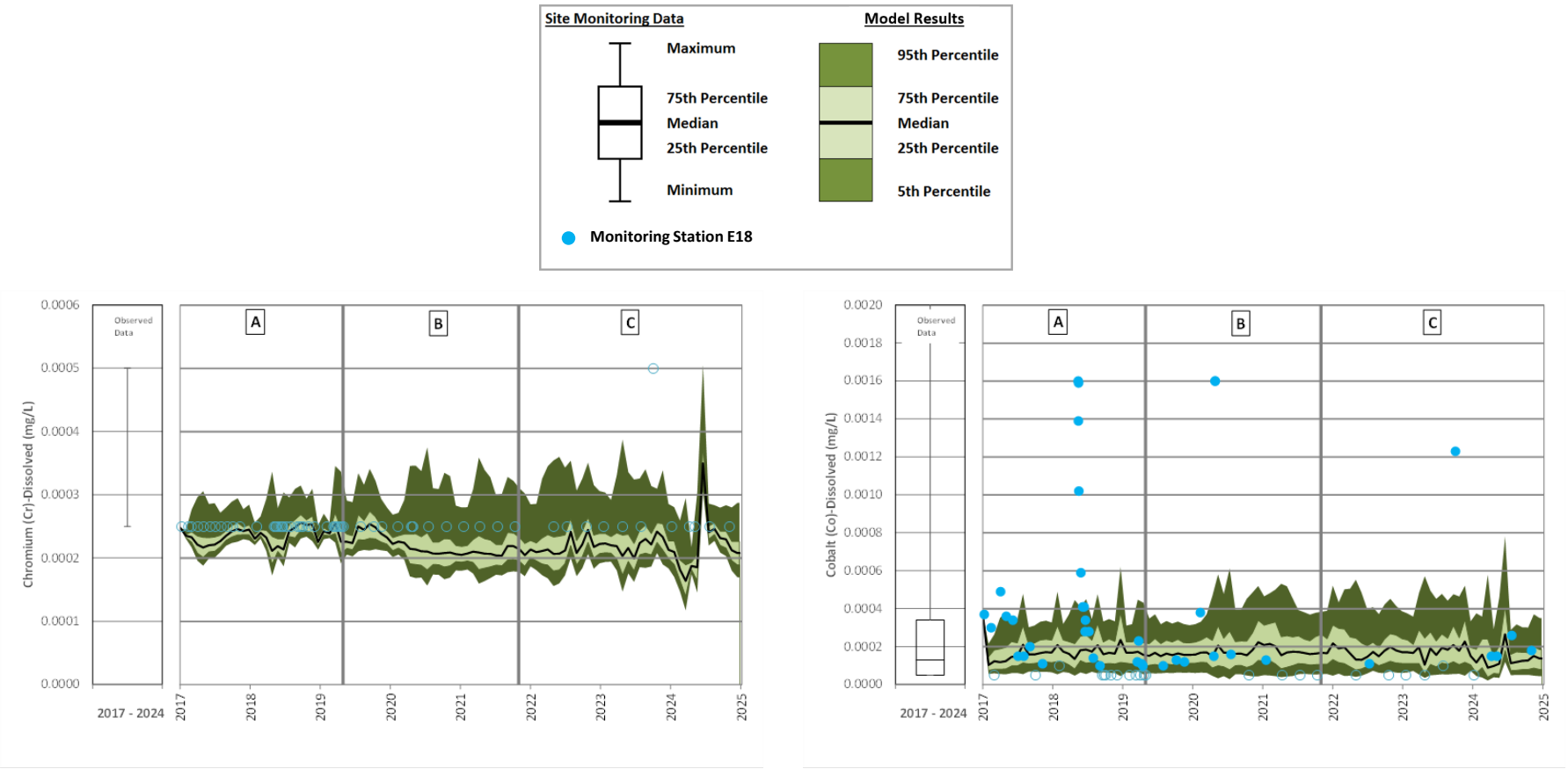
Figure A-69: Central Collection Sump Calibration – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

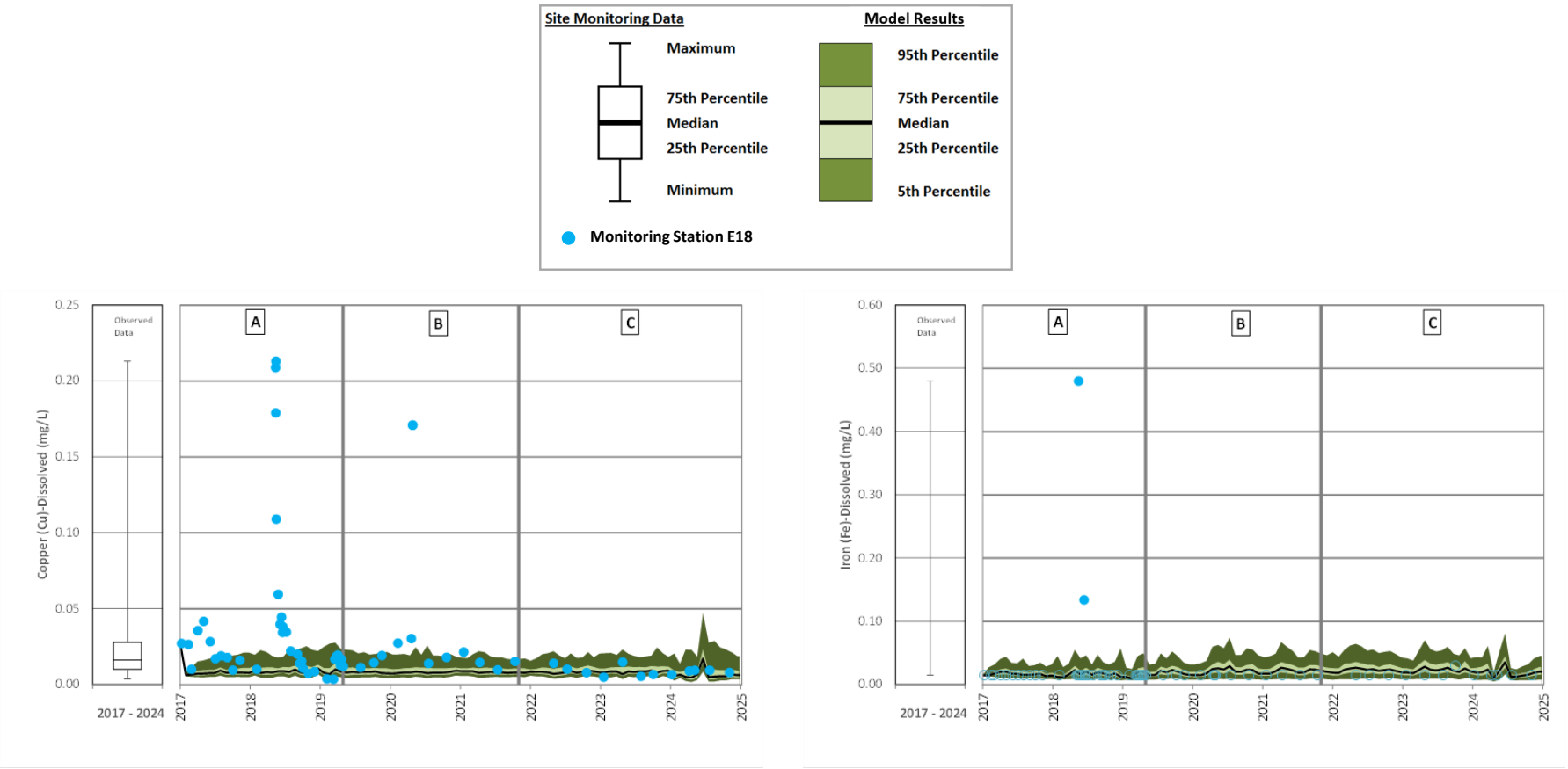
Note: Dissolved boron concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

Figure A-70: Central Collection Sump Calibration – Dissolved Boron and Dissolved Cadmium



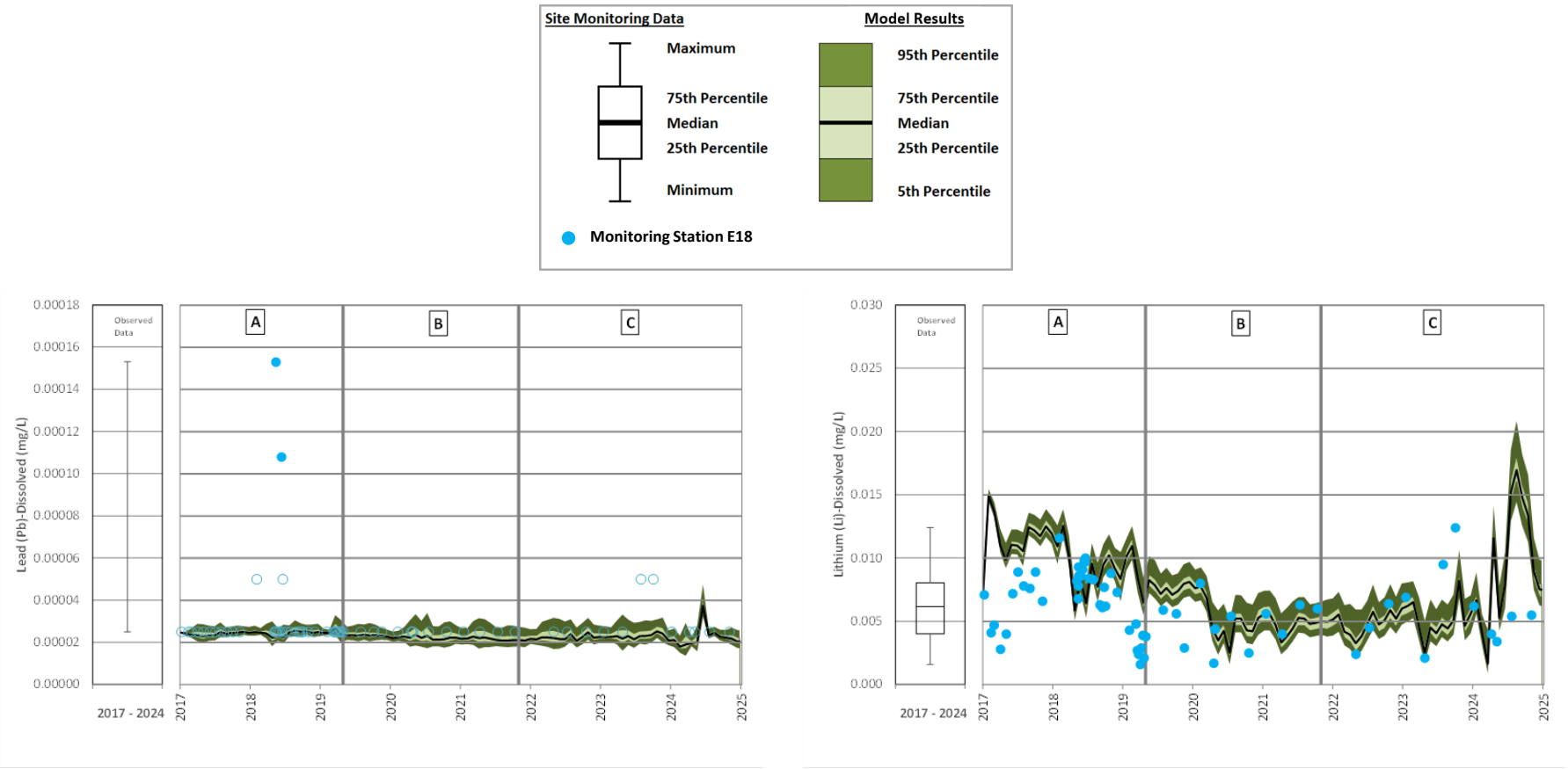
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-71: Central Collection Sump Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

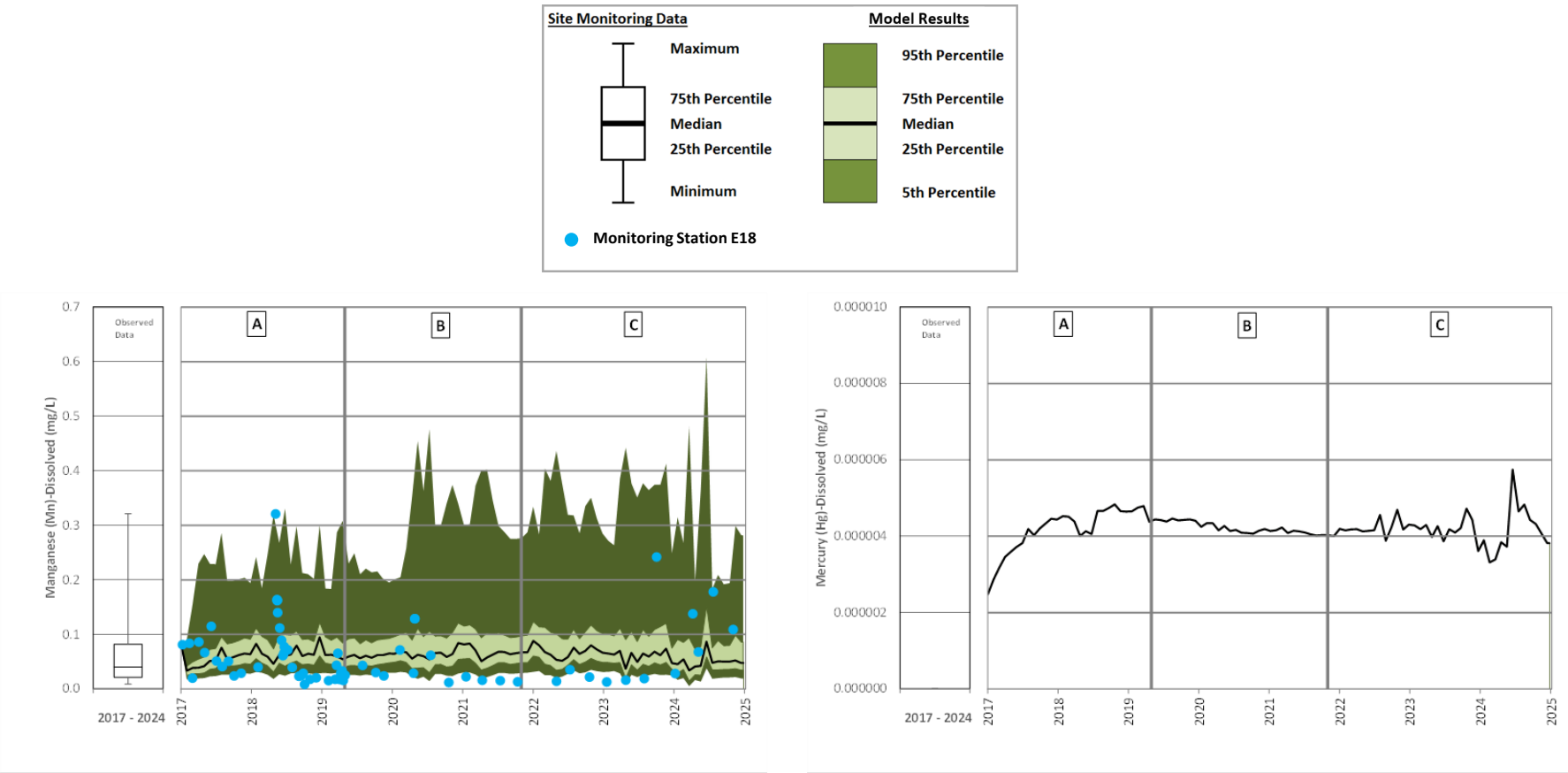
Figure A-72: Central Collection Sump Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

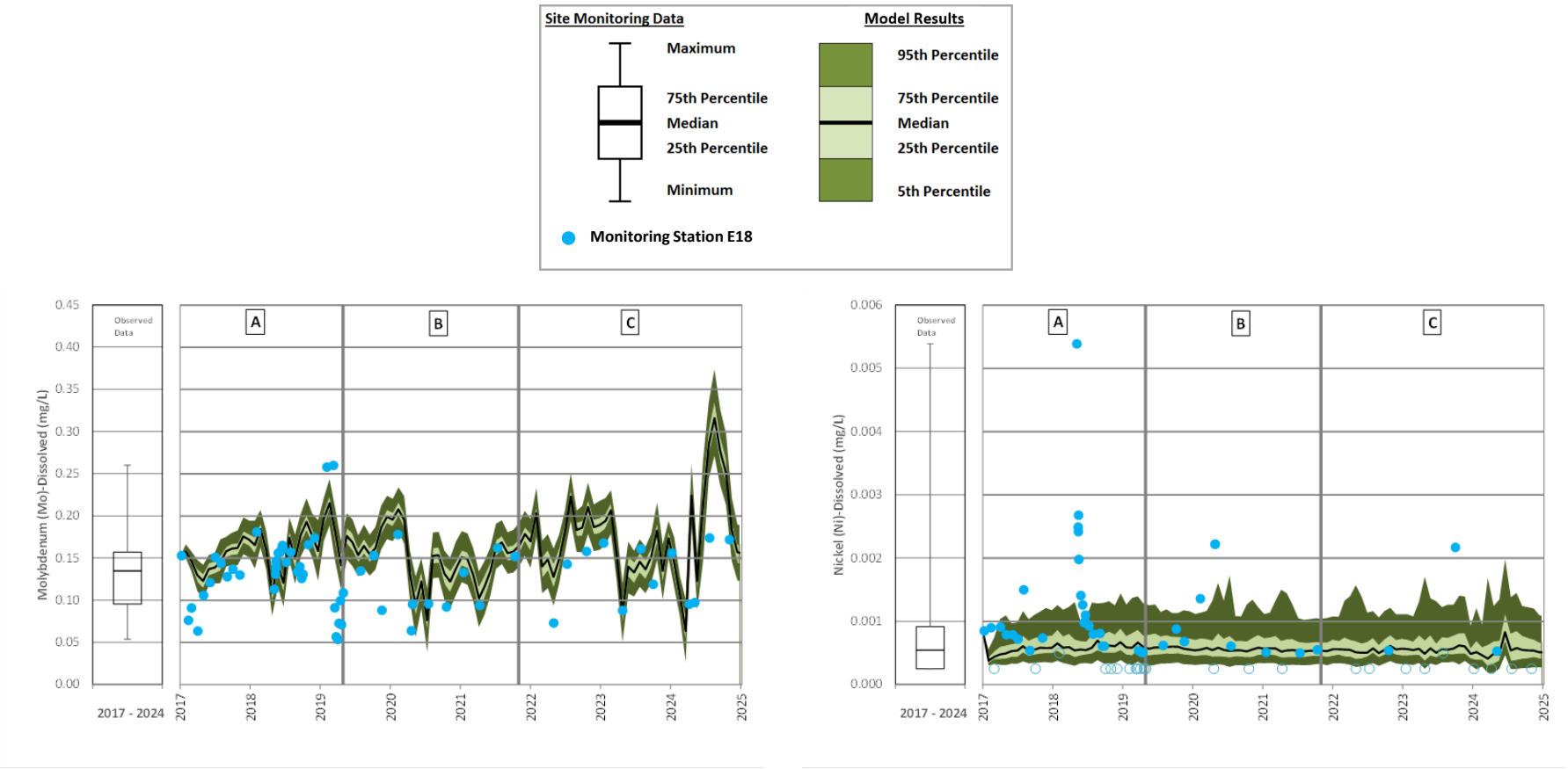
Note: Dissolved lithium concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

Figure A-73: Central Collection Sump Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

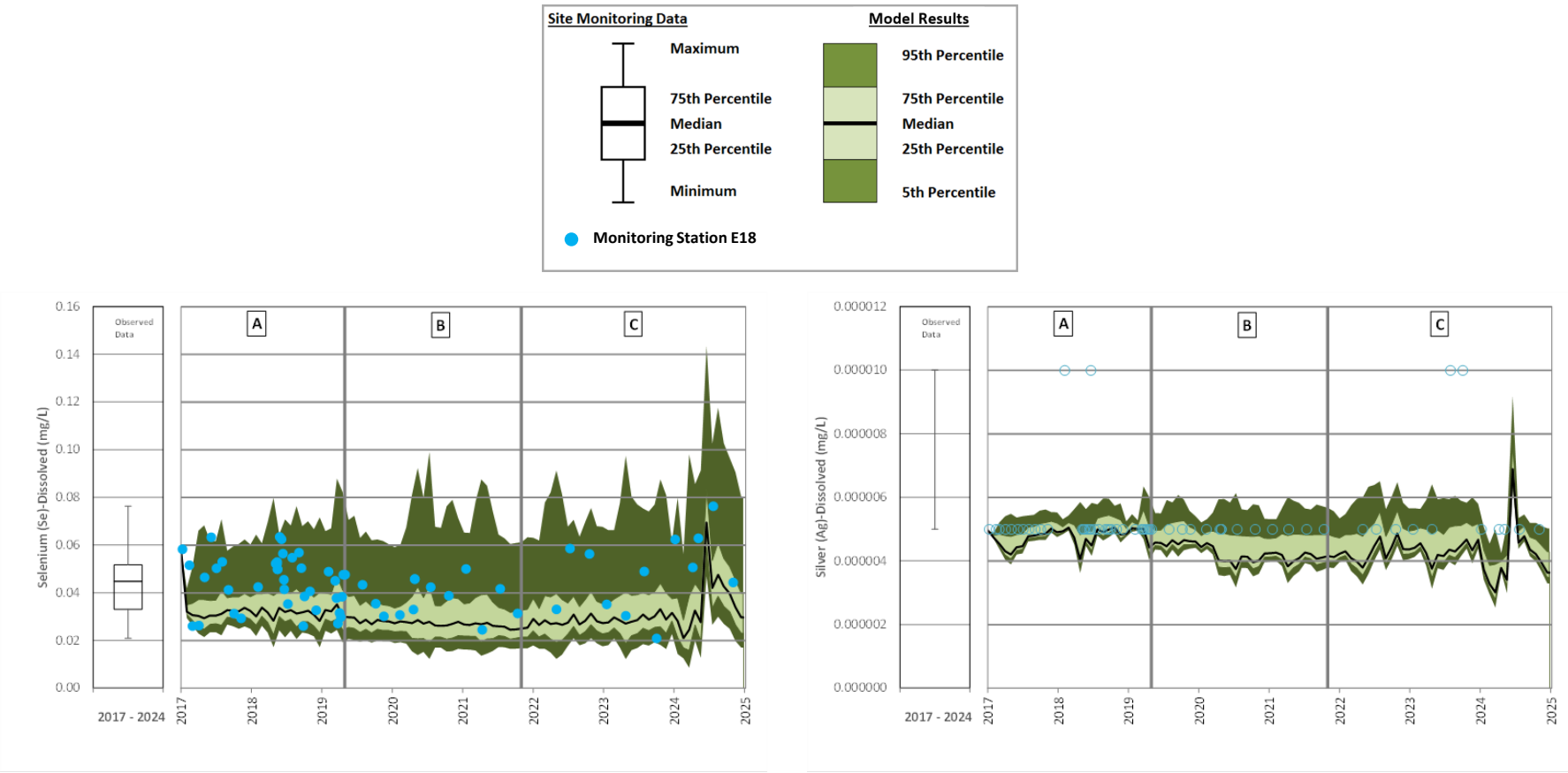
Figure A-74: Central Collection Sump Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

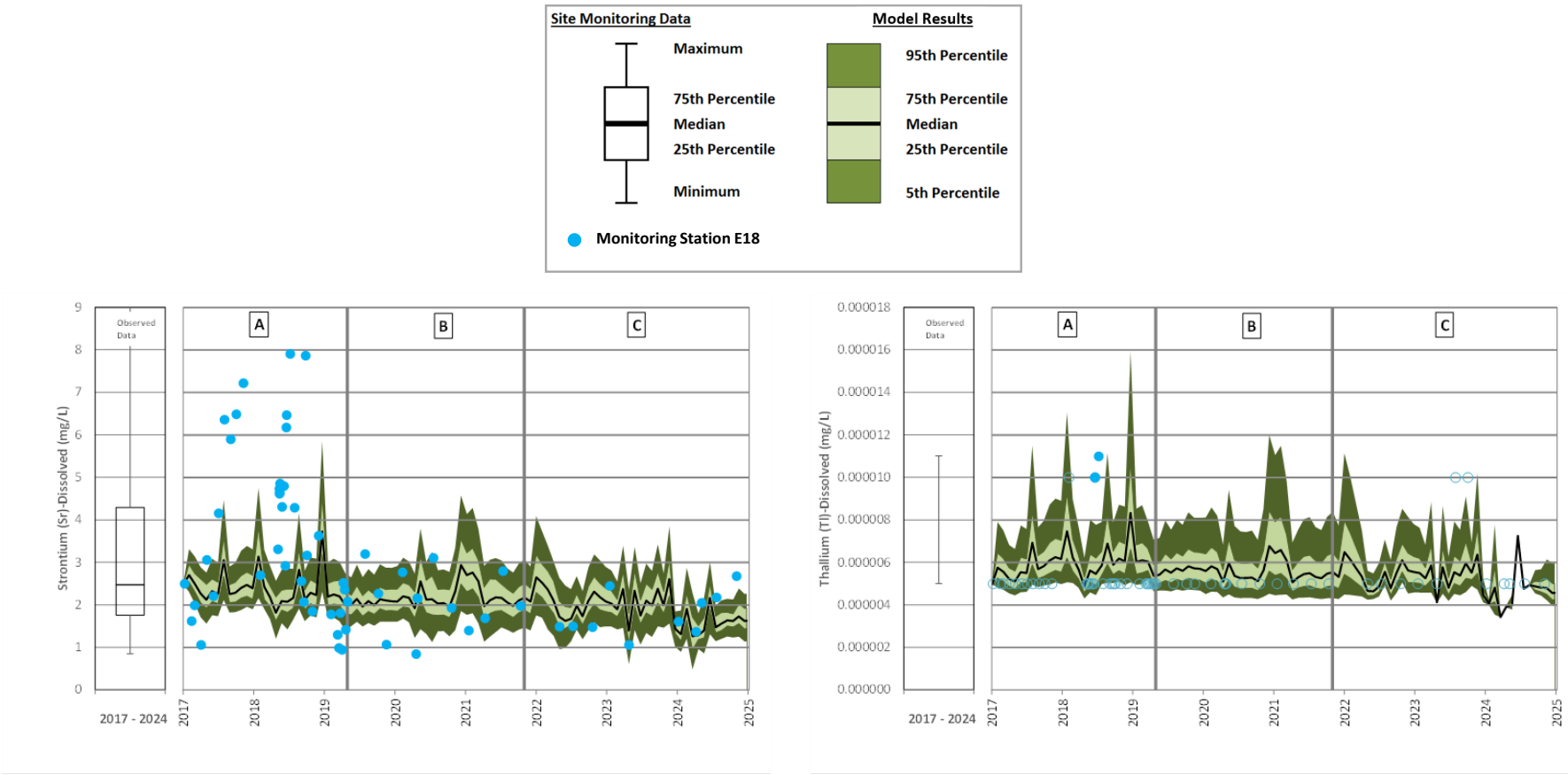
Note: Dissolved molybdenum concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

Figure A-75: Central Collection Sump Calibration – Dissolved Molybdenum and Dissolved Nickel



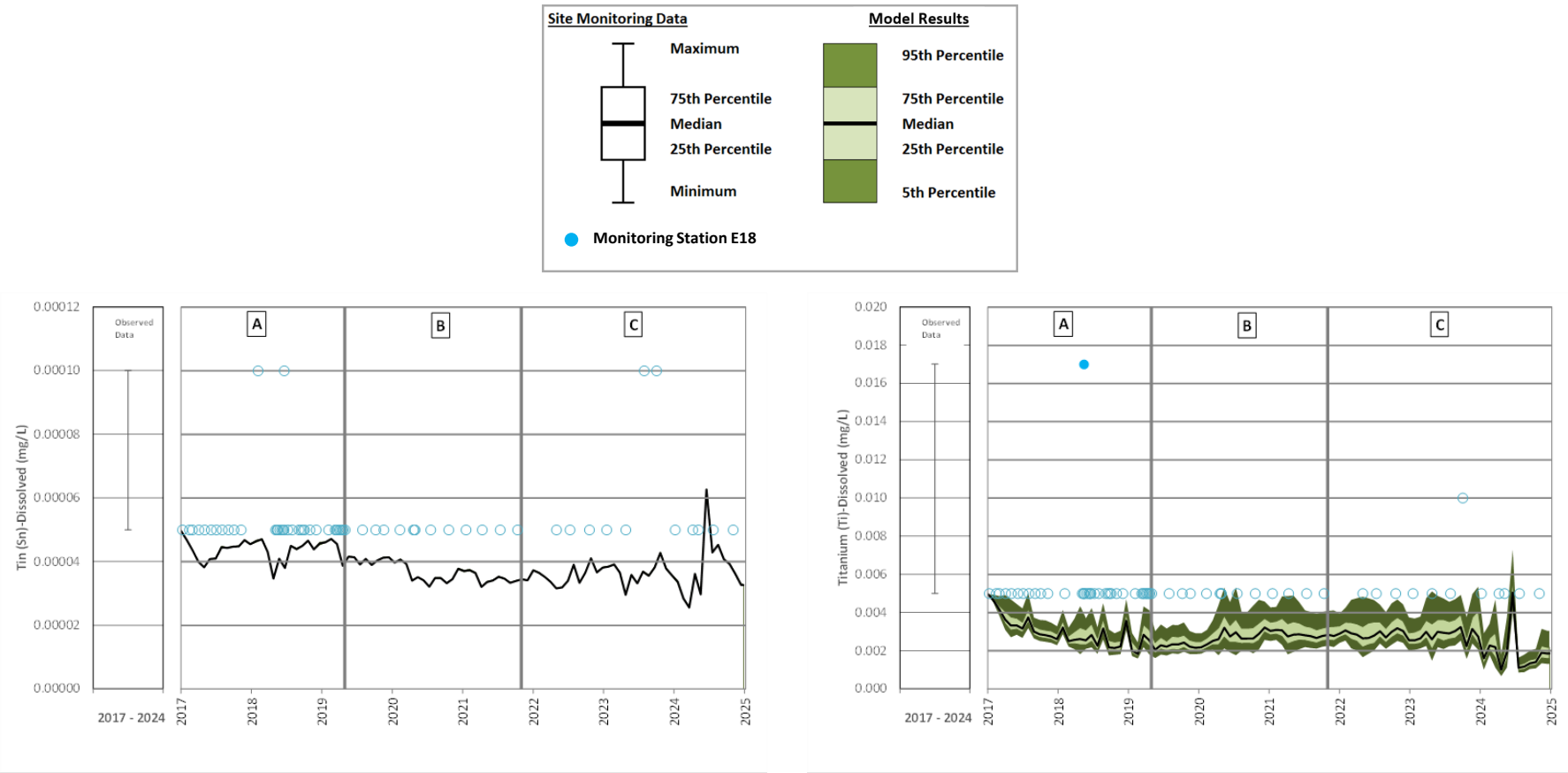
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-76: Central Collection Sump Calibration – Dissolved Selenium and Dissolved Silver



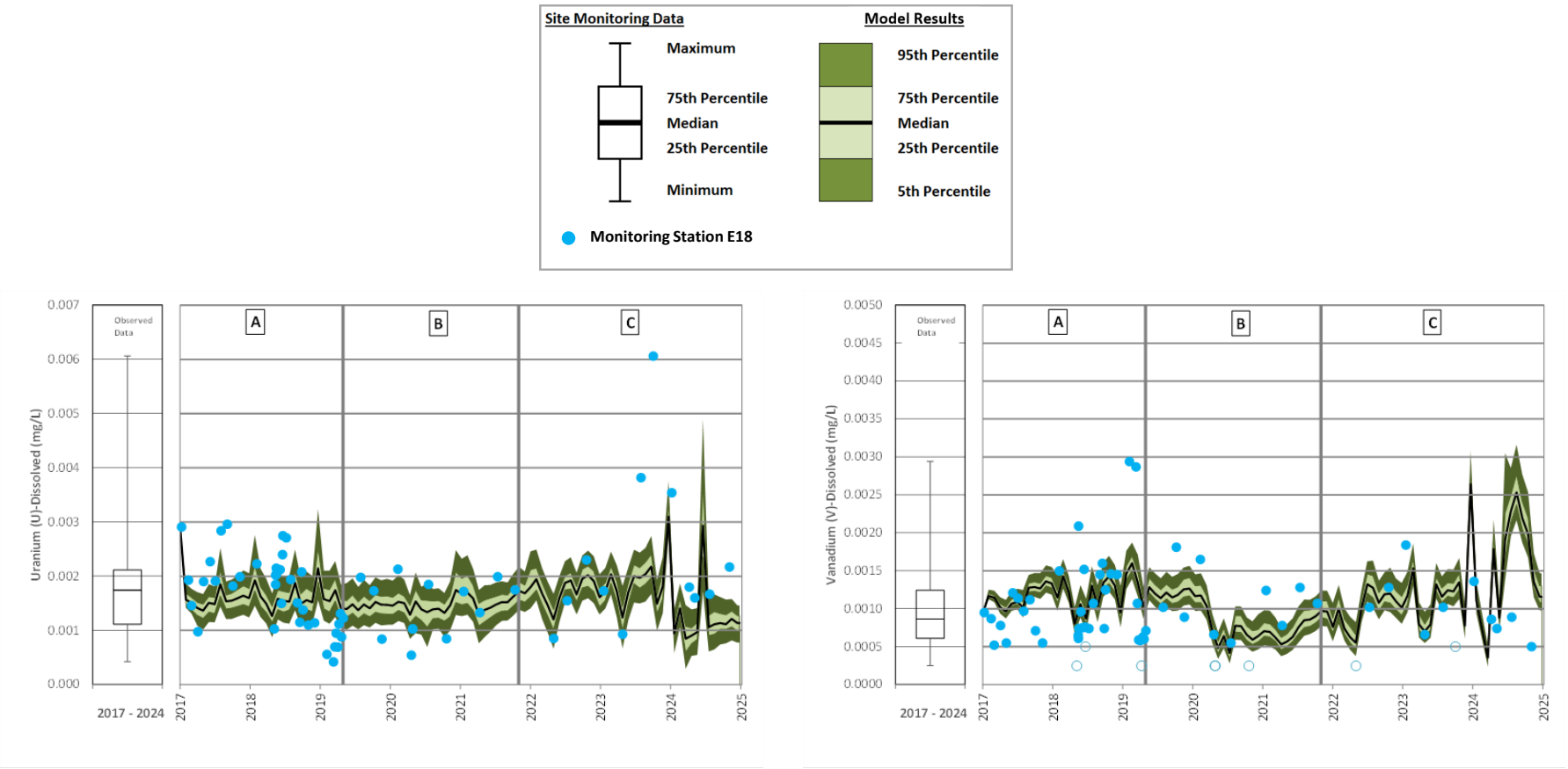
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-77: Central Collection Sump Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

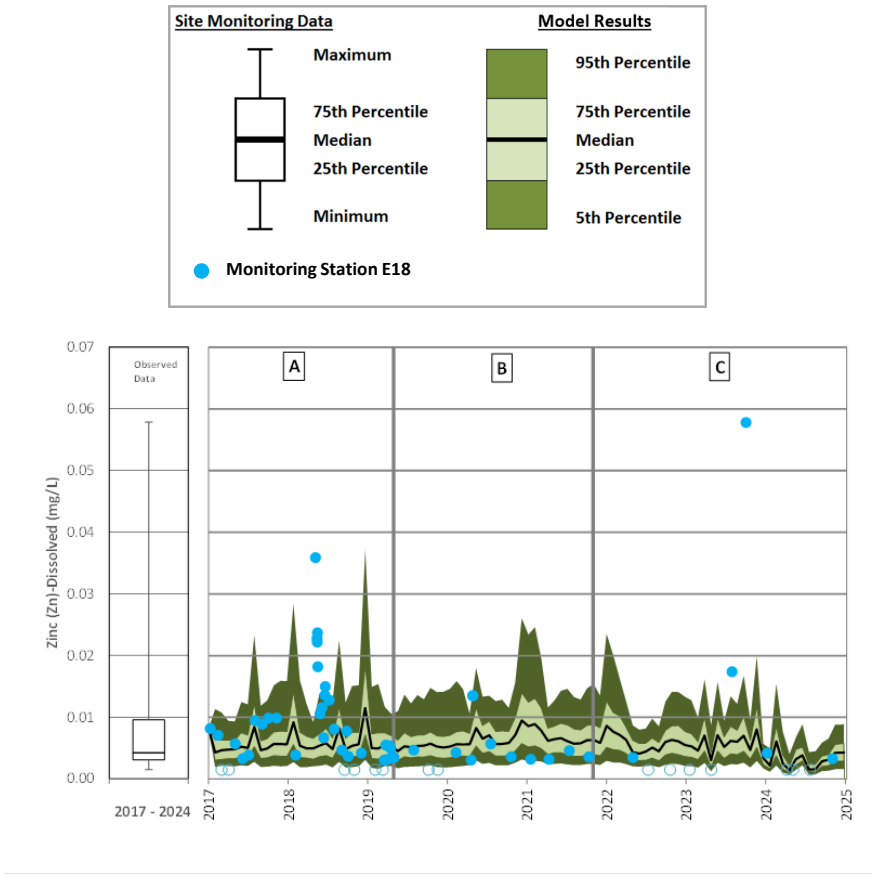
Figure A-78: Central Collection Sump Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved uranium and dissolved vanadium concentrations increase in the Central Collection Sump (CCS) at the start of resumed operations because of water transferred through the mine site from the Tailings Storage Facility and from Cariboo Pit through the following connection: TSF and Cariboo Pit → Mine Drainage Creek Sump → SERDS Ditch → Long Ditch → CCS.

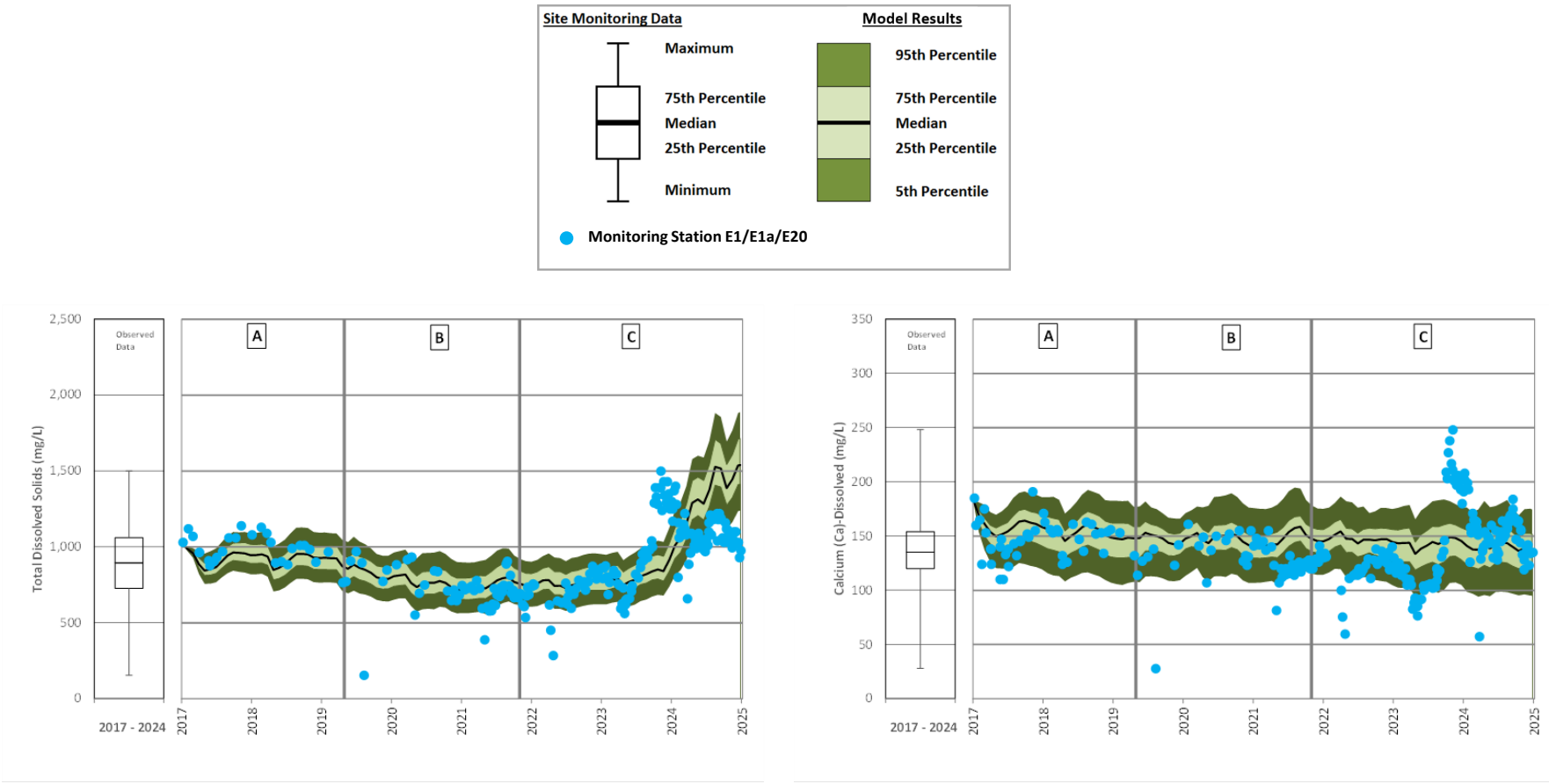
Figure A-79: Central Collection Sump Calibration – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

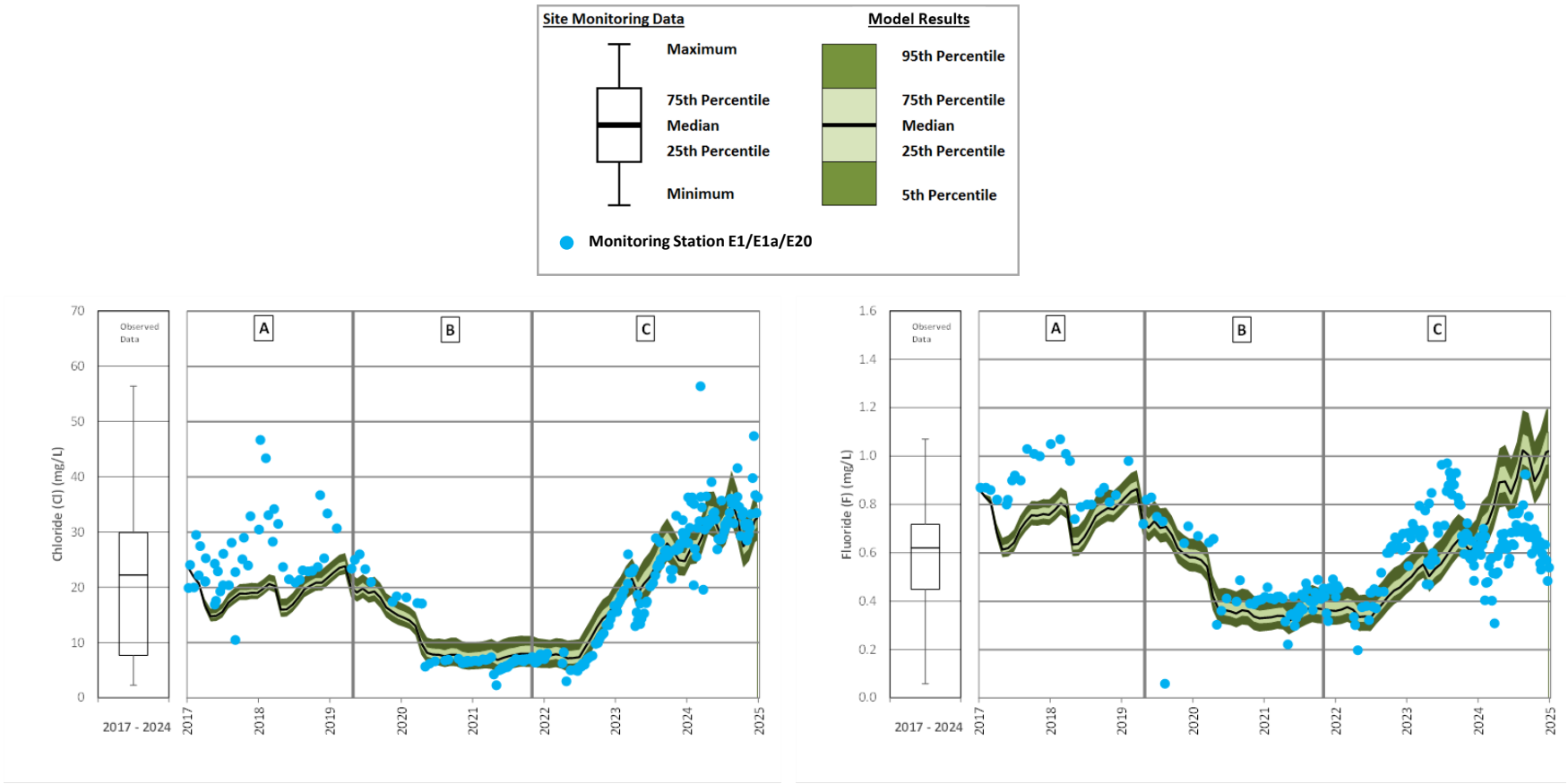
Figure A-80: Central Collection Sump Calibration – Dissolved Zinc

Tailings Storage Facility Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

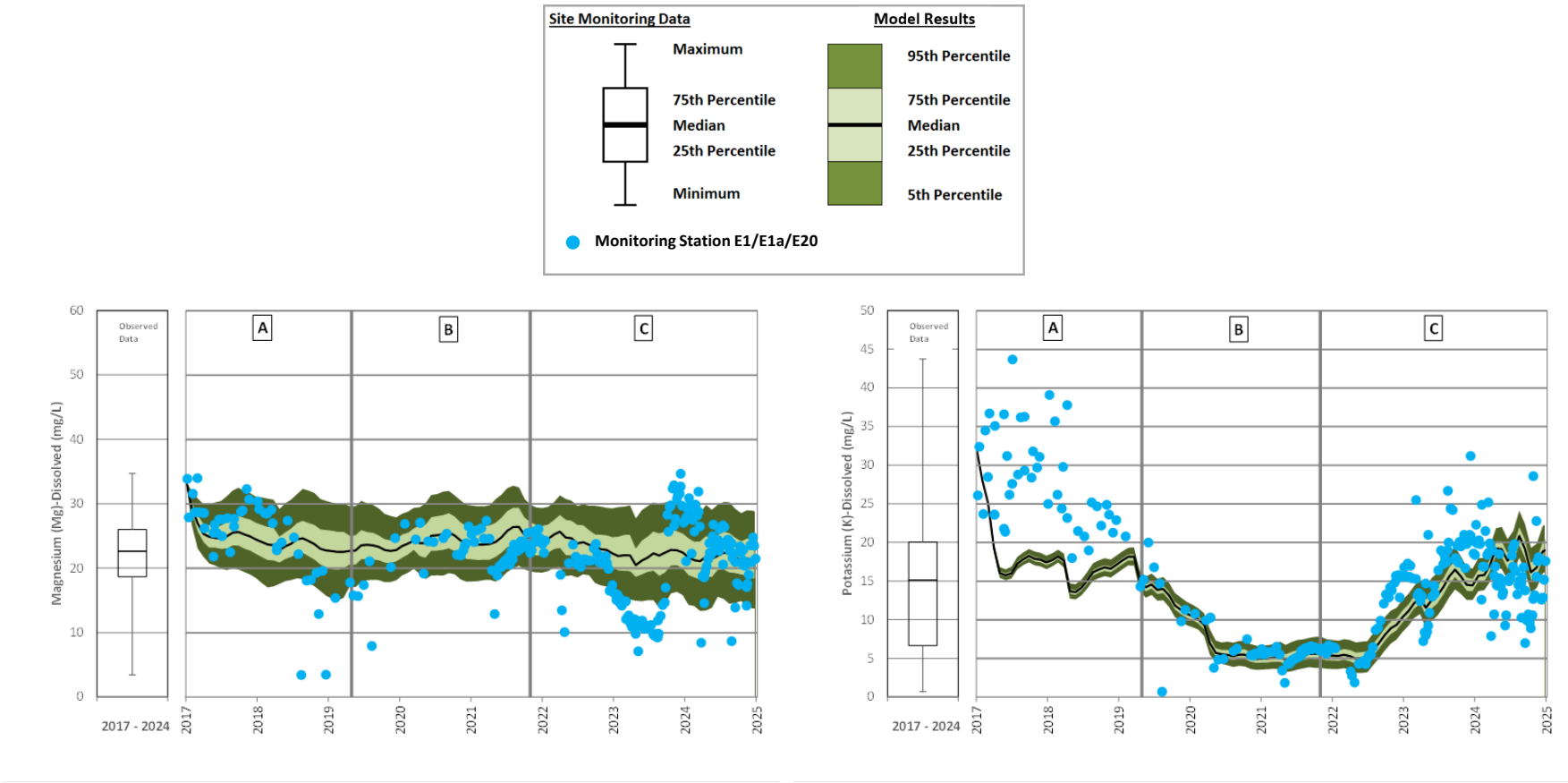
Figure A-81: Tailings Storage Facility Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: The increased chloride and fluoride concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

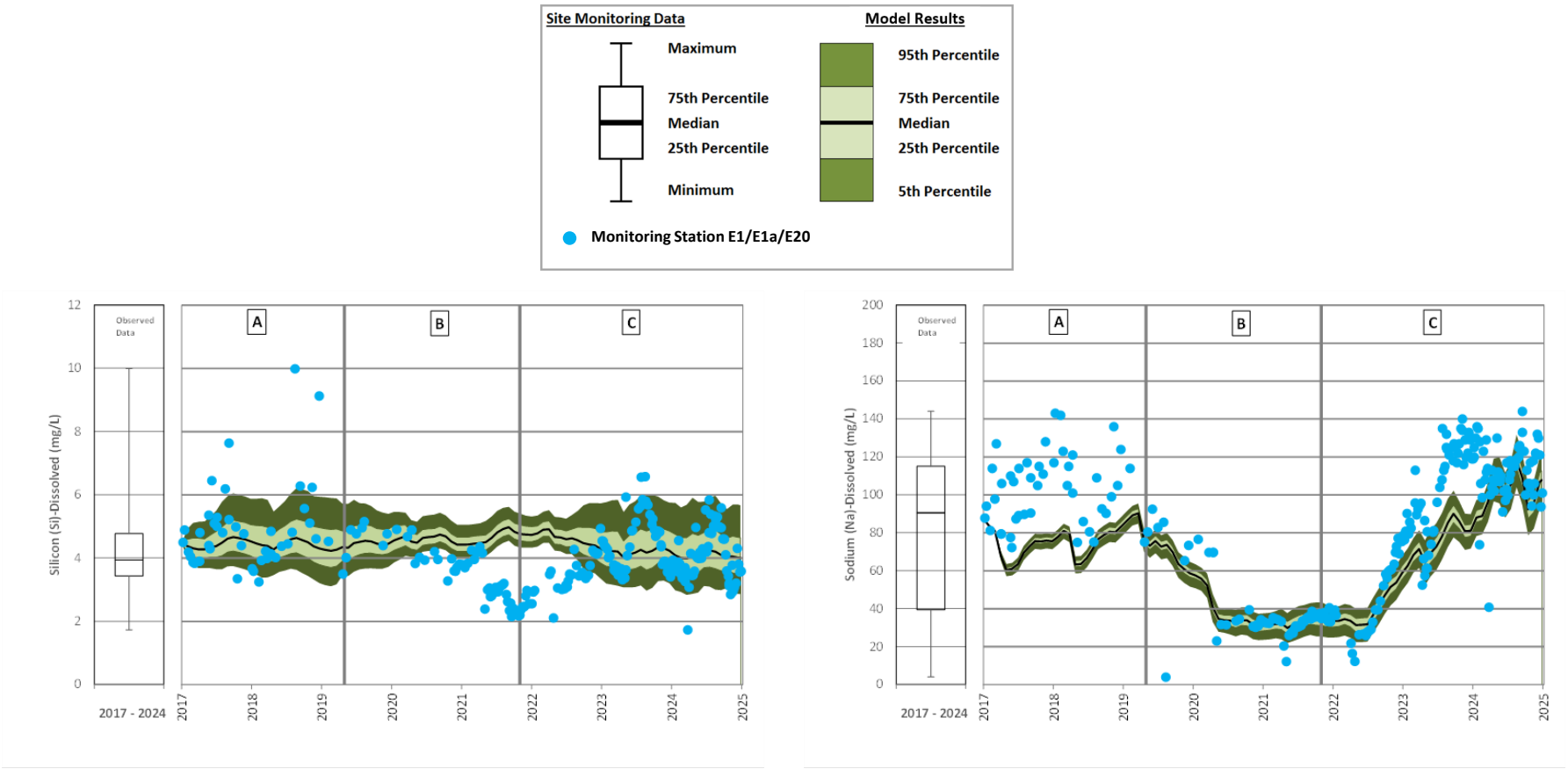
Figure A-82: Tailings Storage Facility Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: The increased potassium concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

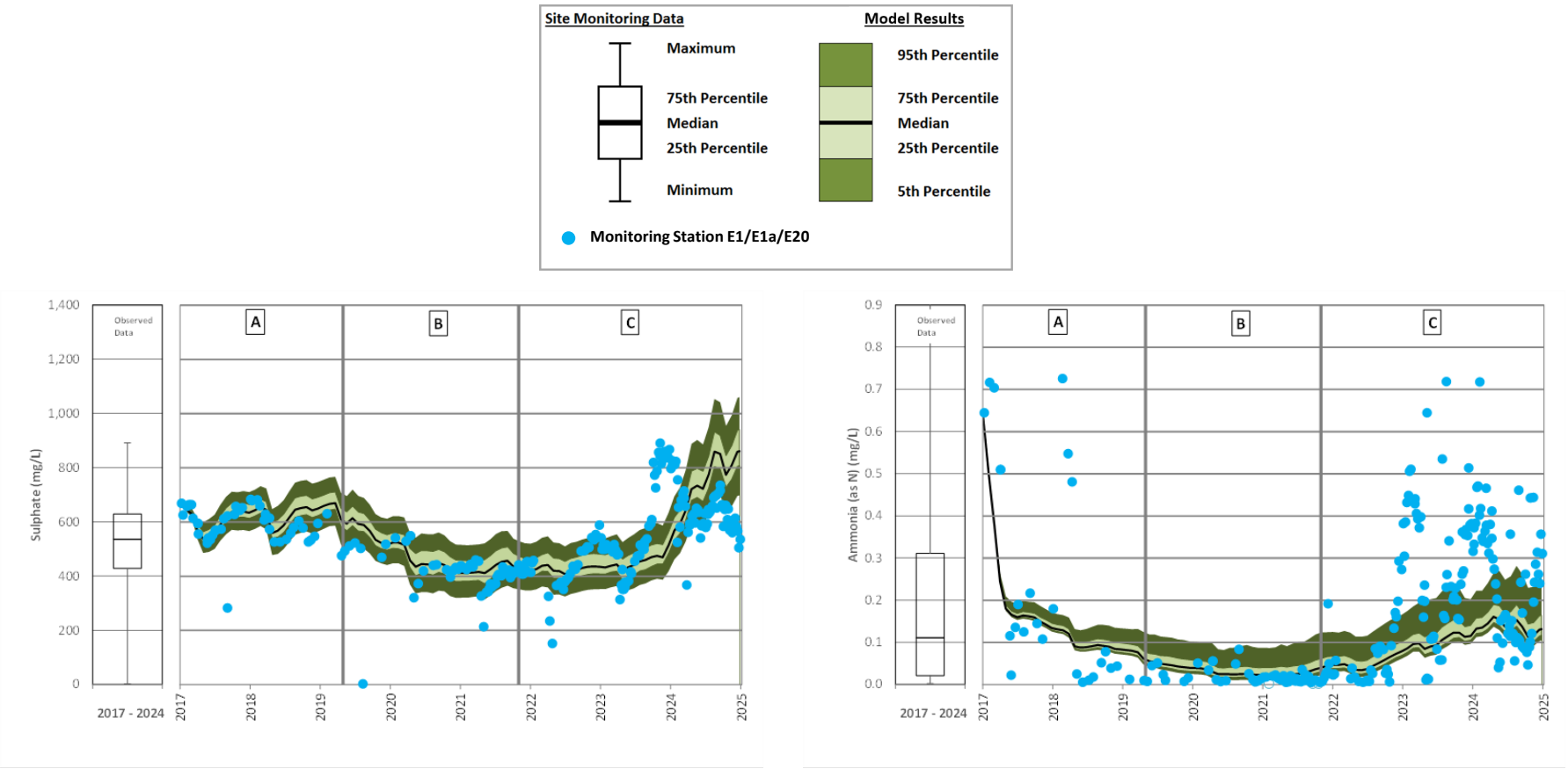
Figure A-83: Tailings Storage Facility Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: The increased sodium concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

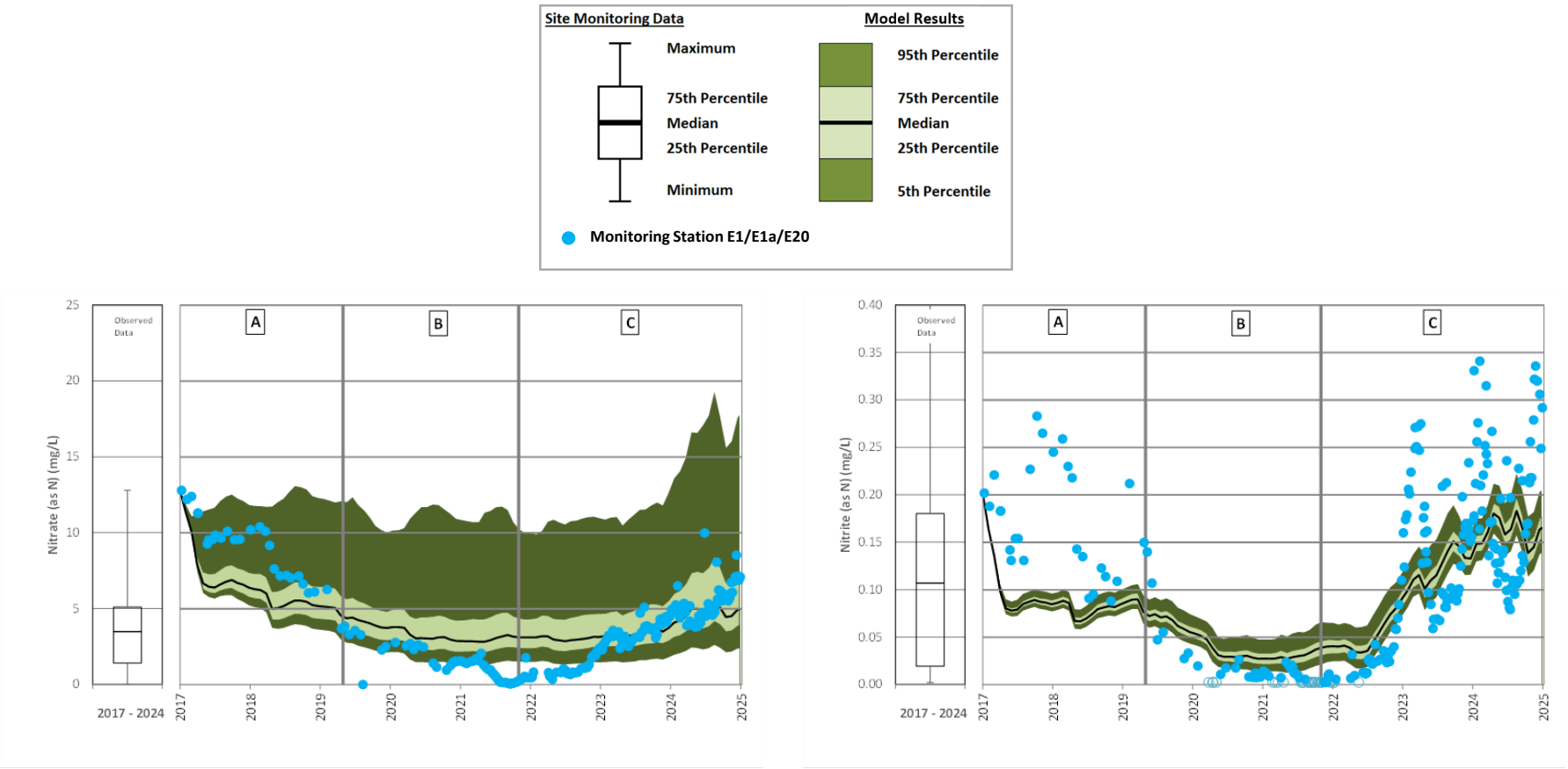
Figure A-84: Tailings Storage Facility Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: The increased sulphate and total ammonia concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

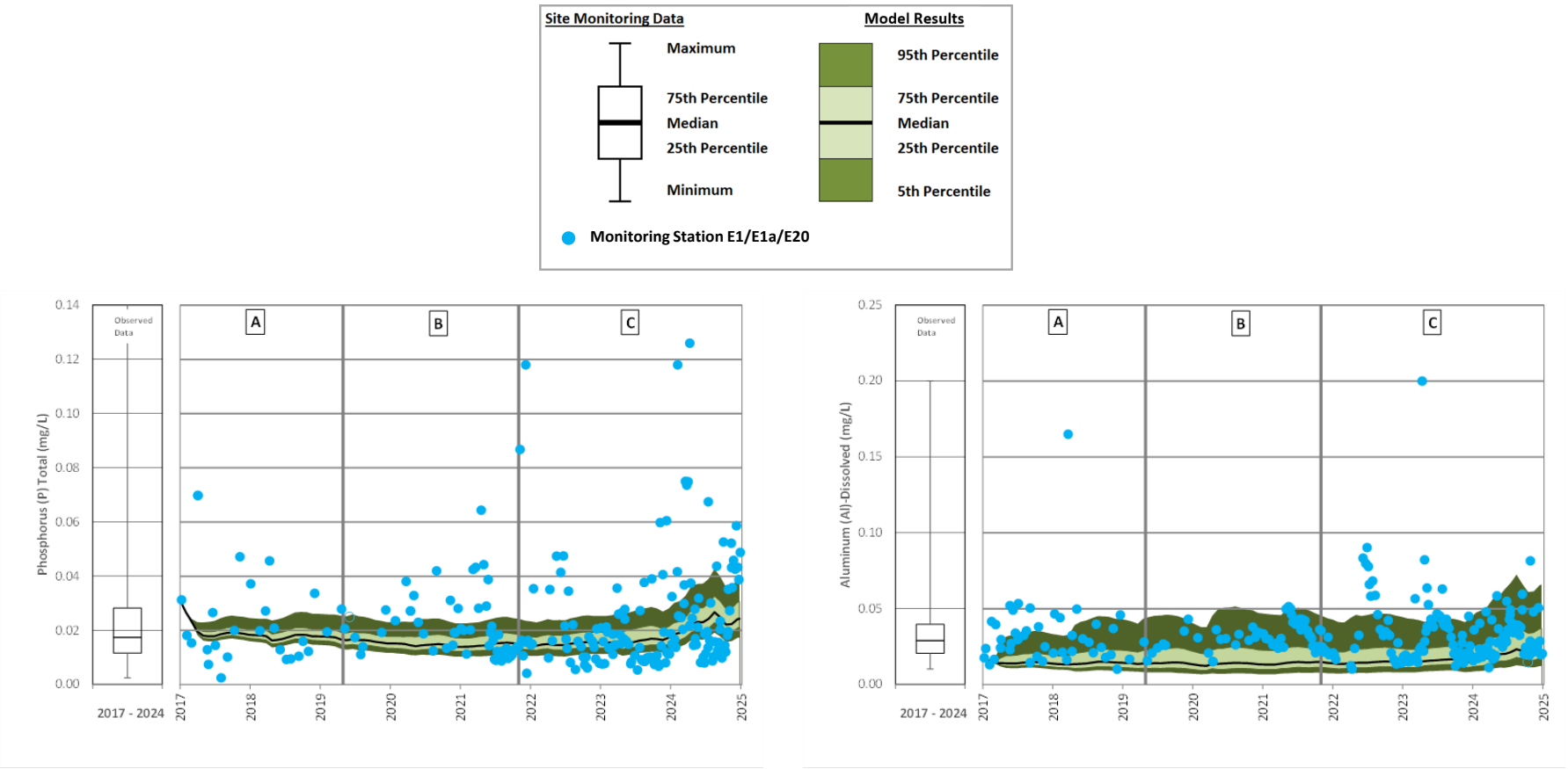
Figure A-85: Tailings Storage Facility Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

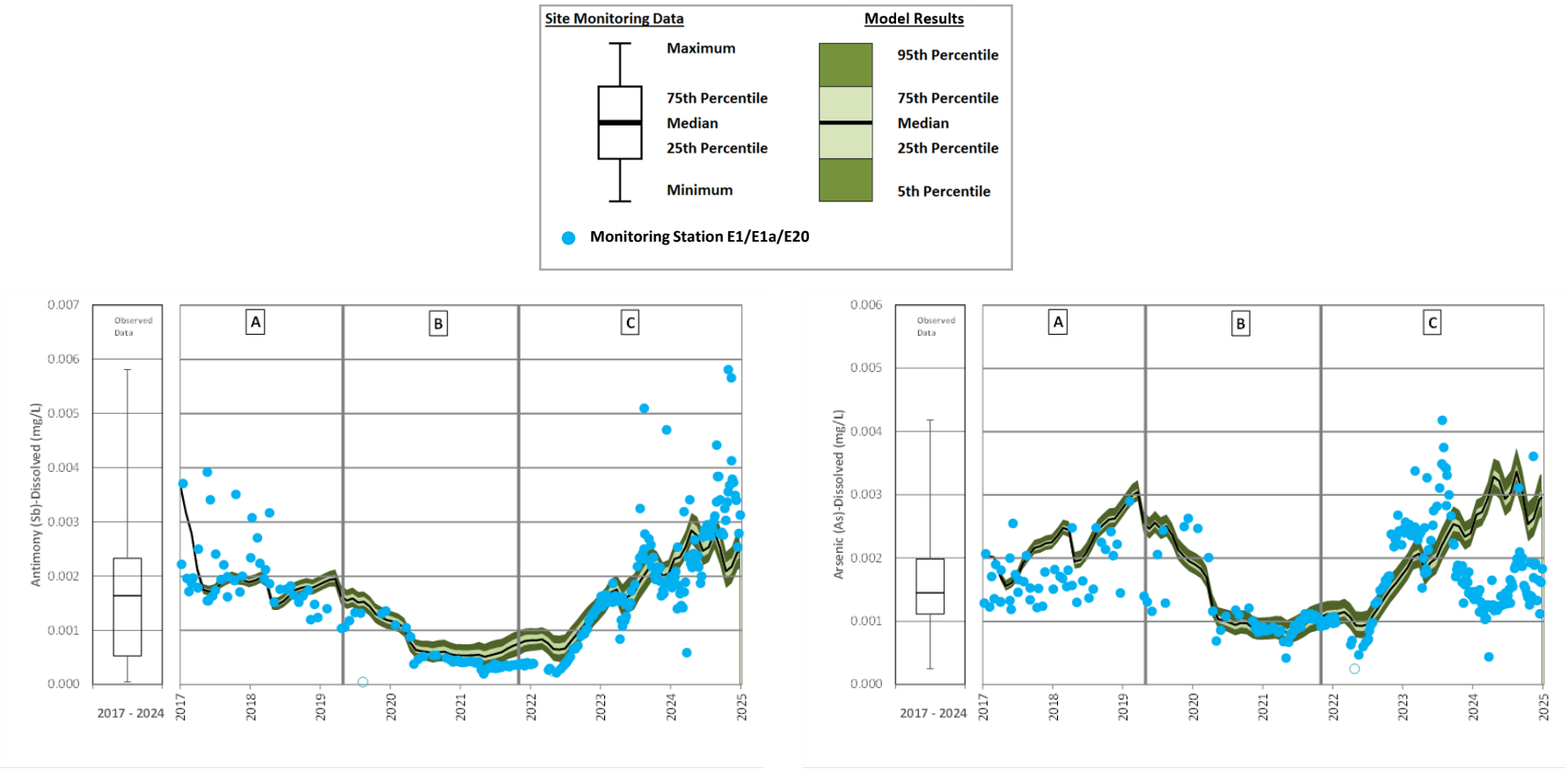
Note: The increased nitrite concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

Figure A-86: Tailings Storage Facility Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations

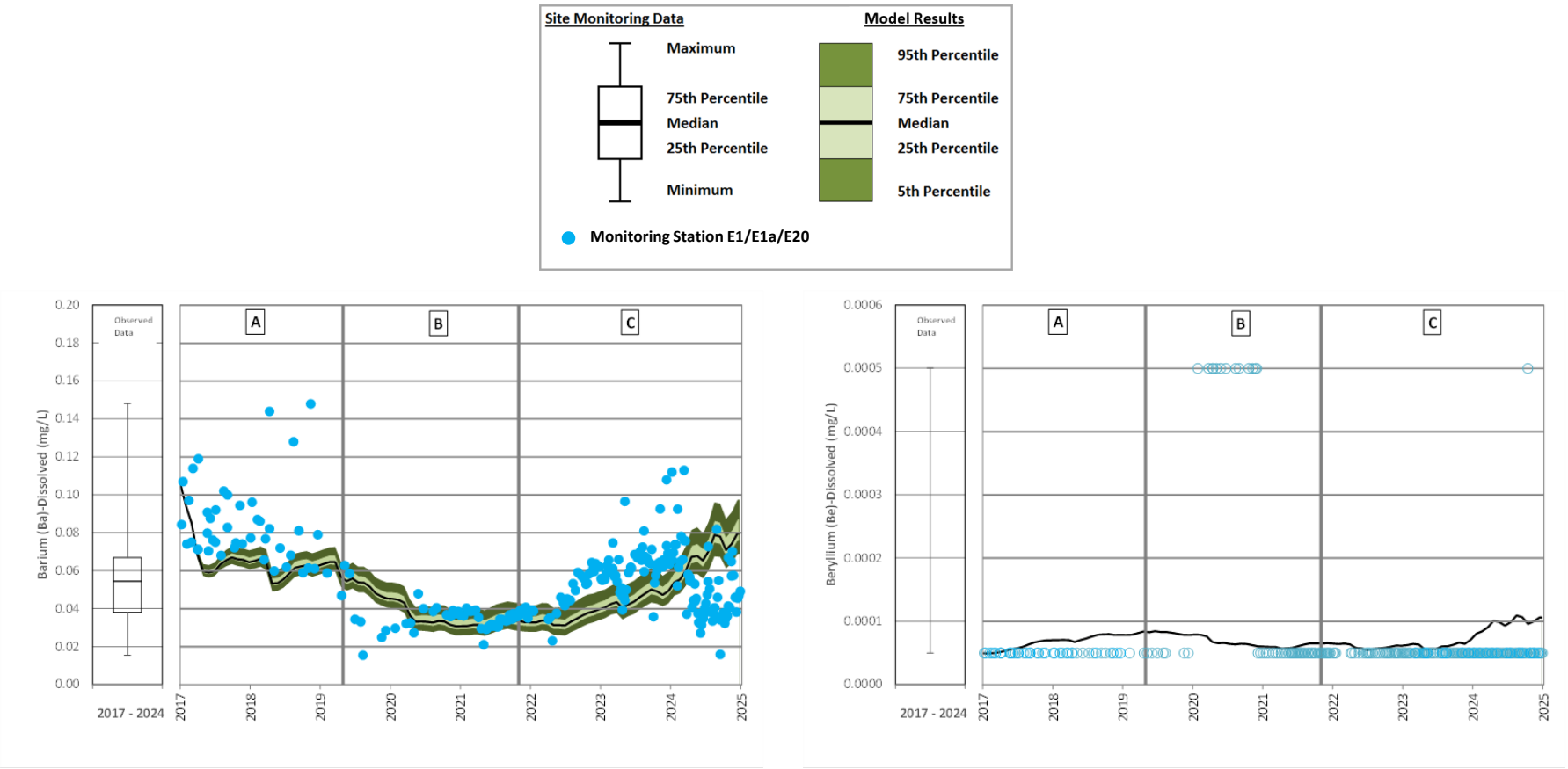
Figure A-87: Tailings Storage Facility Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The increased dissolved antimony and dissolved arsenic concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

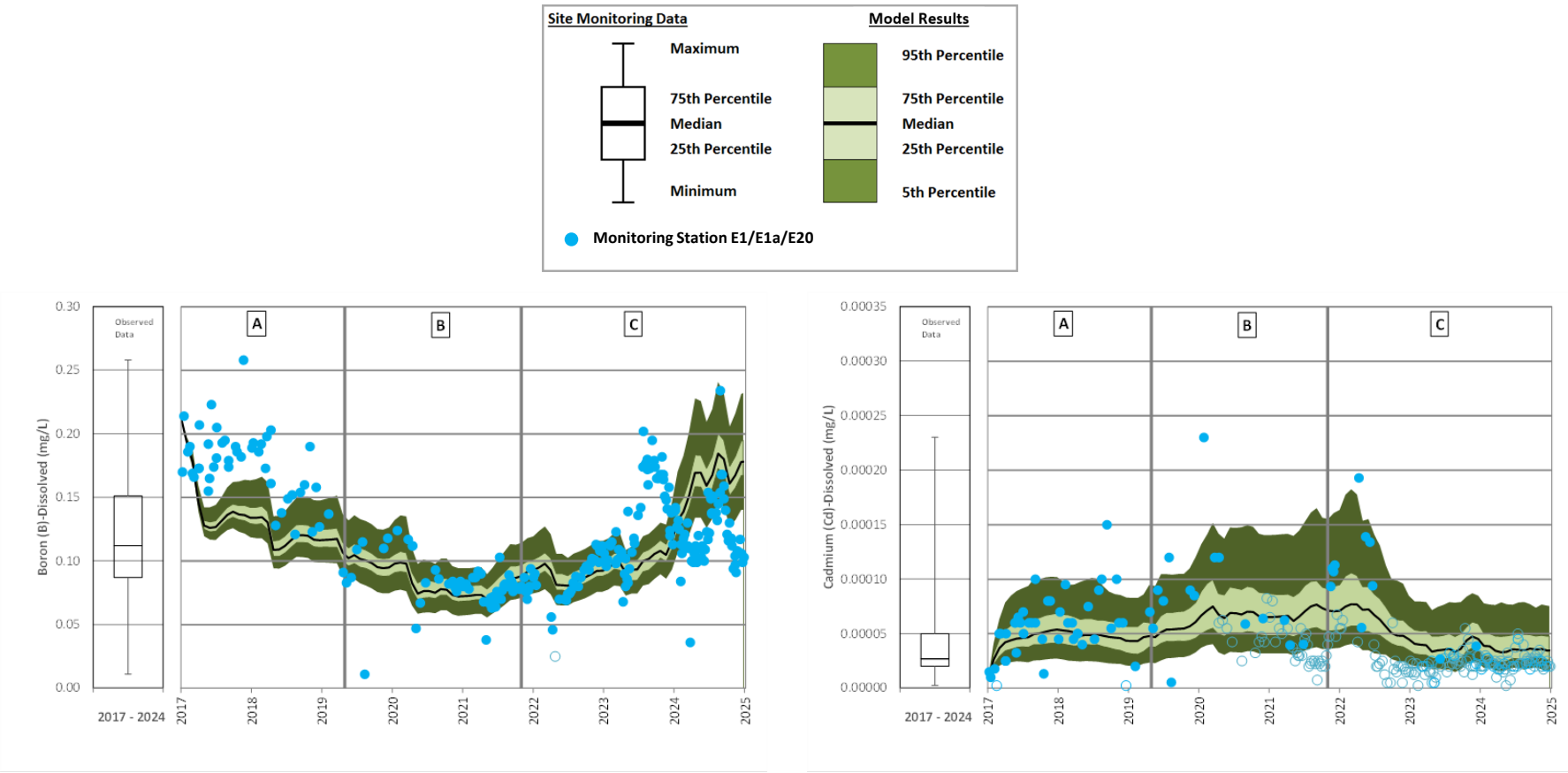
Figure A-88: Tailings Storage Facility Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The increased dissolved barium concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

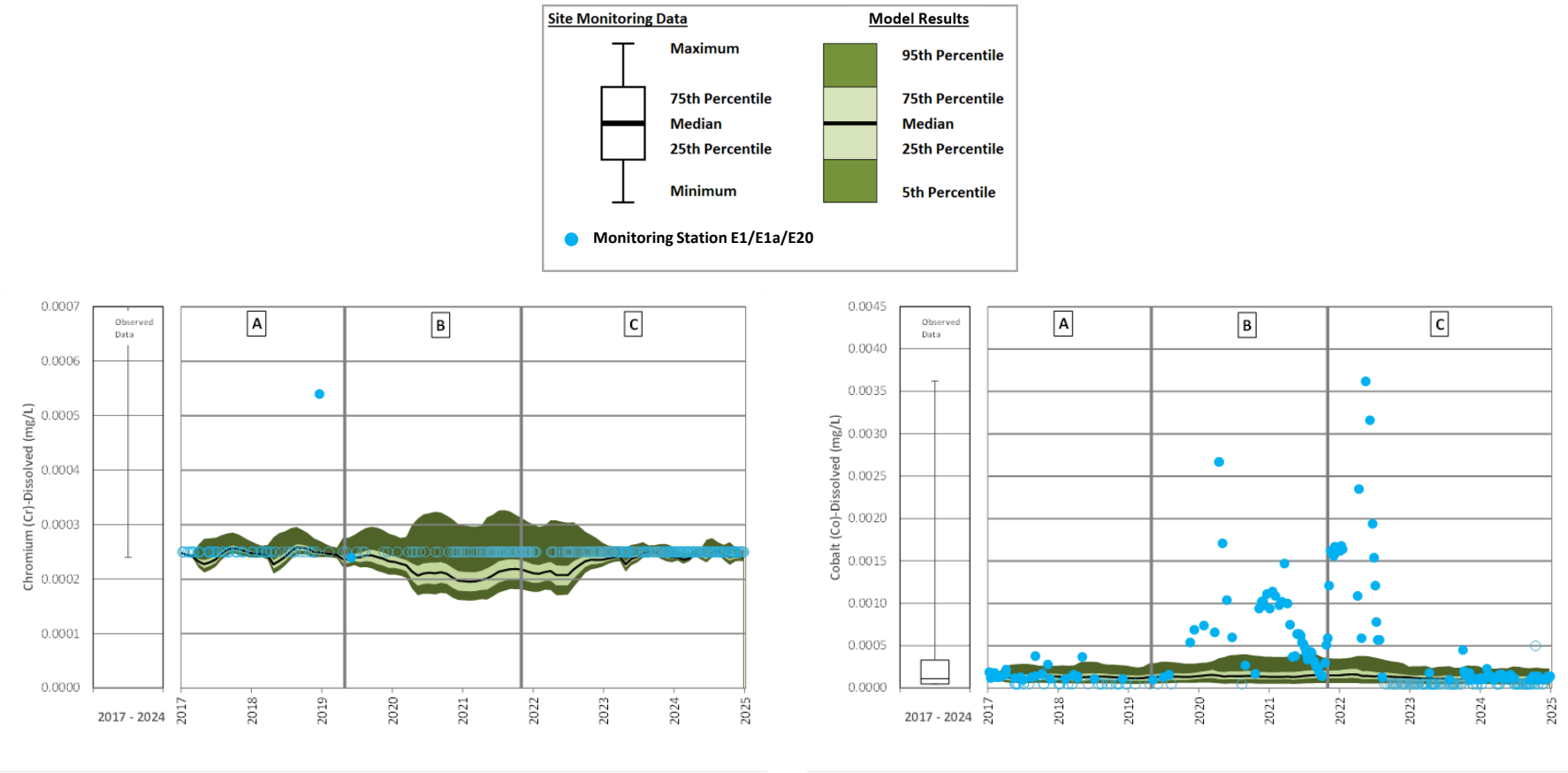
Figure A-89: Tailings Storage Facility Calibration – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The increased dissolved boron concentrations in the Tailings Storage Facility (TSF) are caused by tailings deposition when operations resumed. Dissolved boron concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the TSF. The source of the increased concentrations in the monitoring data for dissolved boron is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

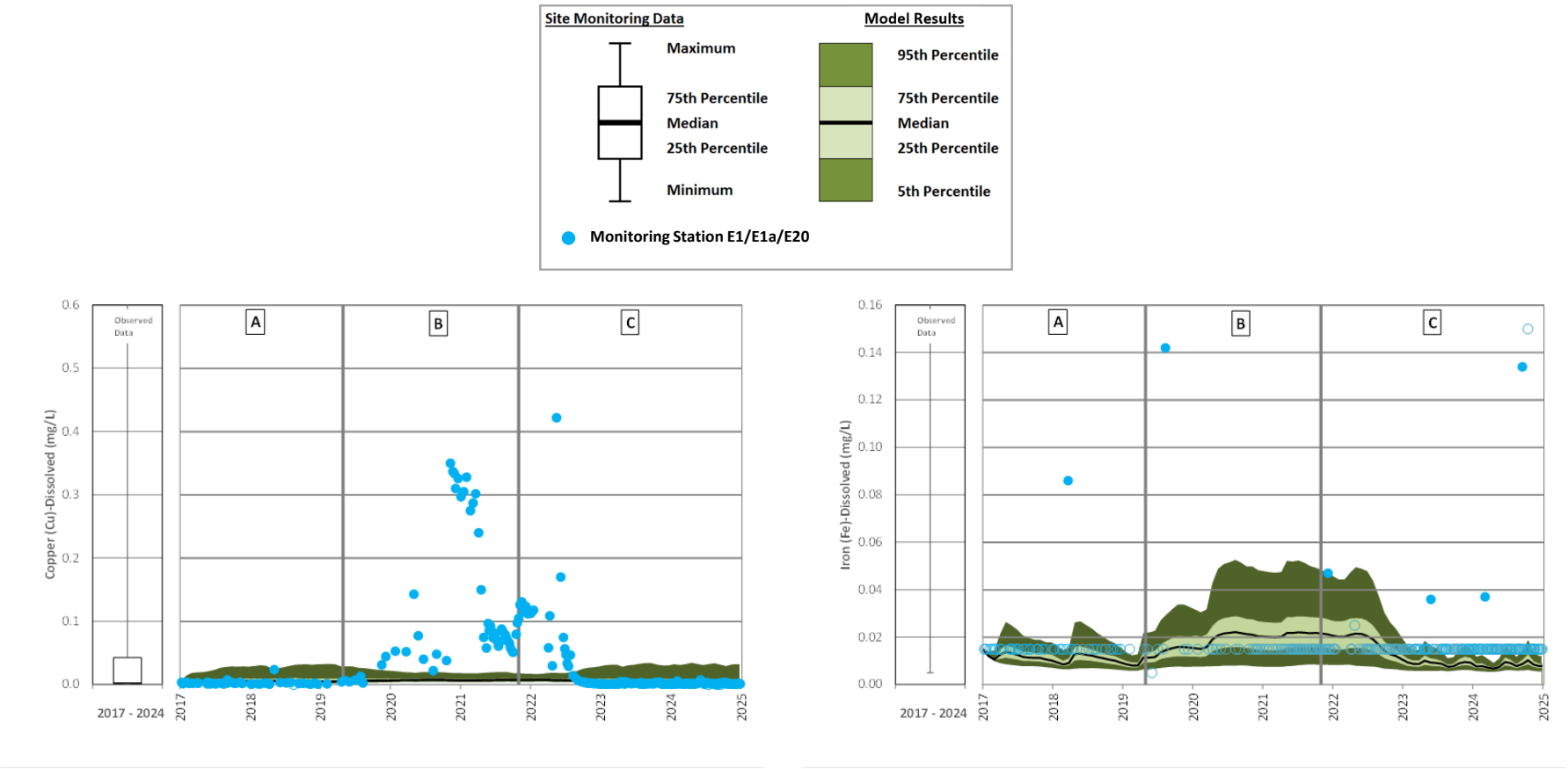
Figure A-90: Tailings Storage Facility Calibration – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The source of increased cobalt concentrations in 2019, 2020 and 2021 monitoring data is due to the discharge of leachate from the onsite test heap leach facility to the Tailings Storage Facility. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process.

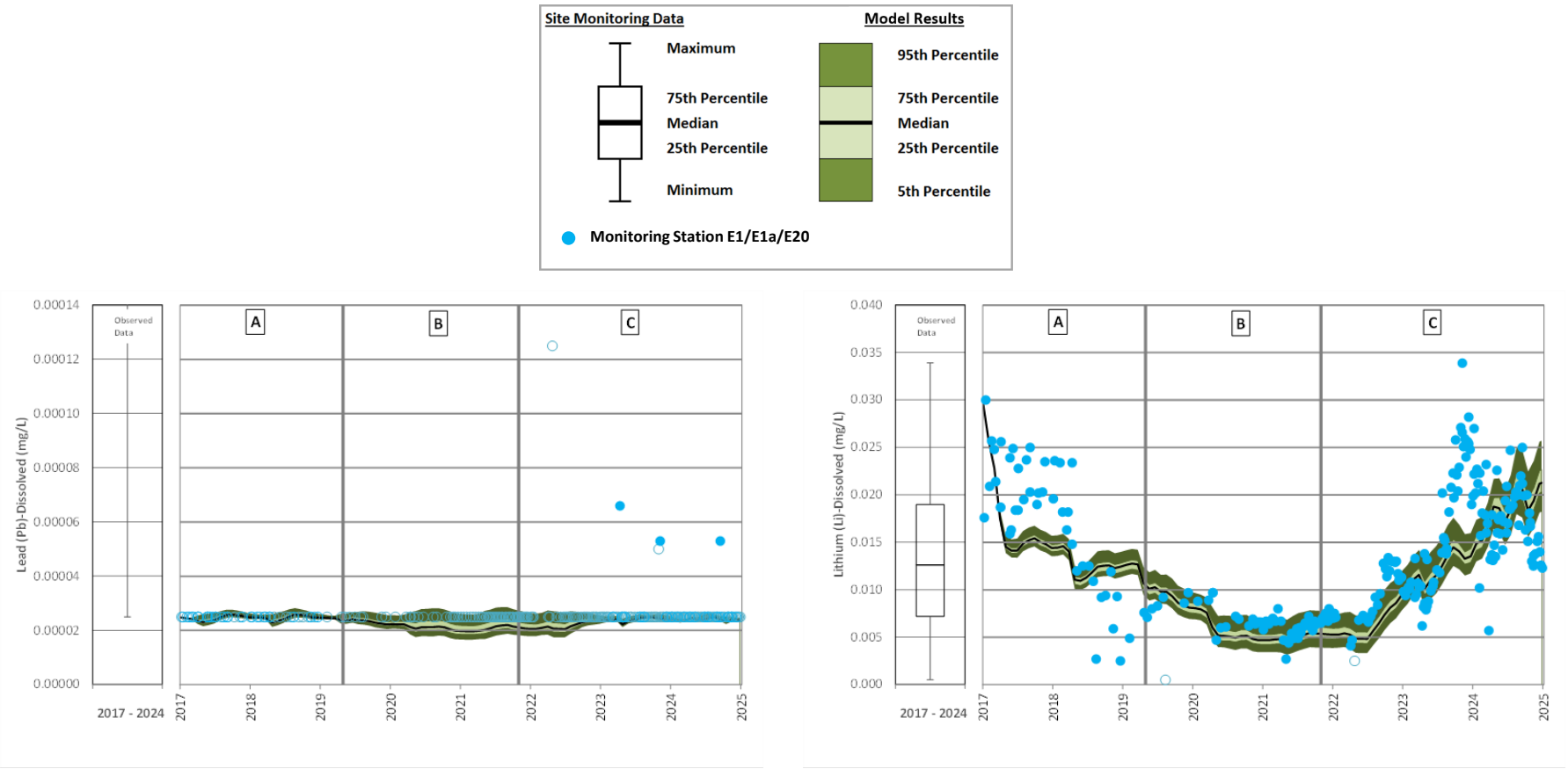
Figure A-91: Tailings Storage Facility Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The source of increased copper concentrations in 2019, 2020 and 2021 monitoring data is due to the discharge of leachate from the onsite test heap leach facility to the Tailings Storage Facility. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process.

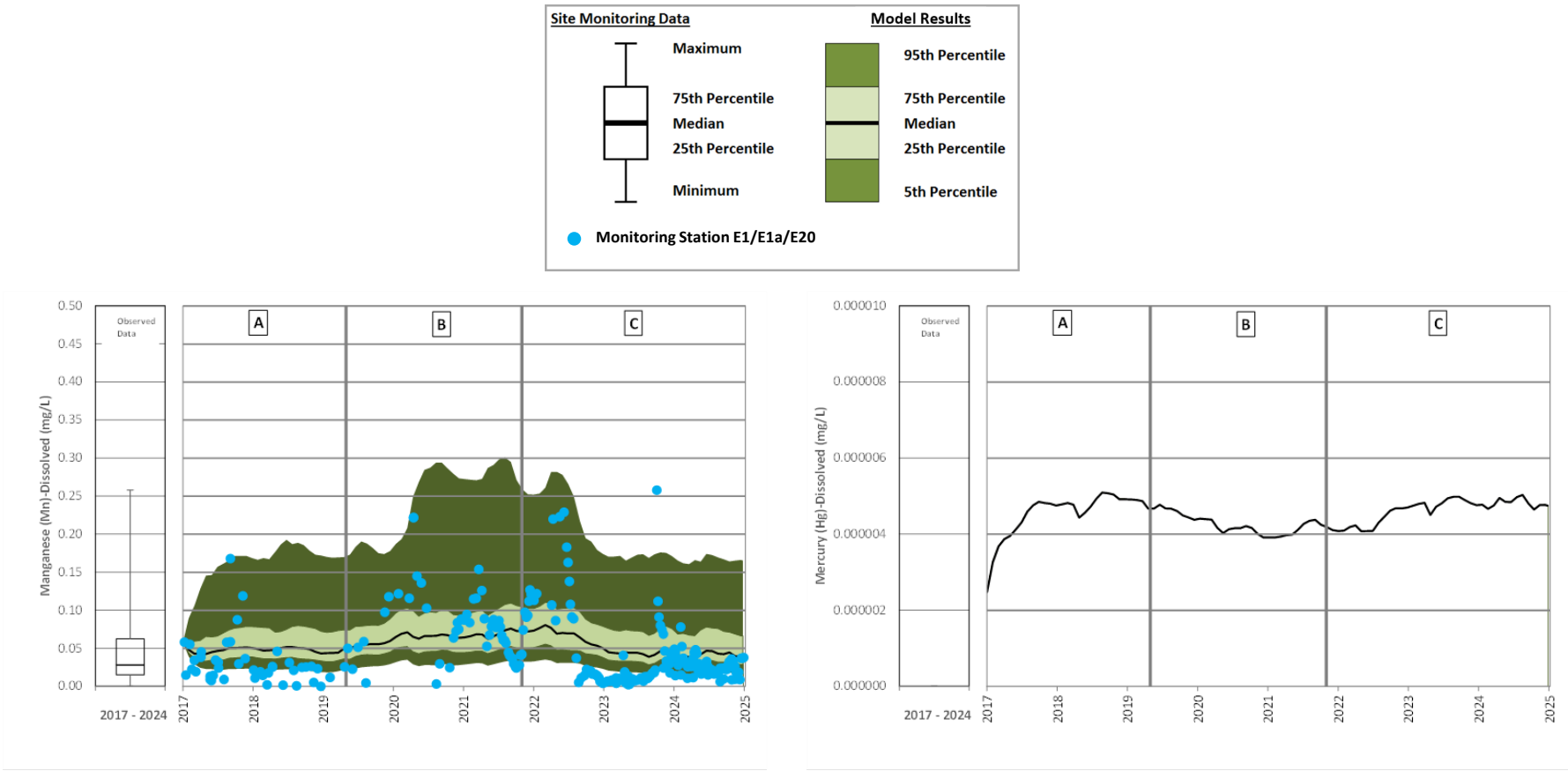
Figure A-92: Tailings Storage Facility Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

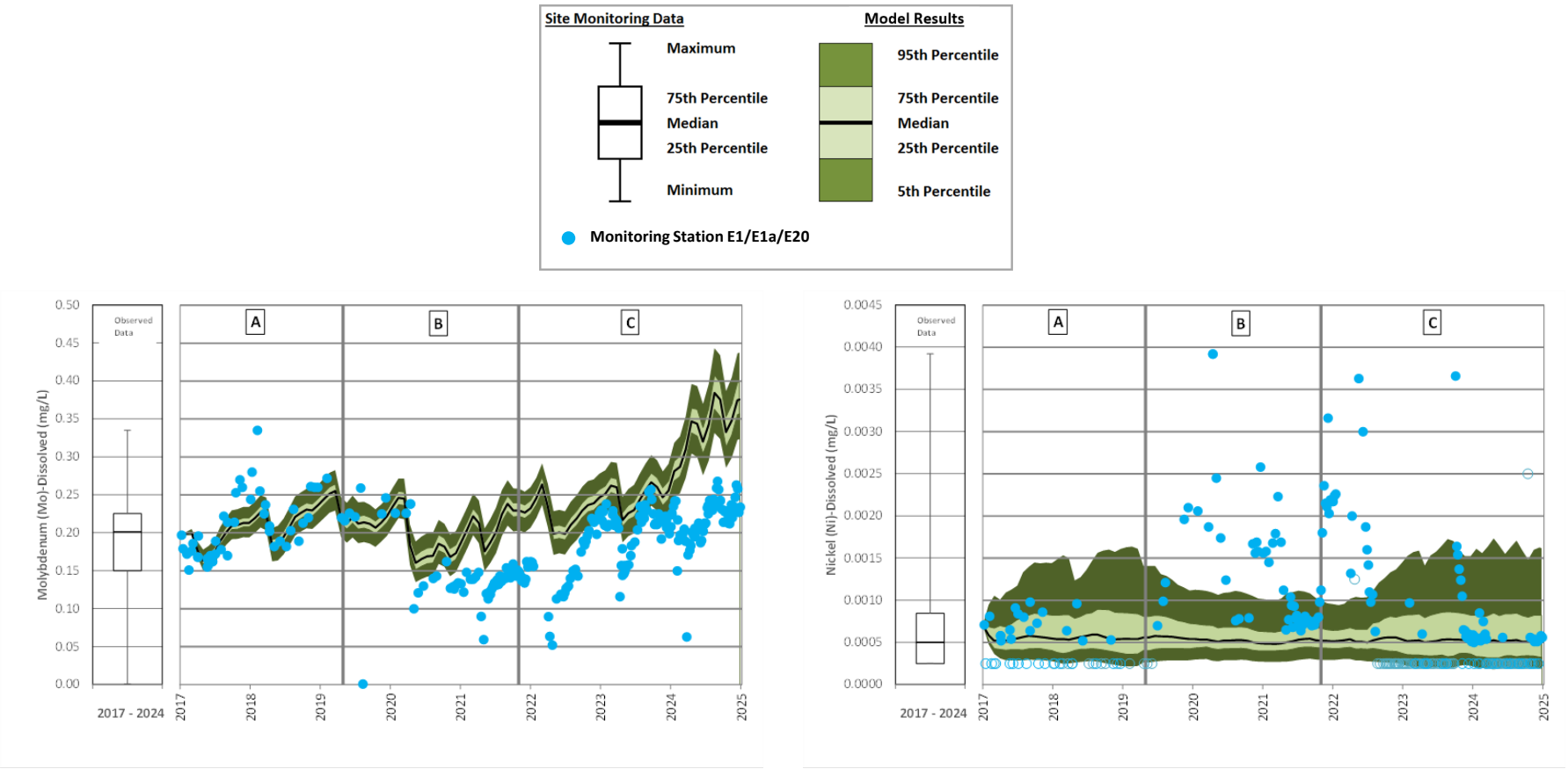
Note: The increased dissolved lithium concentrations in the Tailings Storage Facility (TSF) are caused by tailings deposition when operations resumed. Dissolved lithium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the TSF. The source of the increased concentrations in the monitoring data for dissolved lithium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure A-93: Tailings Storage Facility Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

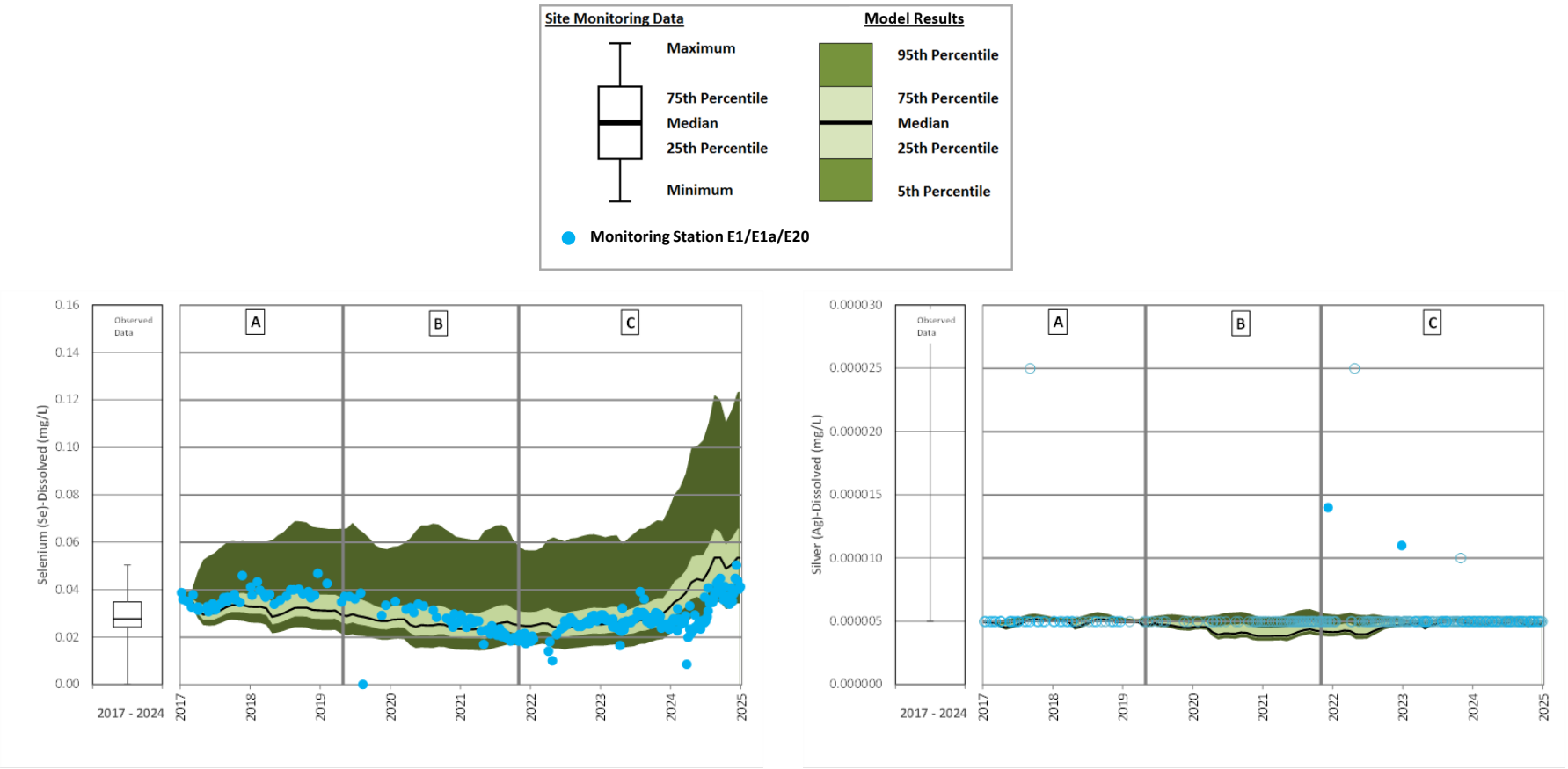
Figure A-94: Tailings Storage Facility Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

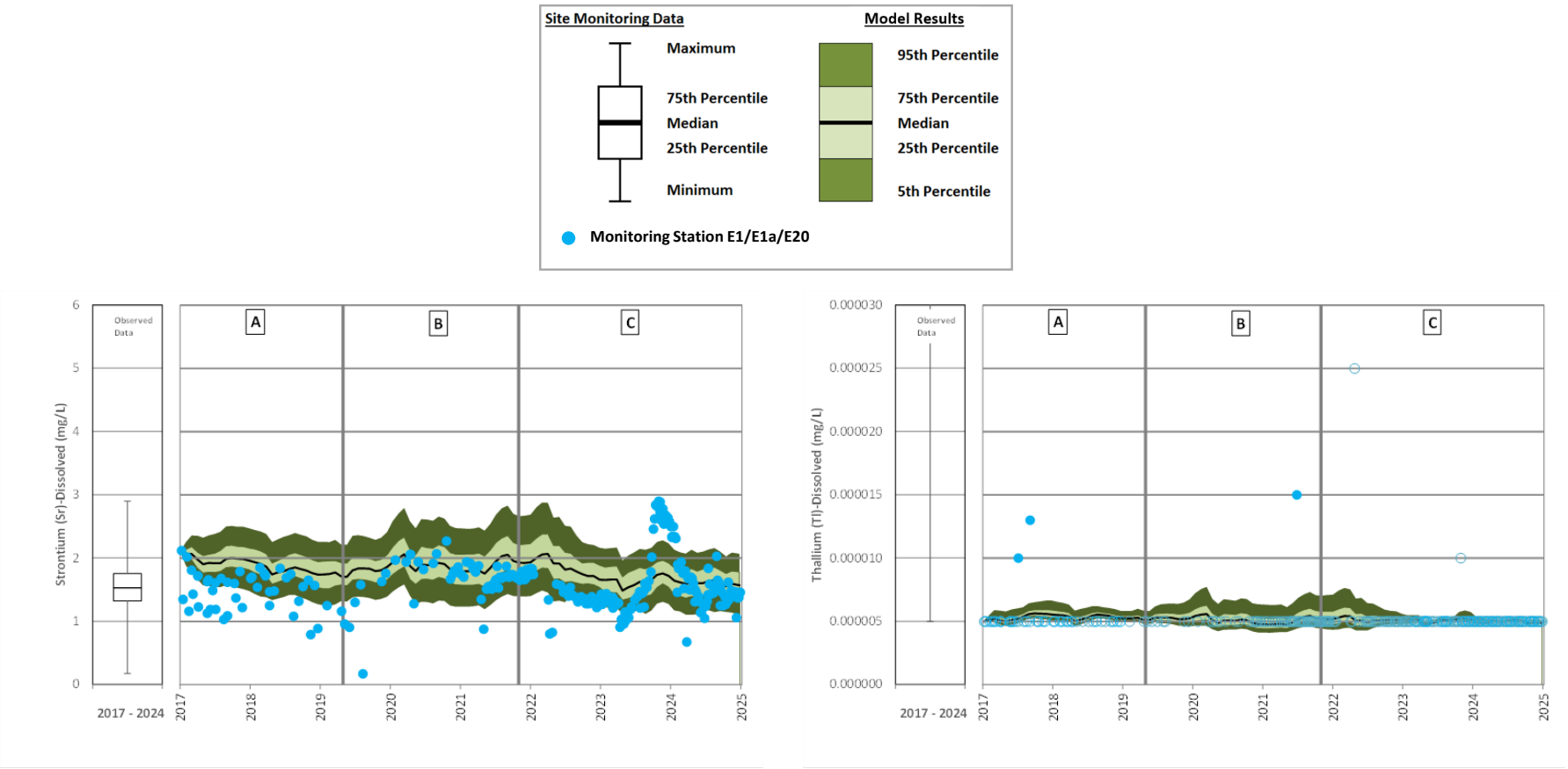
Note: The increased dissolved molybdenum concentrations in the Tailings Storage Facility (TSF) are caused by tailings deposition when operations resumed. The source of increased nickel concentrations in 2019, 2020 and 2021 monitoring data is due to the discharge of leachate from the onsite test heap leach facility to the TSF. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. These conditions are not expected to persist during future operational phases as the leachate will be managed exclusively through the milling process.

Figure A-95: Tailings Storage Facility Calibration – Dissolved Molybdenum and Dissolved Nickel



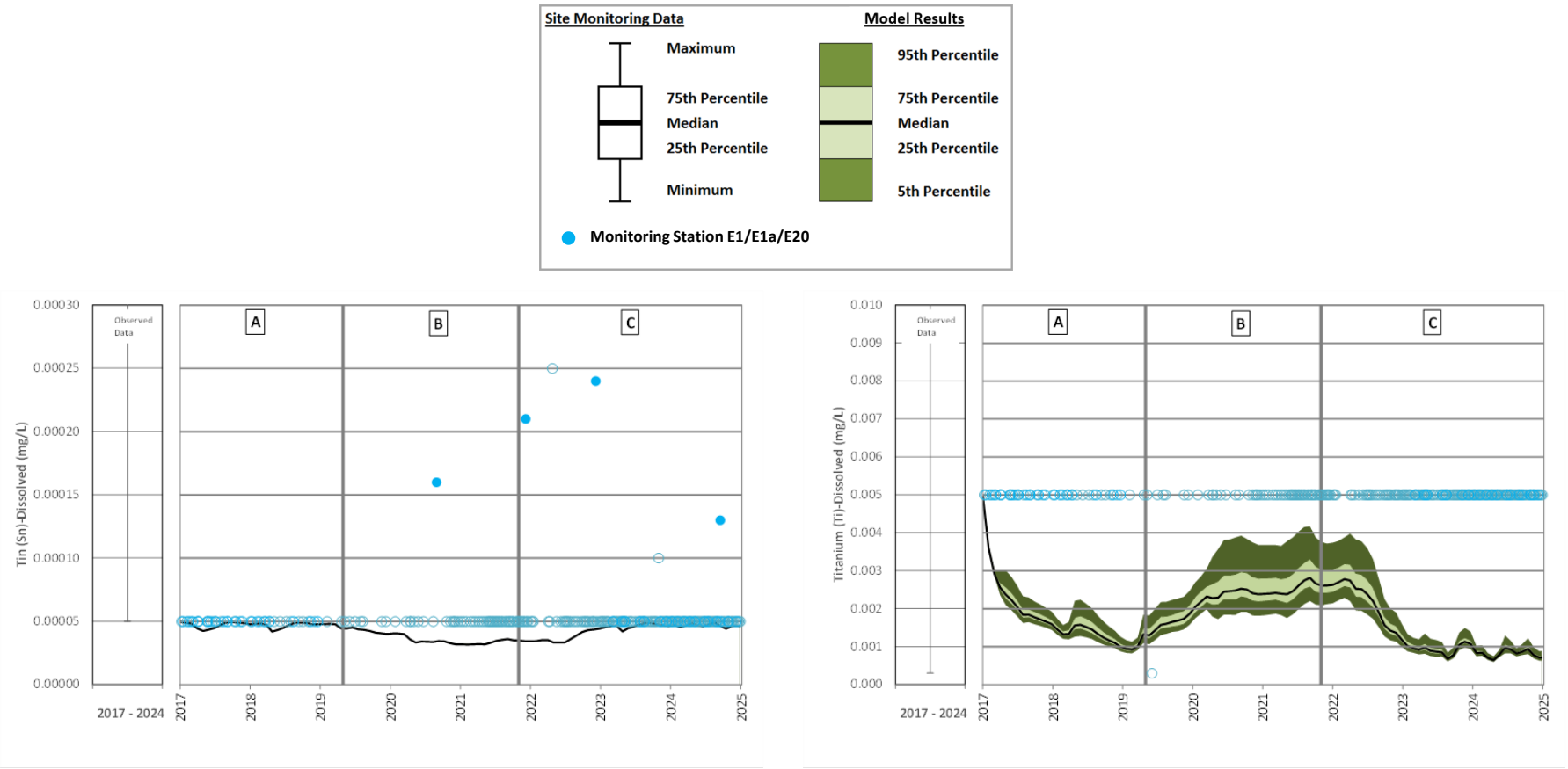
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-96: Tailings Storage Facility Calibration – Dissolved Selenium and Dissolved Silver



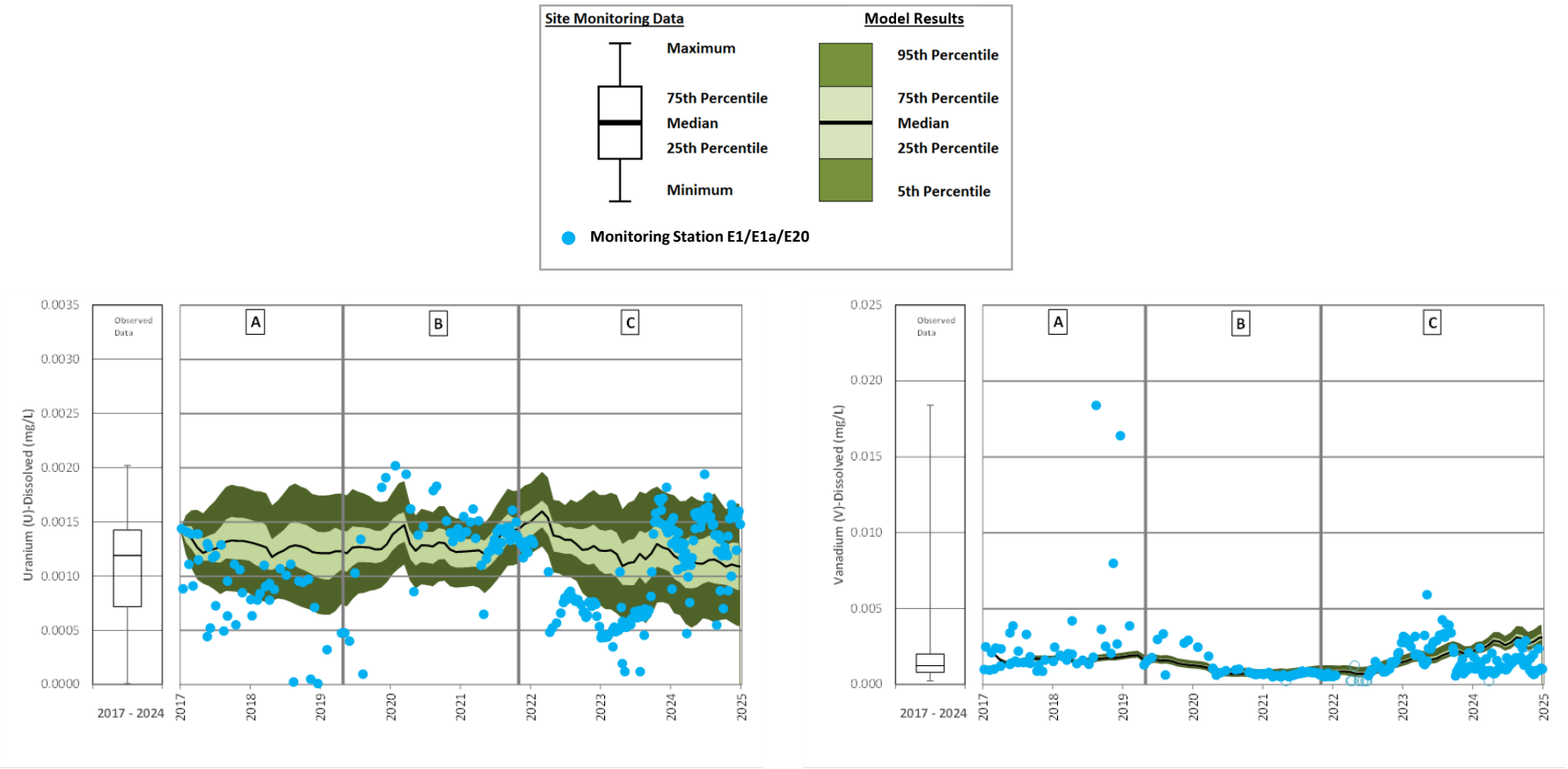
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-97: Tailings Storage Facility Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

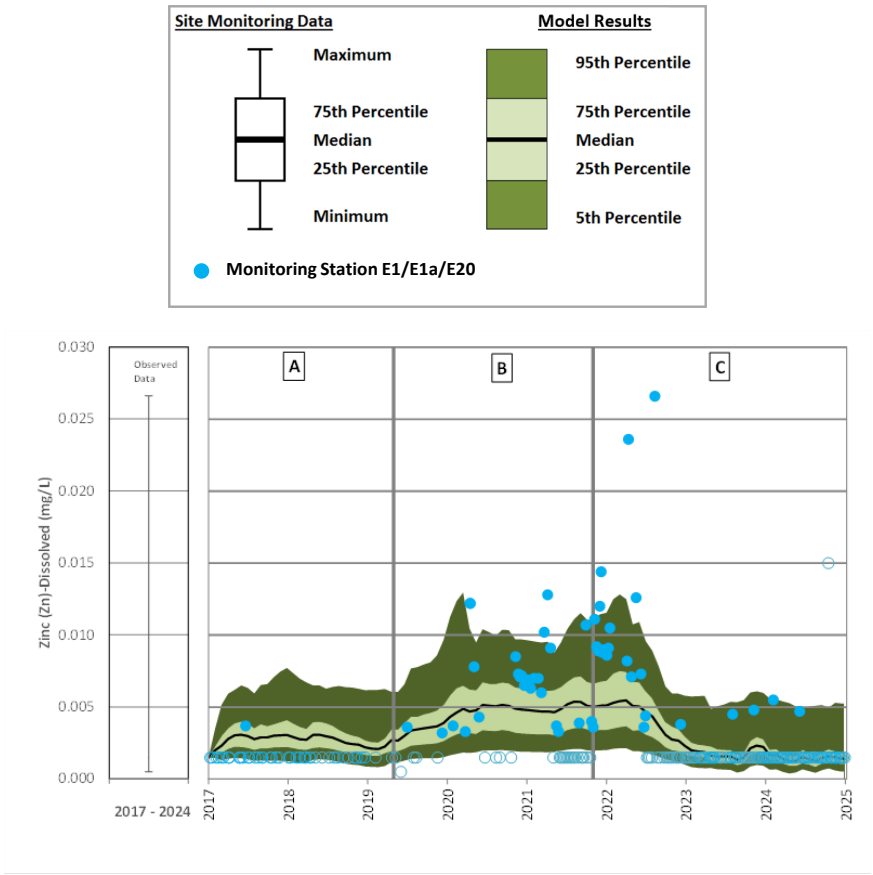
Figure A-98: Tailings Storage Facility Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: The increased dissolved uranium and dissolved vanadium concentrations in the Tailings Storage Facility are caused by tailings deposition when operations resumed.

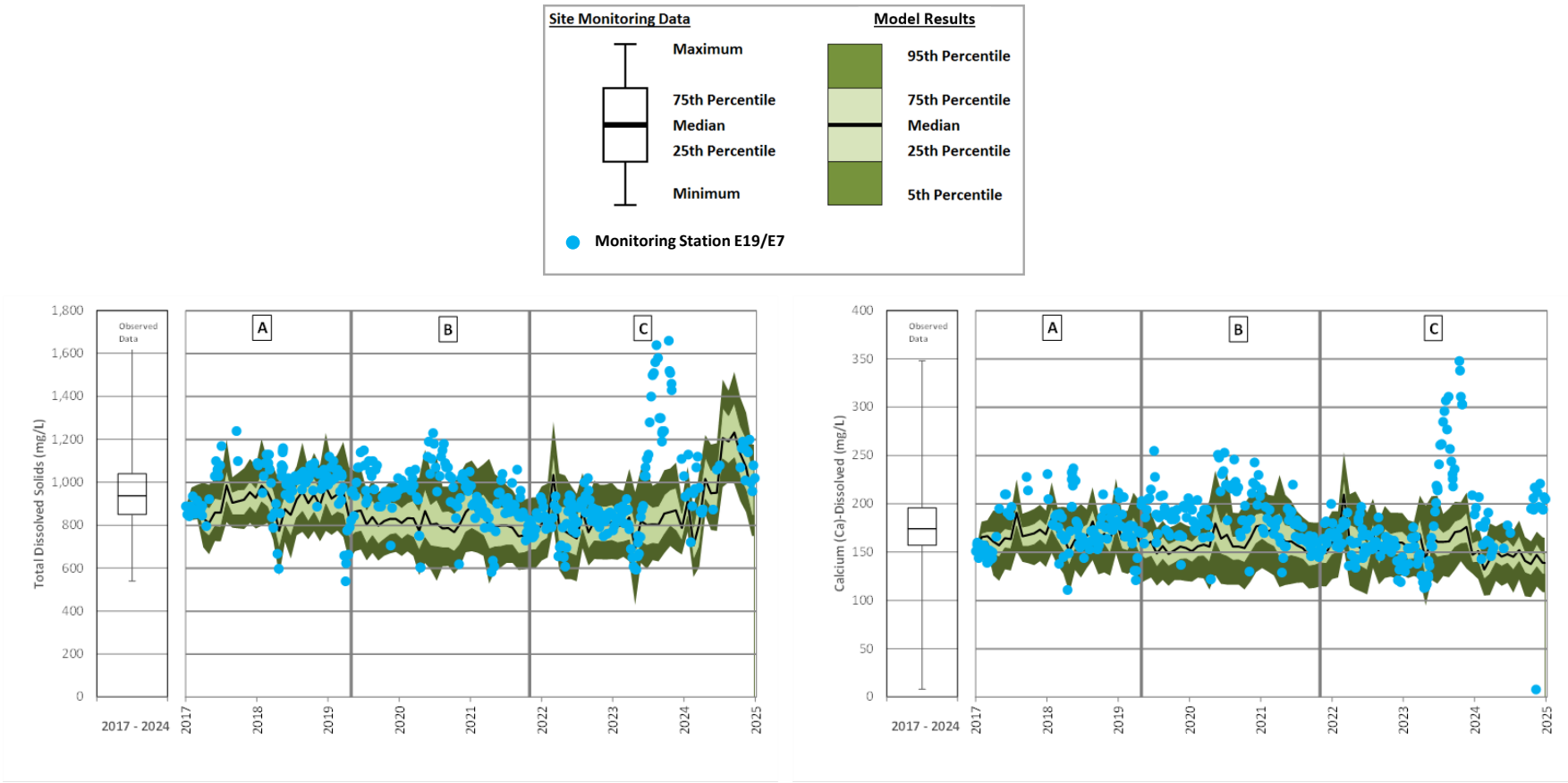
Figure A-99: Tailings Storage Facility Calibration – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-100: Tailings Storage Facility Calibration – Dissolved Zinc

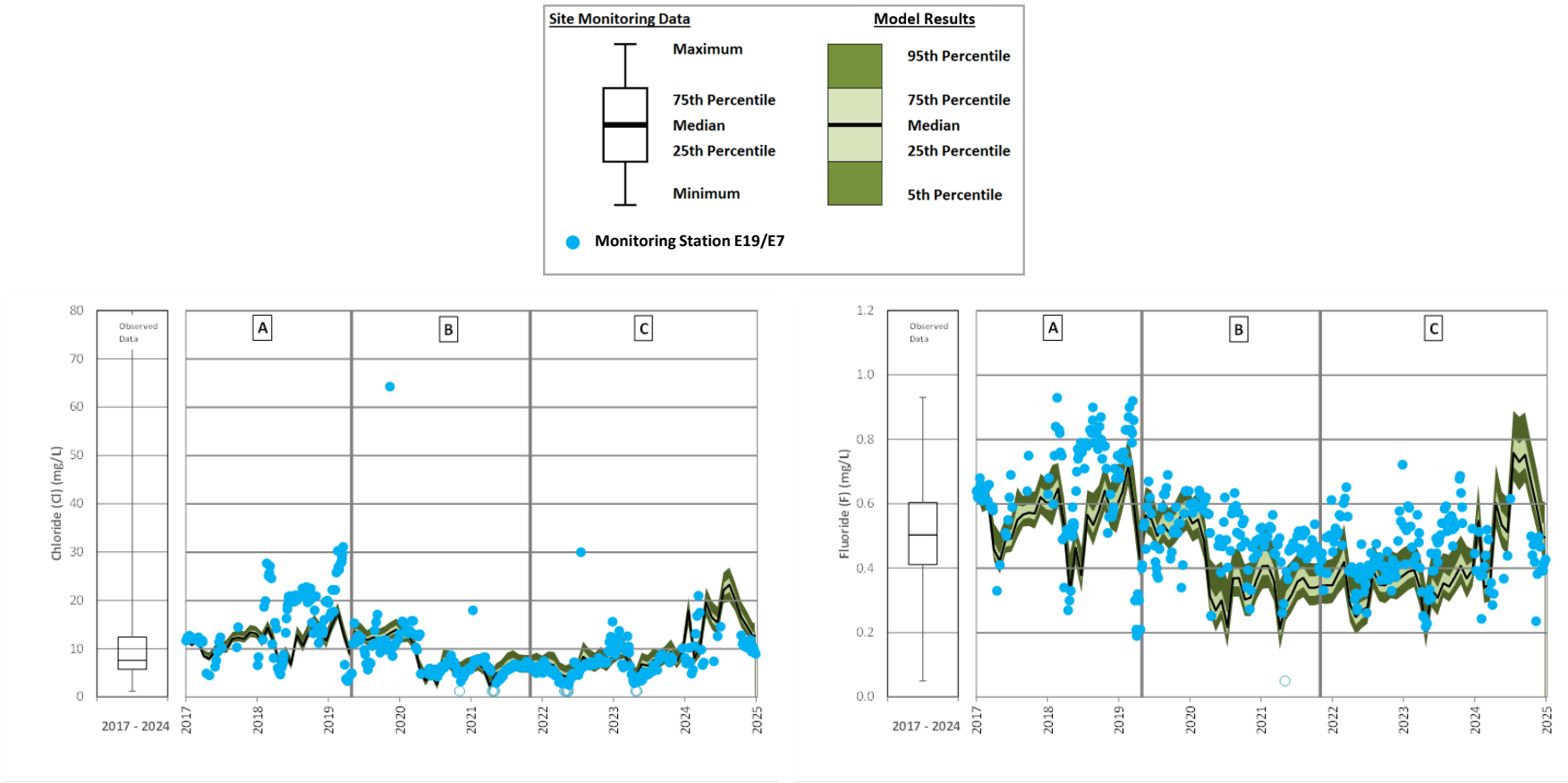
Perimeter Embankment Till Borrow Pond Calibration



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Total dissolved solids and calcium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the Perimeter Embankment Till Borrow Pond. The source of the increased concentrations in the monitoring data for total dissolved solids and calcium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

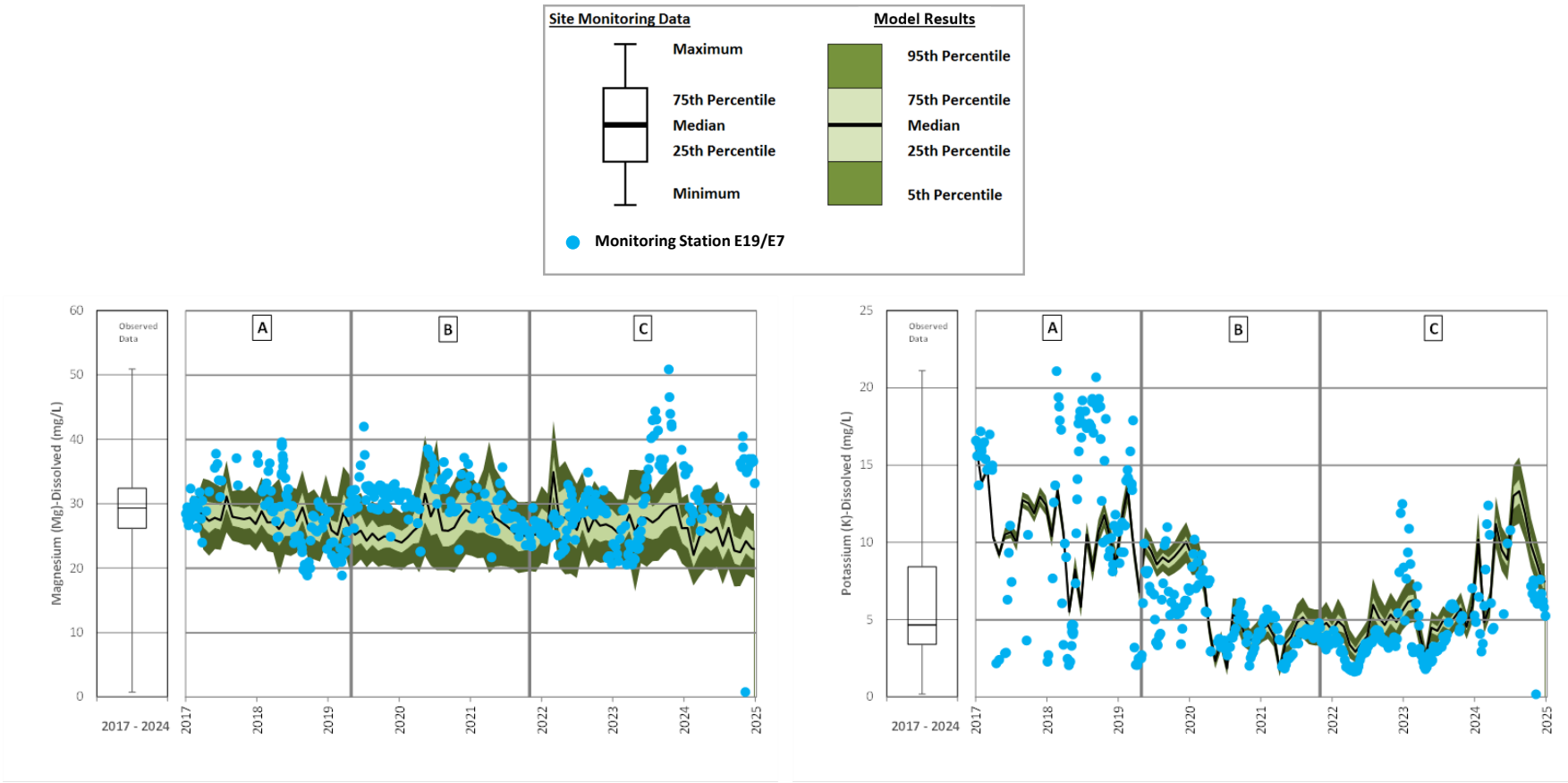
Figure A-101: Perimeter Embankment Till Borrow Pond Calibration – Total Dissolved Solids and Calcium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Chloride and fluoride concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

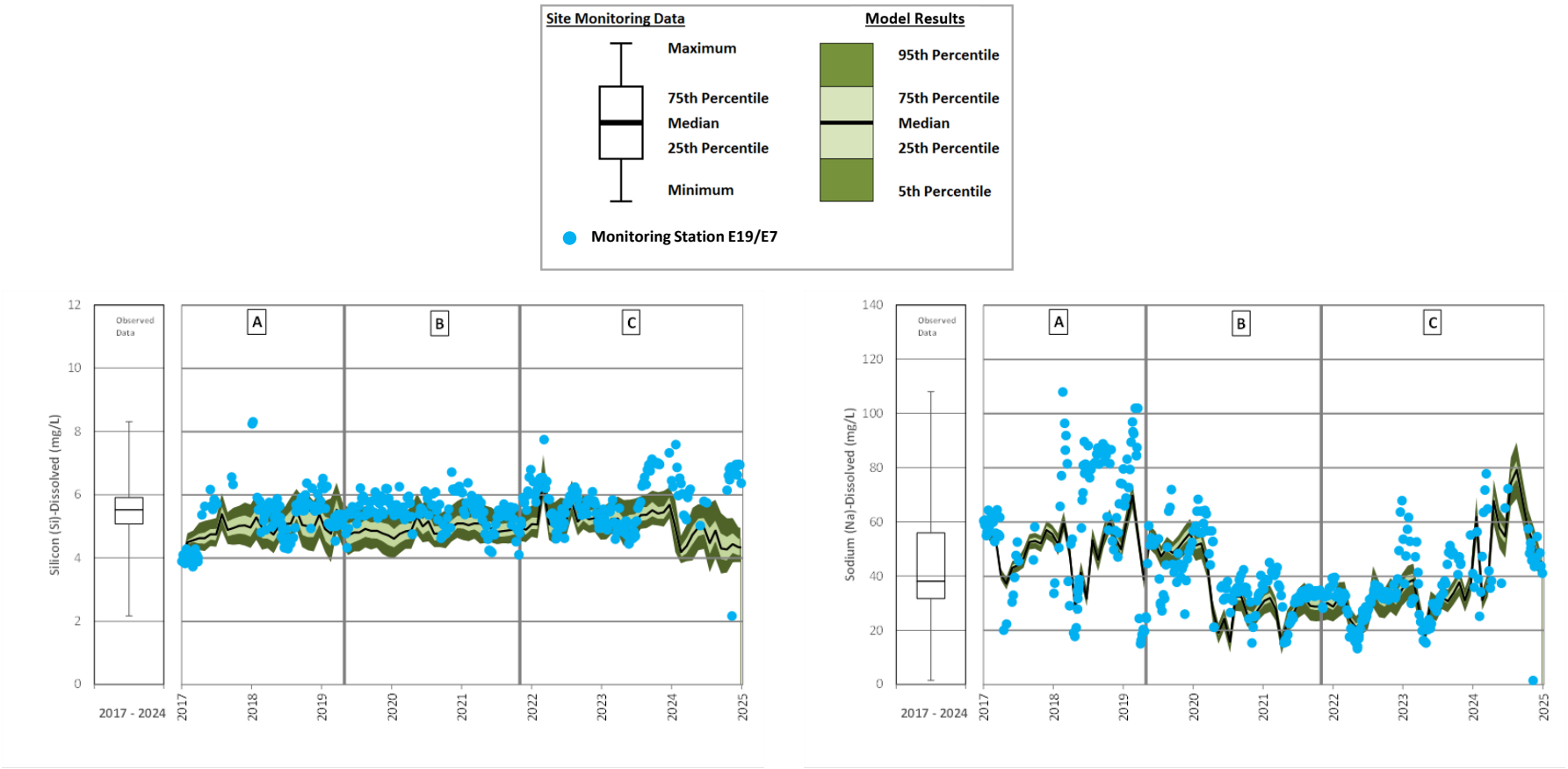
Figure A-102: Perimeter Embankment Till Borrow Pond Calibration – Chloride and Fluoride



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Potassium concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed. Dissolved magnesium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the PETBP. The source of the increased concentrations in the monitoring data for dissolved magnesium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues

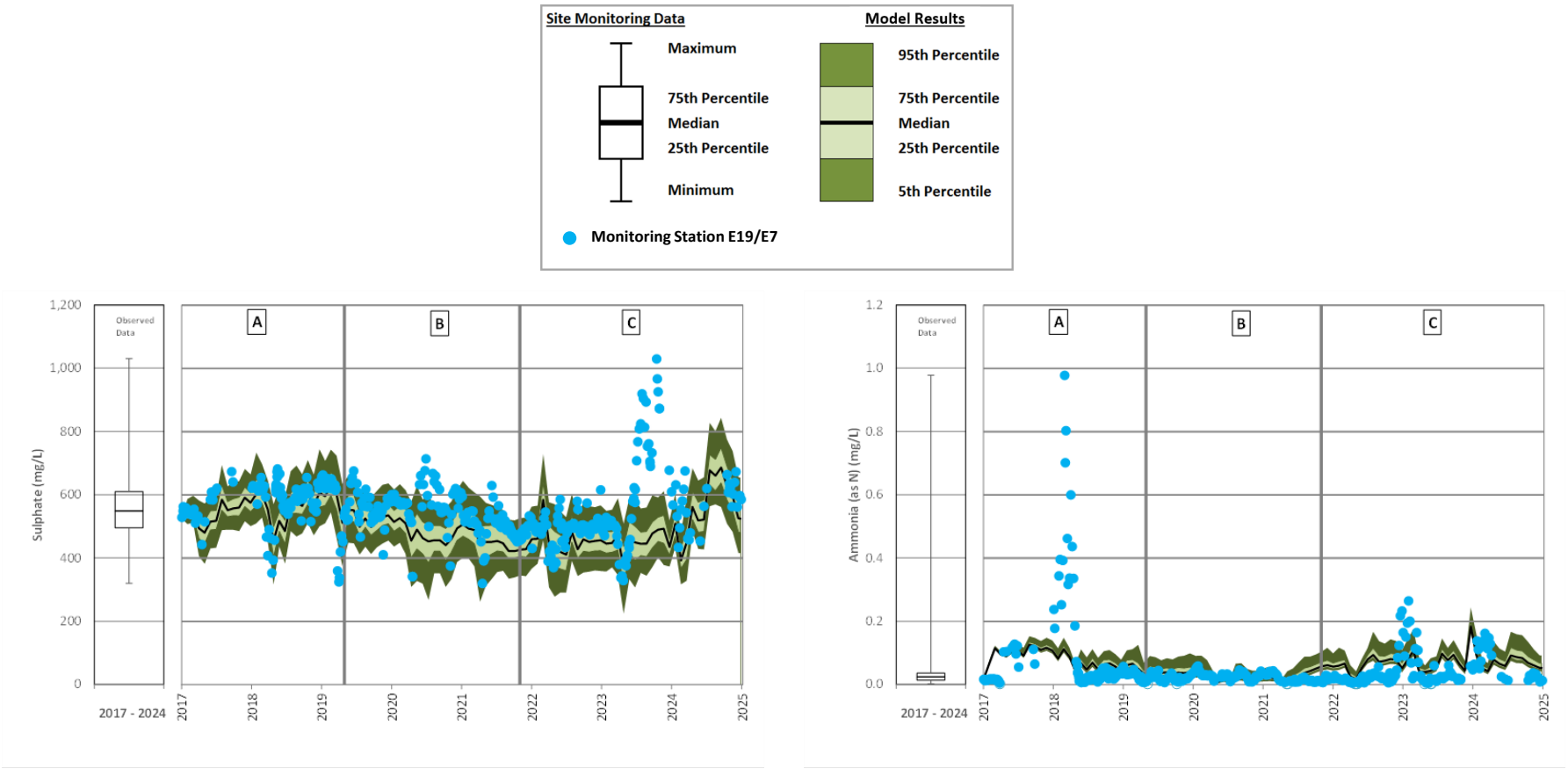
Figure A-103: Perimeter Embankment Till Borrow Pond Calibration – Magnesium and Potassium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Sodium concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

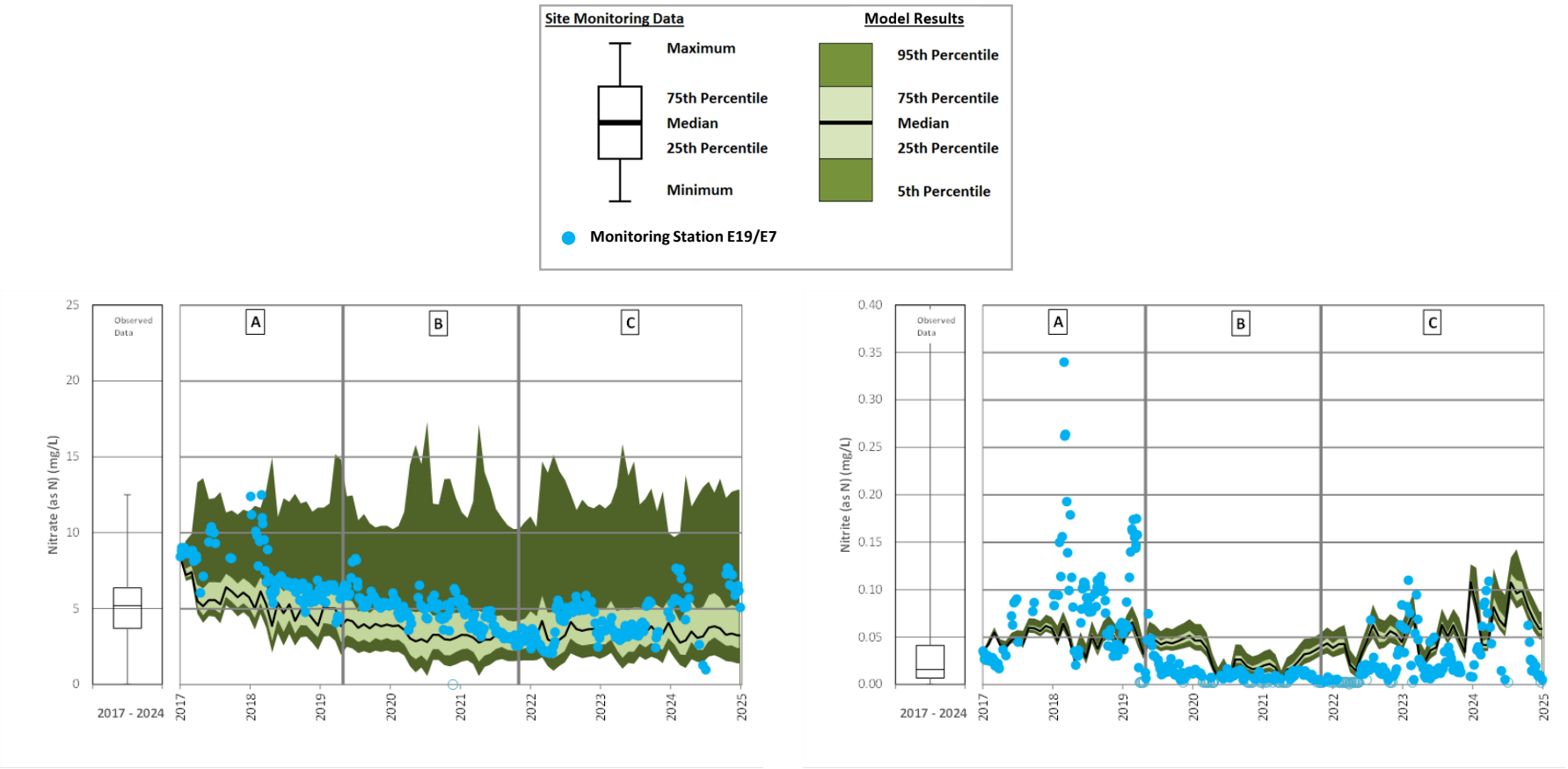
Figure A-104: Perimeter Embankment Till Borrow Pond Calibration – Silicon and Sodium



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Total ammonia concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed. Sulphate concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the PETBP. The source of the increased concentrations in the monitoring data for sulphate is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

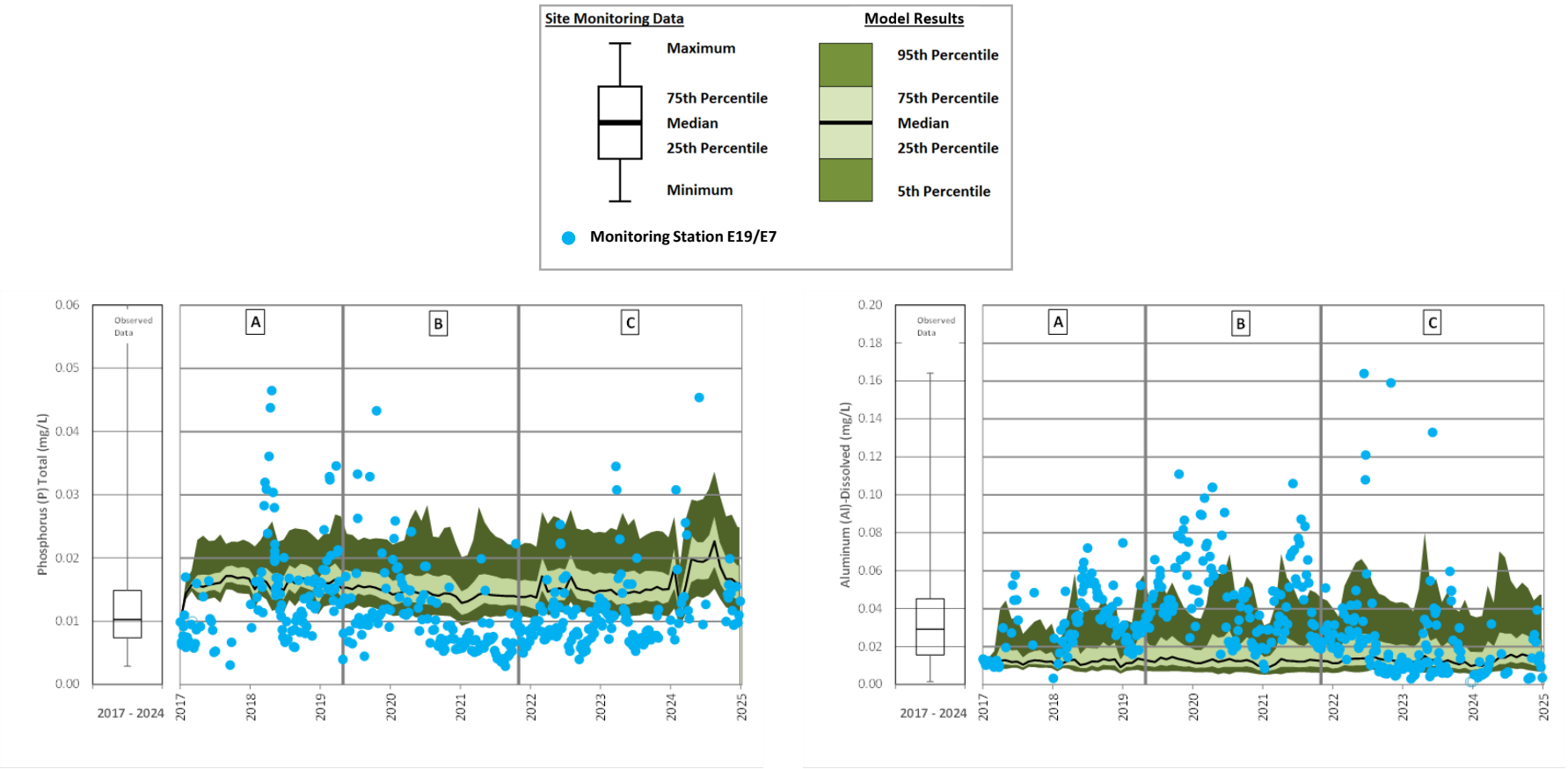
Figure A-105: Perimeter Embankment Till Borrow Pond Calibration – Sulphate and Total Ammonia



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

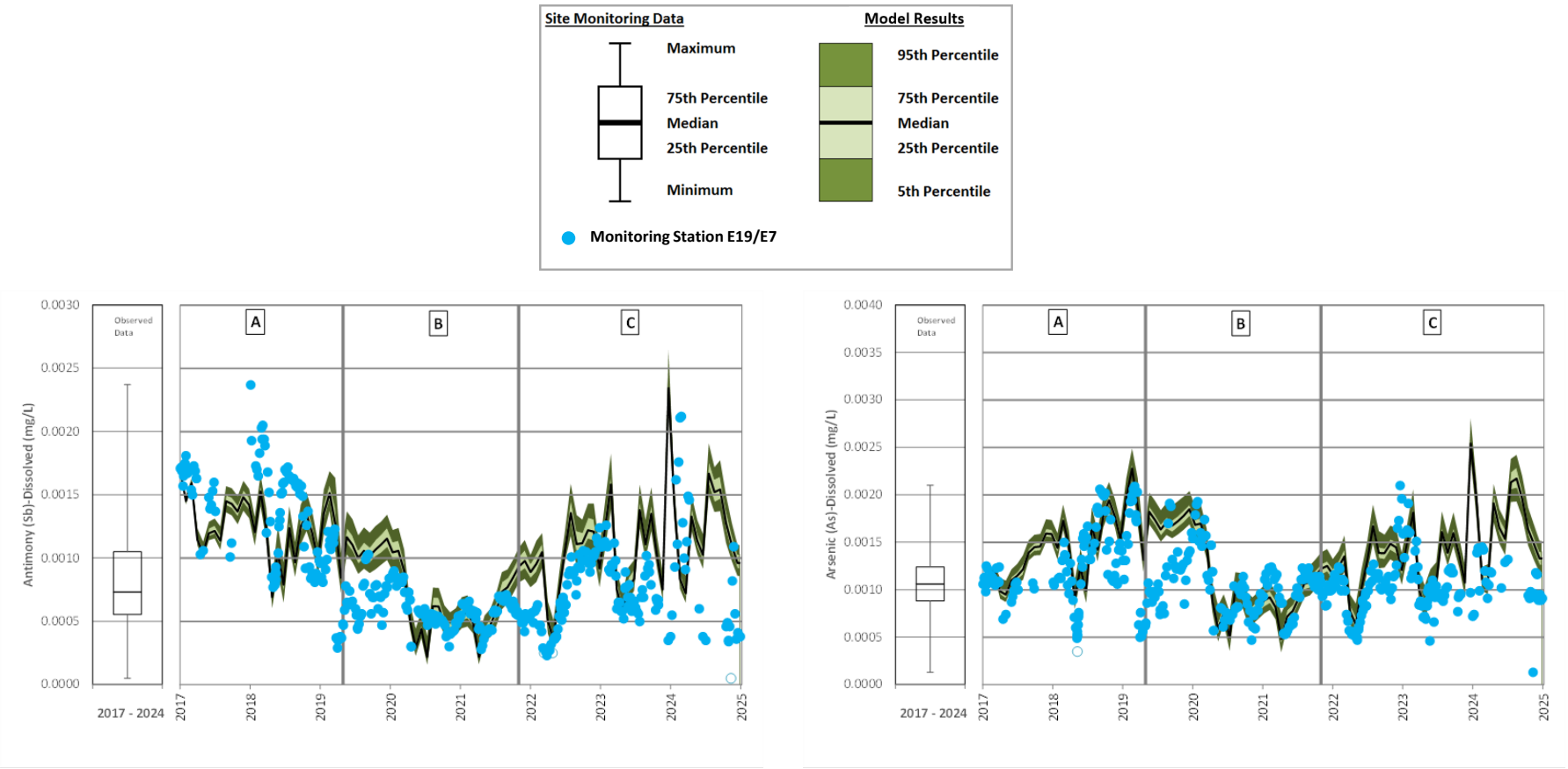
Note: Nitrite concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-106: Perimeter Embankment Till Borrow Pond Calibration – Nitrate and Nitrite



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

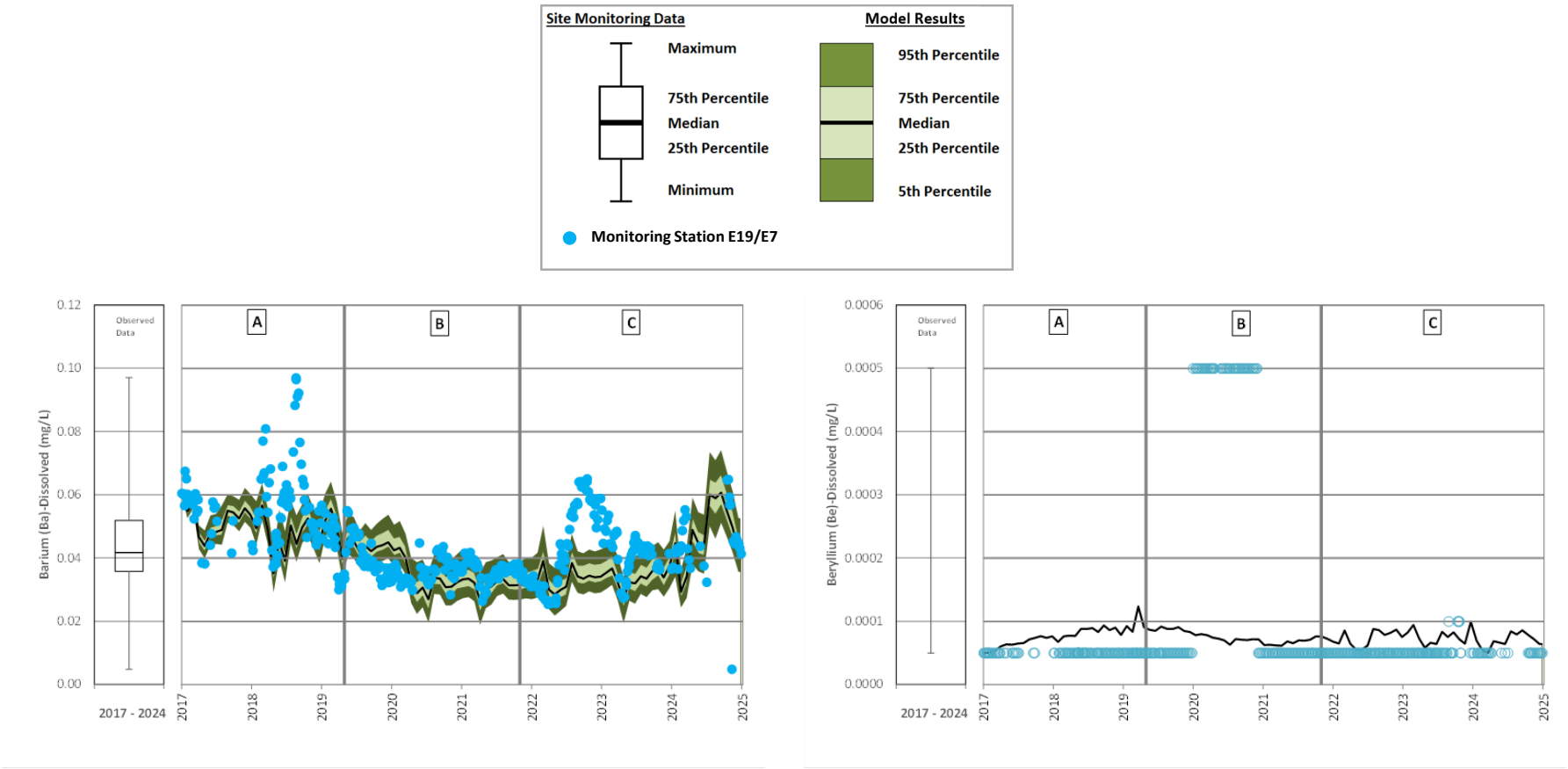
Figure A-107: Perimeter Embankment Till Borrow Pond Calibration – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Care and Maintanence; C = Resumed Operations

Note: Dissolved antimony and dissolved arsenic concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

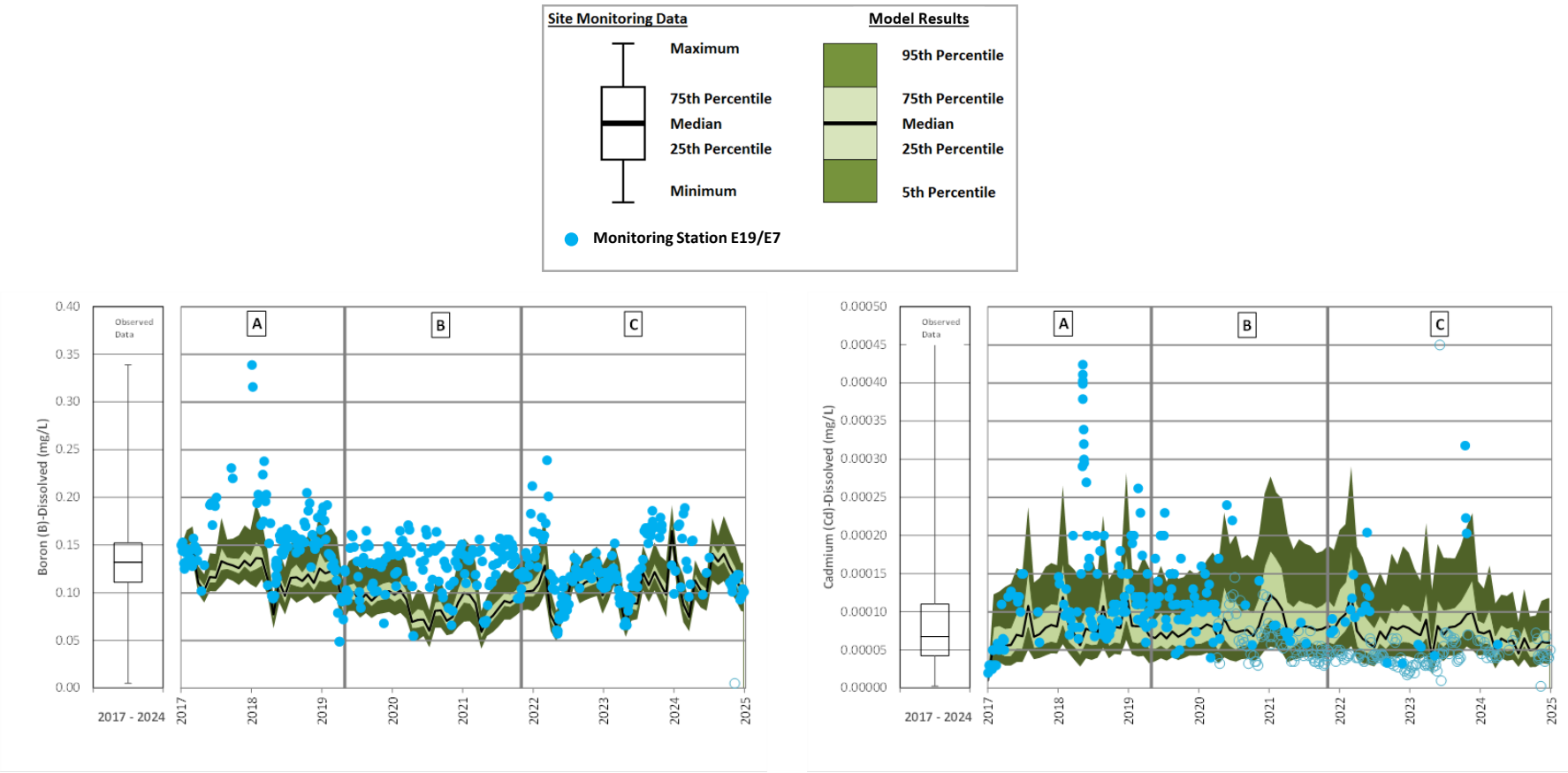
Figure A-108: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

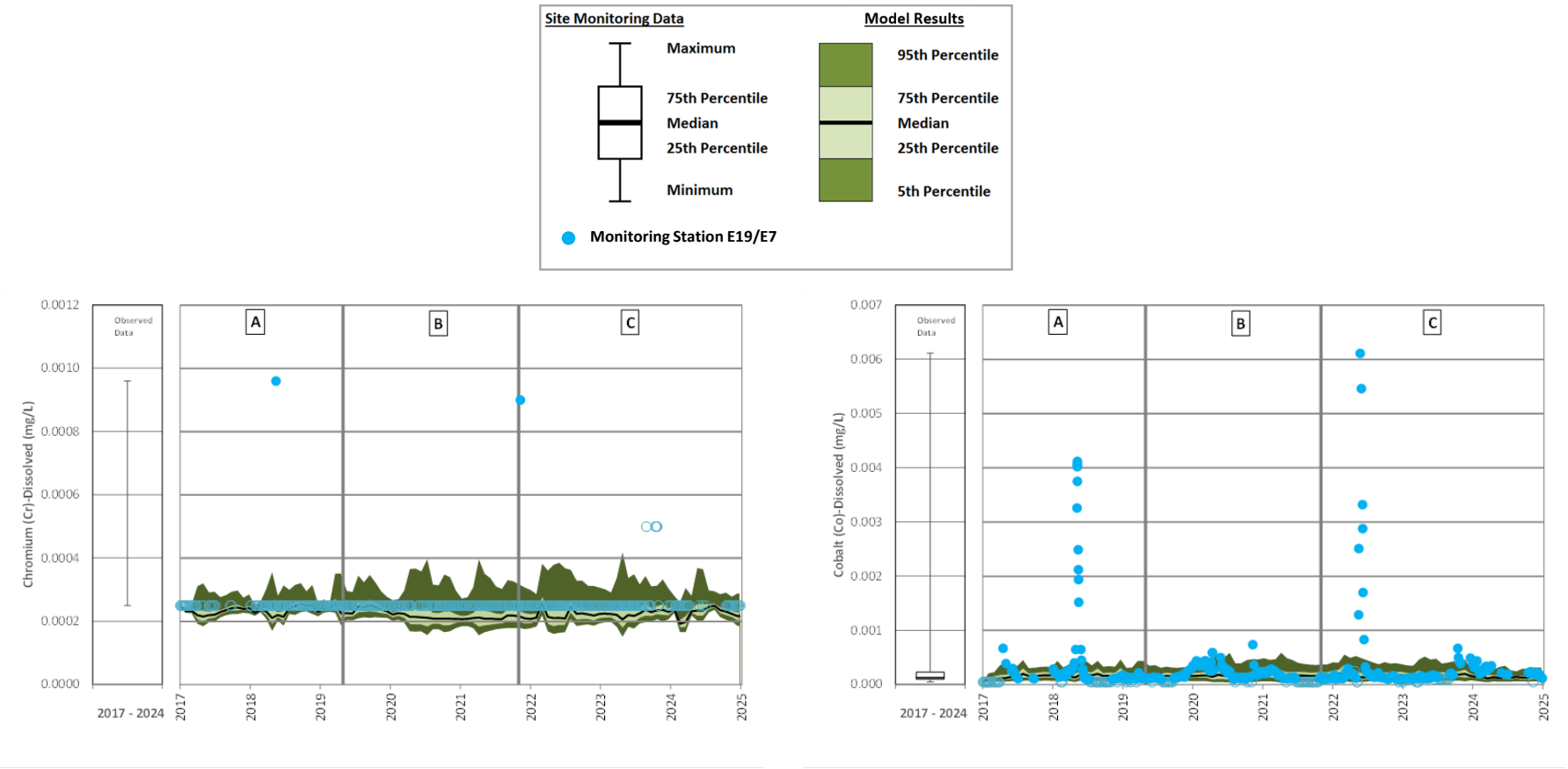
Note: Dissolved barium concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-109: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Barium and Dissolved Beryllium



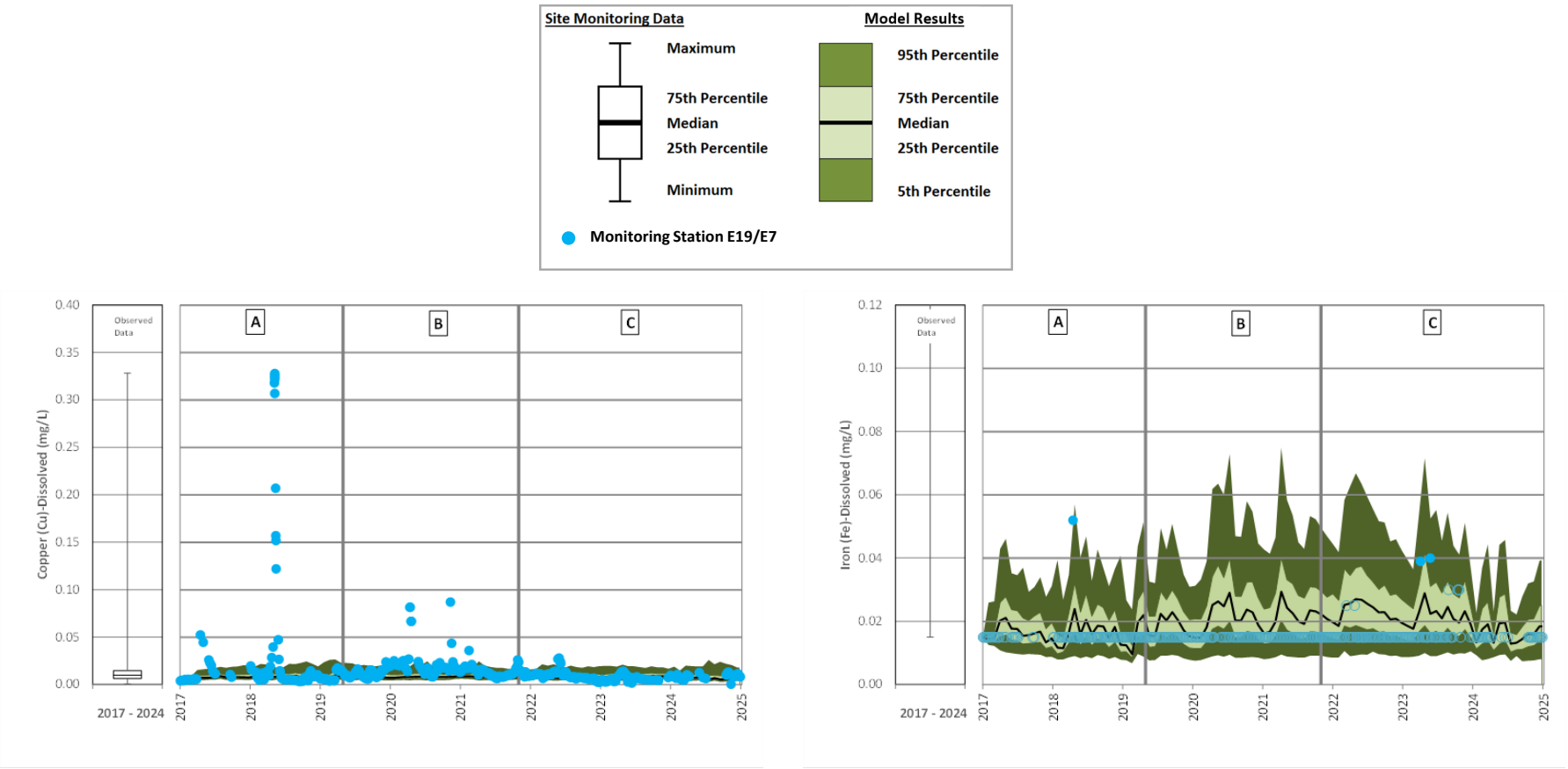
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-110: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Boron and Dissolved Cadmium



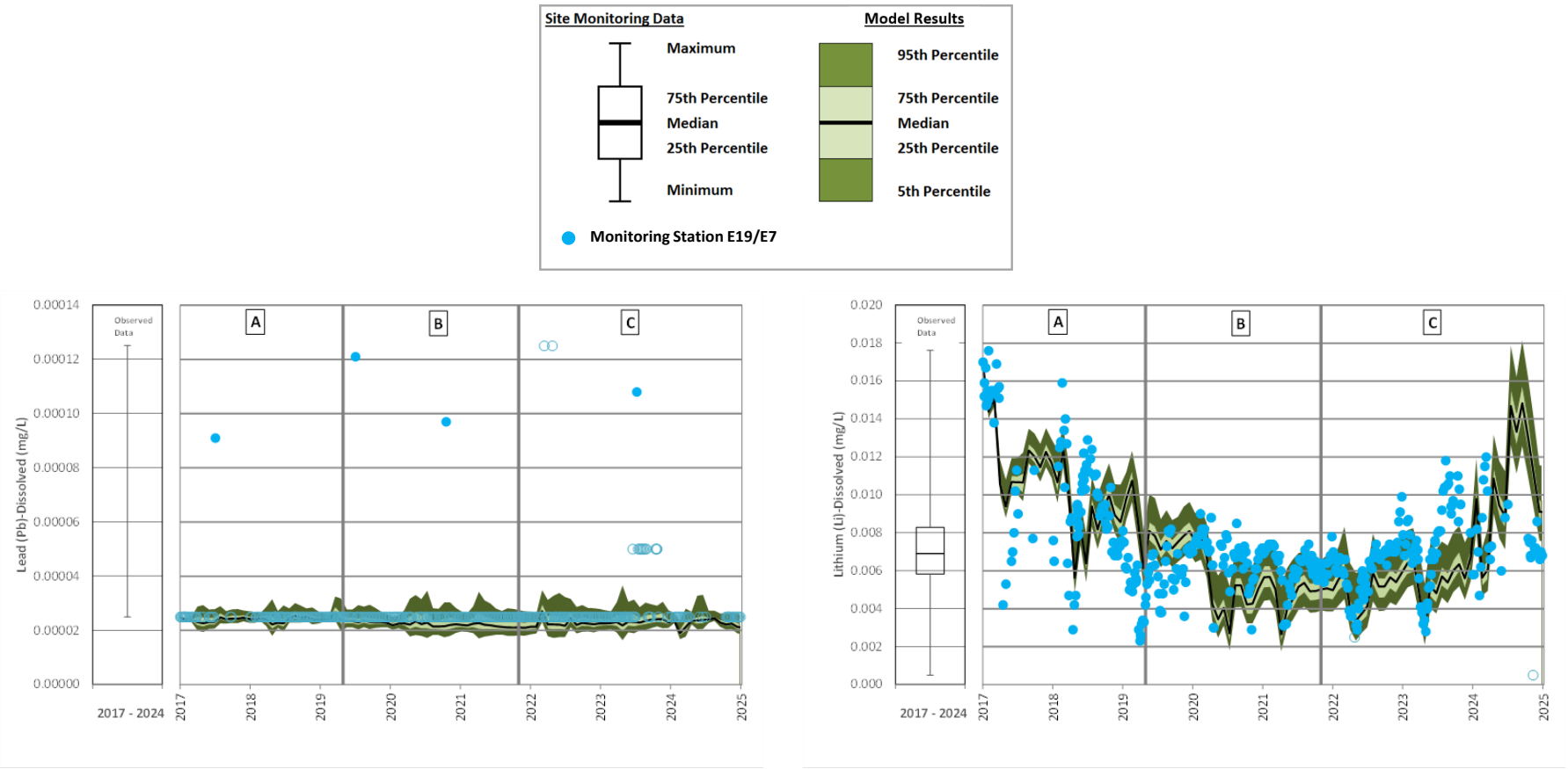
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-111: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

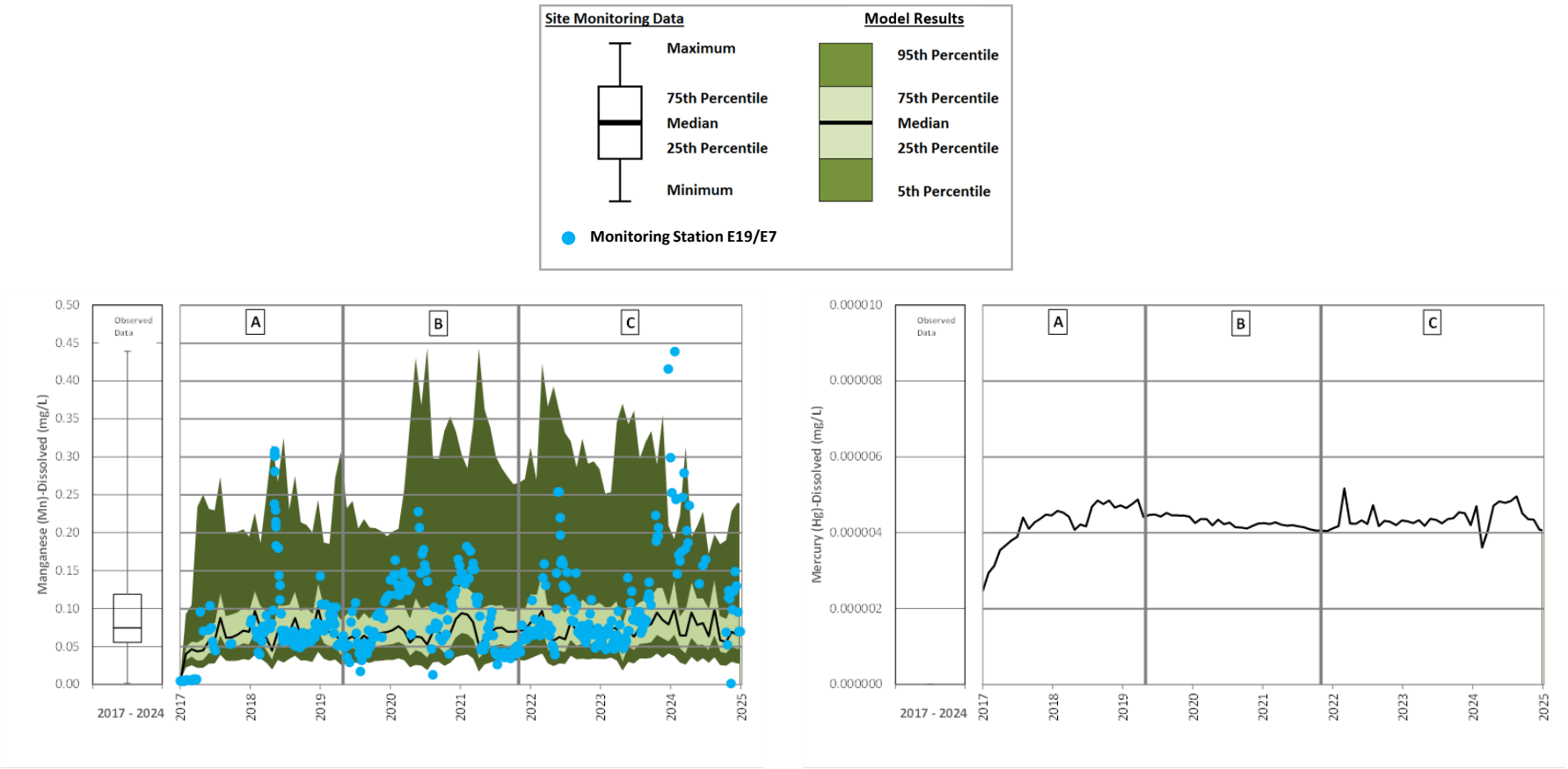
Figure A-112: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Copper and Dissolved Iron



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

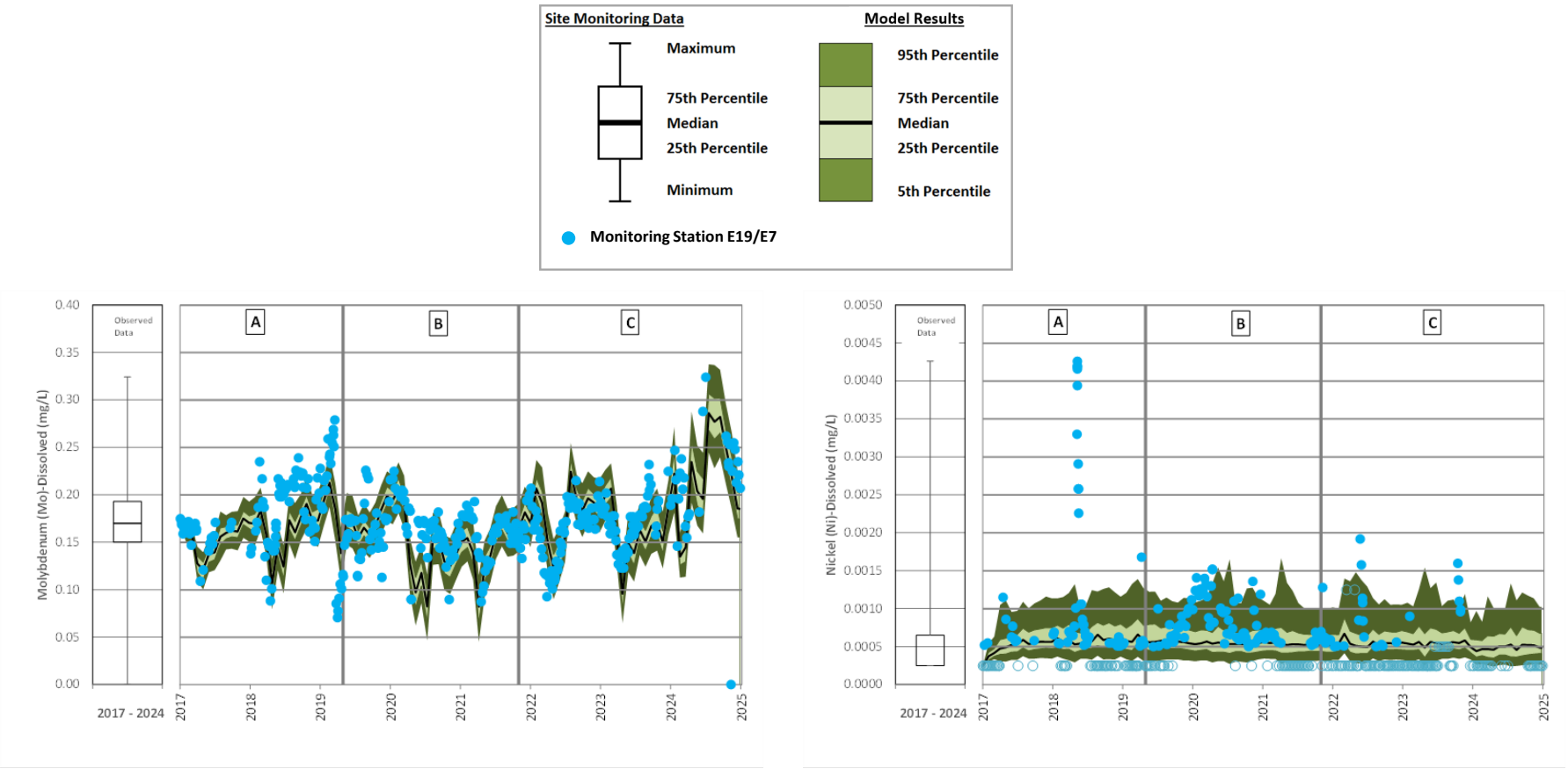
Note: Dissolved lithium concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-113: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Lead and Dissolved Lithium



A = Operations; B = Care and Maintanence; C = Resumed Operations

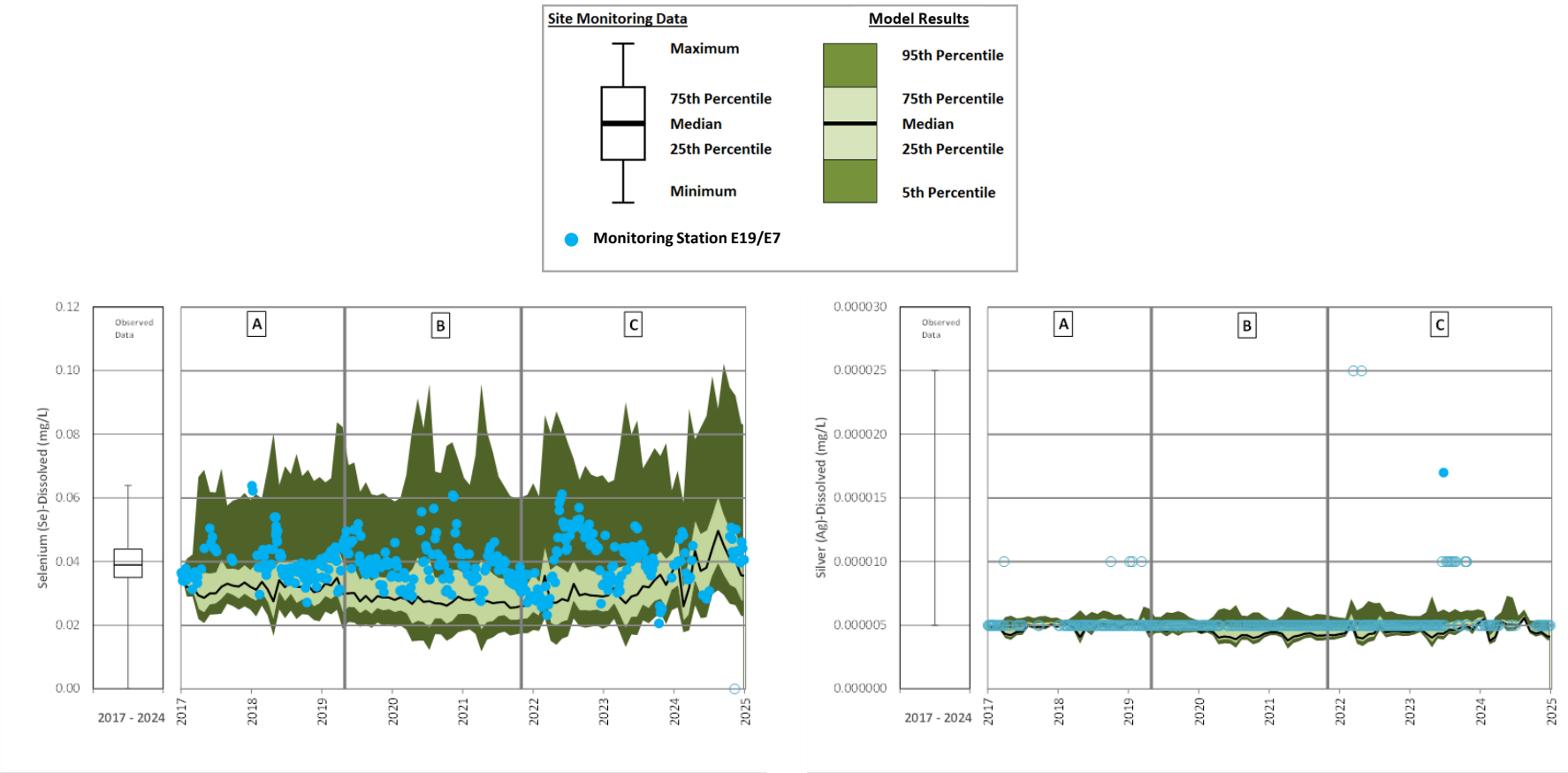
Figure A-114: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

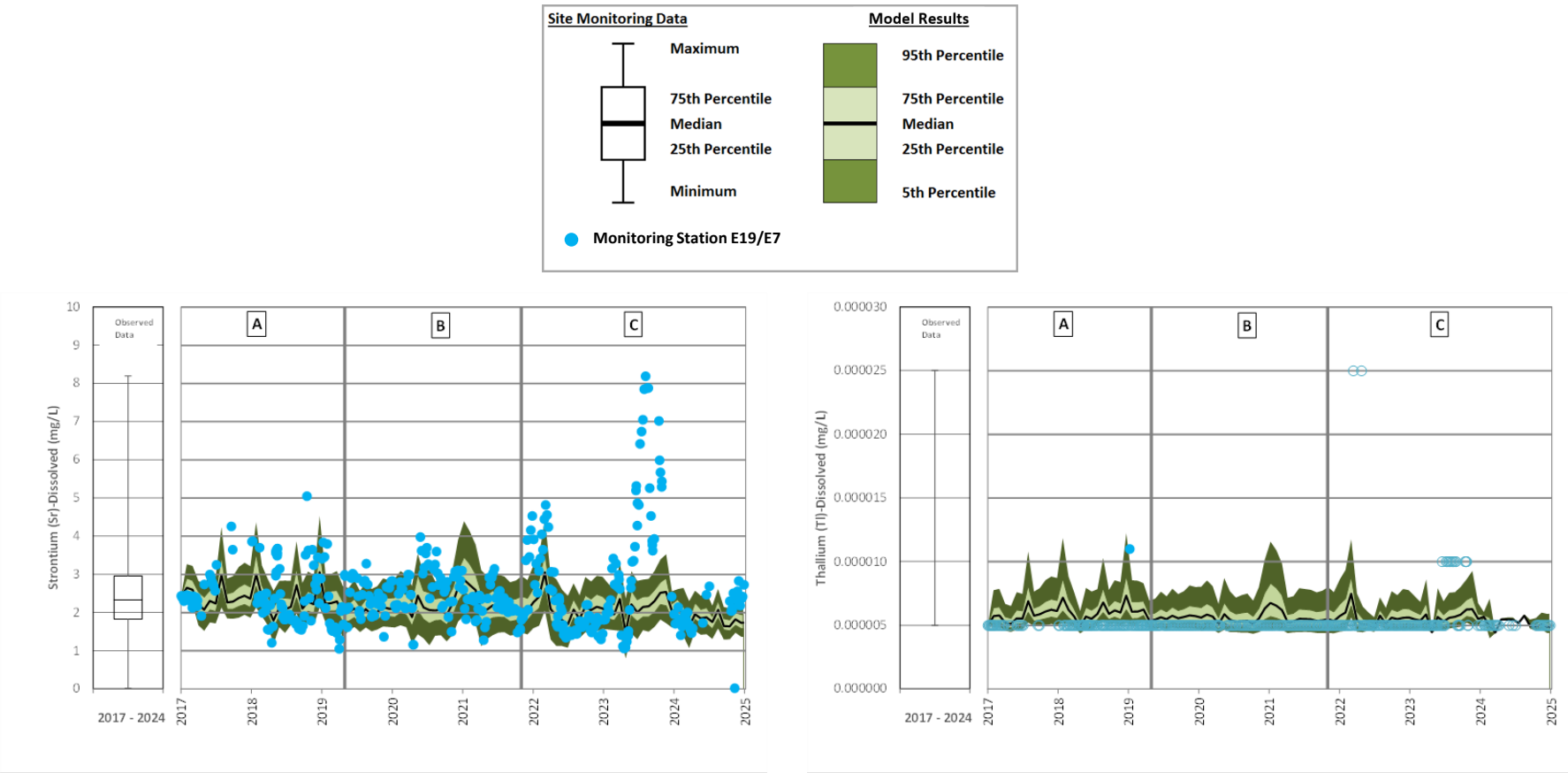
Note: Dissolved molybdenum concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed.

Figure A-115: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

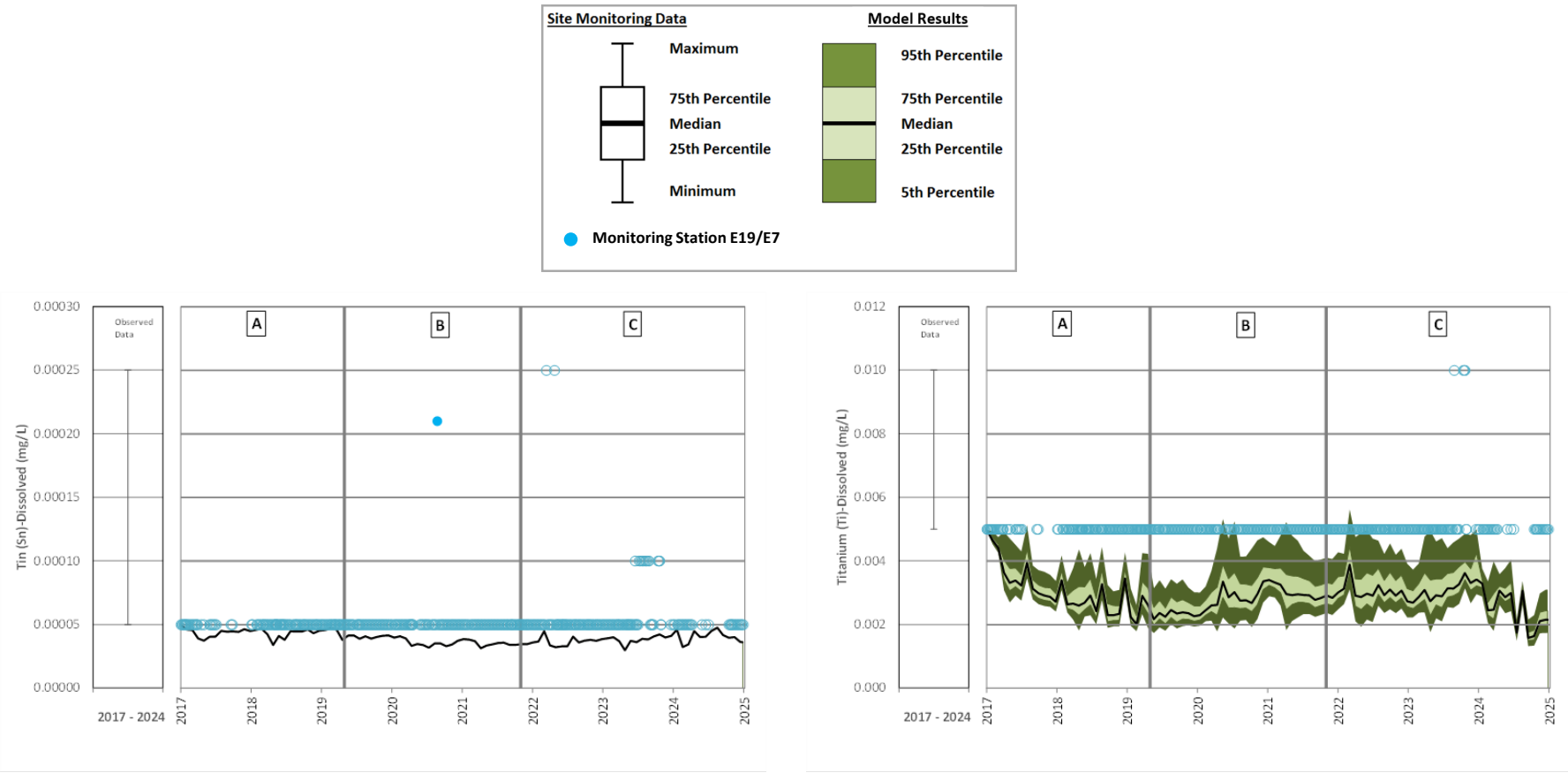
Figure A-116: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Selenium and Dissolved Silver



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

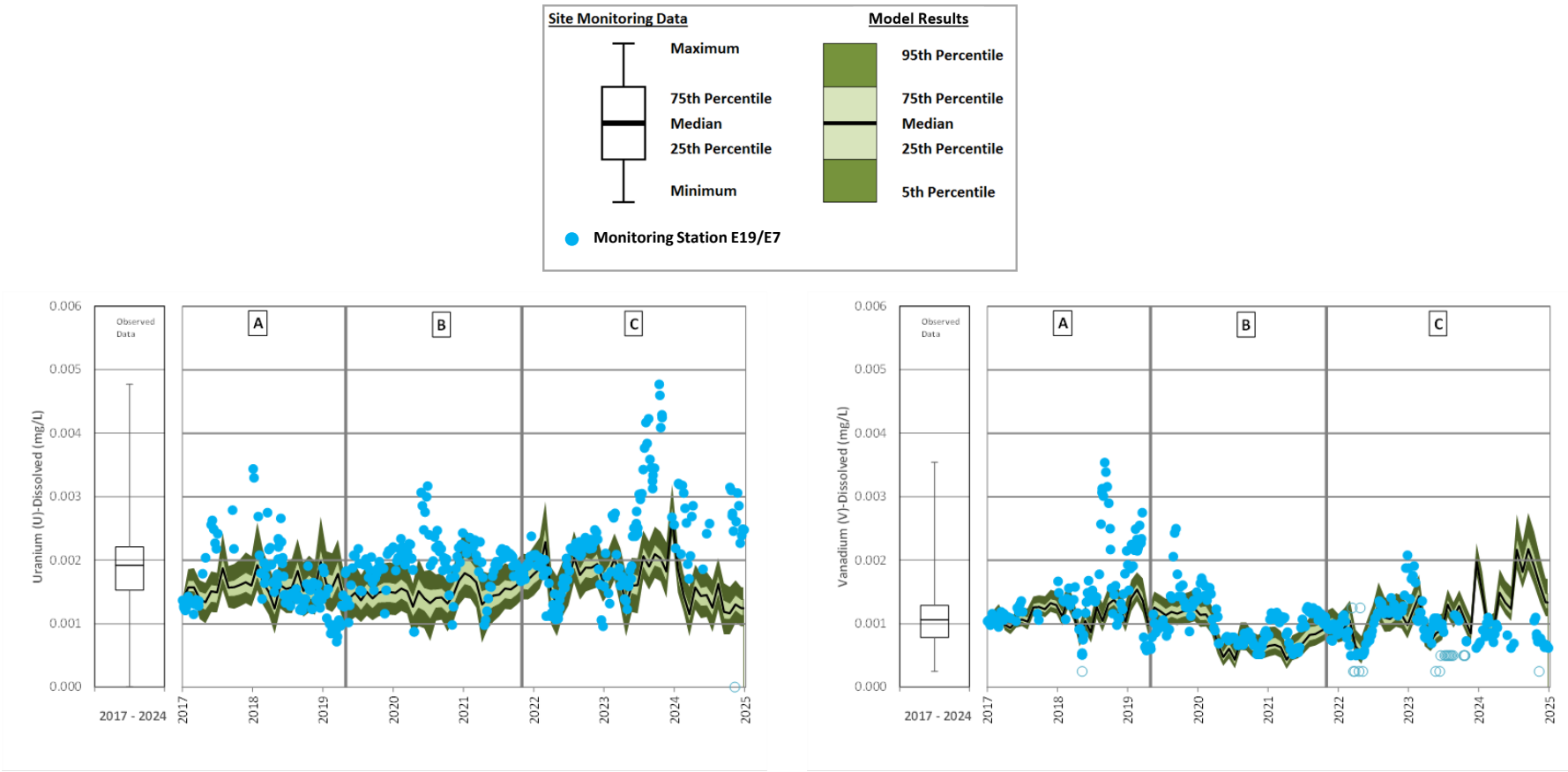
Note: Dissolved strontium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the Perimeter Embankment Till Borrow Pond. The source of the increased concentrations in the monitoring data for dissolved strontium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

Figure A-117: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

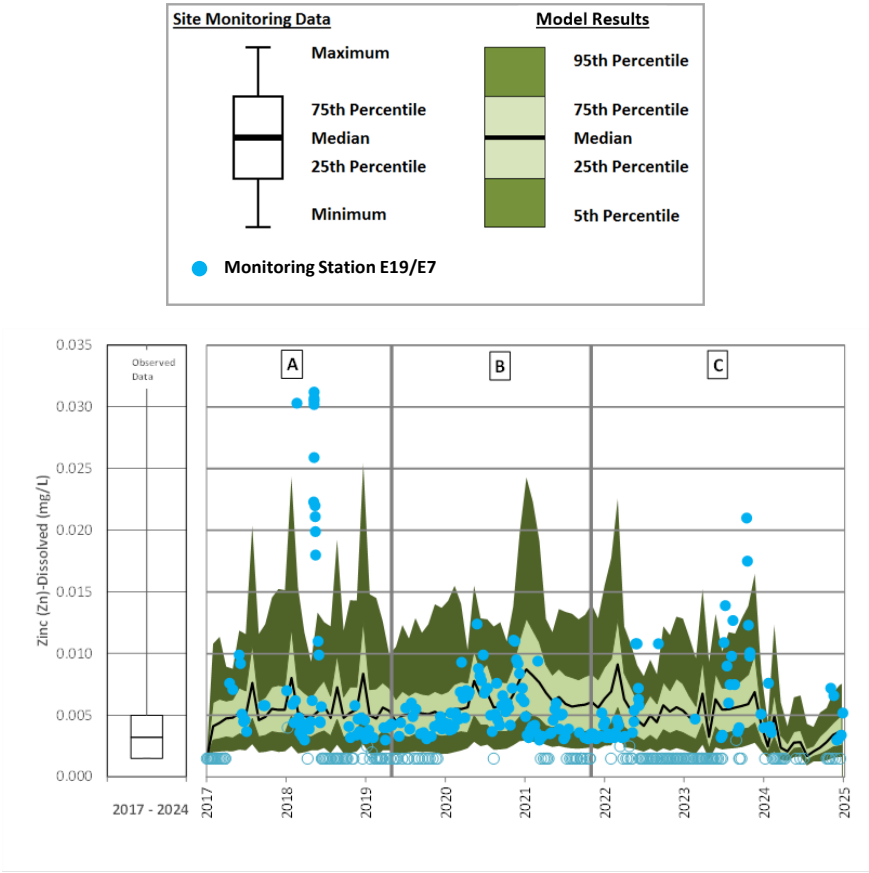
Figure A-118: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Note: Dissolved Vanadium concentrations increase in the Perimeter Embankment Till Borrow Pond (PETBP) at the start of resumed operations because of higher concentrations in the Tailings Storage Facility (TSF) which is pumped to the PETBP. The increased concentrations in the TSF are caused by tailings deposition when operations resumed. Dissolved uranium concentrations were underpredicted during a period in 2023 and 2024 when concentrations increased in the Perimeter Embankment Till Borrow Pond. The source of the increased concentrations in the monitoring data for dissolved uranium is thought to be due to filling of Wight Pit for freshet storage and flushing of interstitial water within waste rock into the overlying pit lake. These increased concentrations were temporary and returned to the normal range of concentrations following the event. These concentrations were not observed throughout the operational phases of the mine and are considered atypical. Future modelling can account for higher parameter concentrations during Wight Pit filling under certain conditions if this trend continues.

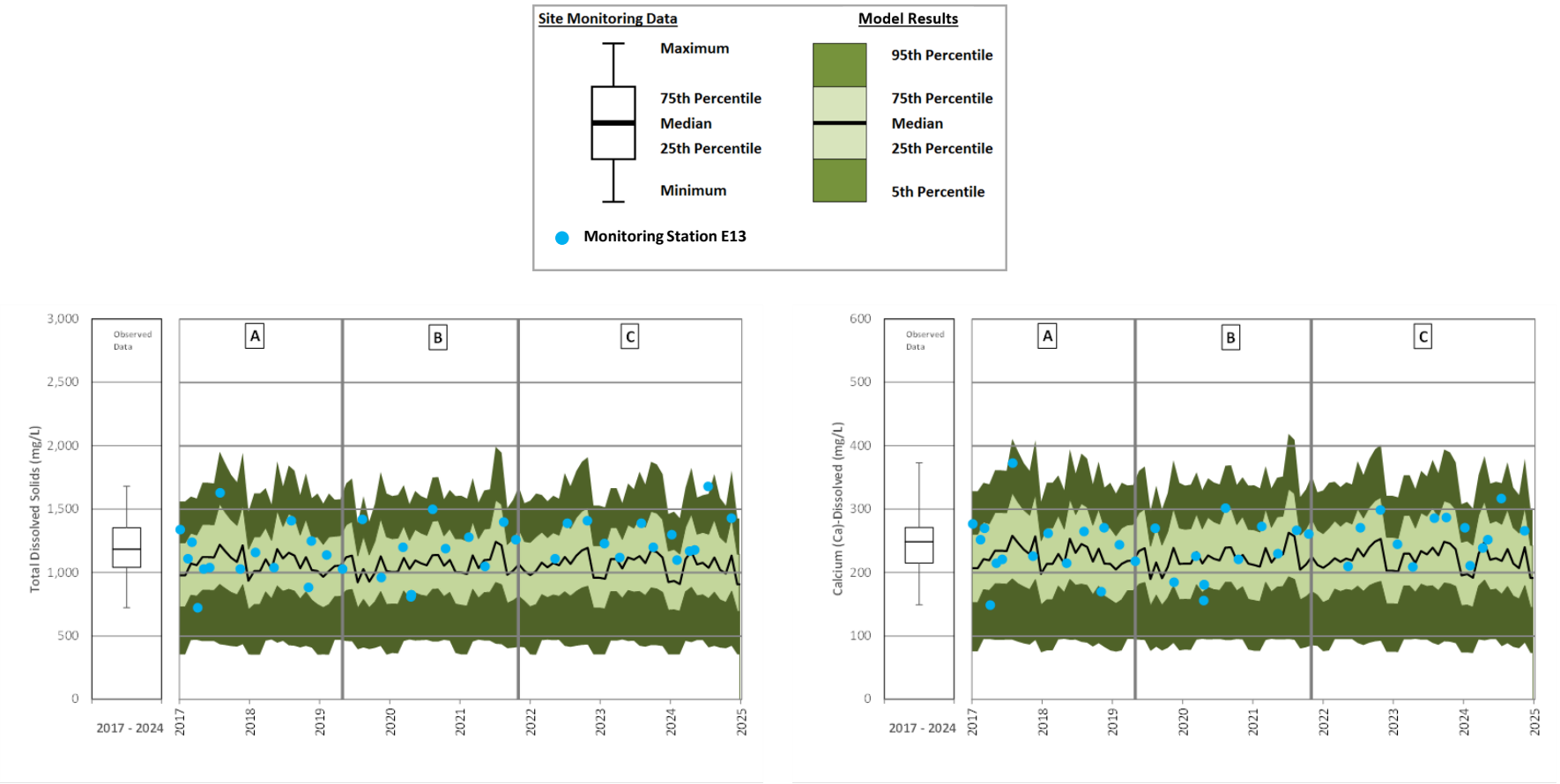
Figure A-119: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

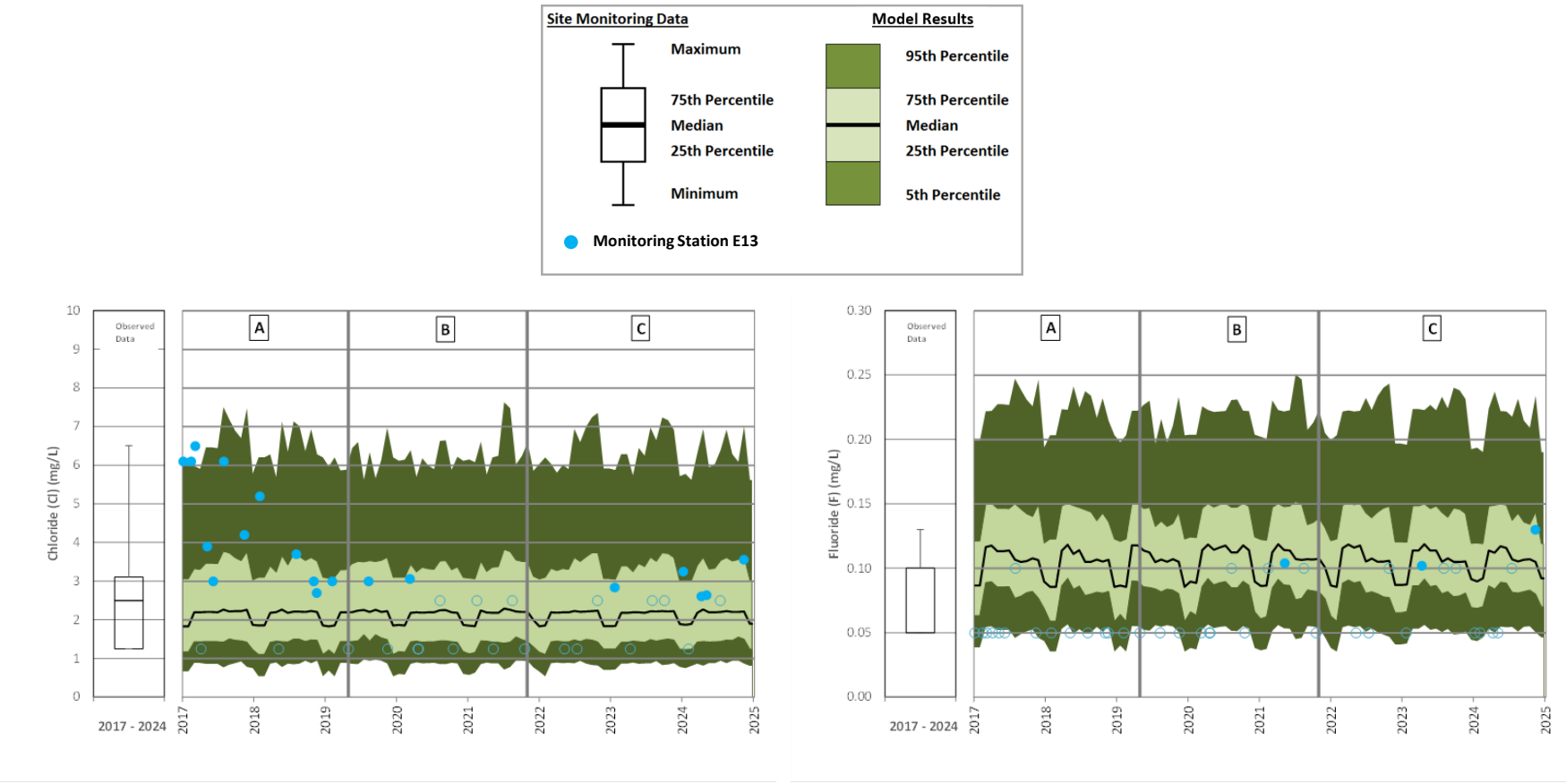
Figure A-120: Perimeter Embankment Till Borrow Pond Calibration – Dissolved Zinc

Northwest Sump Calibration



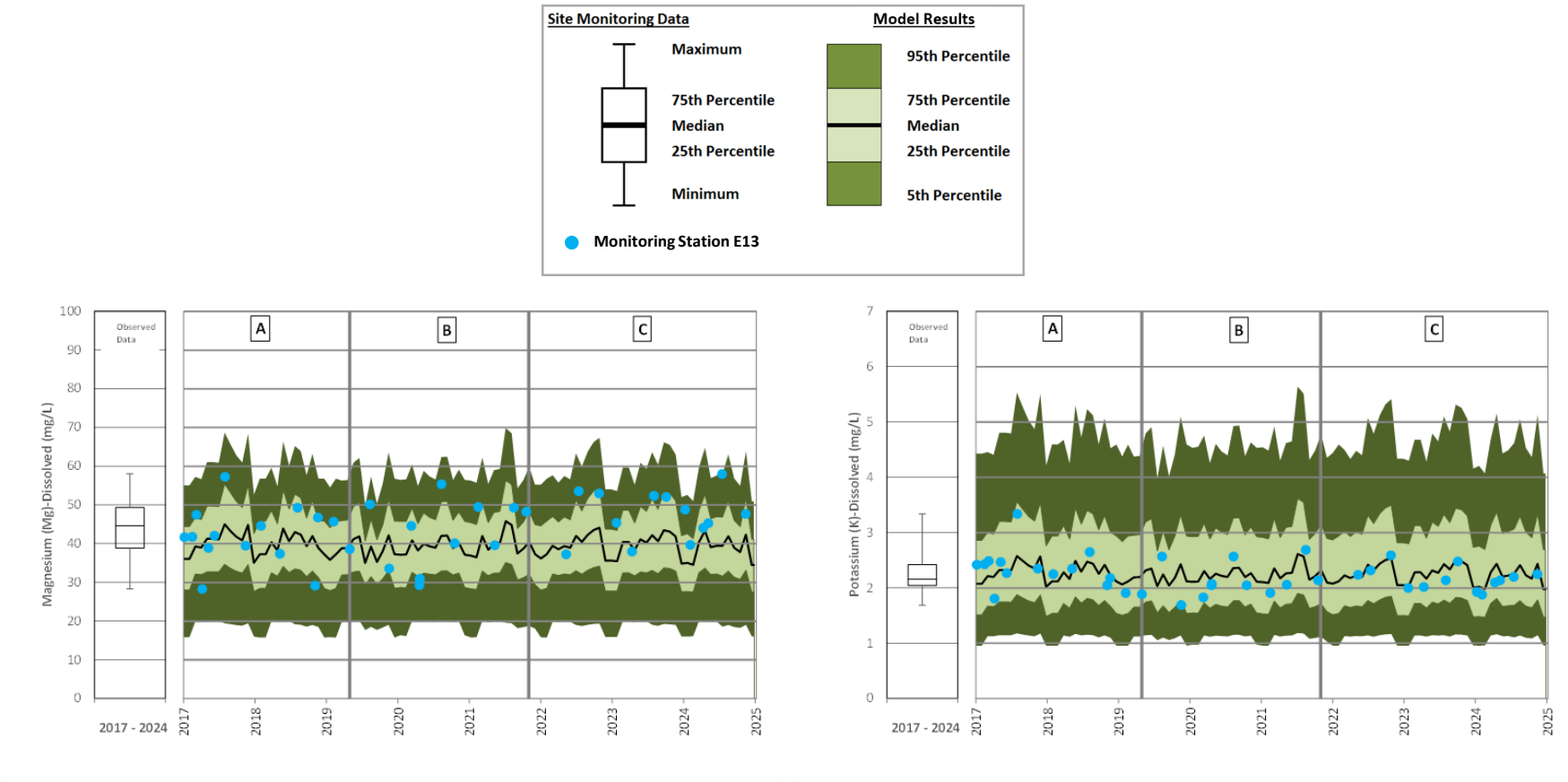
A = Operations; B = Care and Maintanence; C = Resumed Operations

Figure A-121: Northwest Sump Calibration – Total Dissolved Solids and Calcium



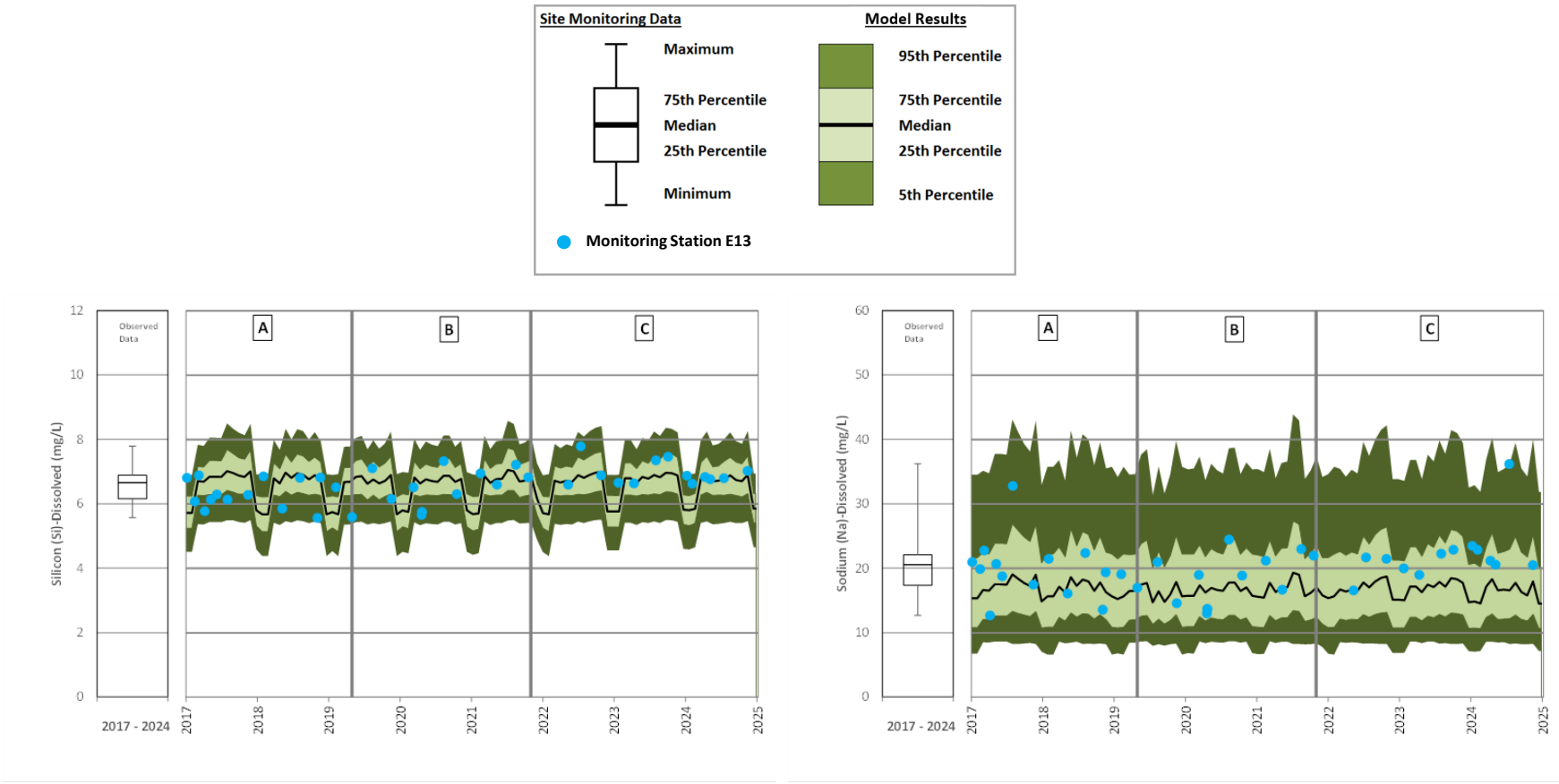
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-122: Northwest Sump Calibration – Chloride and Fluoride



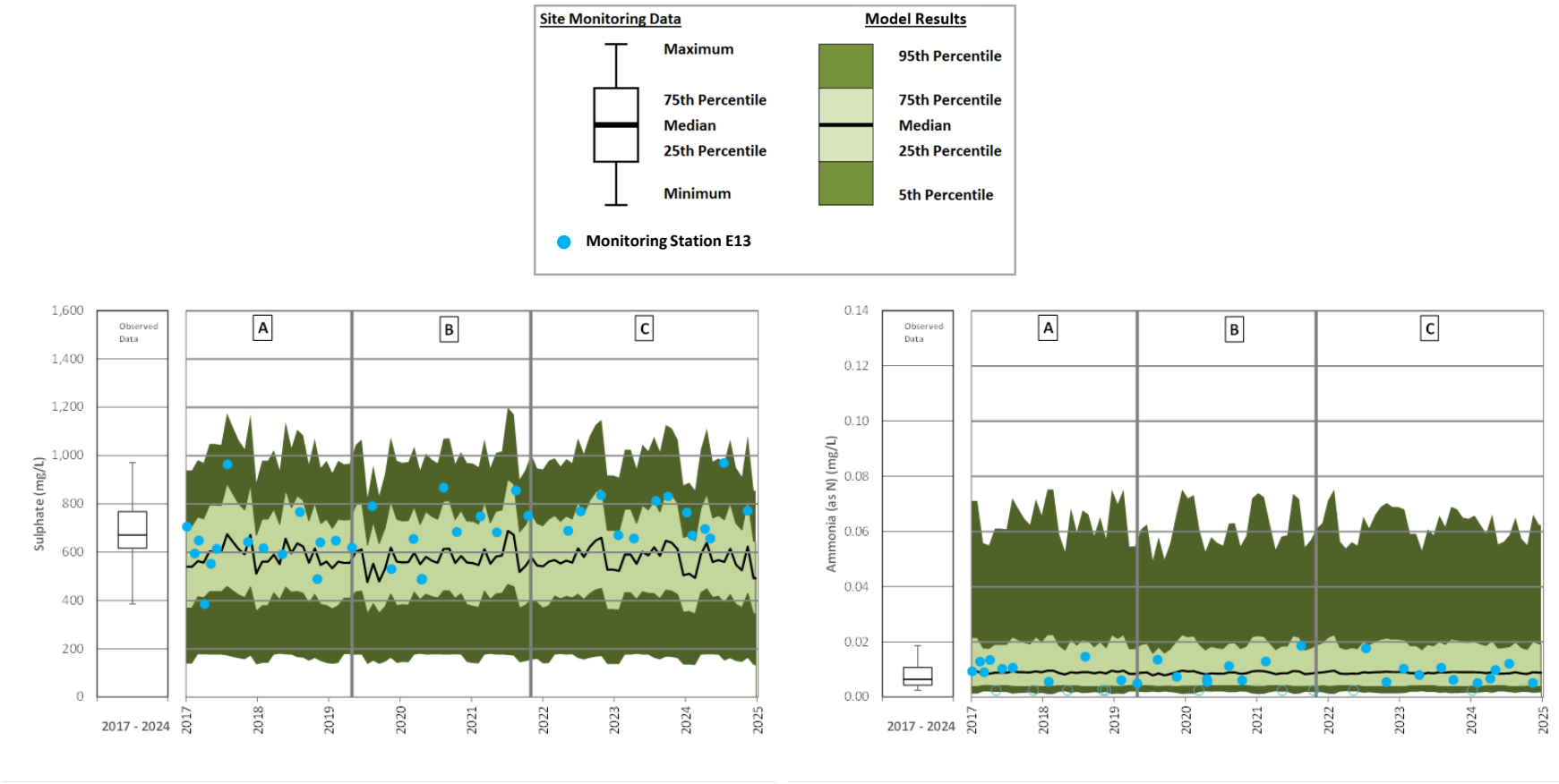
A = Operations; B = Care and Maintanence; C = Resumed Operations

Figure A-123: Northwest Sump Calibration – Magnesium and Potassium



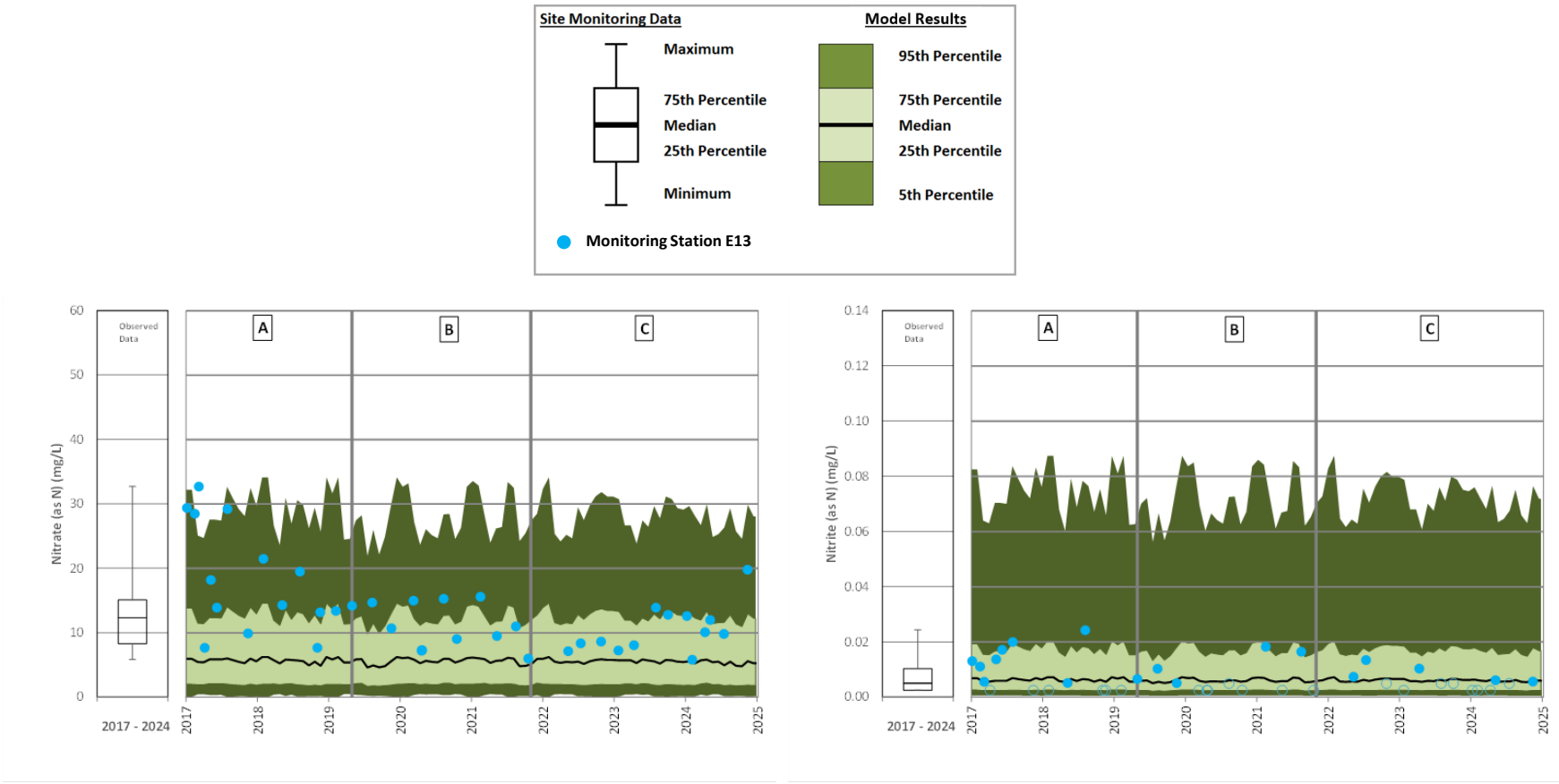
A = Operations; B = Care and Maintanence; C = Resumed Operations

Figure A-124: Northwest Sump Calibration – Silicon and Sodium



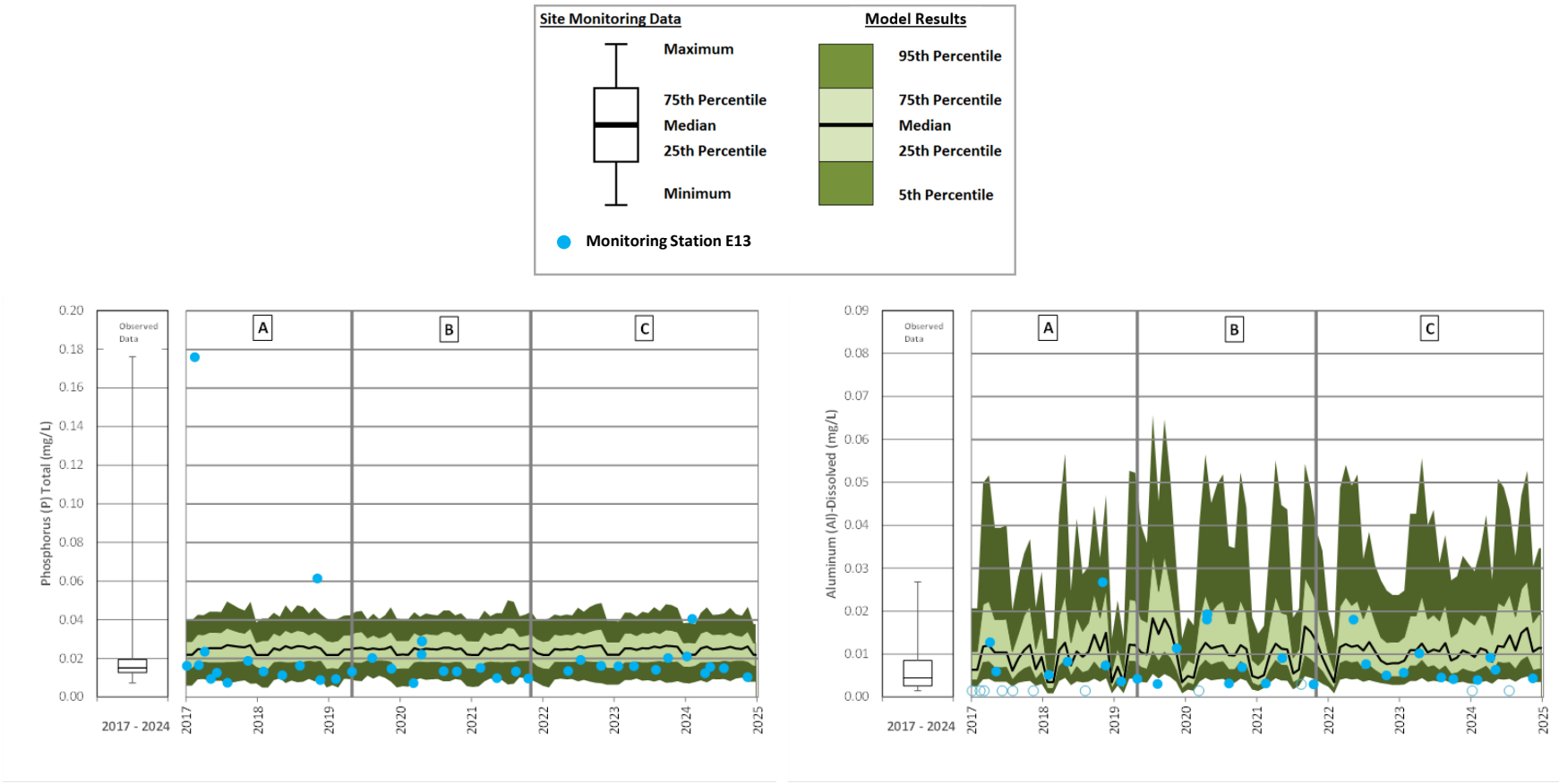
A = Operations; B = Care and Maintanence; C = Resumed Operations

Figure A-125: Northwest Sump Calibration – Sulphate and Total Ammonia



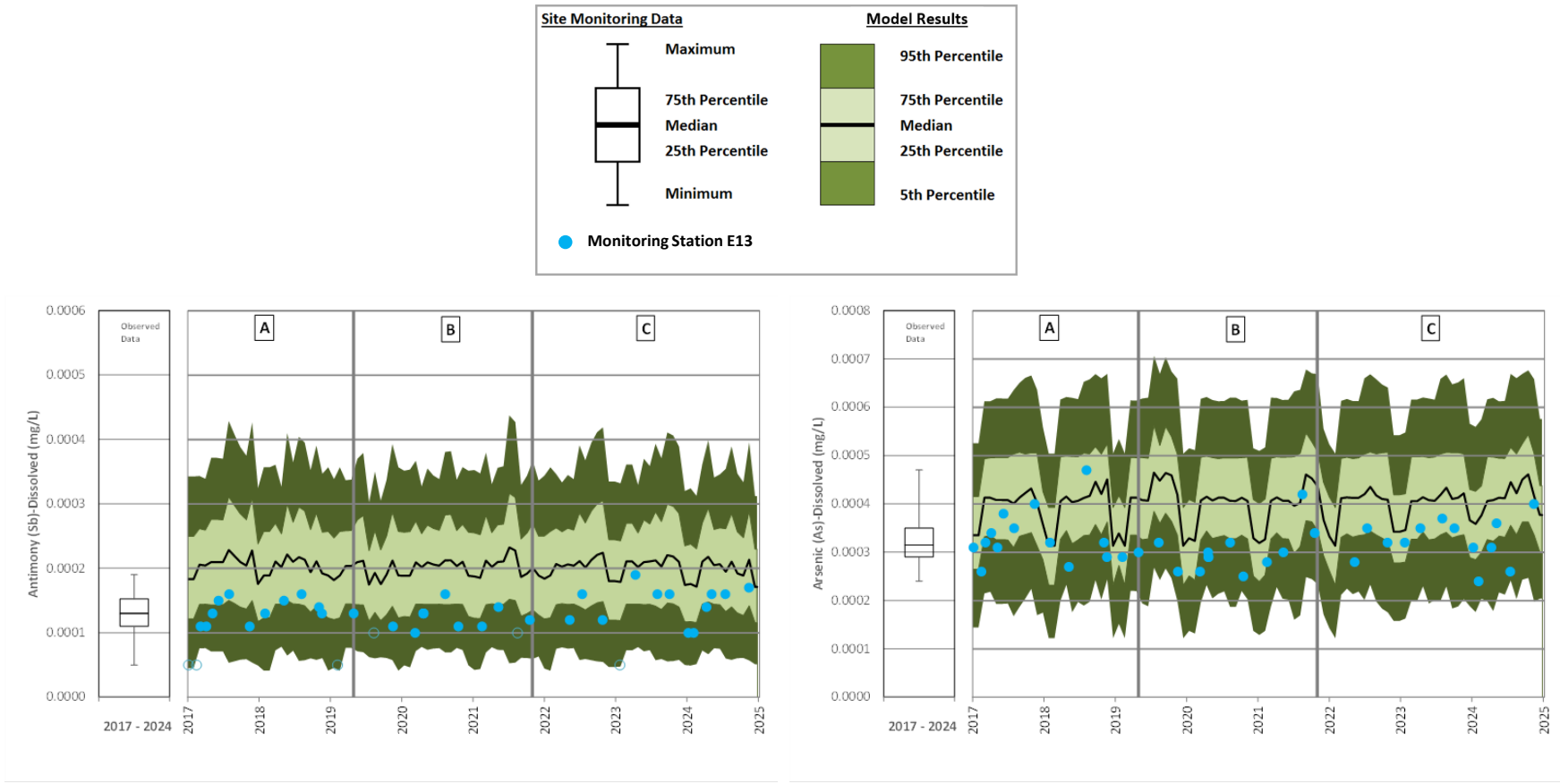
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-126: Northwest Sump Calibration – Nitrate and Nitrite



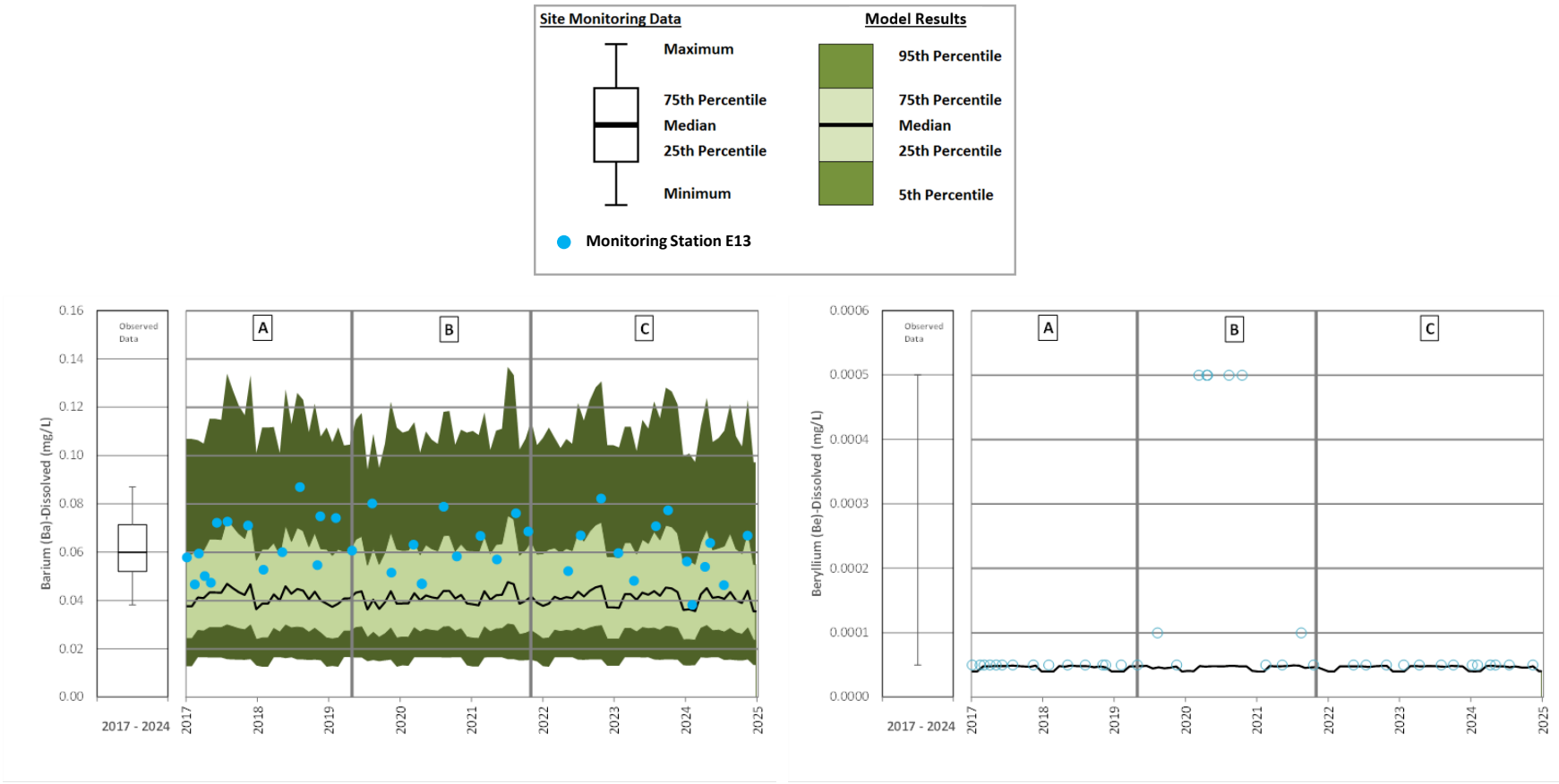
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-127: Northwest Sump Calibration – Total Phosphorus and Dissolved Aluminum



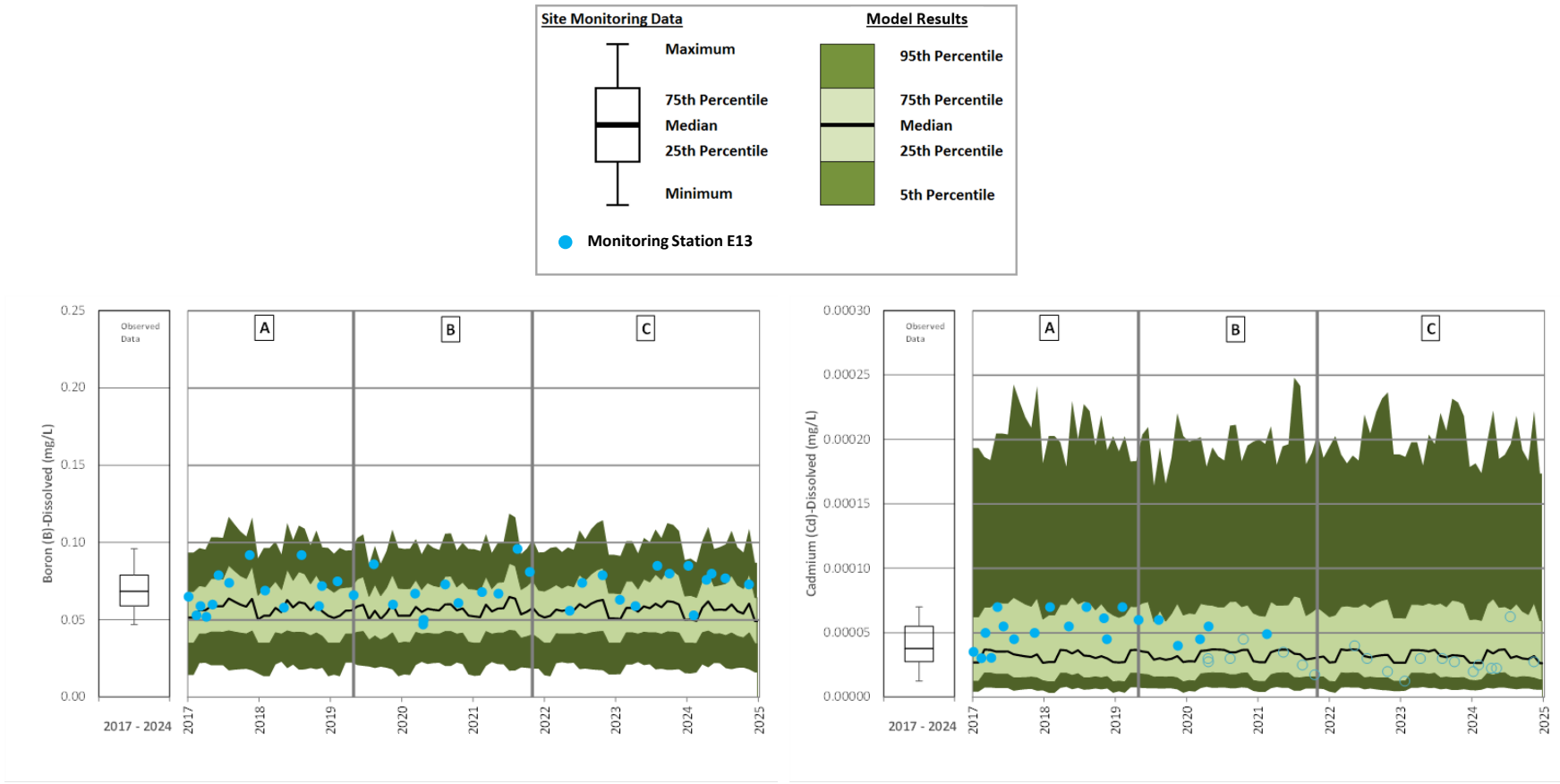
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-128: Northwest Sump Calibration – Dissolved Antimony and Dissolved Arsenic



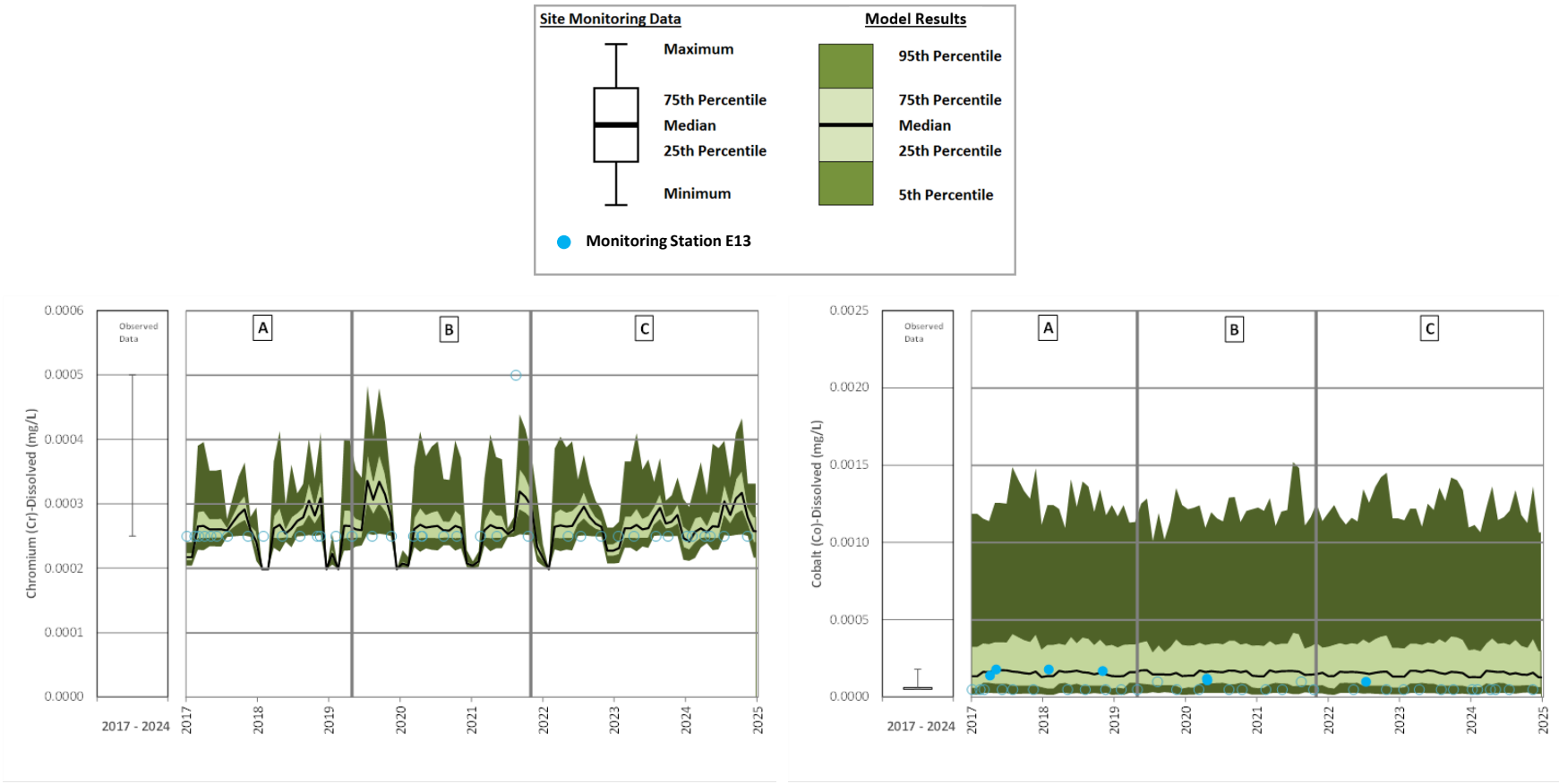
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-129: Northwest Sump Calibration – Dissolved Barium and Dissolved Beryllium



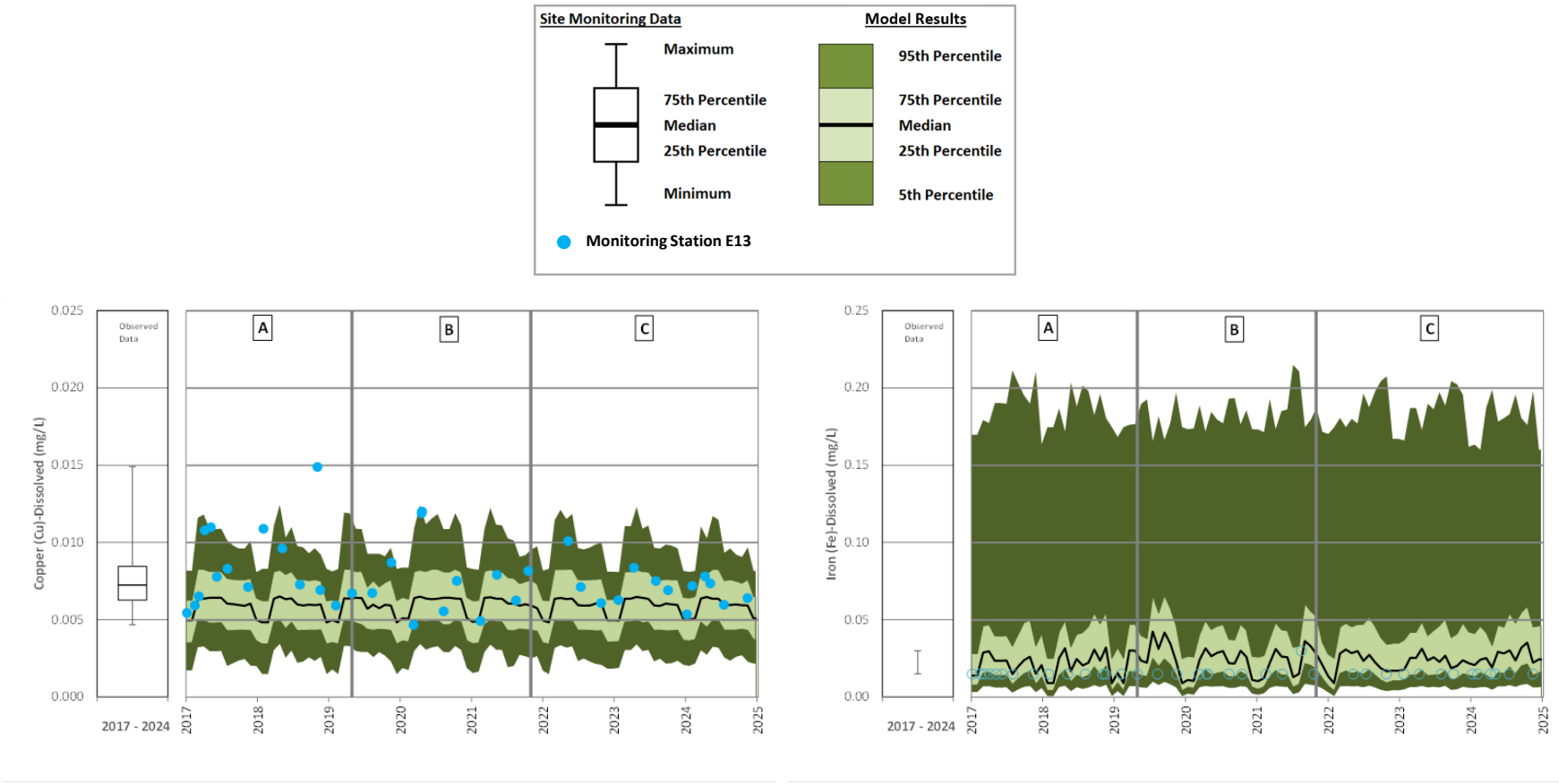
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-130: Northwest Sump Calibration – Dissolved Boron and Dissolved Cadmium



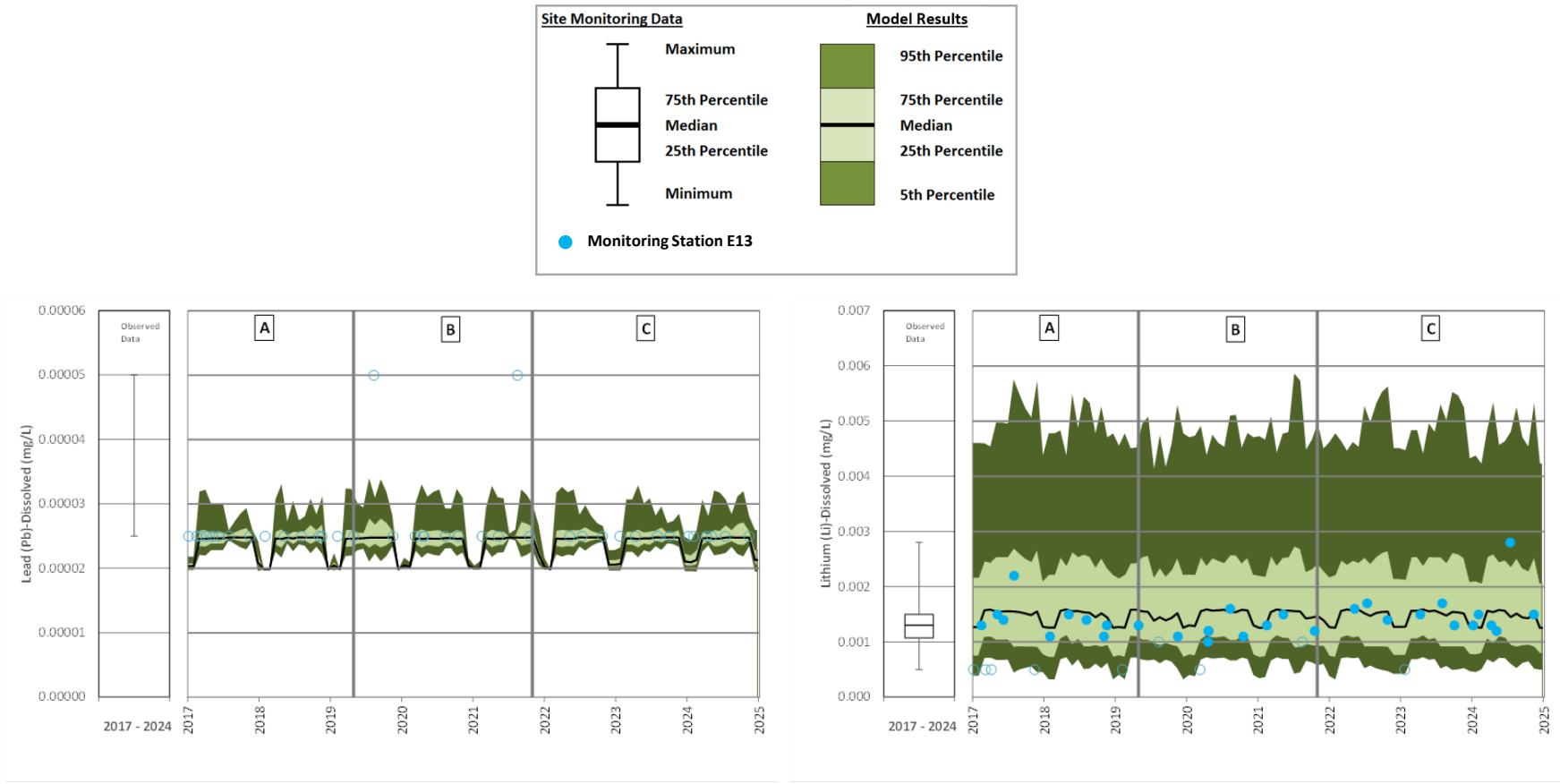
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-131: Northwest Sump Calibration – Dissolved Chromium and Dissolved Cobalt



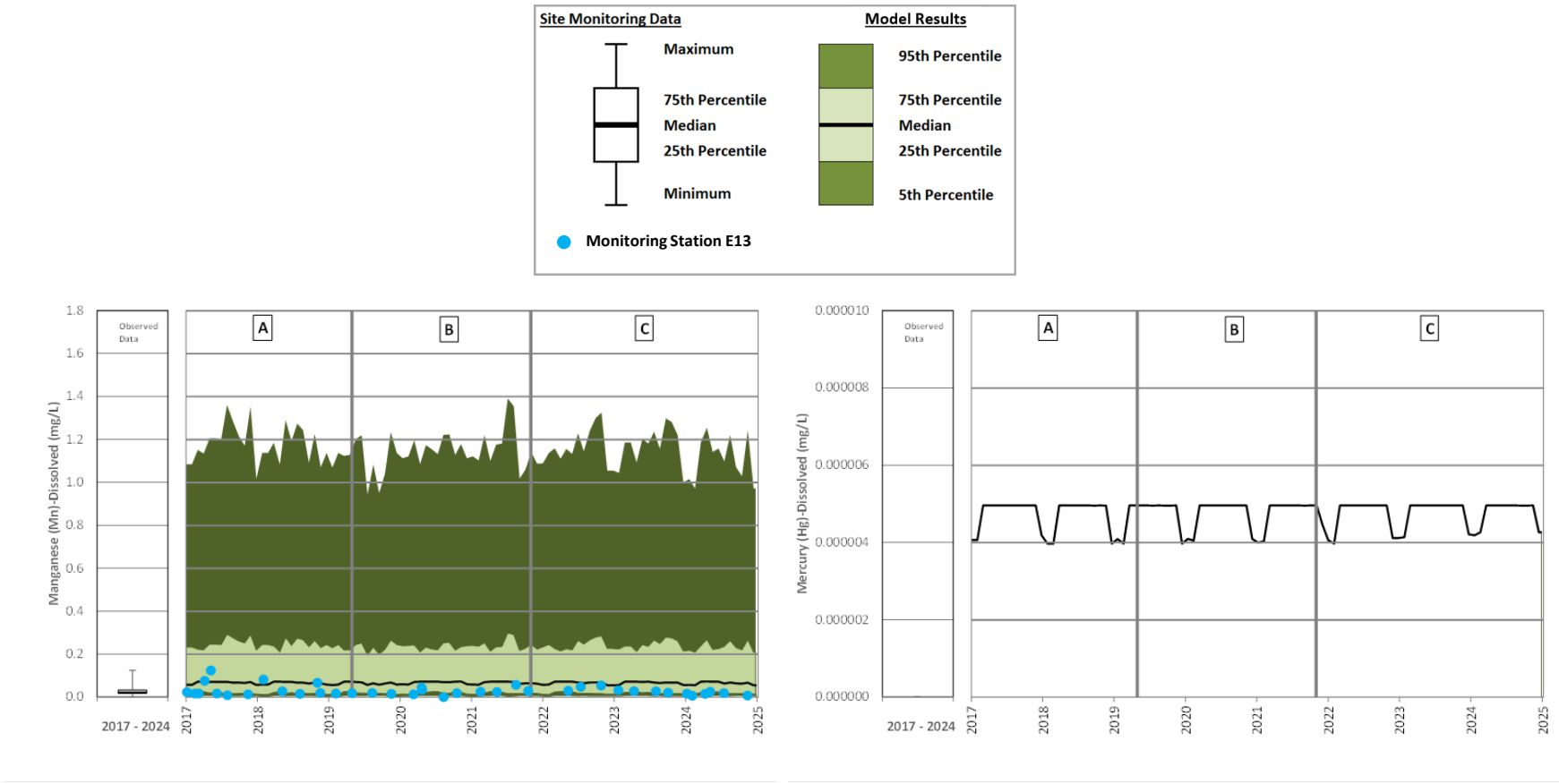
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-132: Northwest Sump Calibration – Dissolved Copper and Dissolved Iron



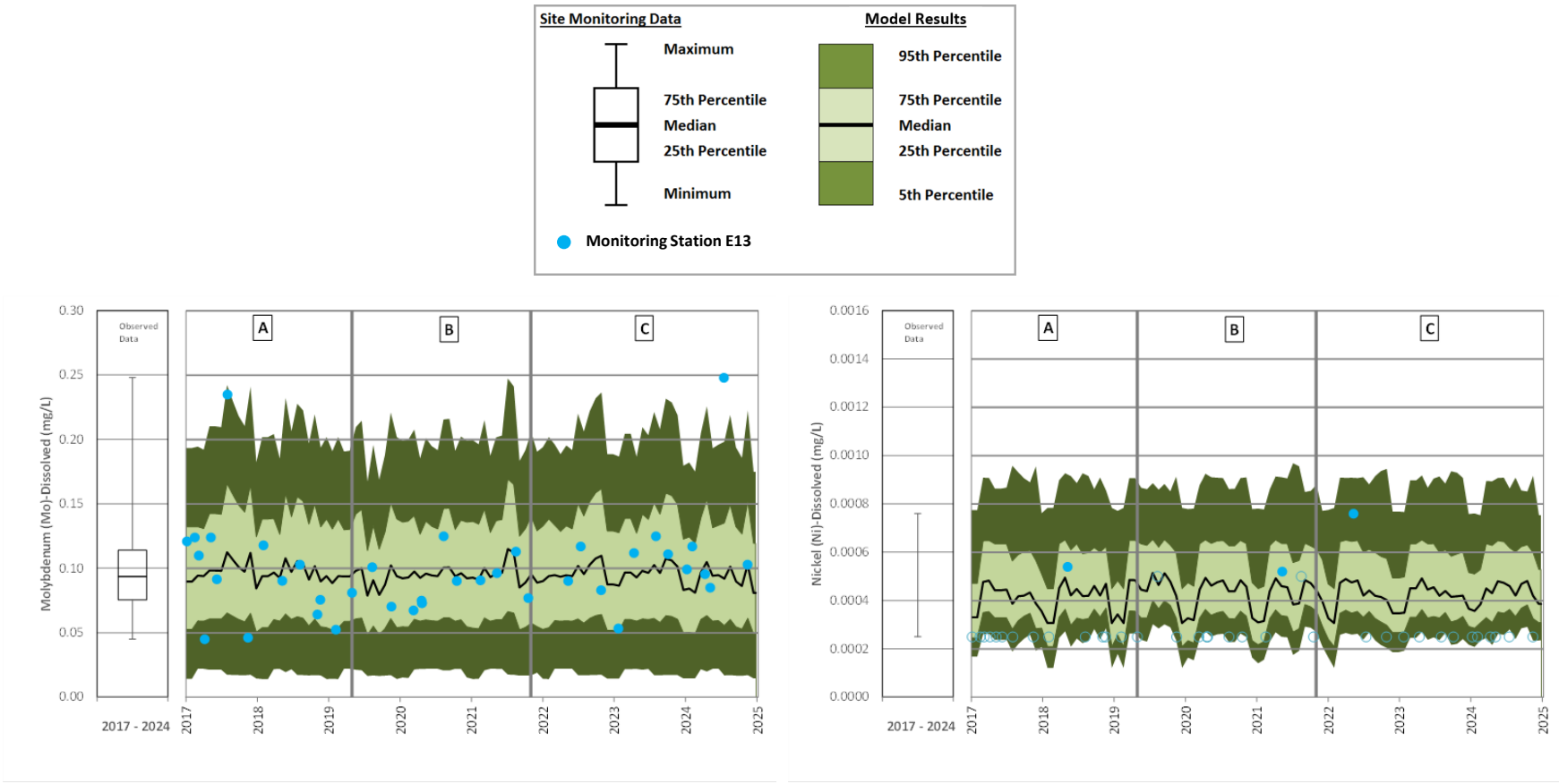
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-133: Northwest Sump Calibration – Dissolved Lead and Dissolved Lithium



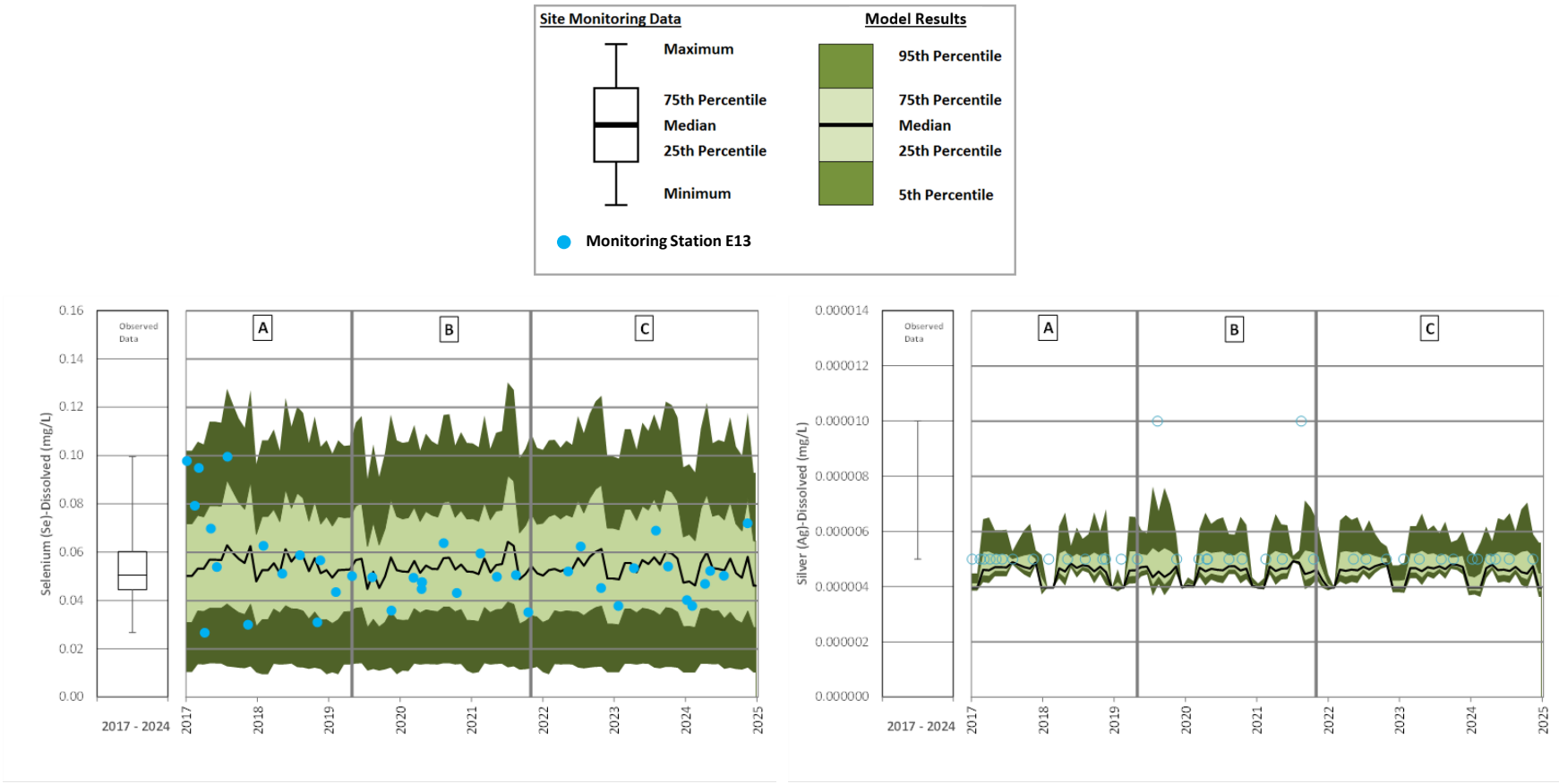
A = Operations; B = Care and Maintanence; C = Resumed Operations

Figure A-134: Northwest Sump Calibration – Dissolved Manganese and Dissolved Mercury



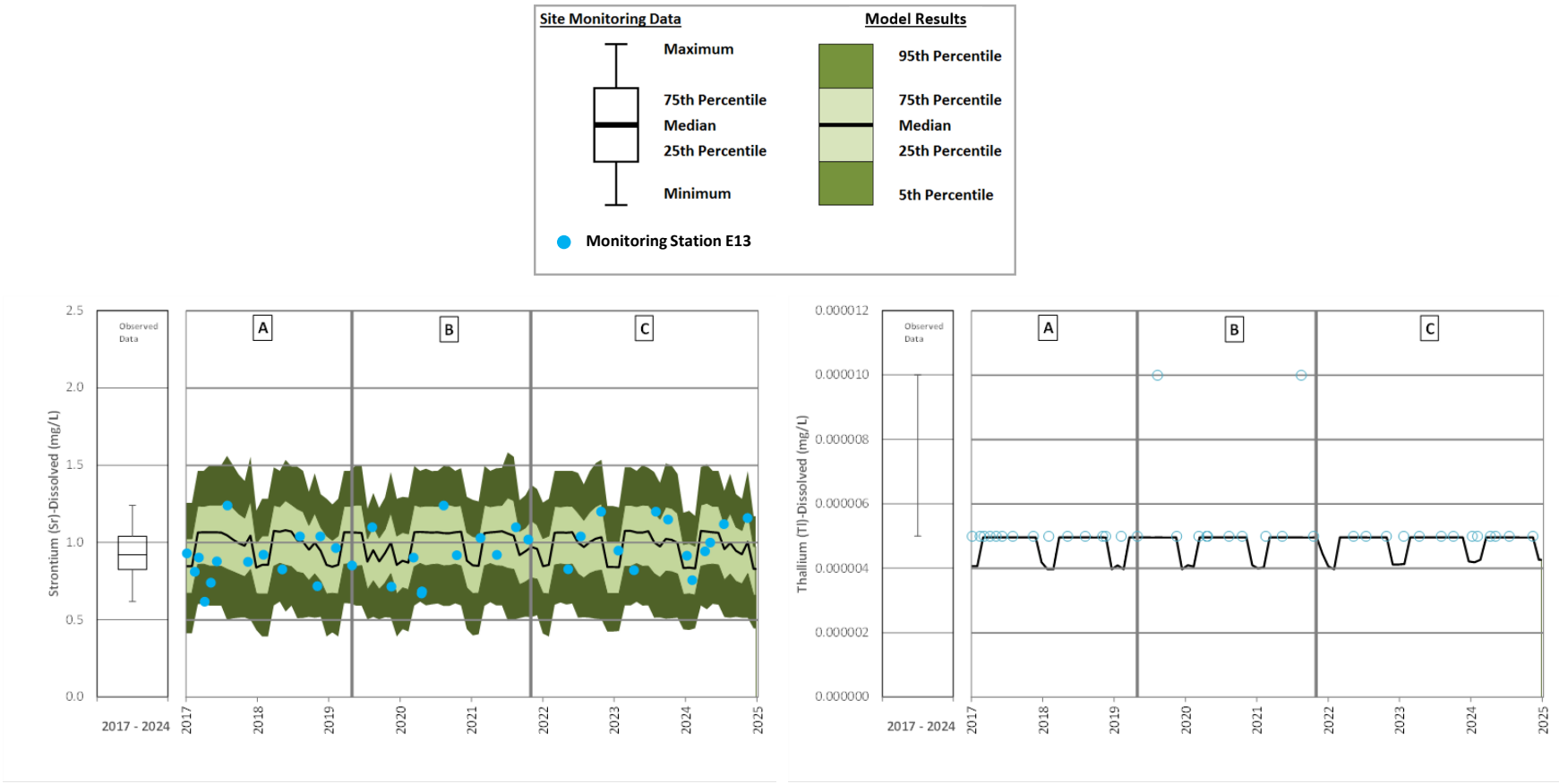
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-135: Northwest Sump Calibration – Dissolved Molybdenum and Dissolved Nickel



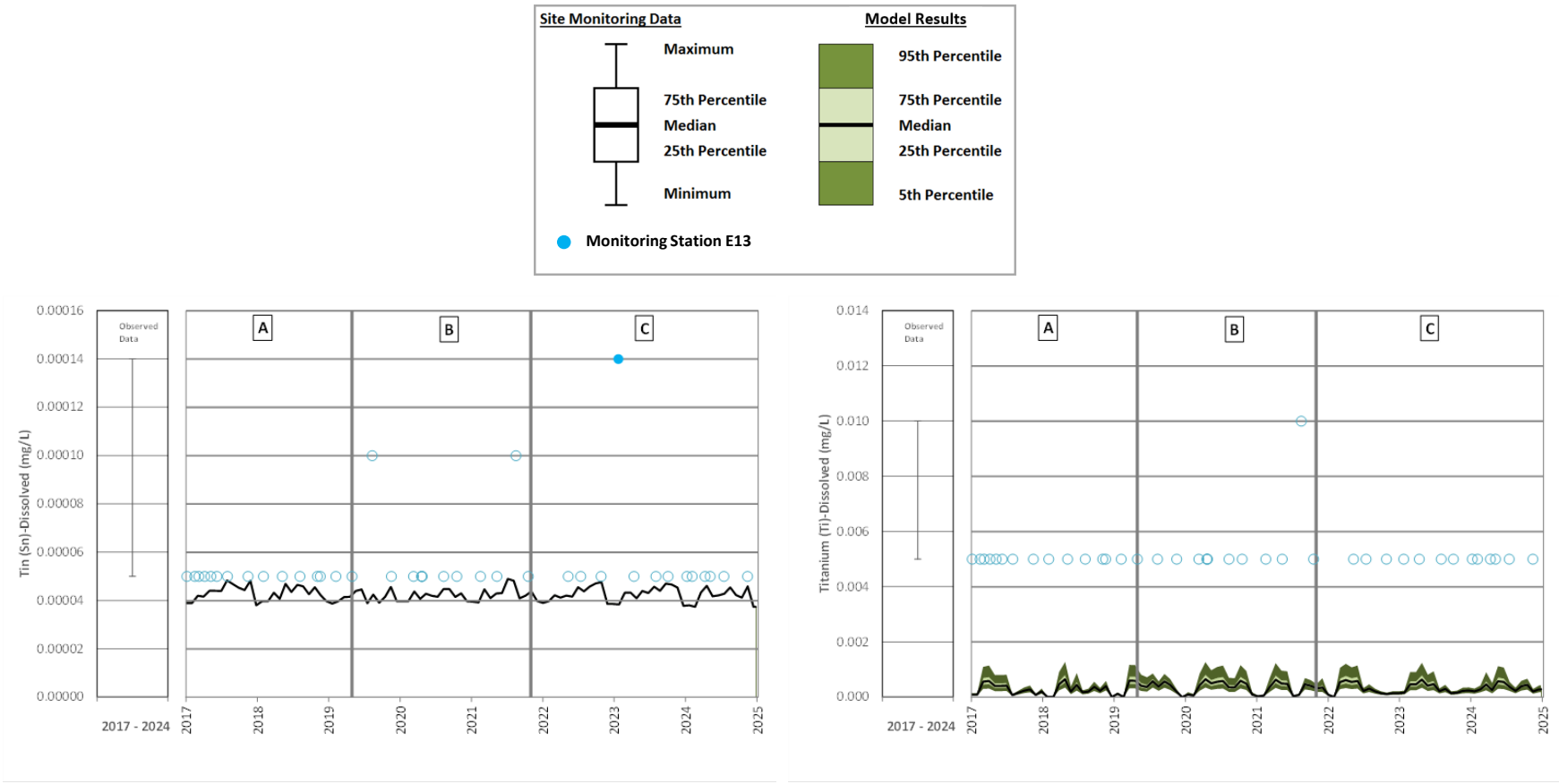
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-136: Northwest Sump Calibration – Dissolved Selenium and Dissolved Silver



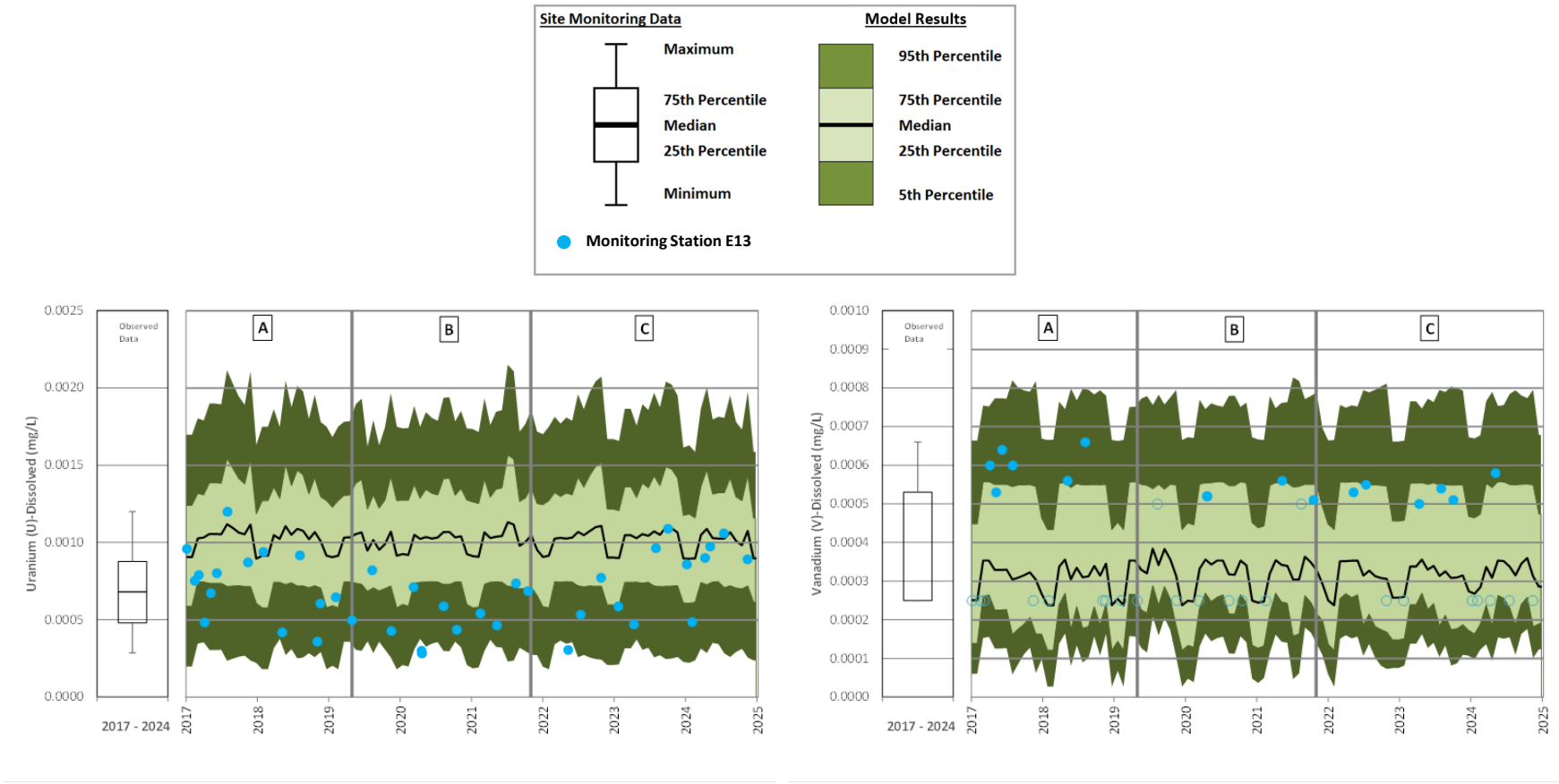
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-137: Northwest Sump Calibration – Dissolved Strontium and Dissolved Thallium



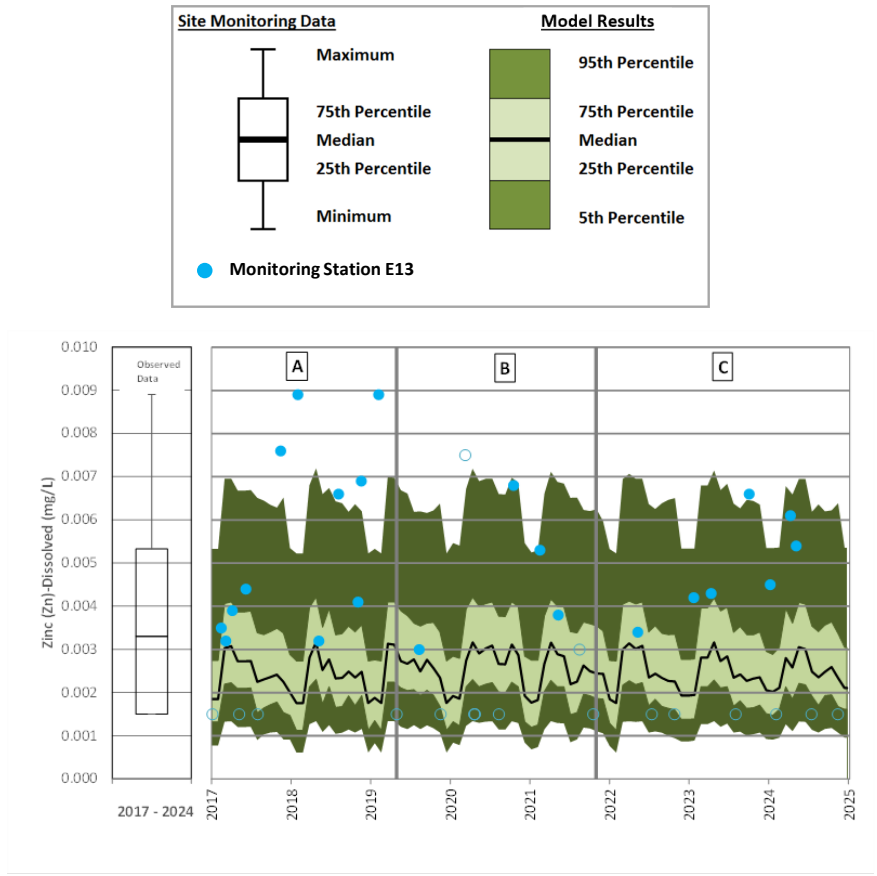
A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-138: Northwest Sump Calibration – Dissolved Tin and Dissolved Titanium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-139: Northwest Sump Calibration – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Care and Maintanence; C = Resumed Operations; concentrations below the detection limit are shown at the detection limit as open markers

Figure A-140: Northwest Sump Calibration – Dissolved Zinc

APPENDIX B

Water Quality Model Results – Operations, Closure and Post-closure

Appendix B

Water Quality Model Results - Operations, Closure and Post-closure

Reference No. CA0047730.8440-016-R-Rev0-31241

August 2025

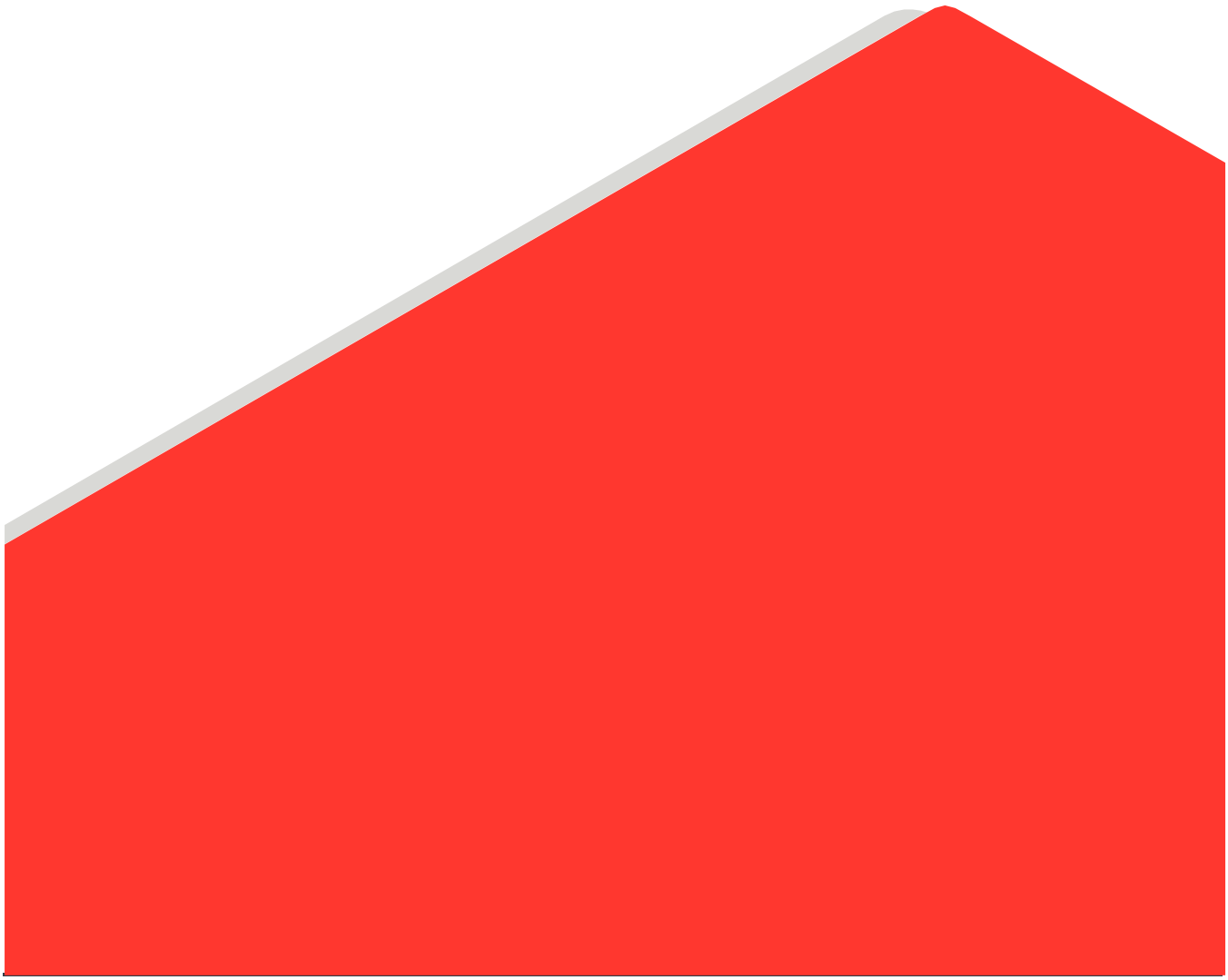


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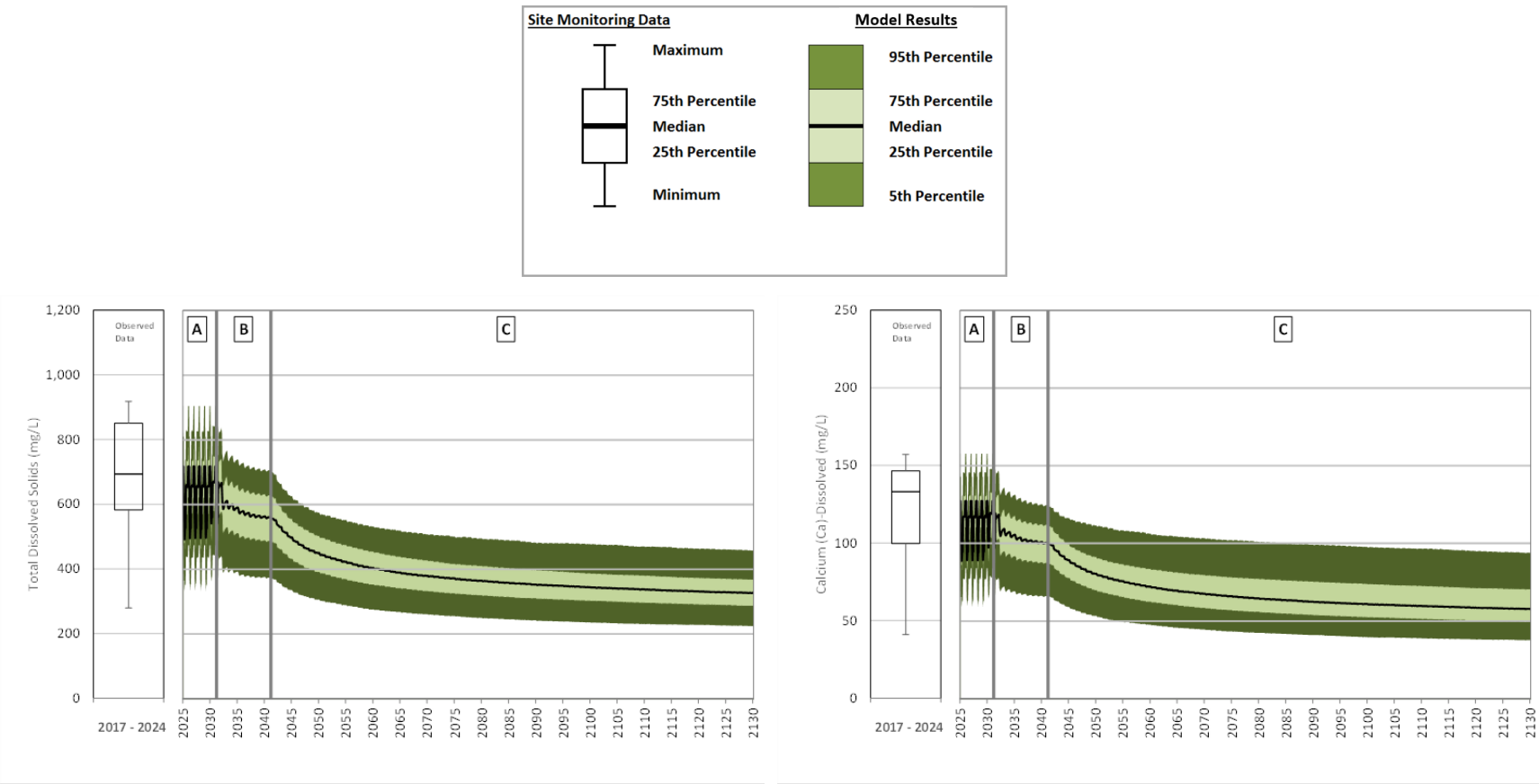
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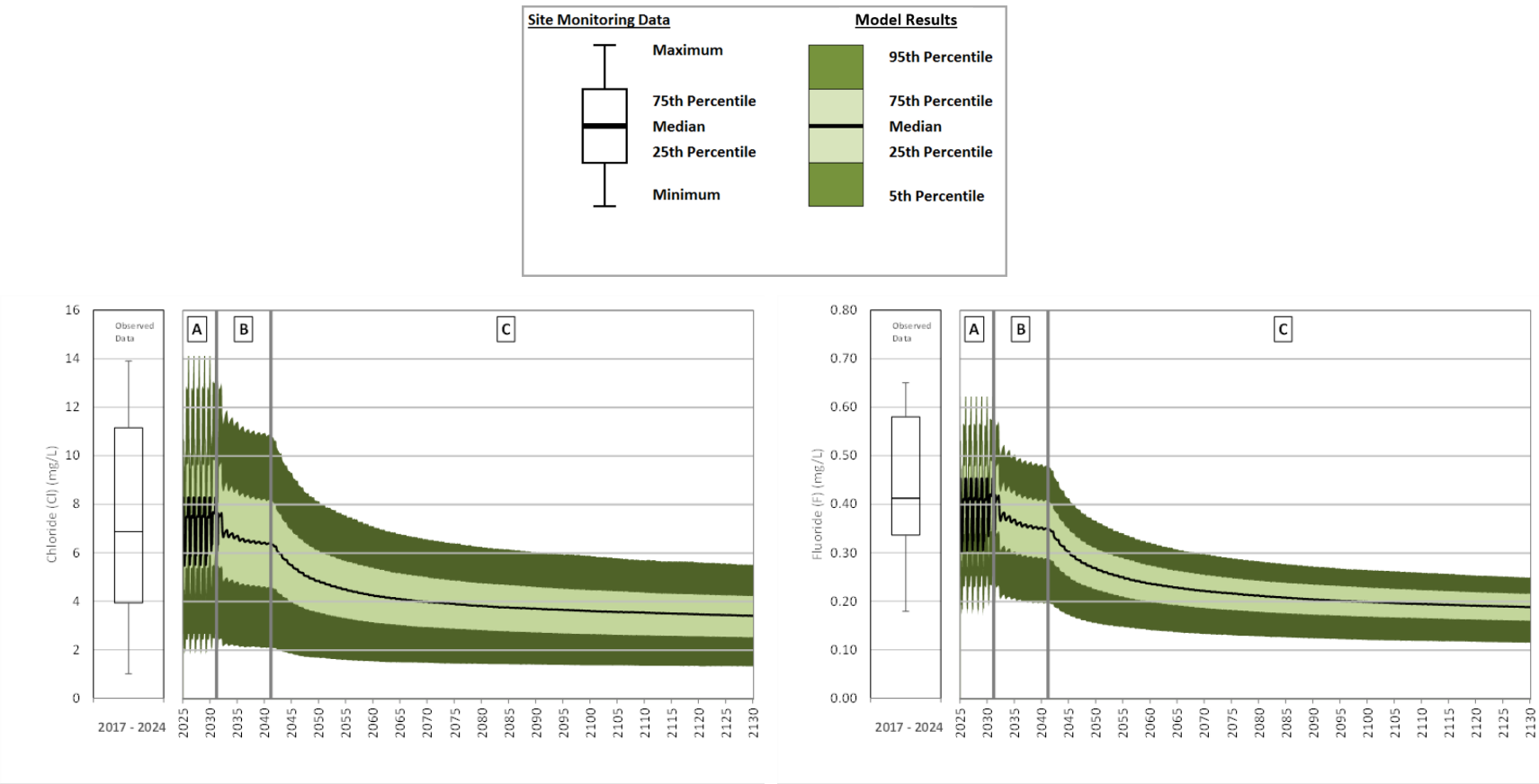
This attachment presents the water quality results Figures for all modeled parameters in Springer-Cariboo Pit, Wight Pit, the Central Collection Sump, the Tailings Storage Facility, the Perimeter Embankment Till Borrow Pond the 9K Sump, the Northwest Sump and Long Ditch. The operations period is from January 2025 to March 2031. The closure period is from April 2031 to March 2041. The post-closure period is from April 2041 to March 2131.

Springer-Cariboo Pit Operations, Closure and Post-closure



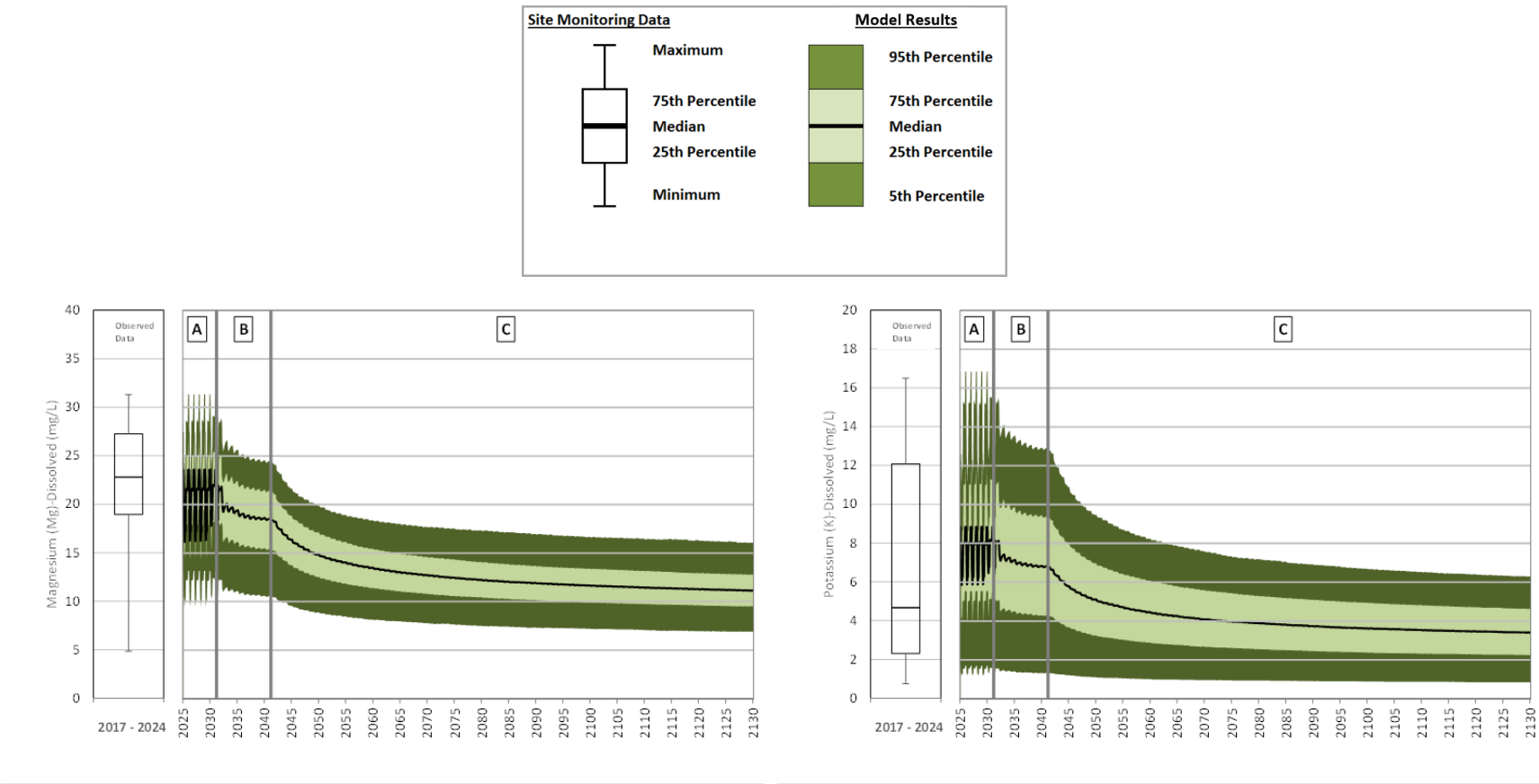
A = Operations; B = Closure; C = Post-closure

Figure B-1: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



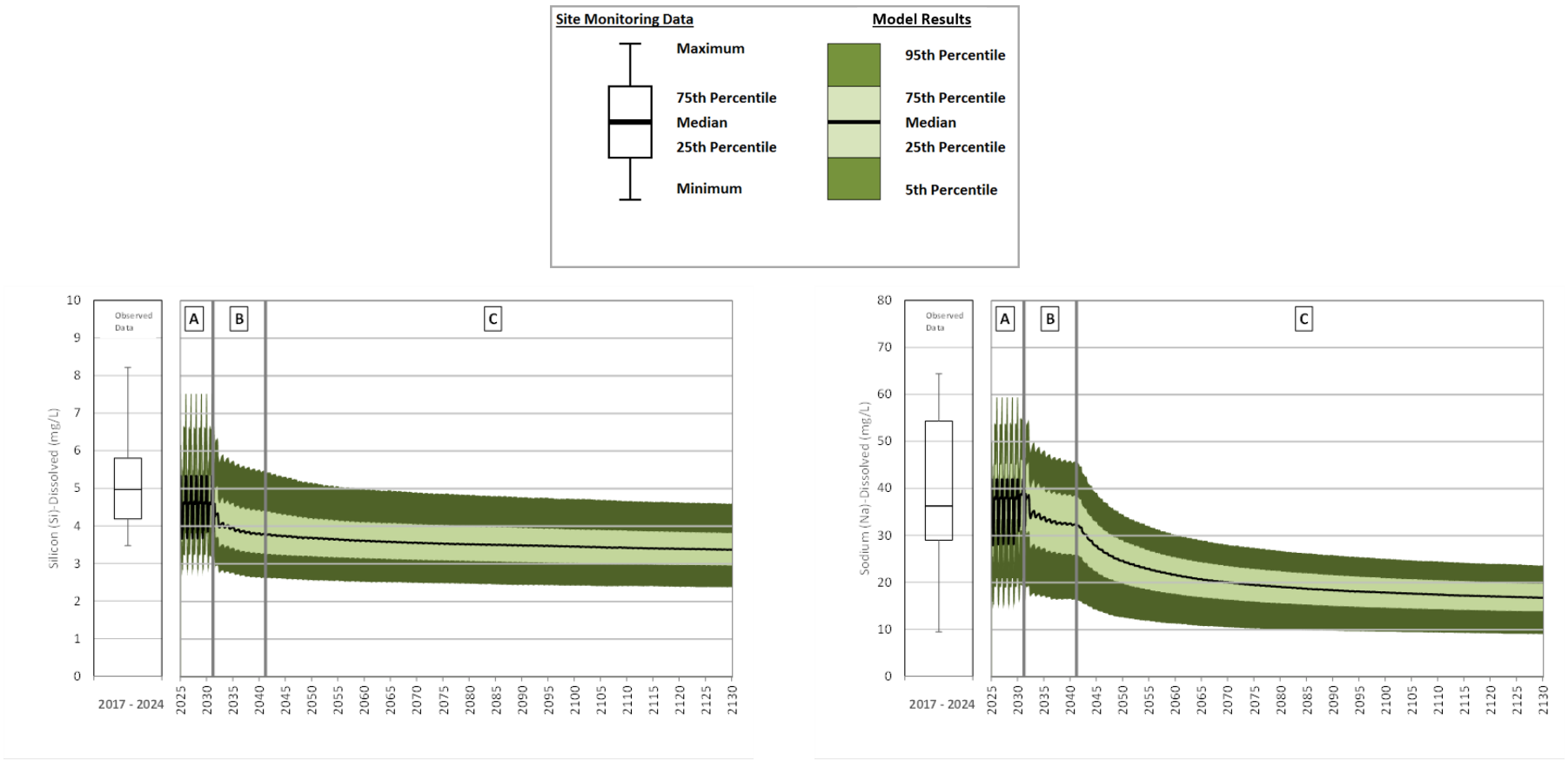
A = Operations; B = Closure; C = Post-closure

Figure B-2: Springer-Cariboo Pit Operations, Closure and Post-closure – Chloride and Fluoride



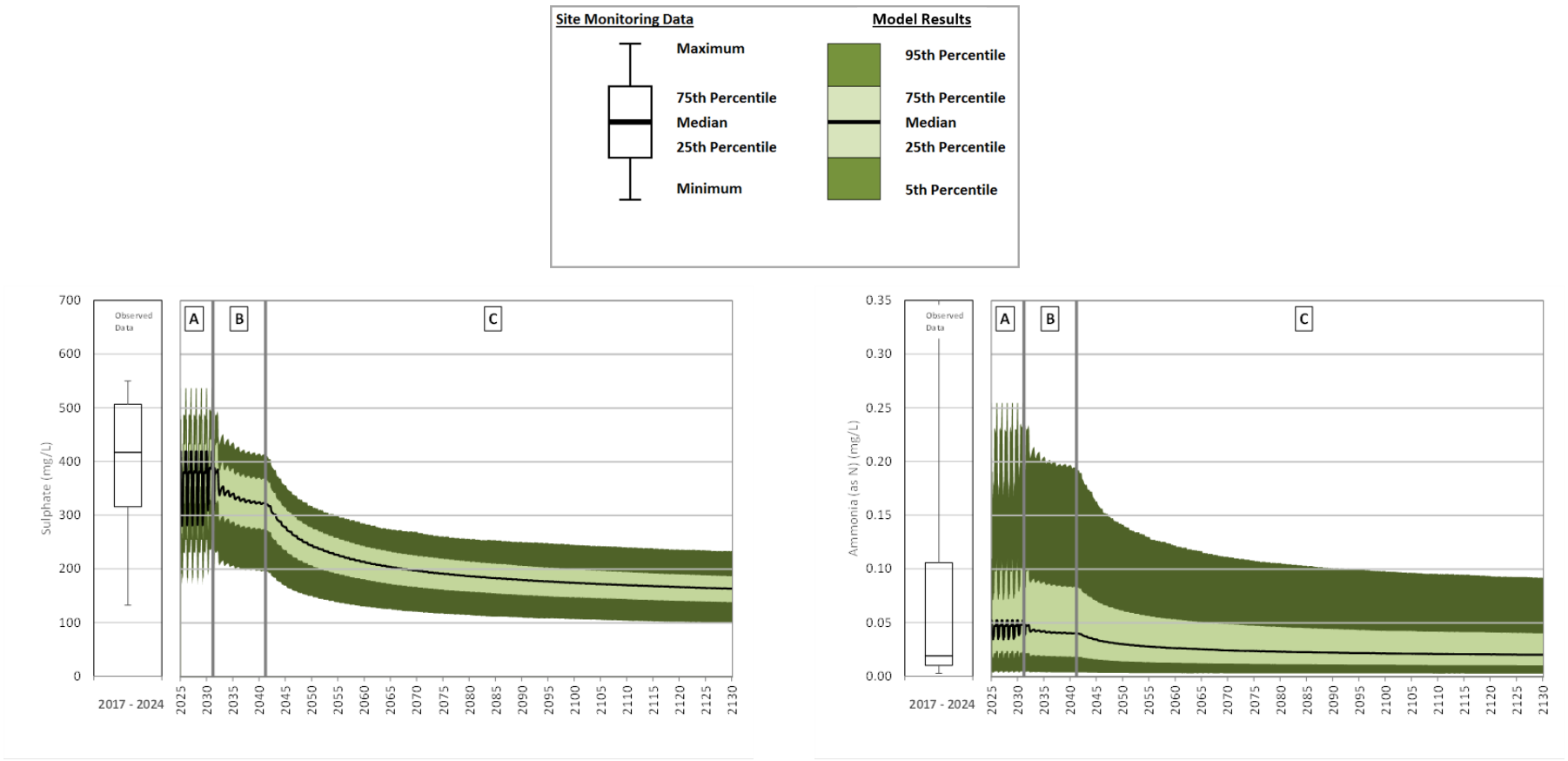
A = Operations; B = Closure; C = Post-closure

Figure B-3: Springer-Cariboo Pit Operations, Closure and Post-closure – Magnesium and Potassium



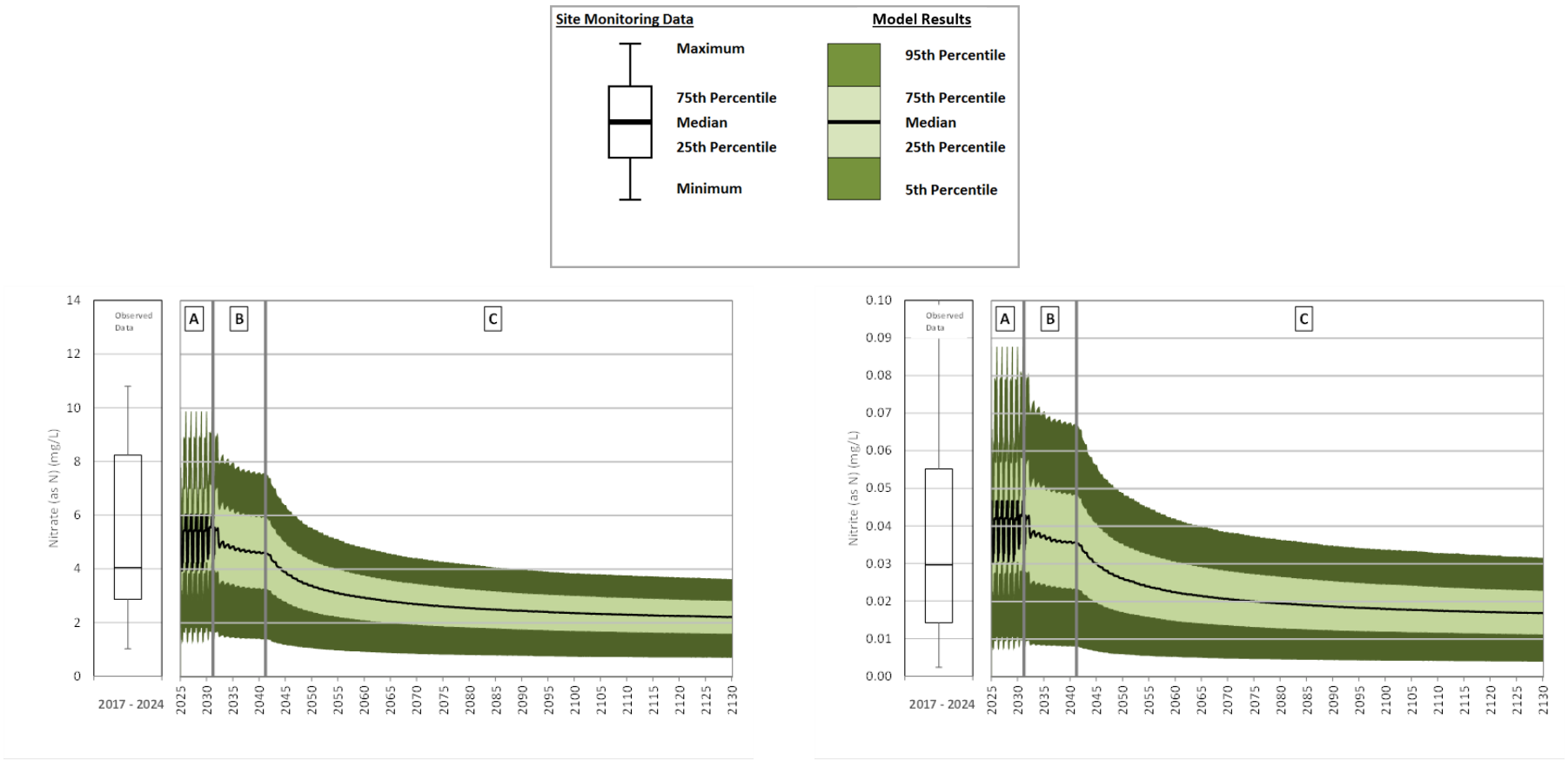
A = Operations; B = Closure; C = Post-closure

Figure B-4: Springer-Cariboo Pit Operations, Closure and Post-closure – Silicon and Sodium



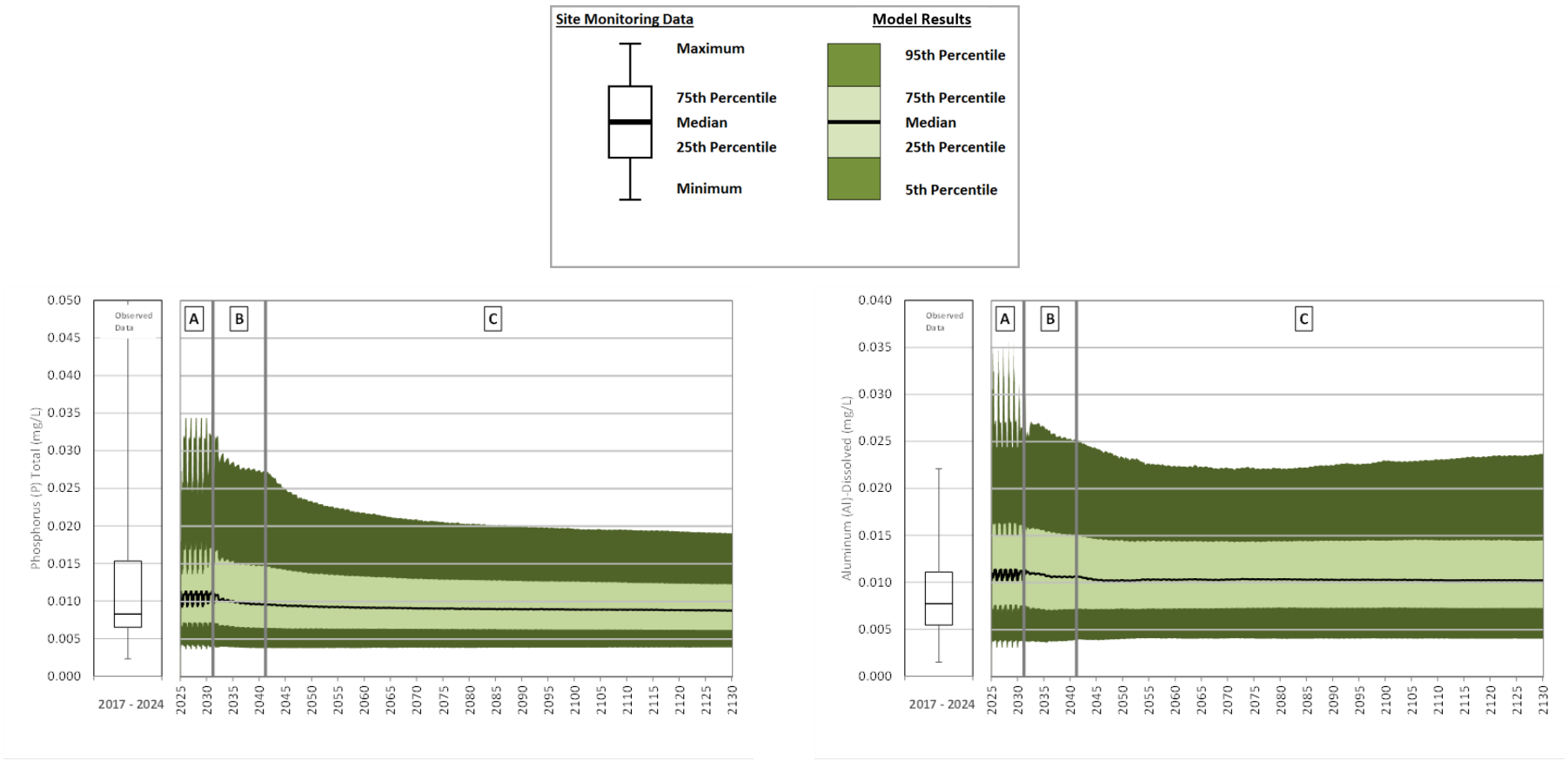
A = Operations; B = Closure; C = Post-closure

Figure B-5: Springer-Cariboo Pit Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

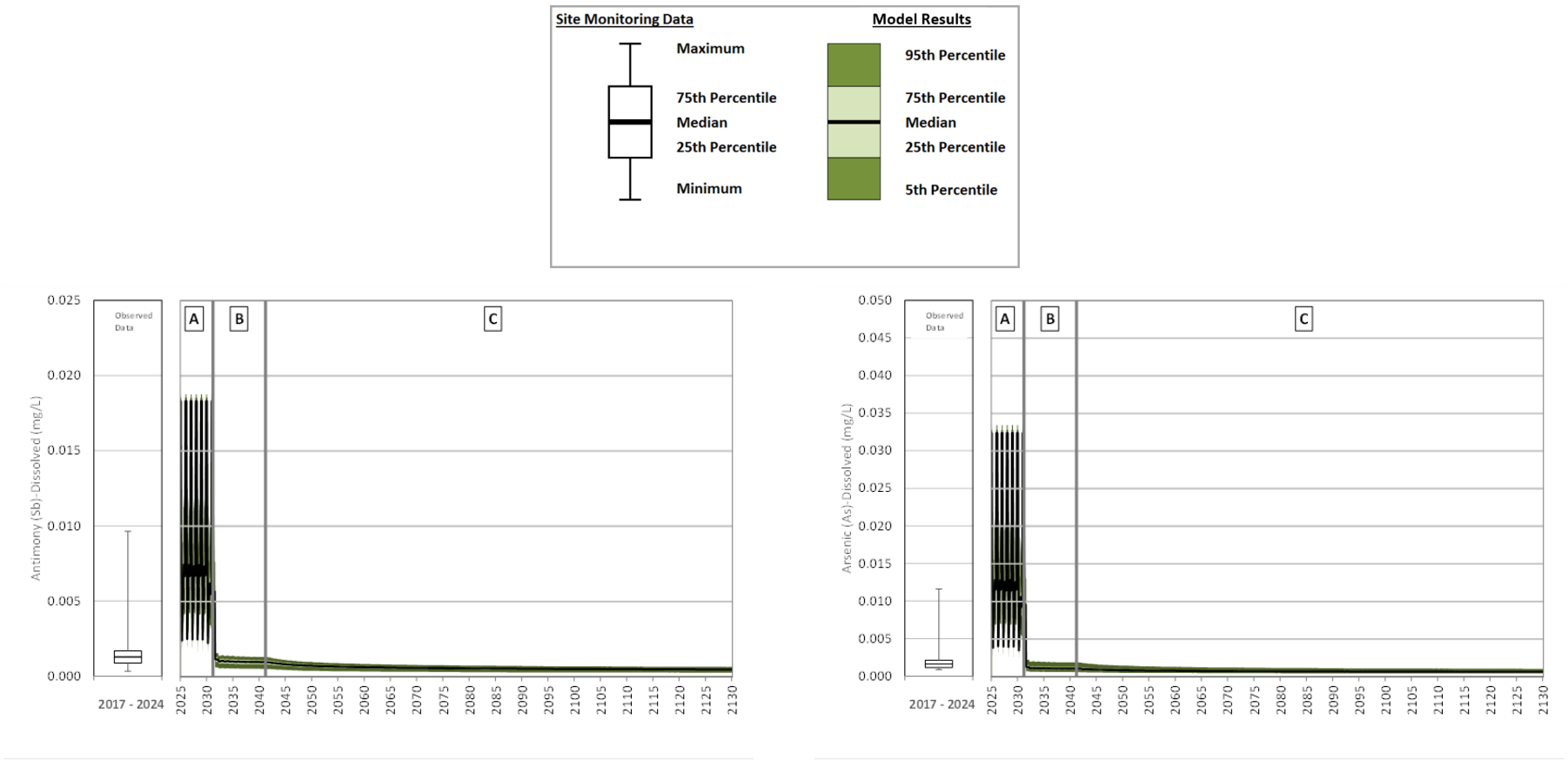
Figure B-6: Springer-Cariboo Pit Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

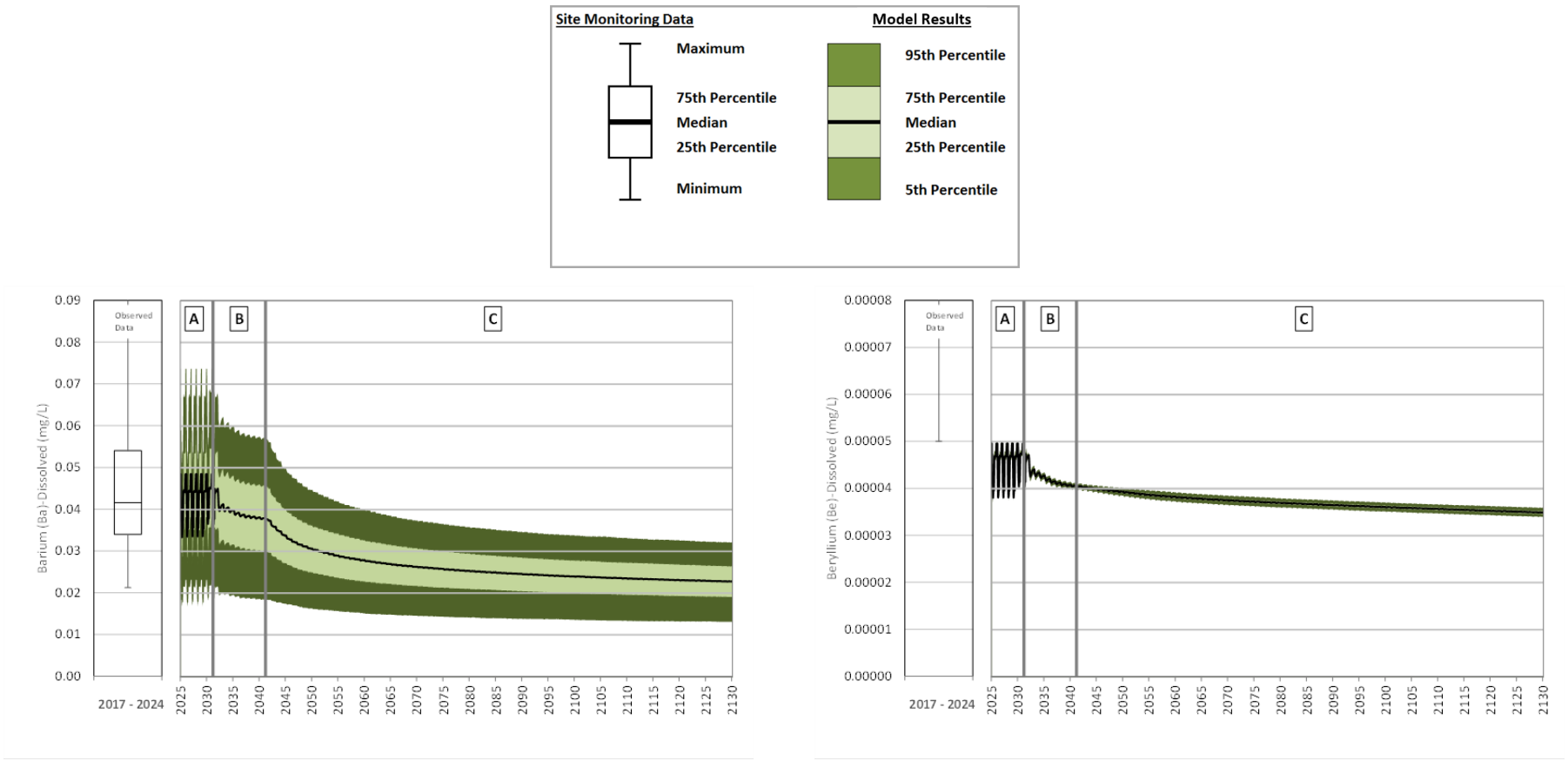
Note: The increases in dissolved aluminum concentrations are caused by higher concentrations in the undisturbed water quality inputs compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

Figure B-7: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



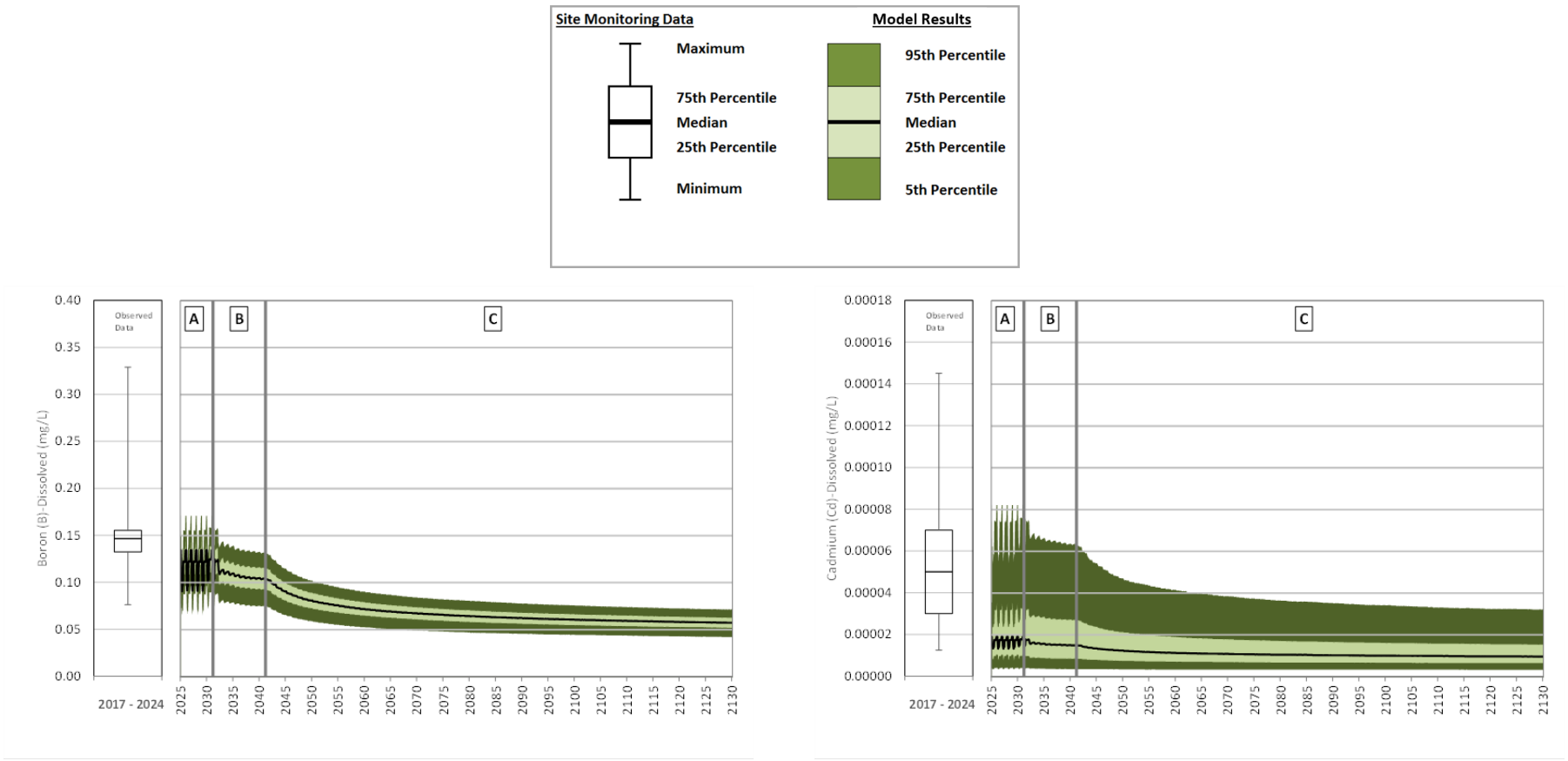
A = Operations; B = Closure; C = Post-closure

Figure B-8: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



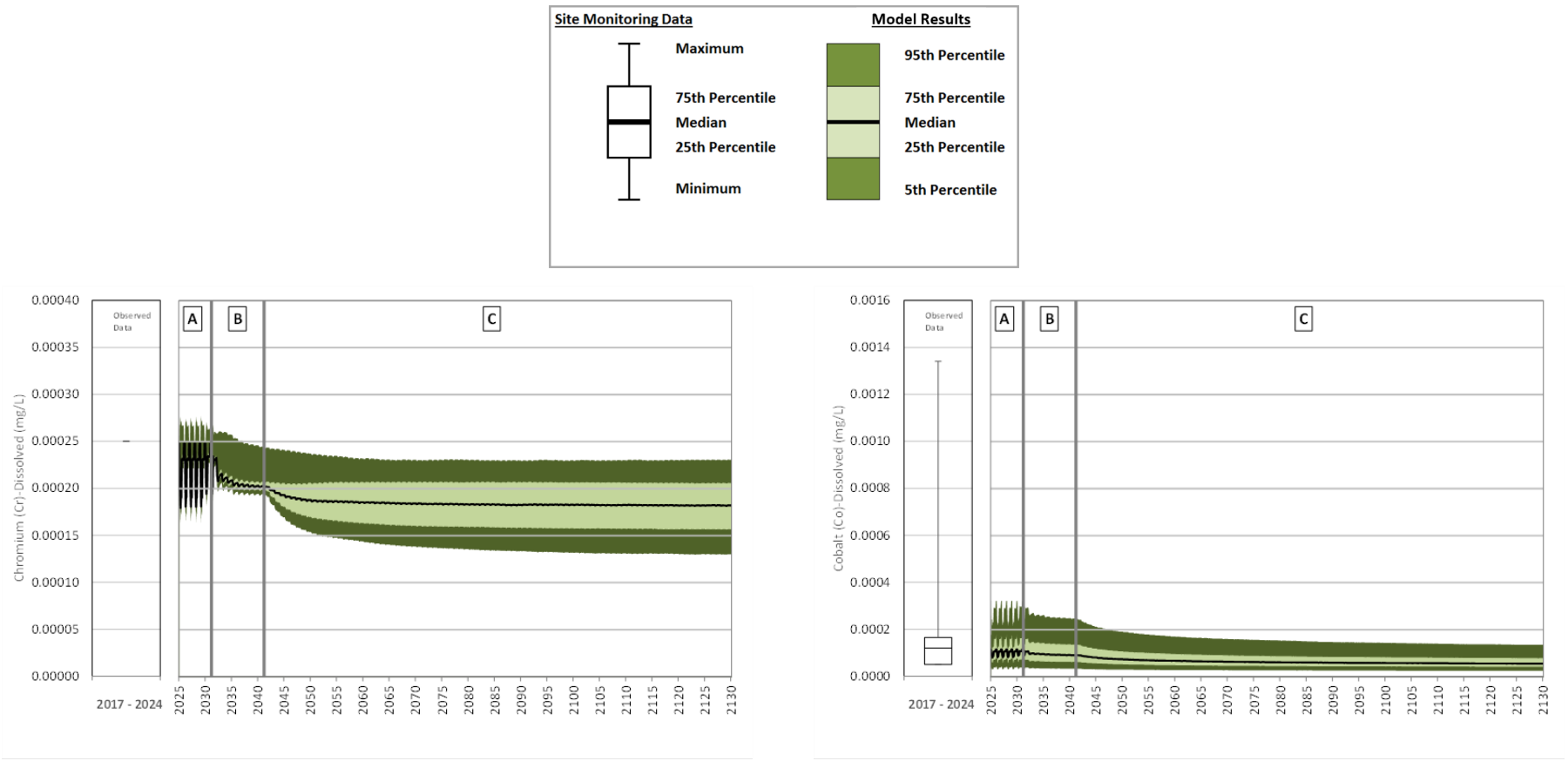
A = Operations; B = Closure; C = Post-closure

Figure B-9: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

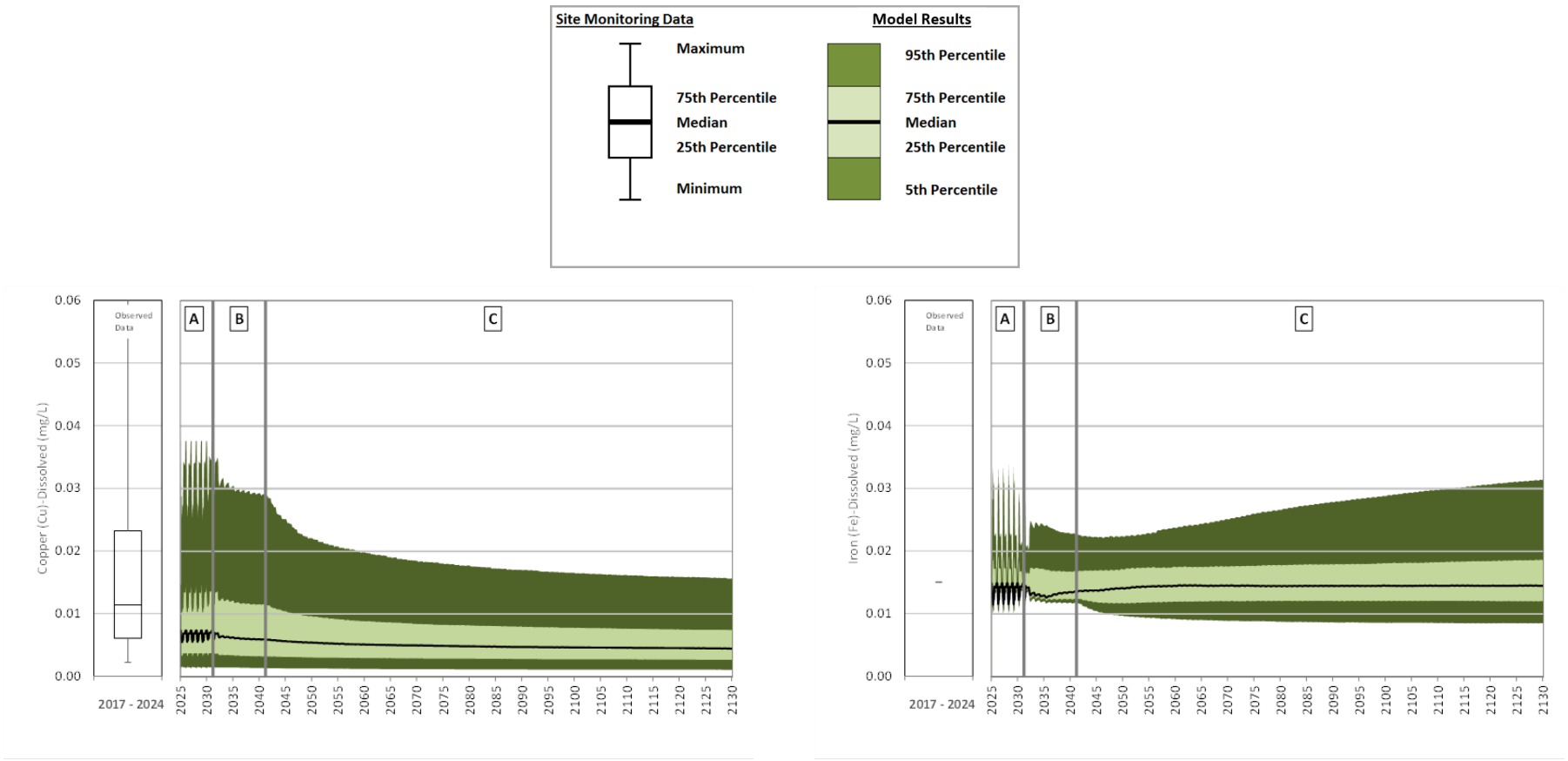
Figure B-10: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved chromium concentrations is caused by higher concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

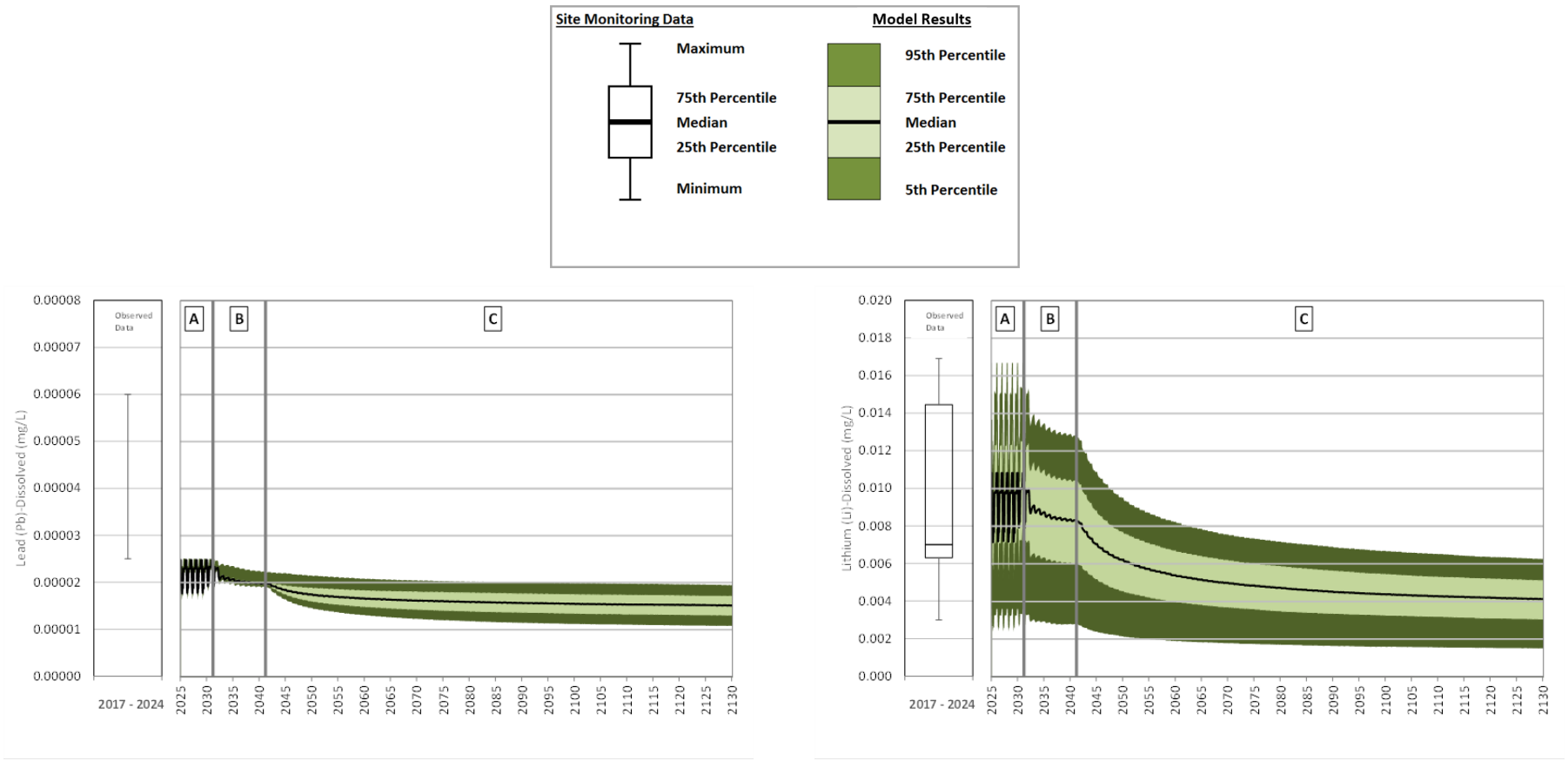
Figure B-11: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved iron concentrations is caused by higher concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

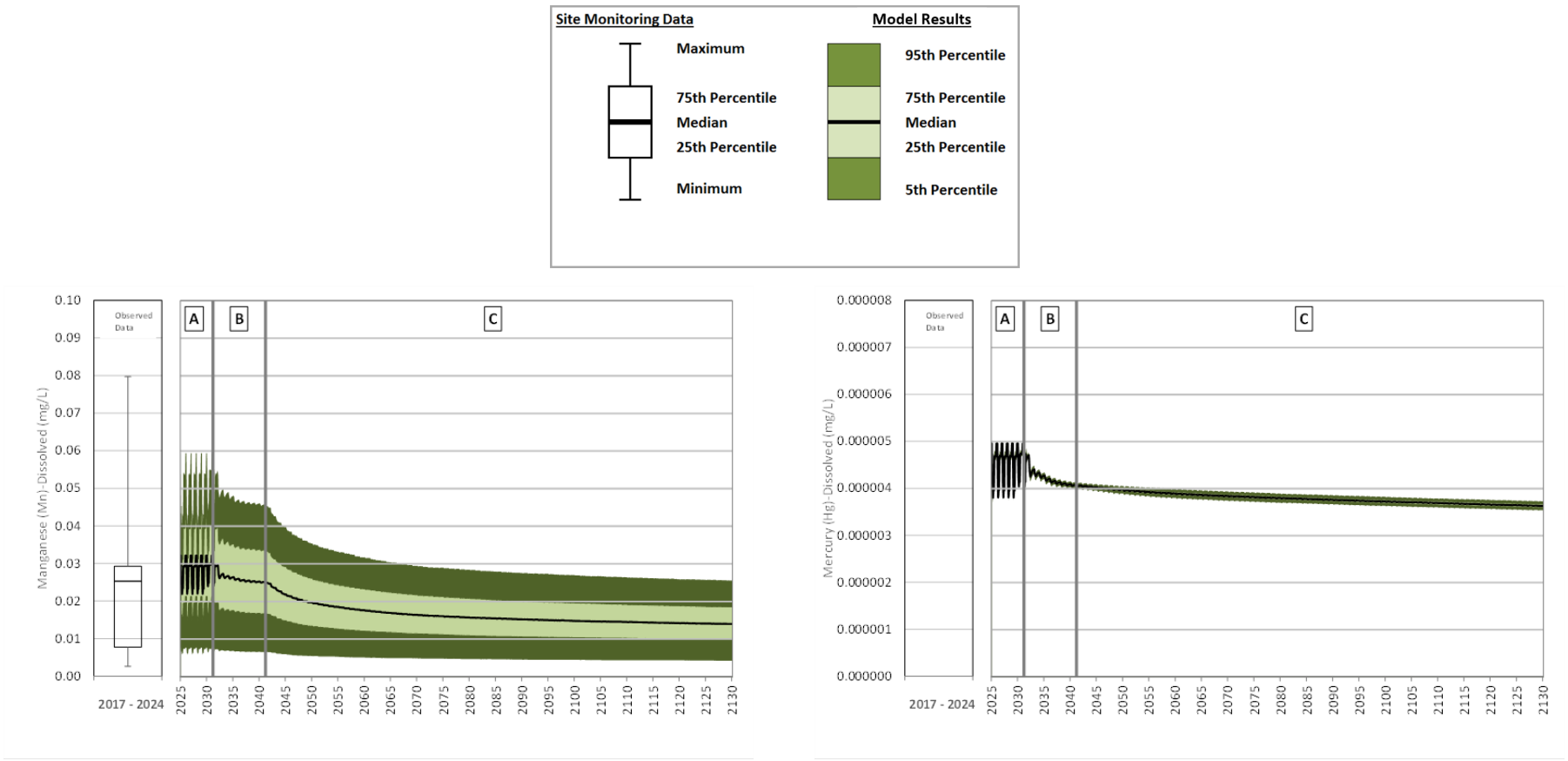
Figure B-12: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

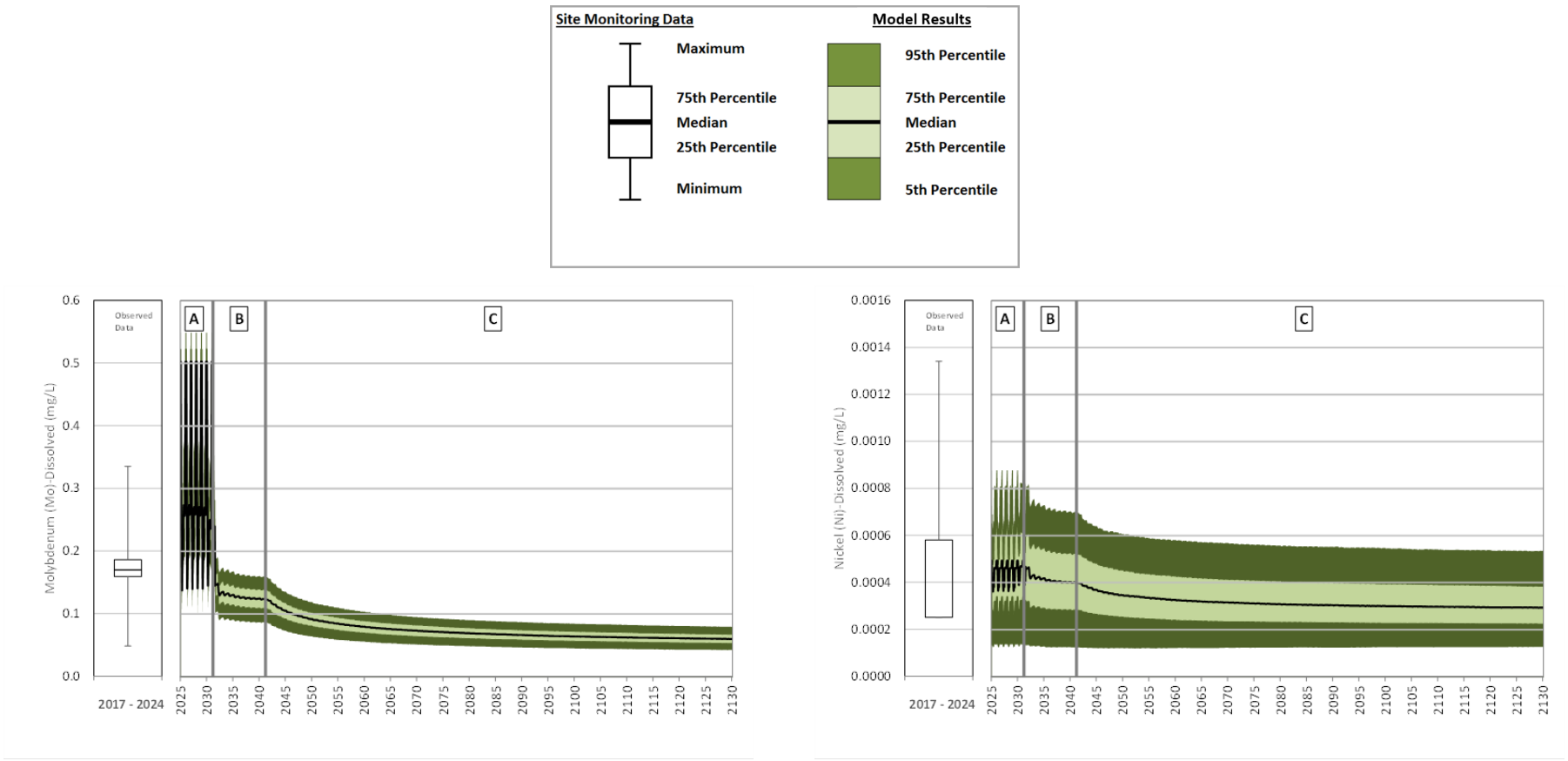
Note: The increase in the 95th percentile of dissolved lead concentrations is caused by higher maximum concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

Figure B-13: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



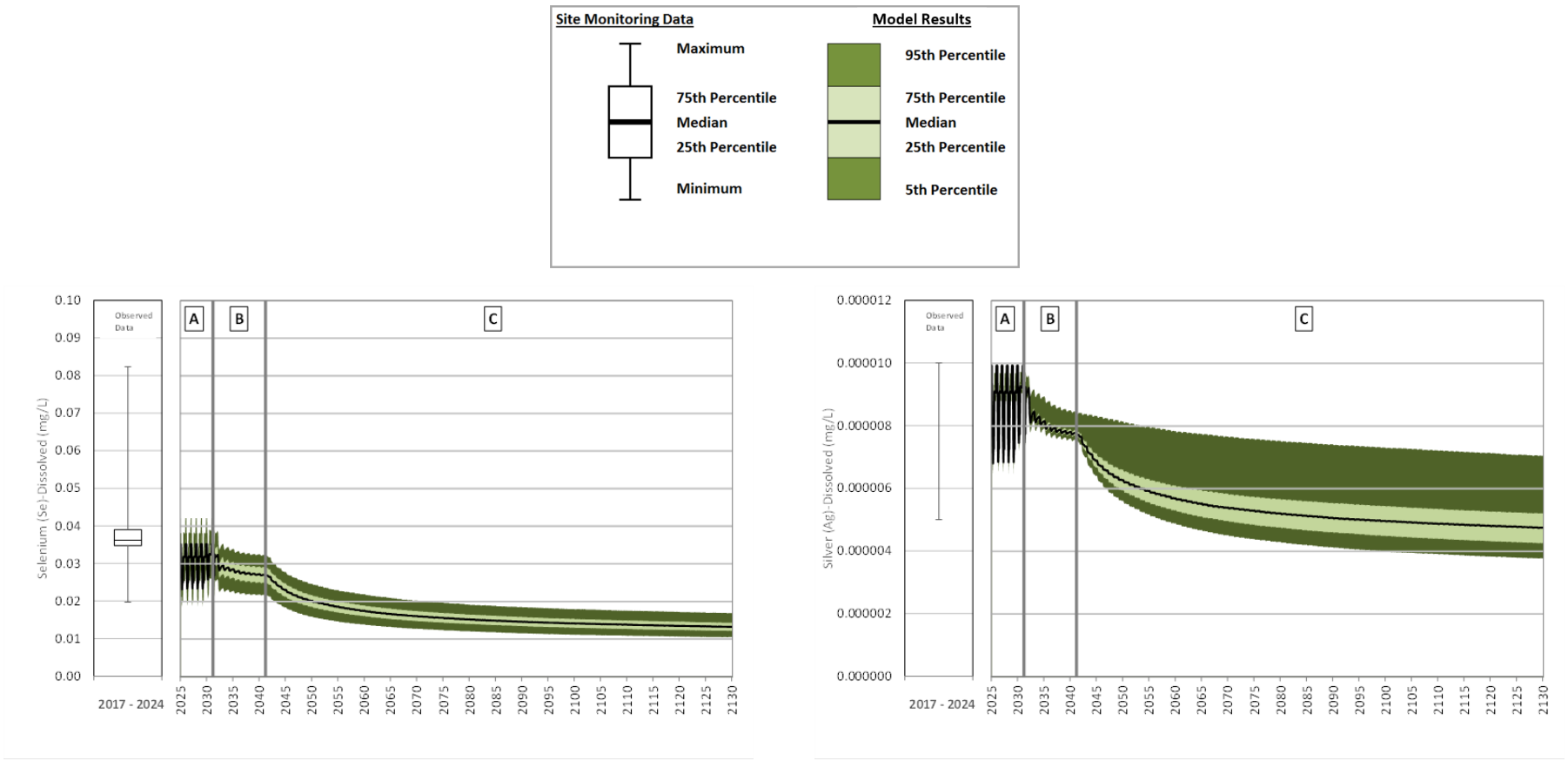
A = Operations; B = Closure; C = Post-closure

Figure B-14: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



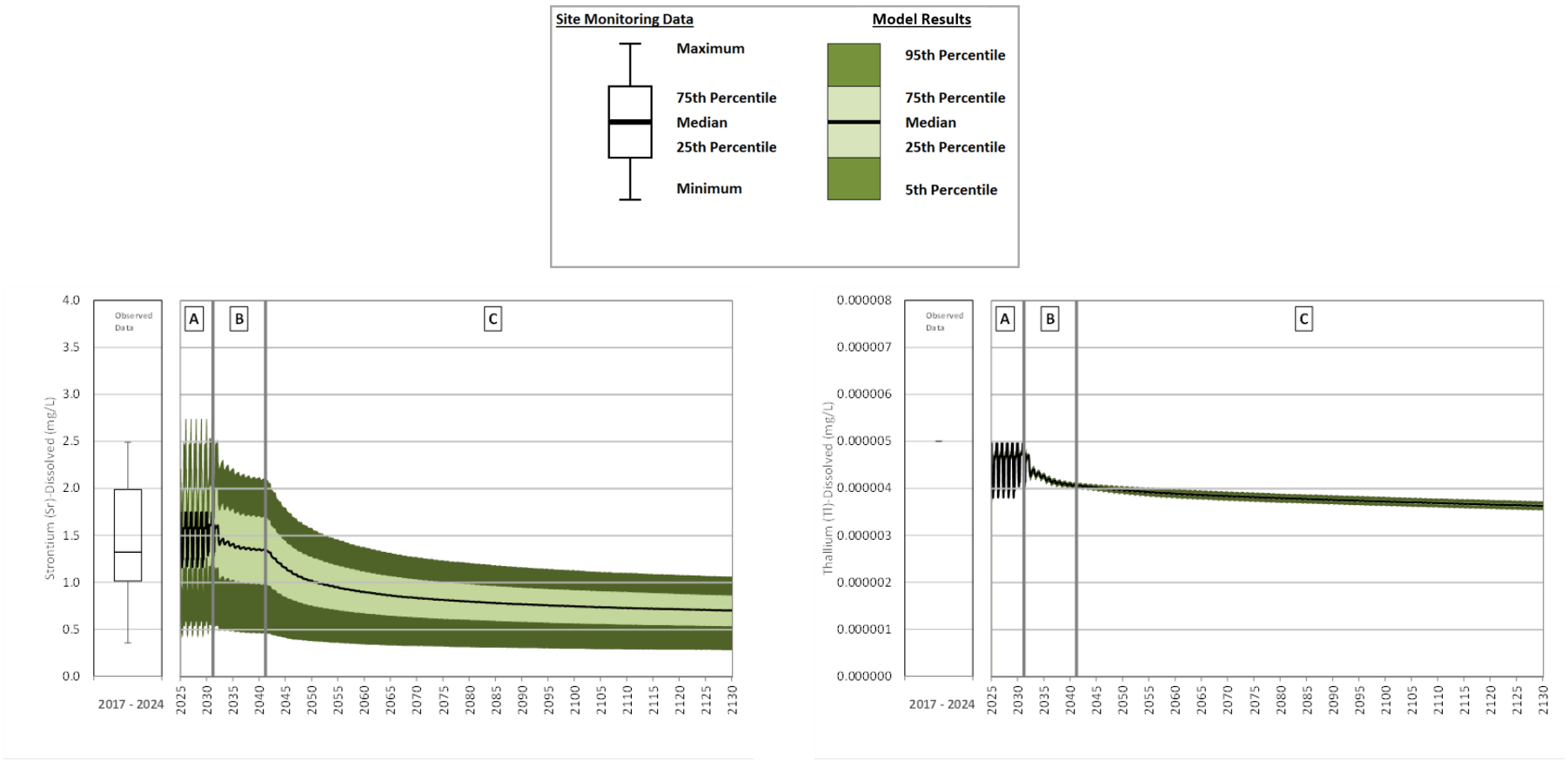
A = Operations; B = Closure; C = Post-closure

Figure B-15: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



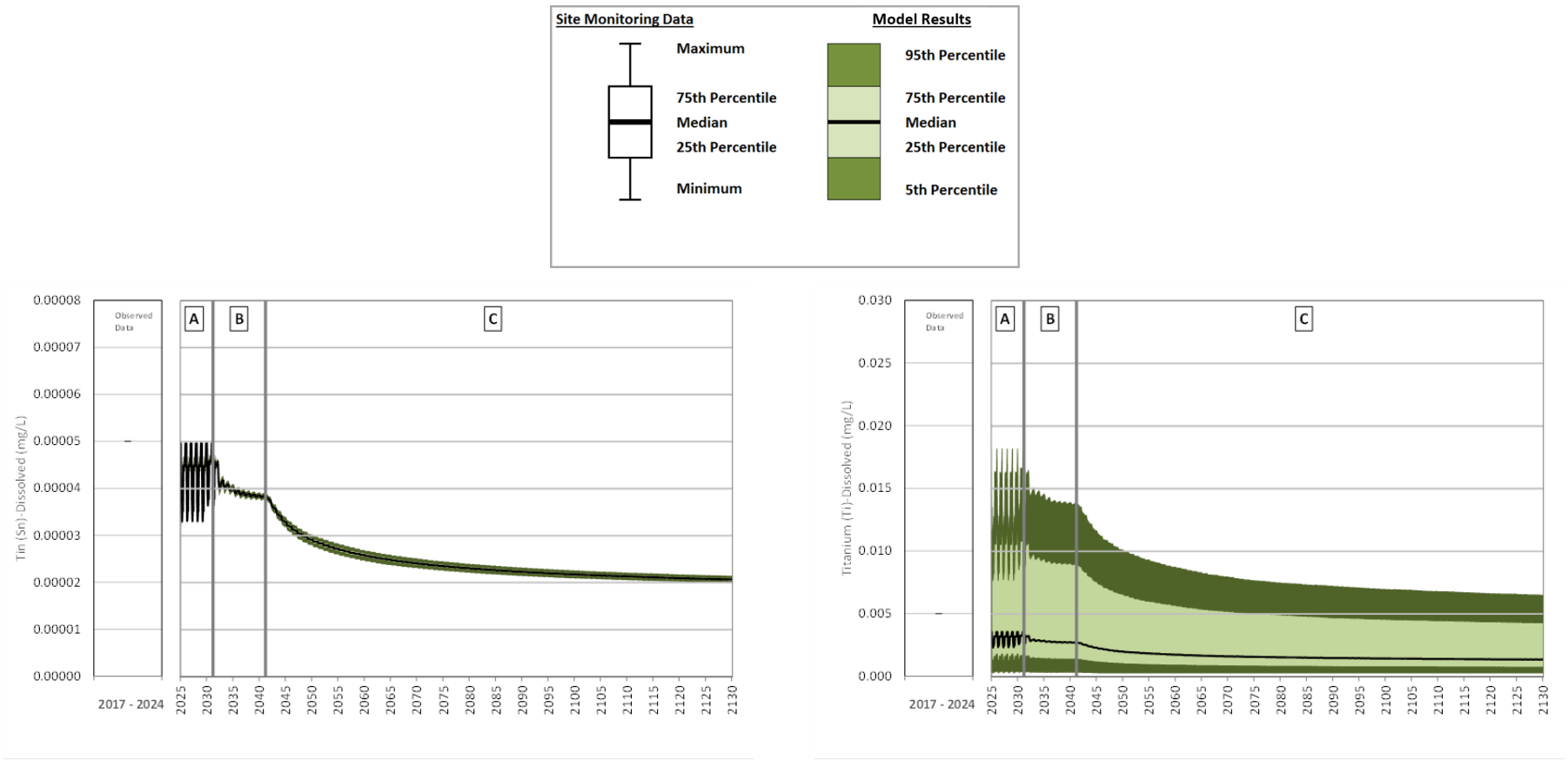
A = Operations; B = Closure; C = Post-closure

Figure B-16: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



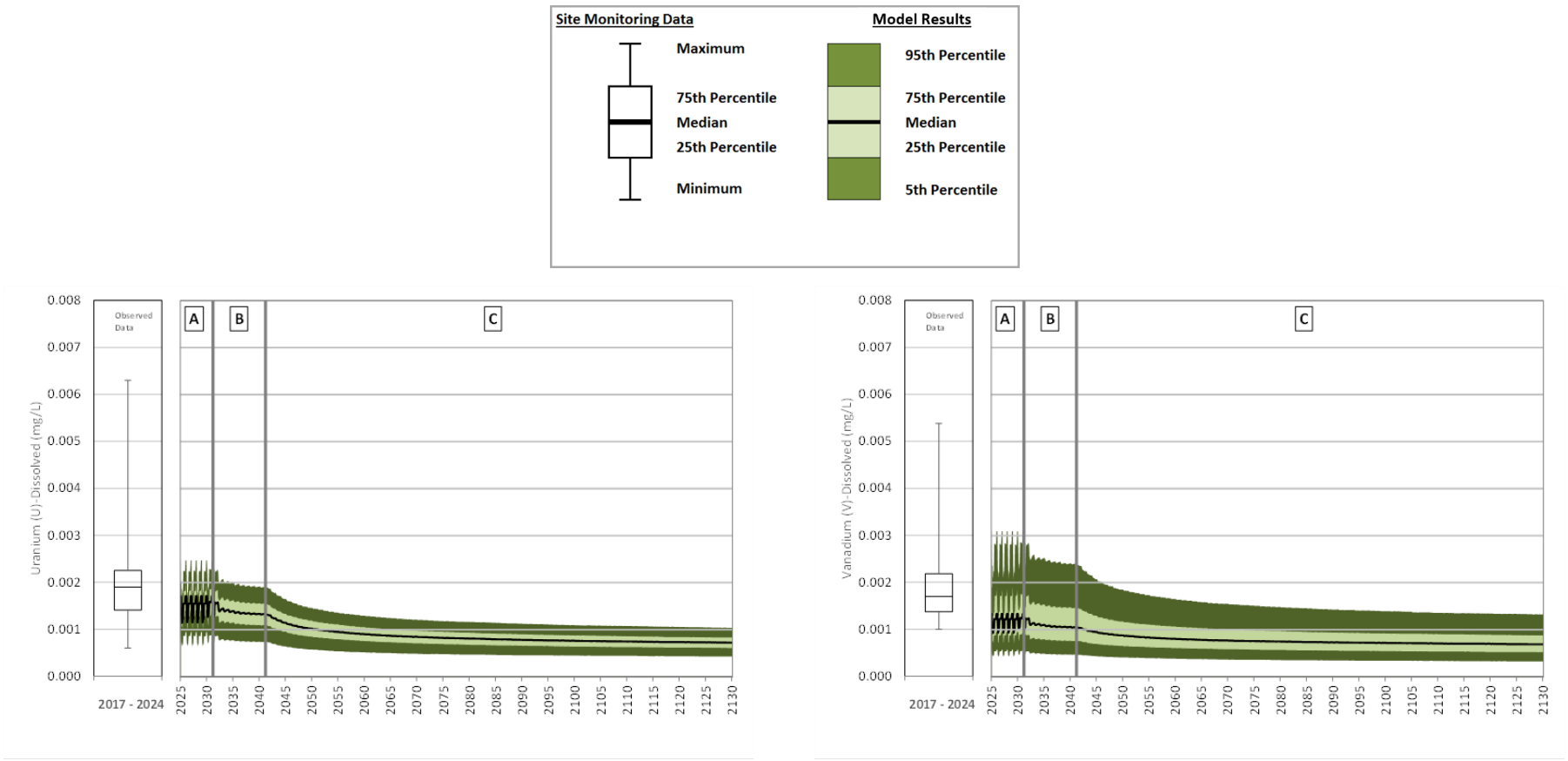
A = Operations; B = Closure; C = Post-closure

Figure B-17: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



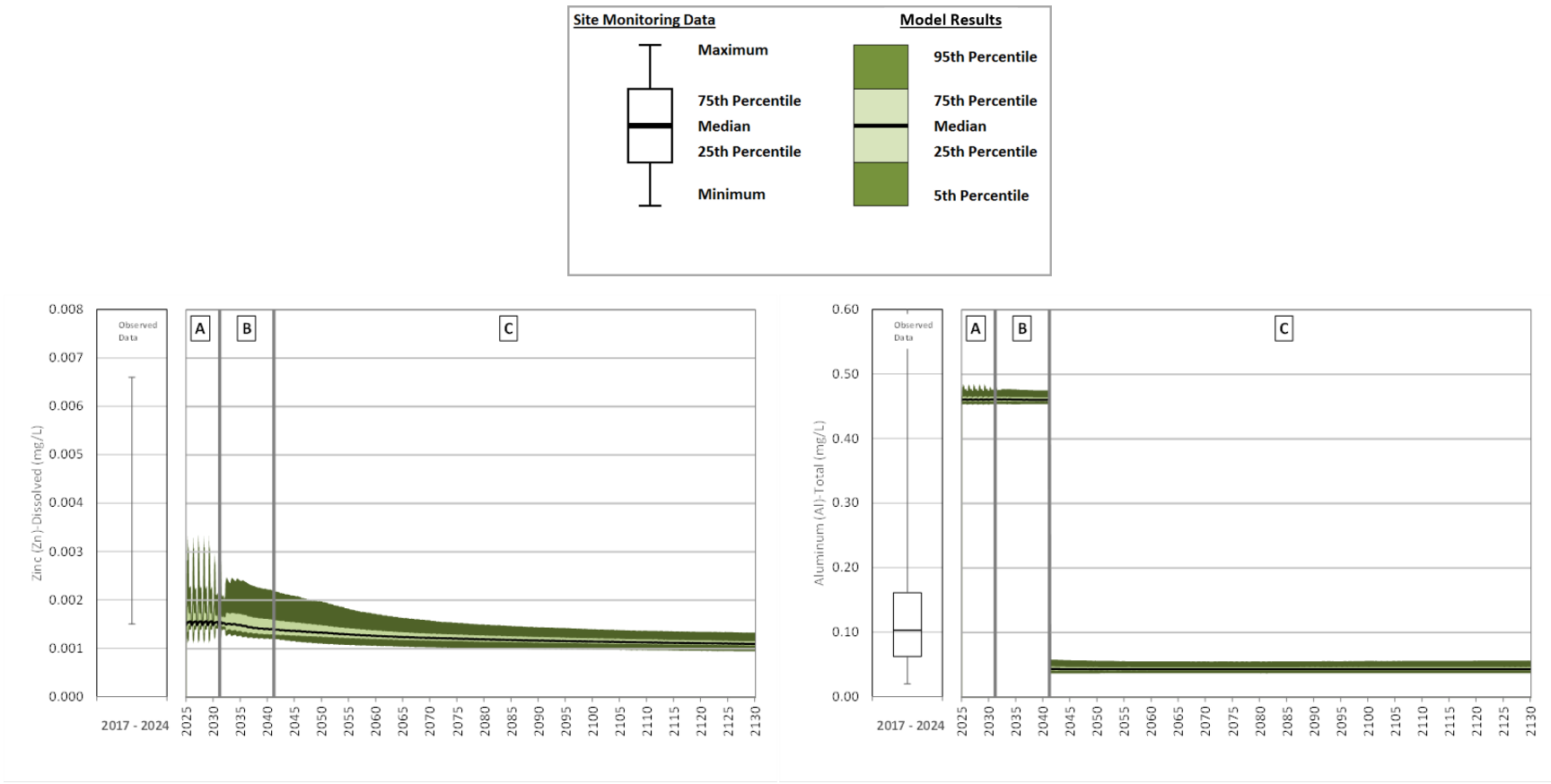
A = Operations; B = Closure; C = Post-closure

Figure B-18: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



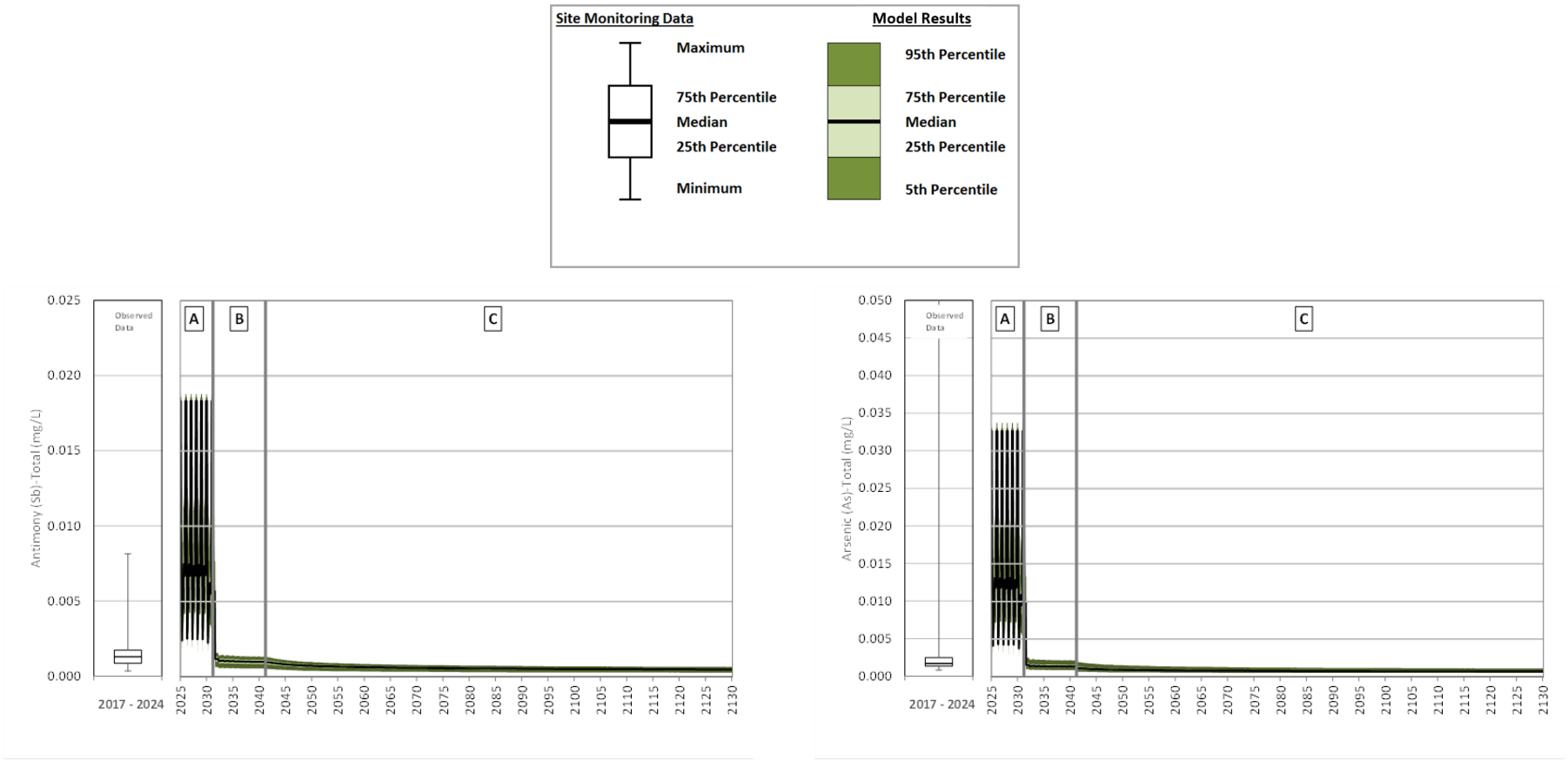
A = Operations; B = Closure; C = Post-closure

Figure B-19: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



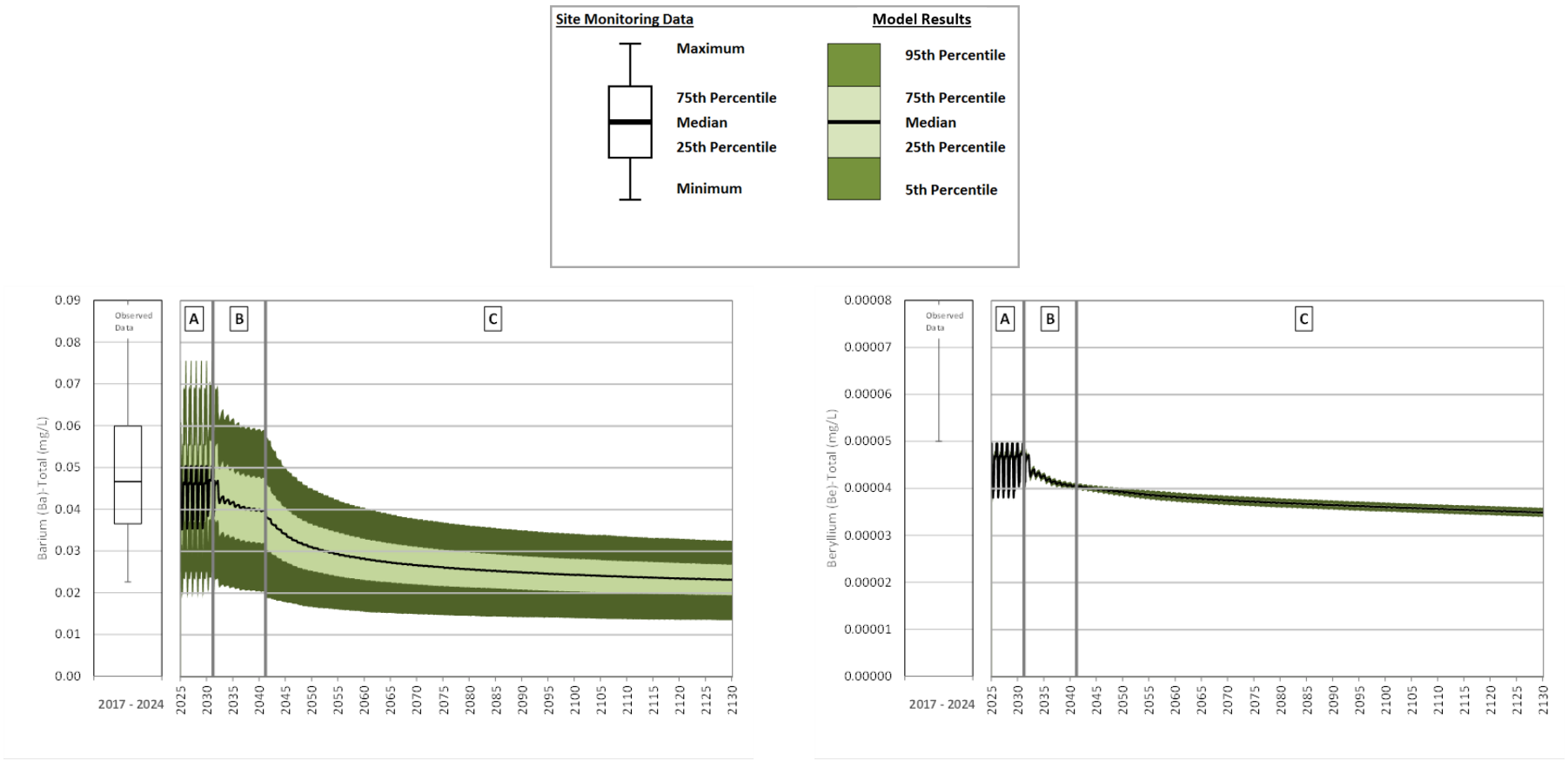
A = Operations; B = Closure; C = Post-closure

Figure B-20: Springer-Cariboo Pit Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



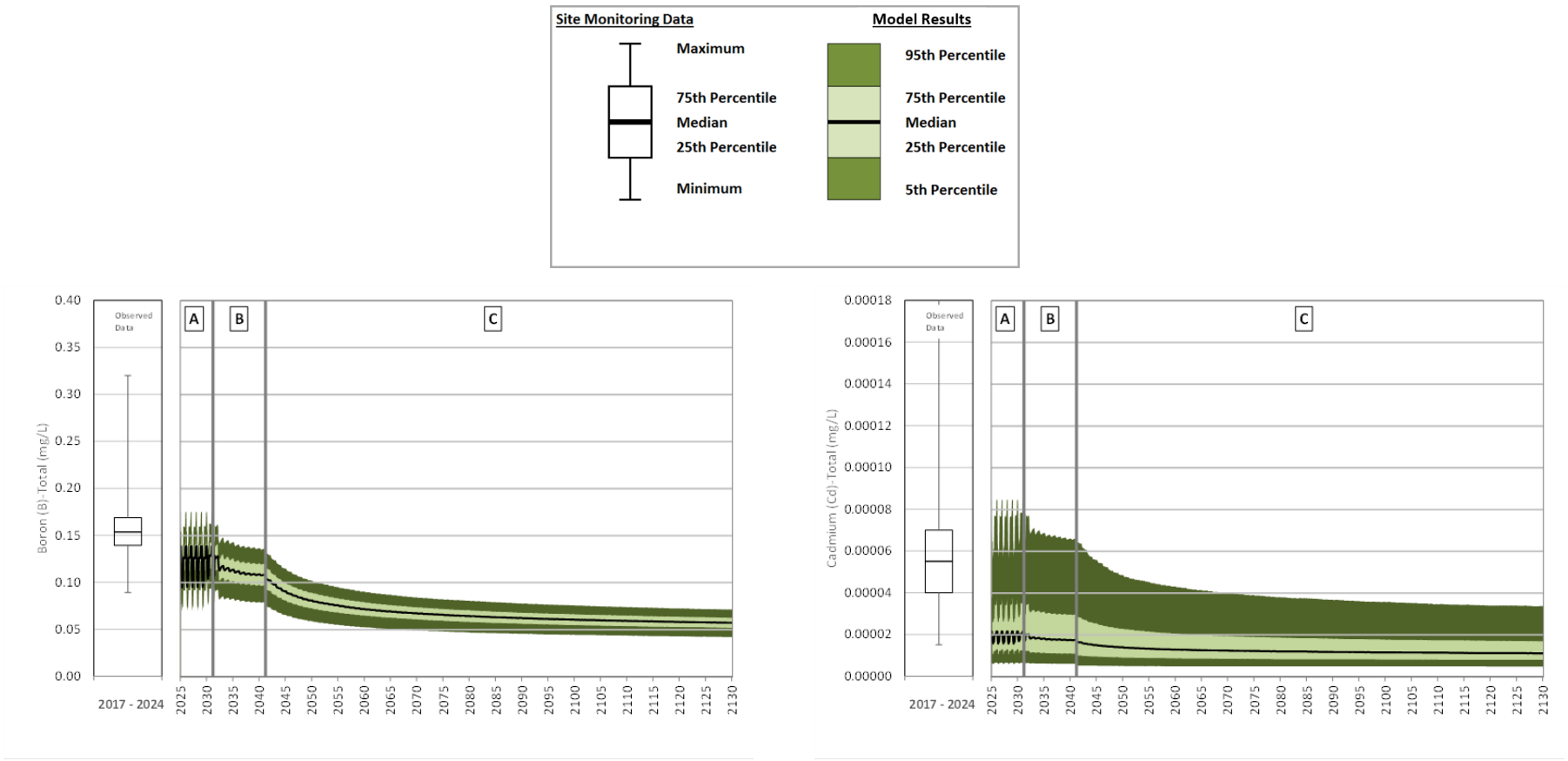
A = Operations; B = Closure; C = Post-closure

Figure B-21: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Antimony and Total Arsenic



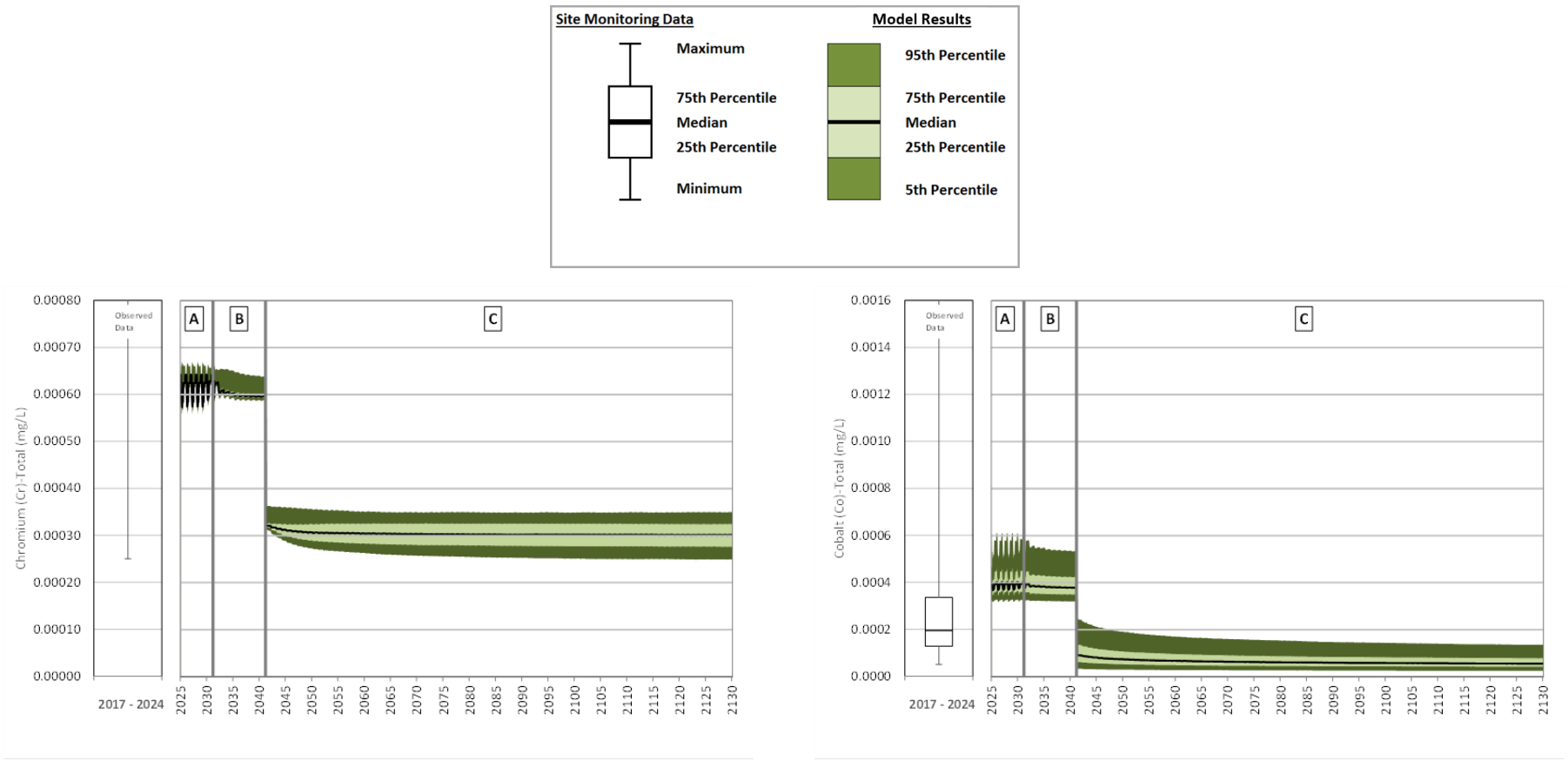
A = Operations; B = Closure; C = Post-closure

Figure B-22: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

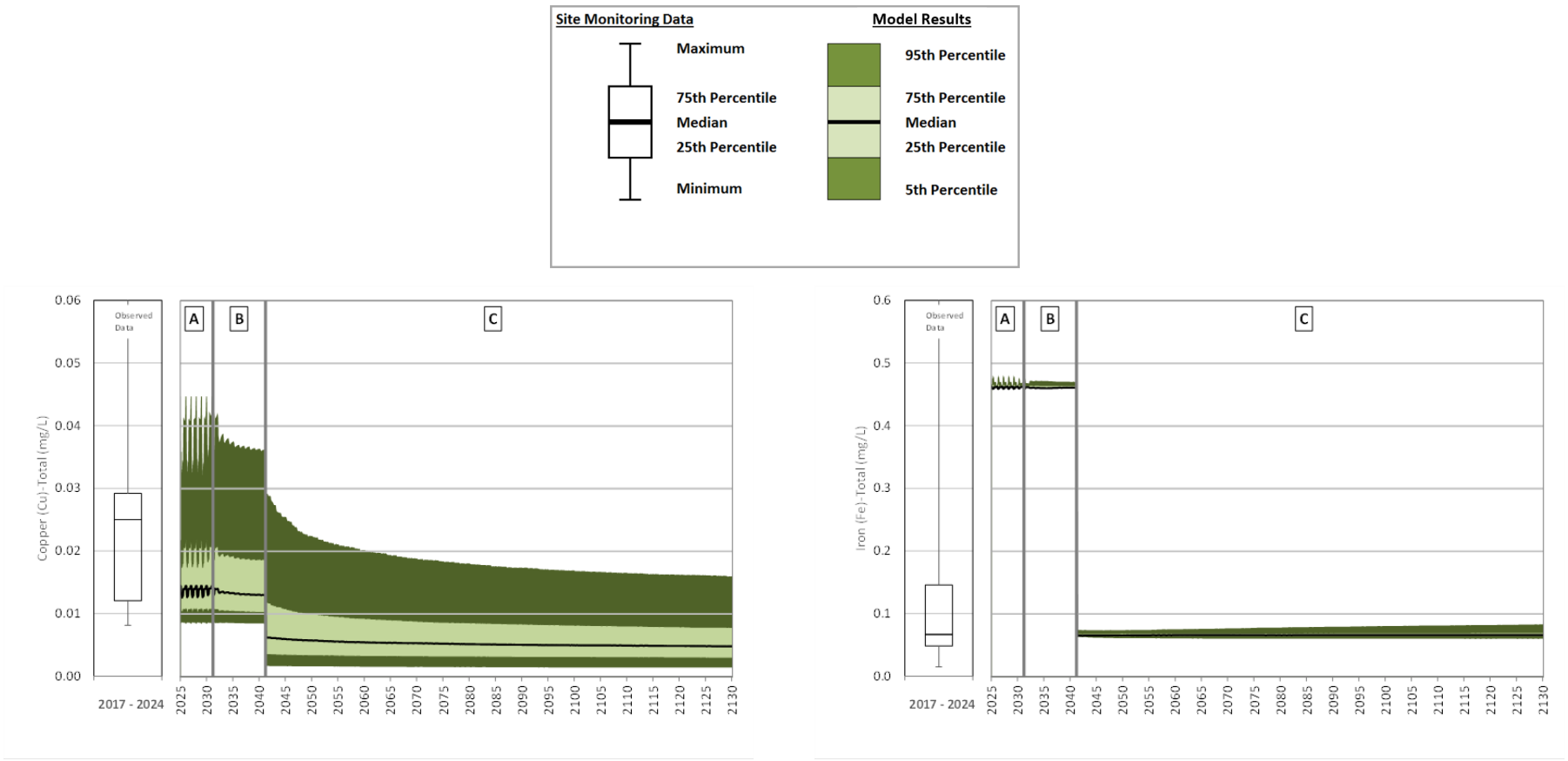
Figure B-23: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved chromium concentrations is caused by higher concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

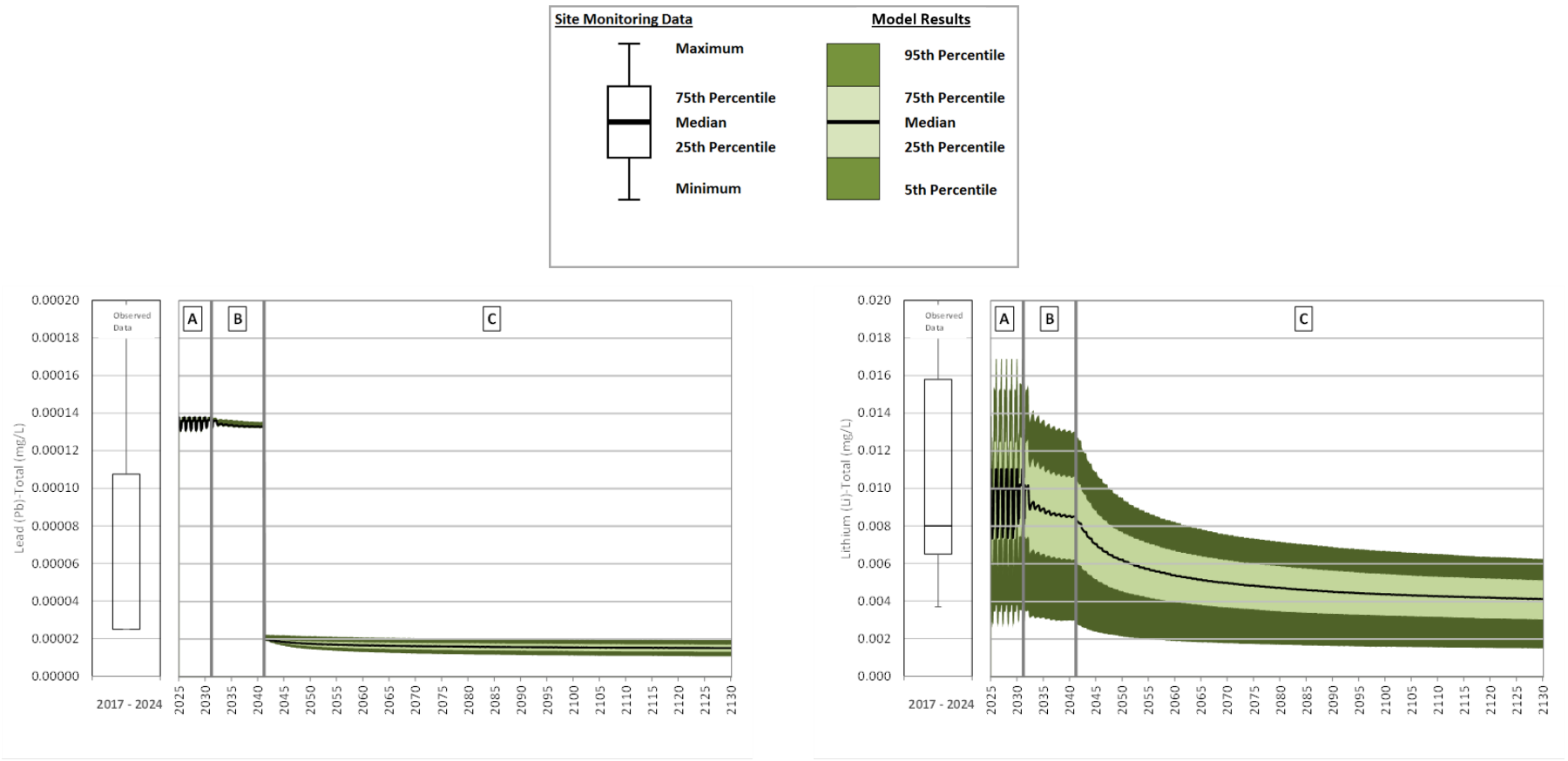
Figure B-24: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved iron concentrations is caused by higher concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

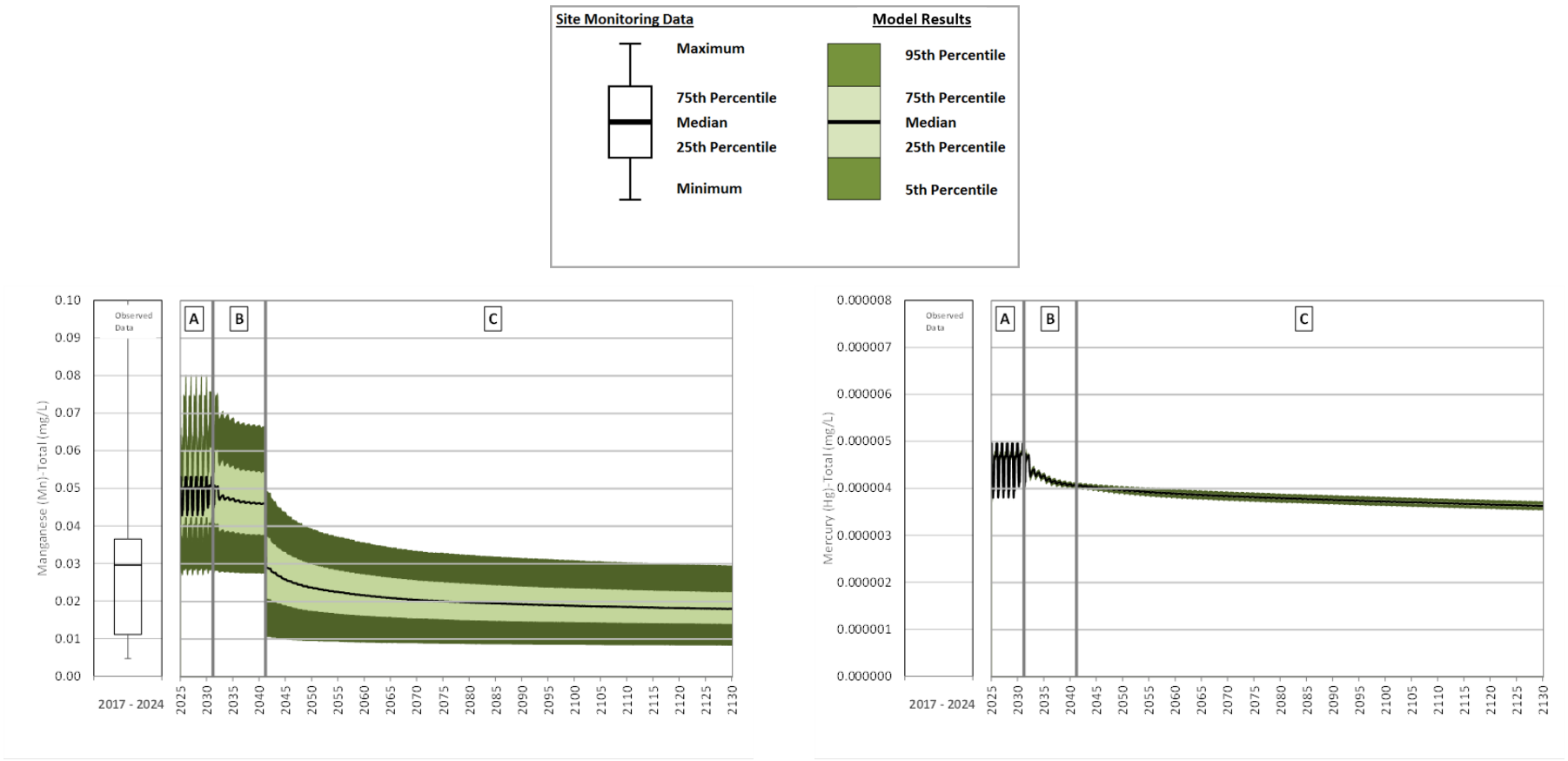
Figure B-25: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

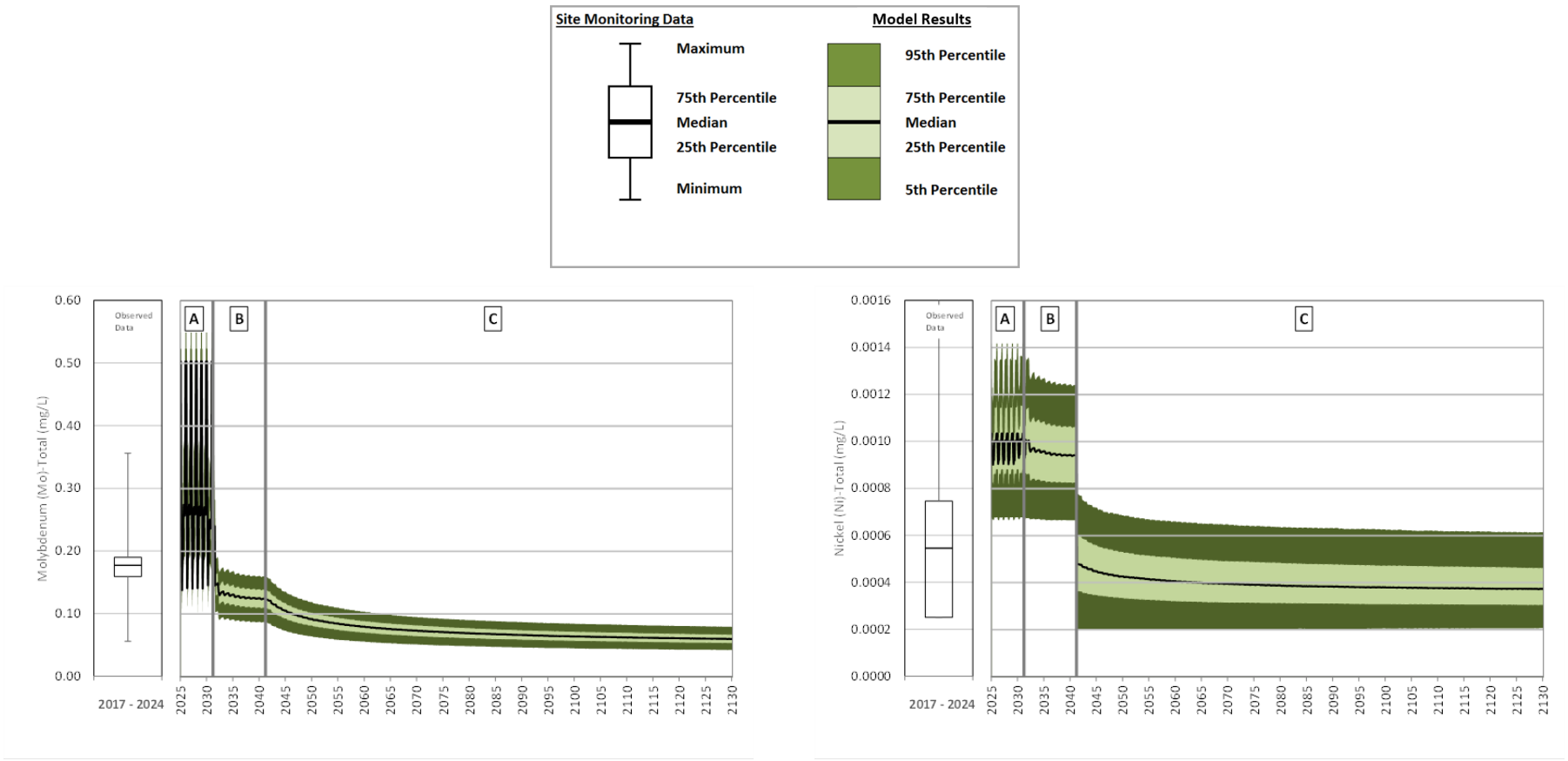
Note: The increase in the 95th percentile of dissolved lead concentrations is caused by higher maximum concentrations in the undisturbed water quality input compared to contact and disturbed runoff water quality inputs. Reclaimed areas are assigned the undisturbed water quality input.

Figure B-26: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Lead and Total Lithium



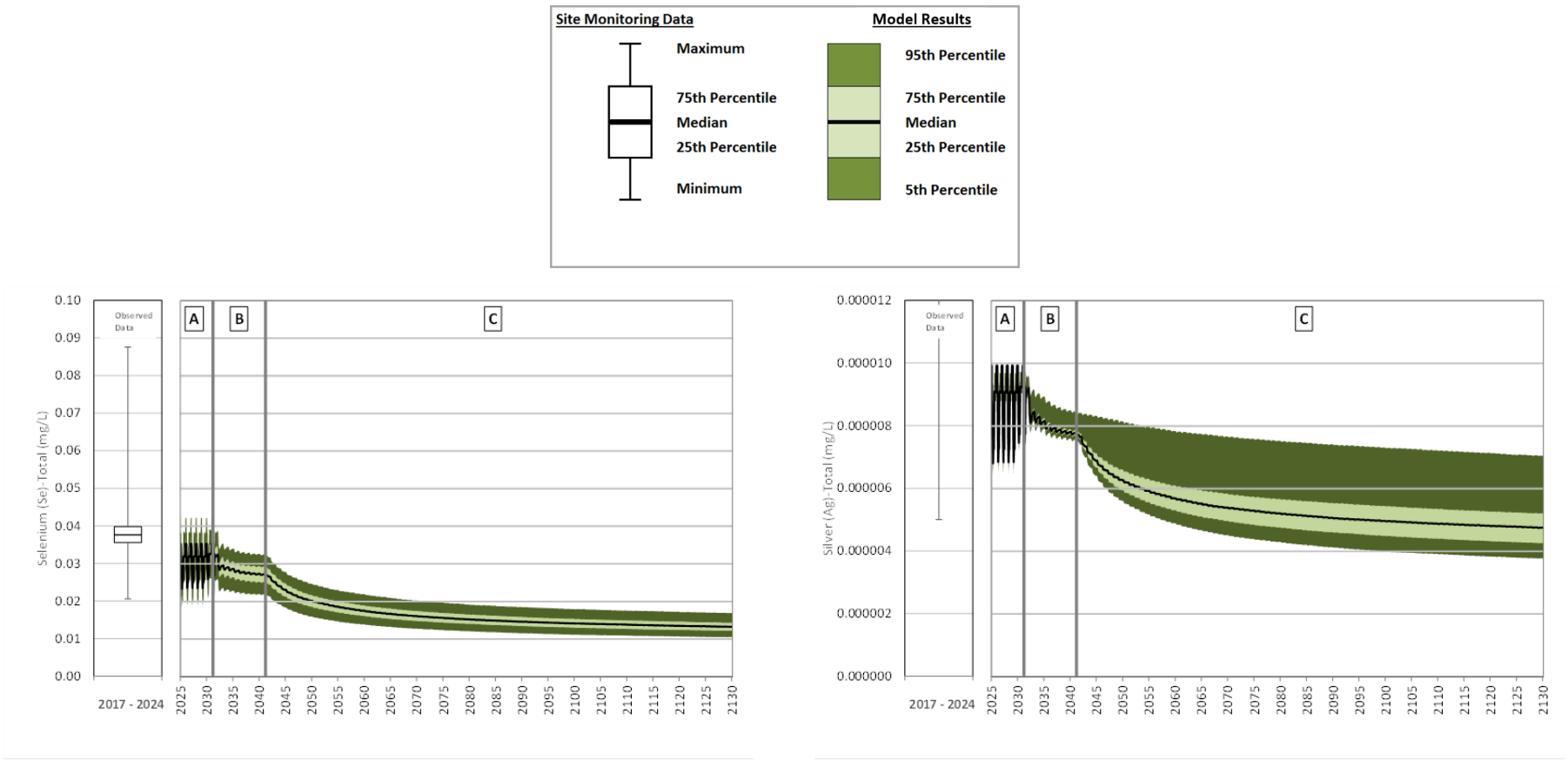
A = Operations; B = Closure; C = Post-closure

Figure B-27: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Manganese and Total Mercury



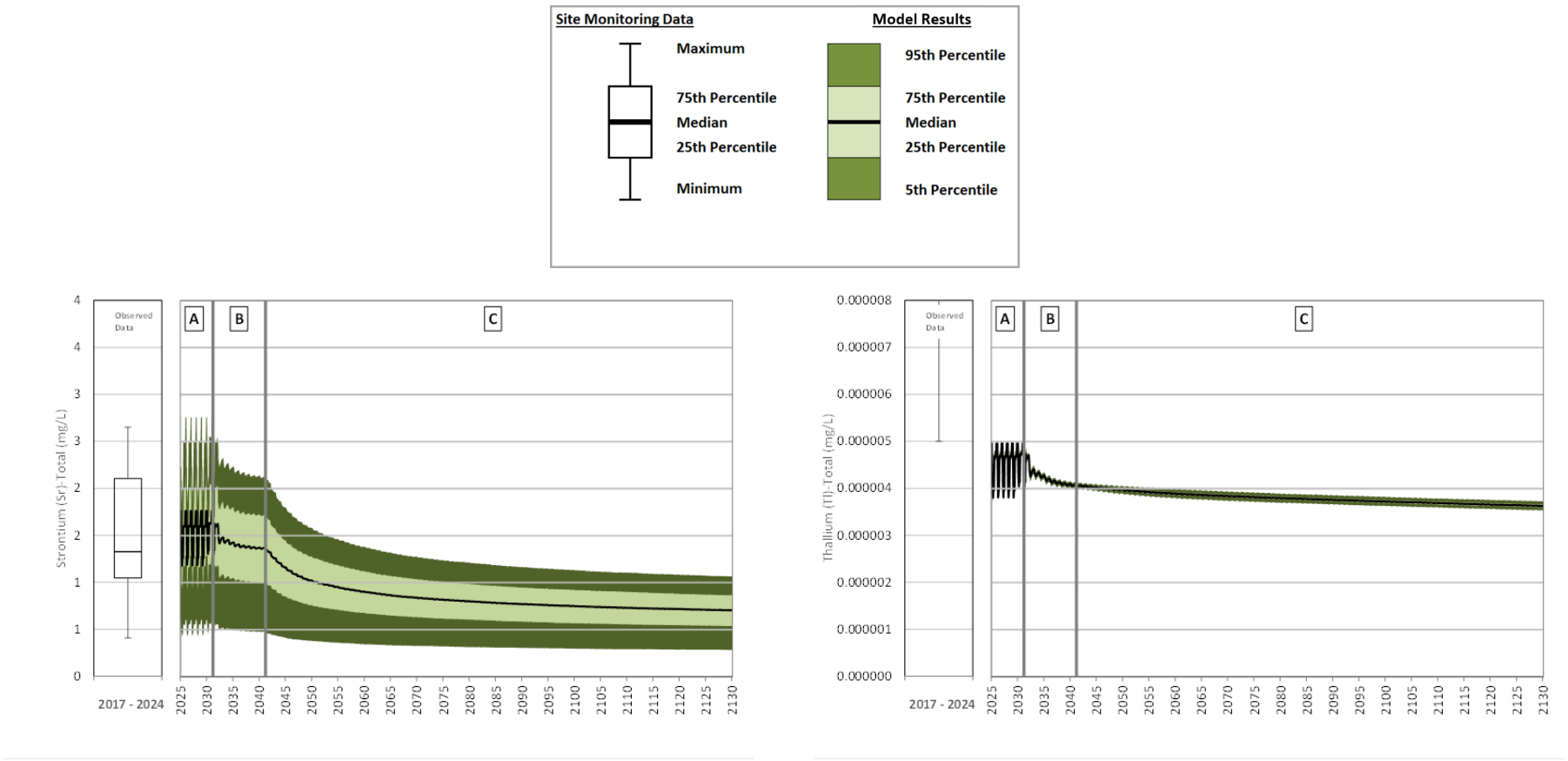
A = Operations; B = Closure; C = Post-closure

Figure B-28: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



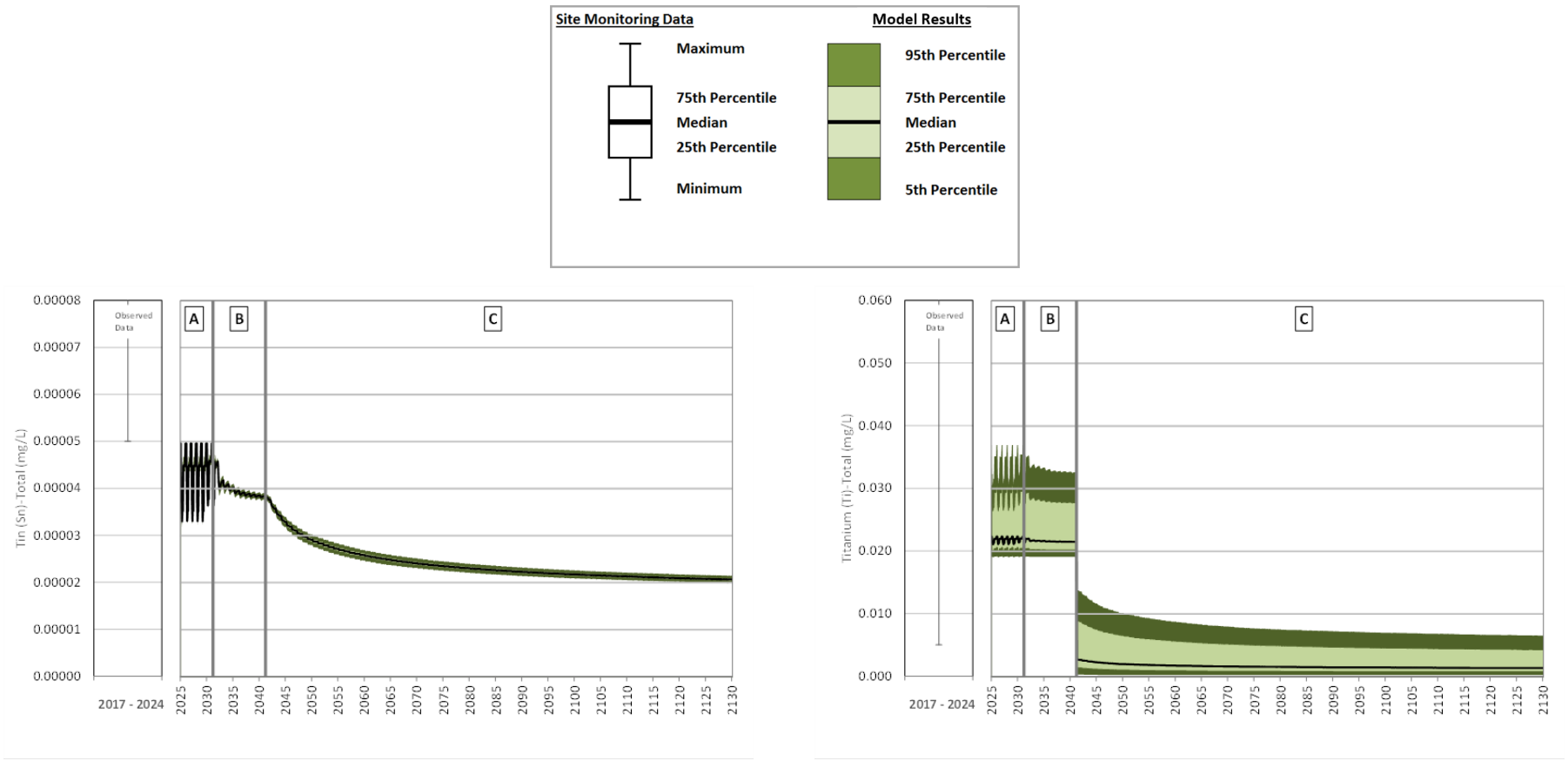
A = Operations; B = Closure; C = Post-closure

Figure B-29: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Selenium and Total Silver



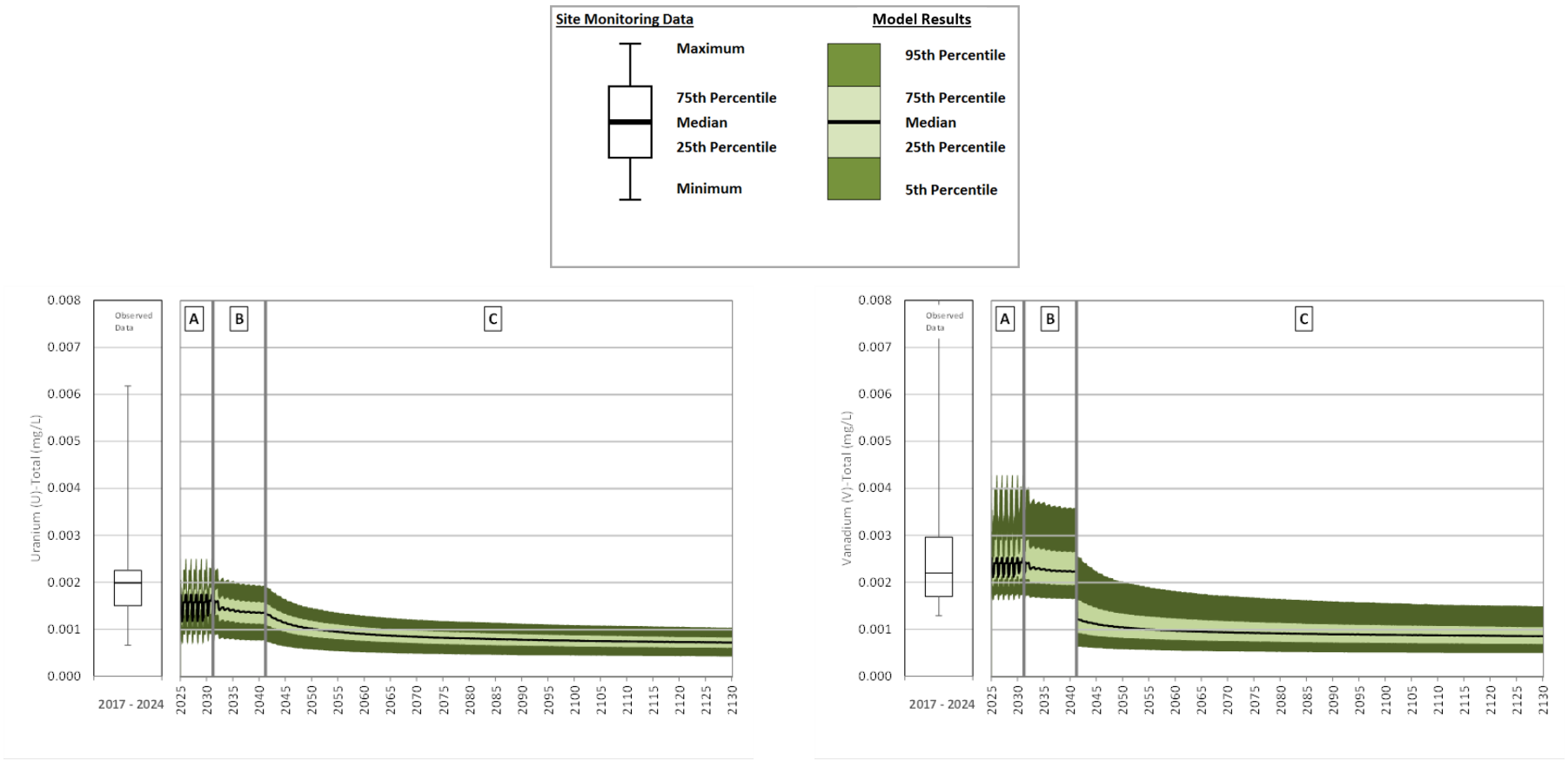
A = Operations; B = Closure; C = Post-closure

Figure B-30: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Strontium and Total Thallium



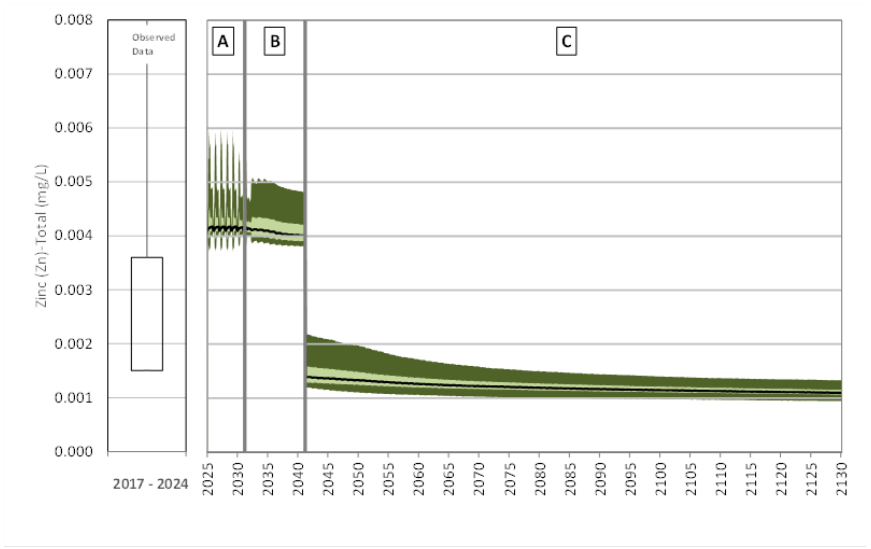
A = Operations; B = Closure; C = Post-closure

Figure B-31: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

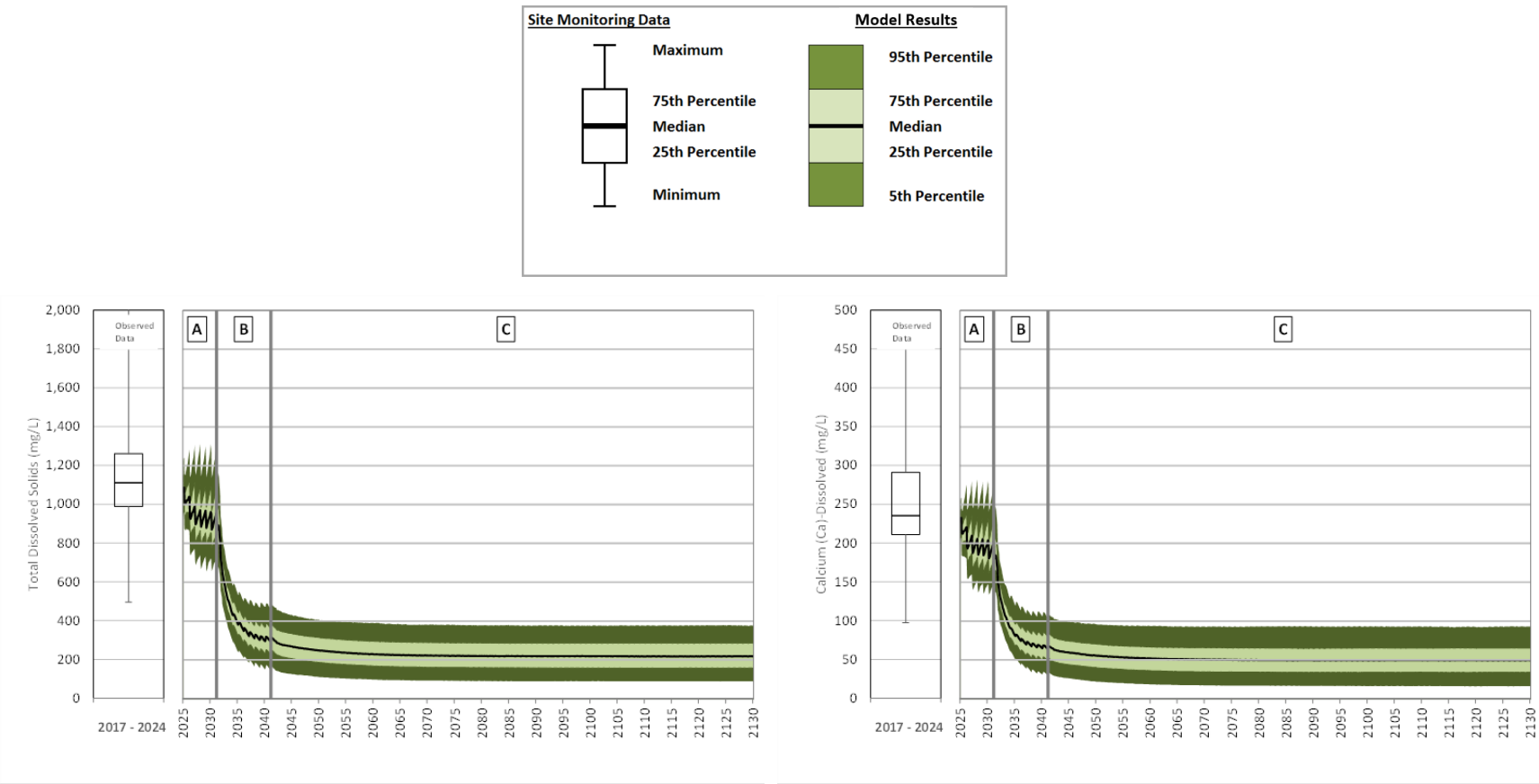
Figure B-32: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Uranium and Total Vanadium



A = Operations; B = Closure; C = Post-closure

Figure B-33: Springer-Cariboo Pit Operations, Closure and Post-closure – Total Zinc

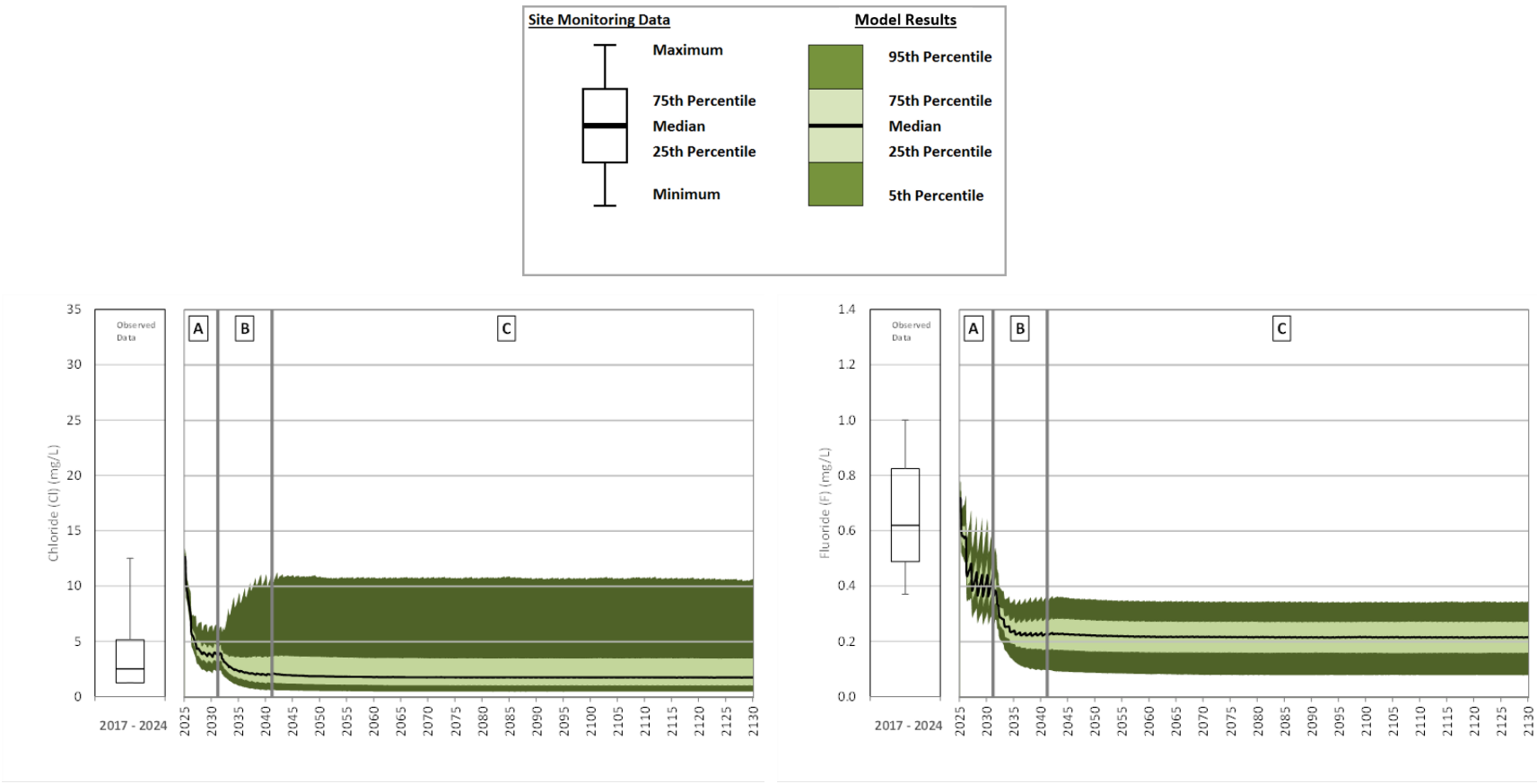
Wight Pit Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

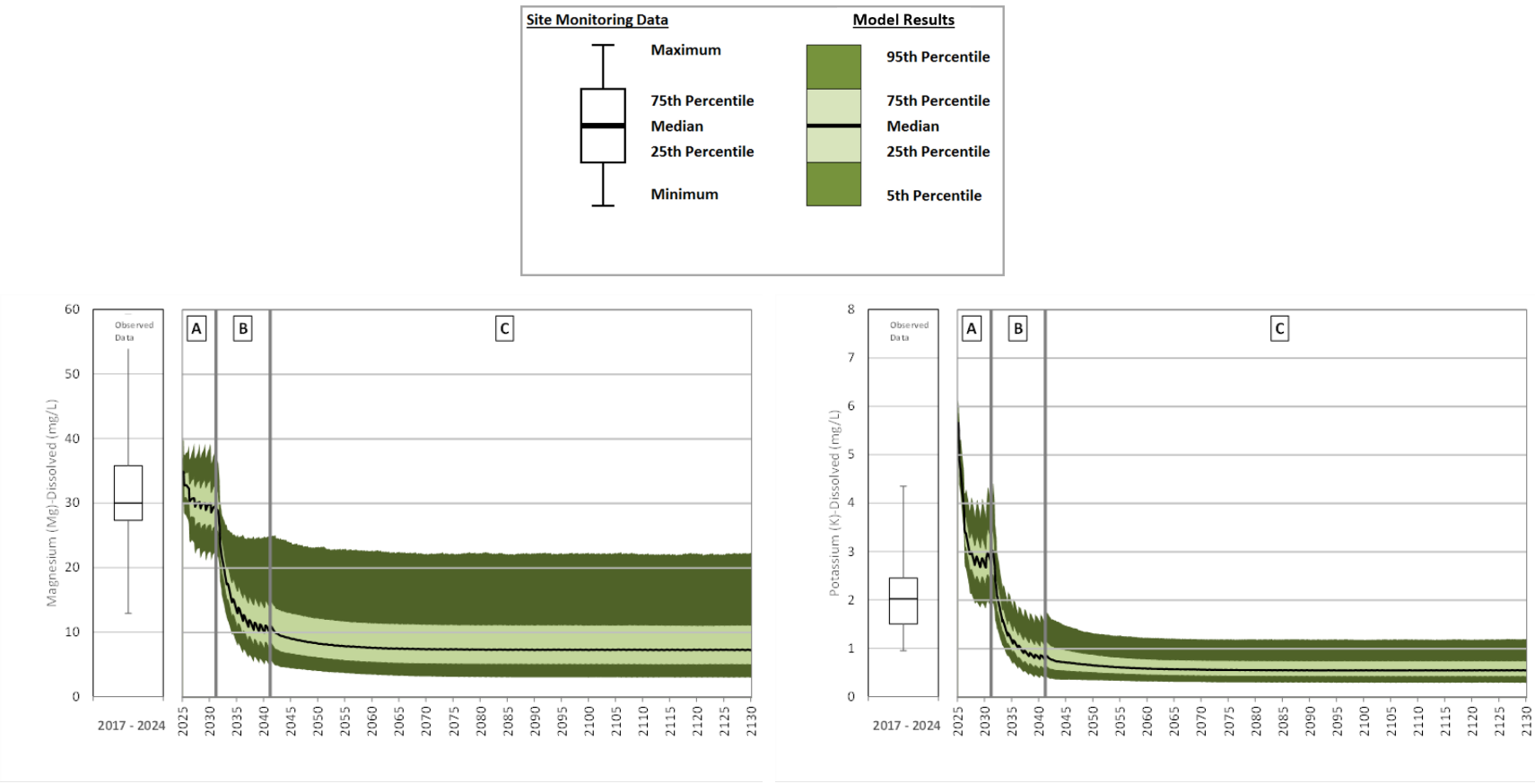
Figure B-34: Wight Pit Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-clsoure when reclamation of the mine site areas in complete.

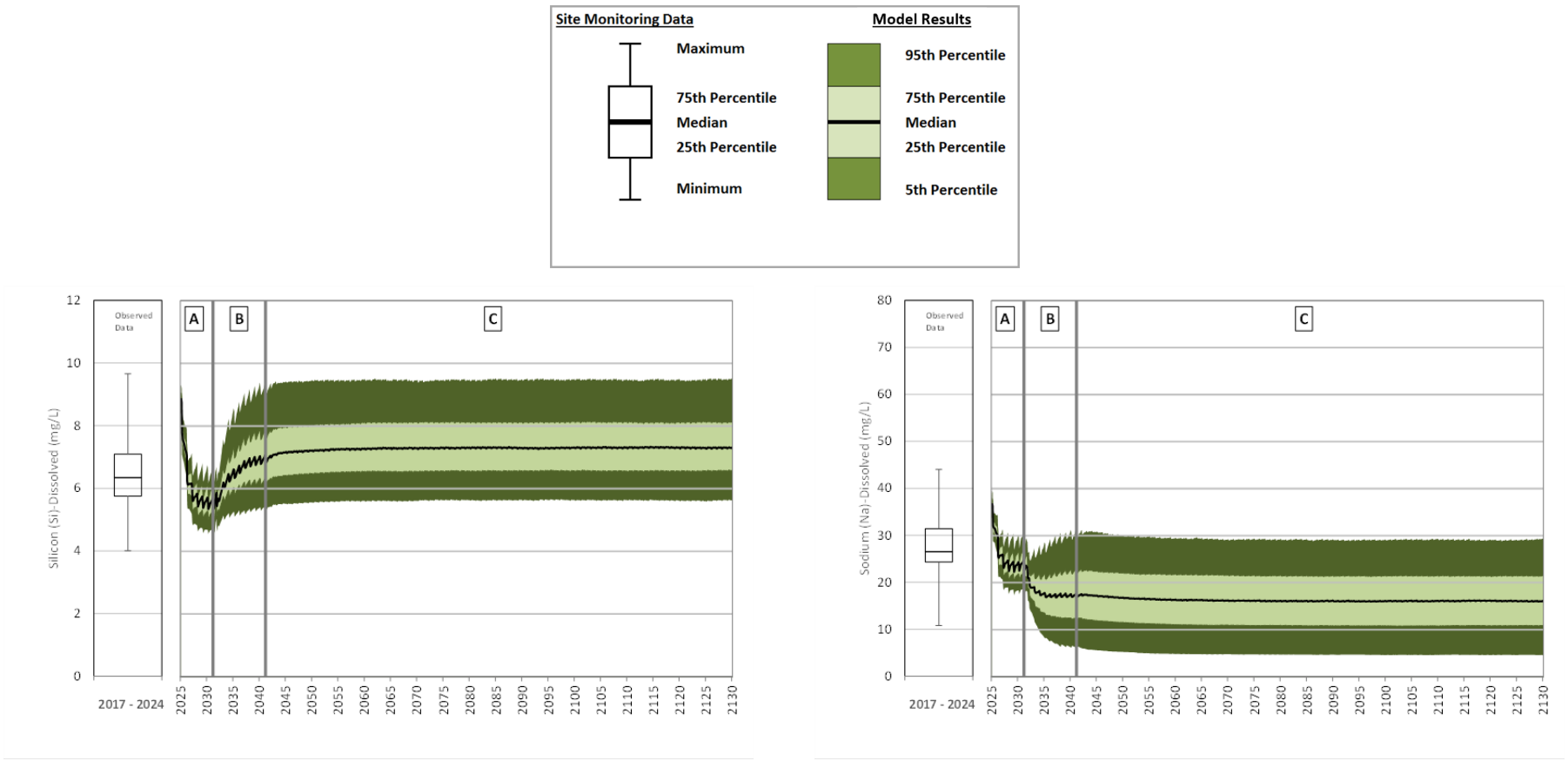
Figure B-35: Wight Pit Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

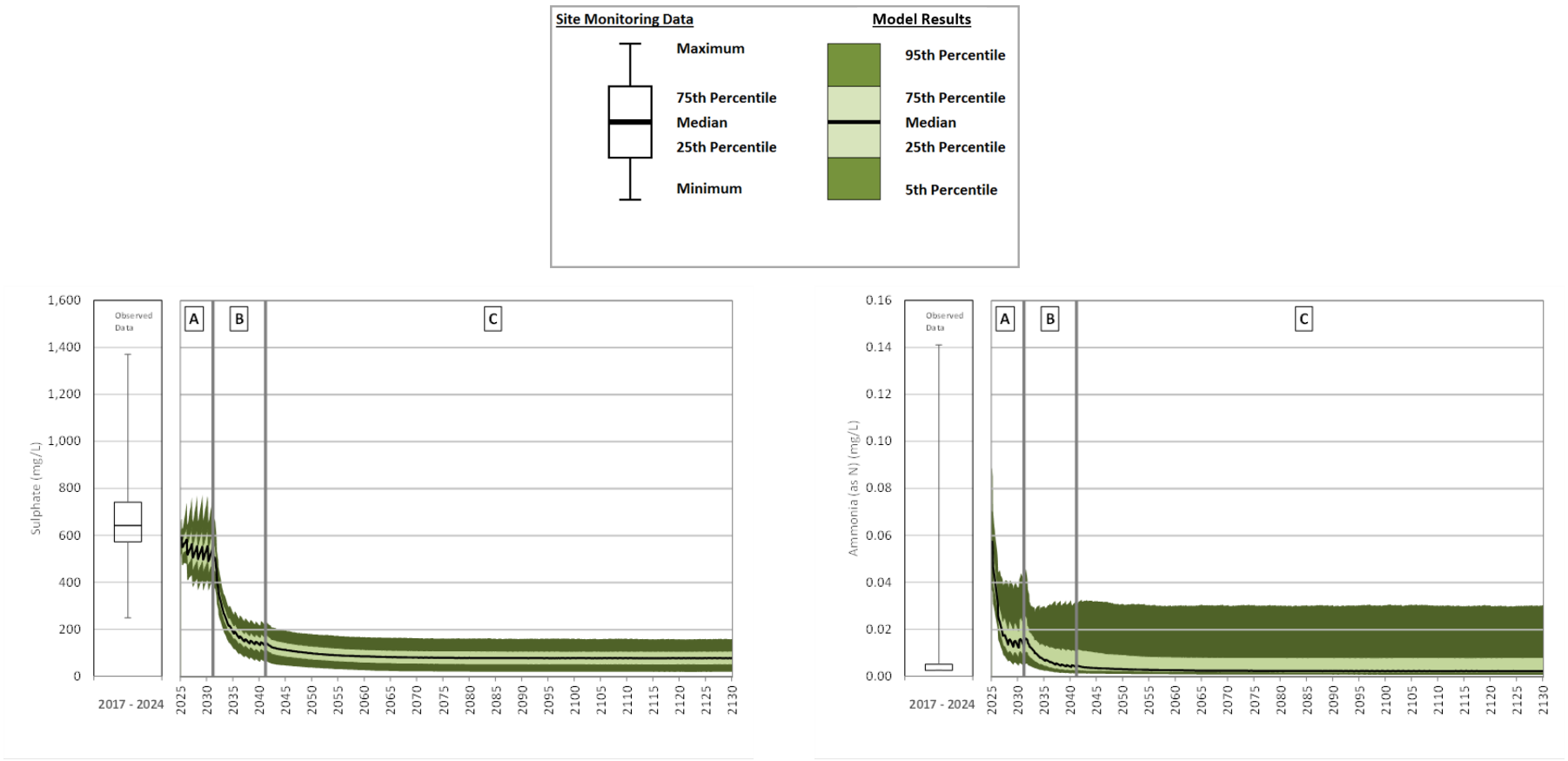
Figure B-36: Wight Pit Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

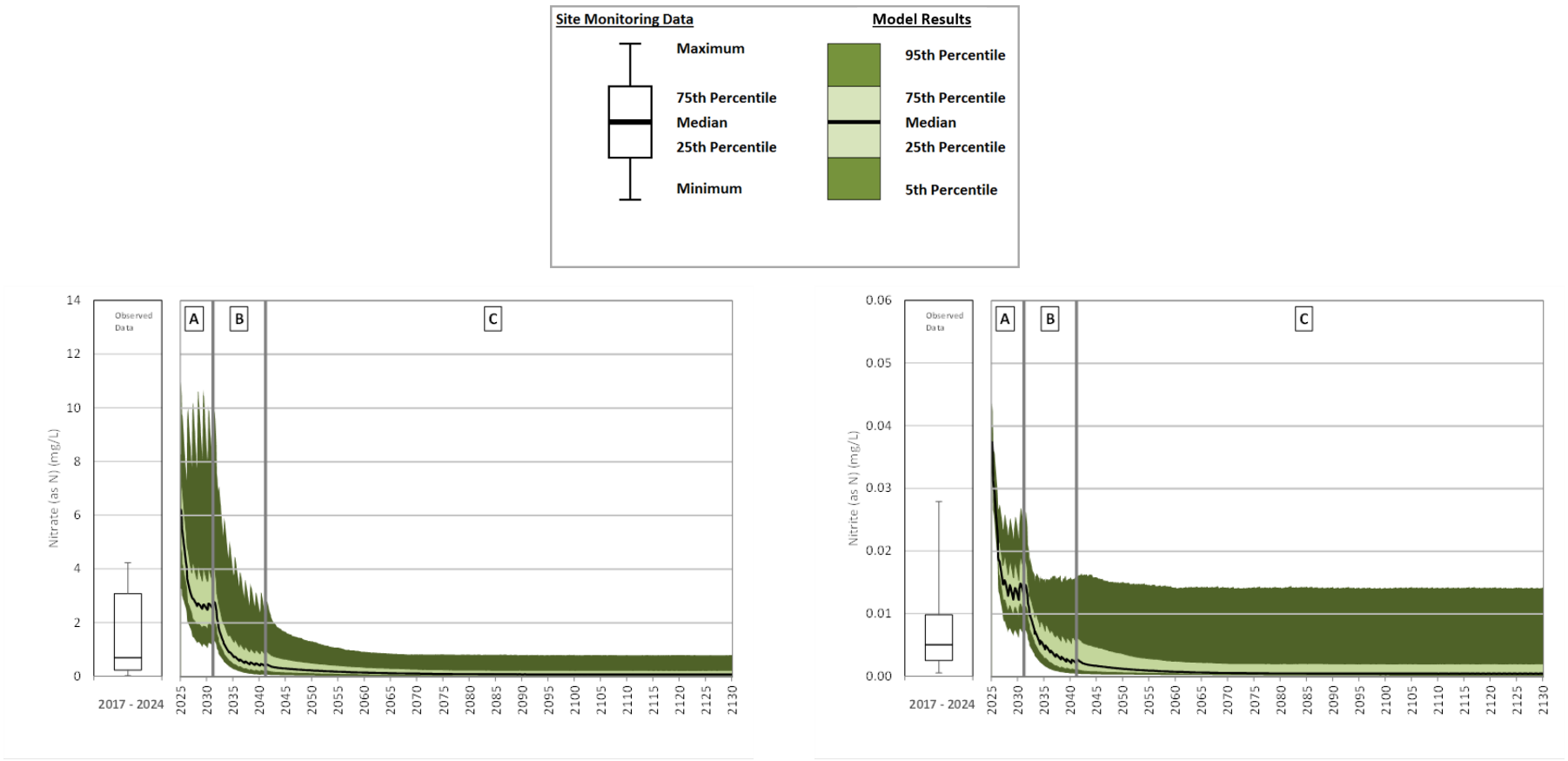
Figure B-37: Wight Pit Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

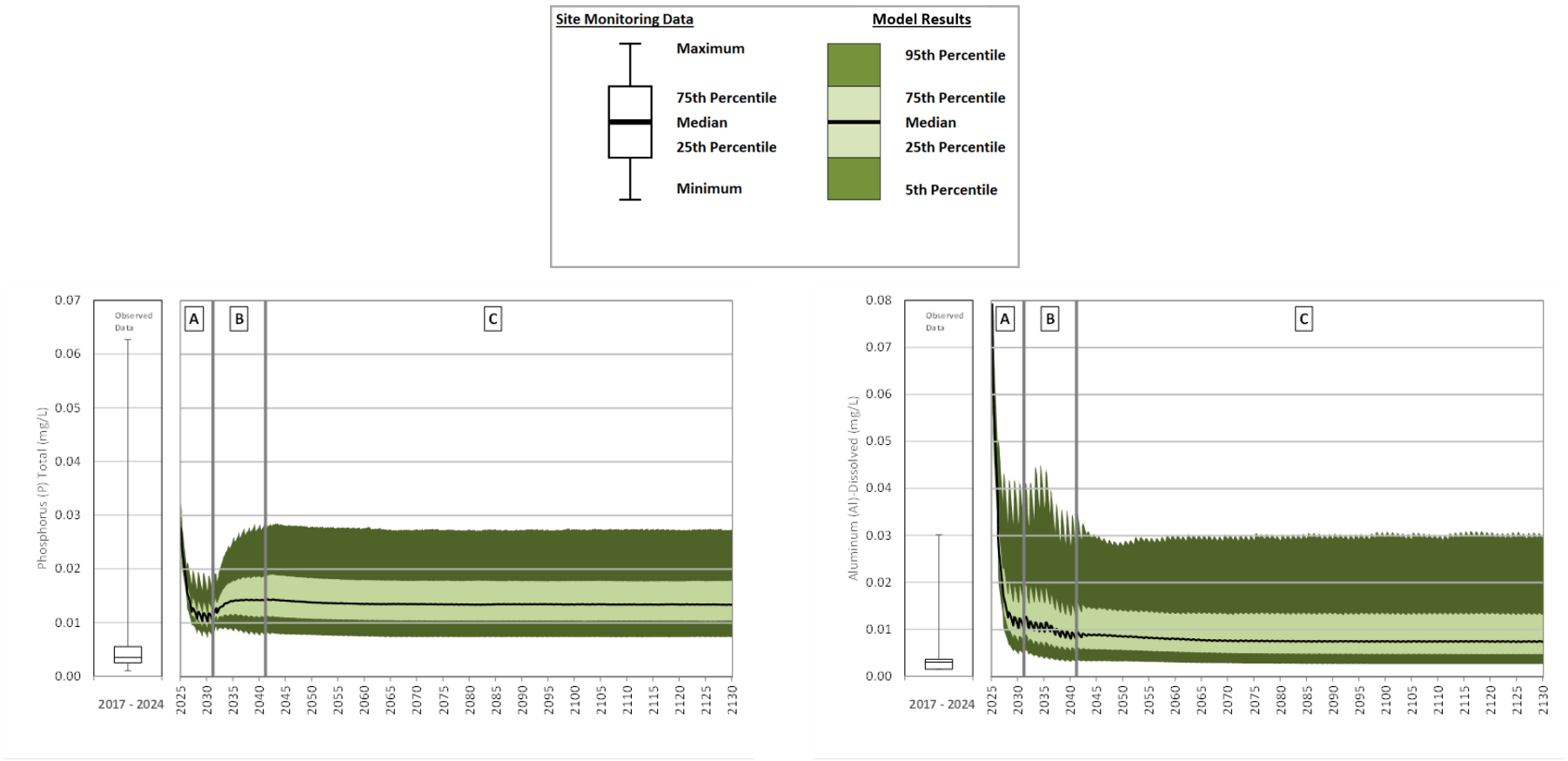
Figure B-38: Wight Pit Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

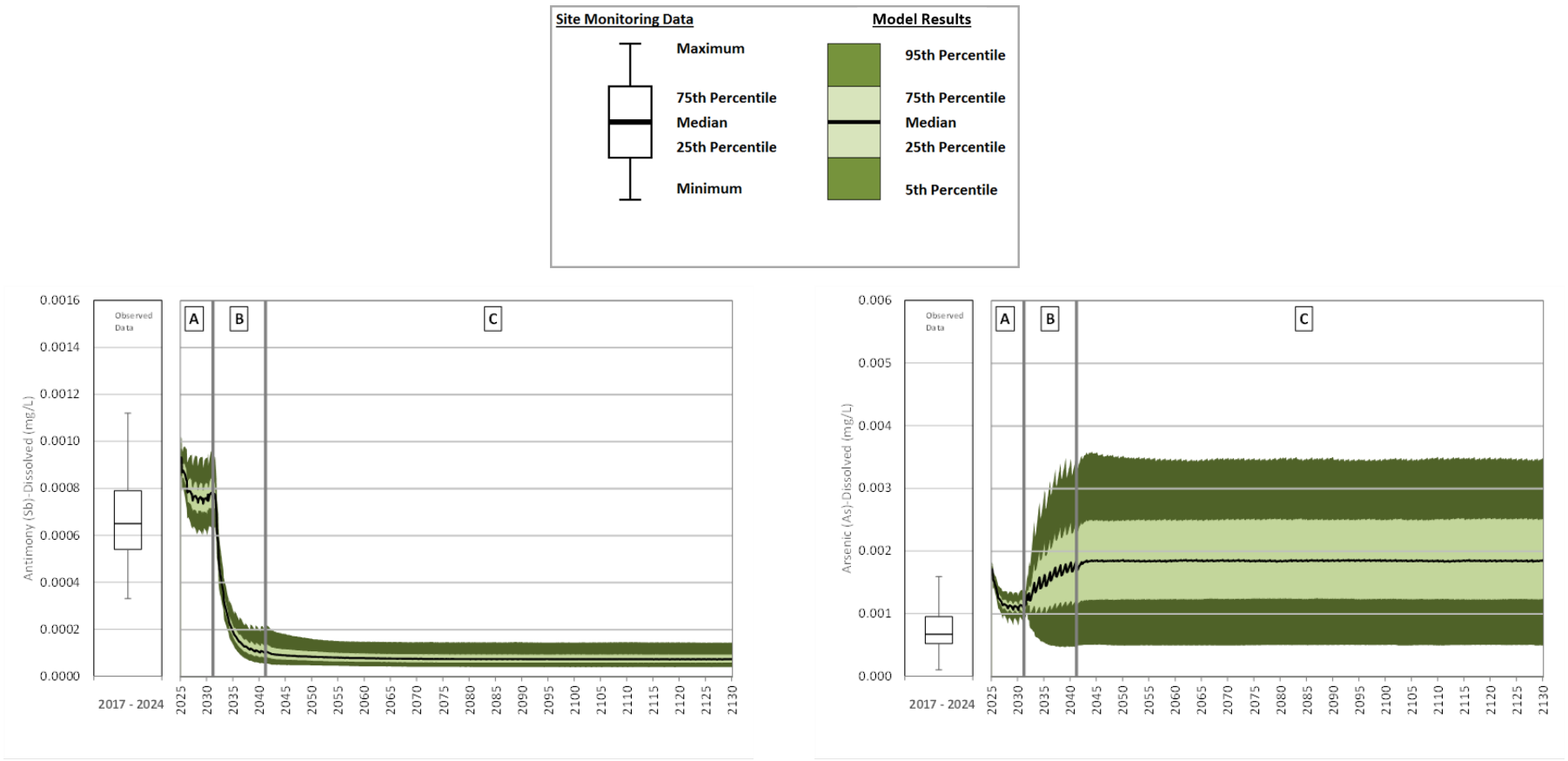
Figure B-39: Wight Pit Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus concentrations increase from operations to closure due to pumping from the Tailings Storage Facility. Total phosphorus concentrations then decrease during post-closure as runoff areas are remediated. The increase in dissolved aluminum concentrations from operations to closure and post-closure is caused by higher dissolved aluminum concentrations in the disturbed and undisturbed water quality inputs as well as pumping from the Central Collection Sump.

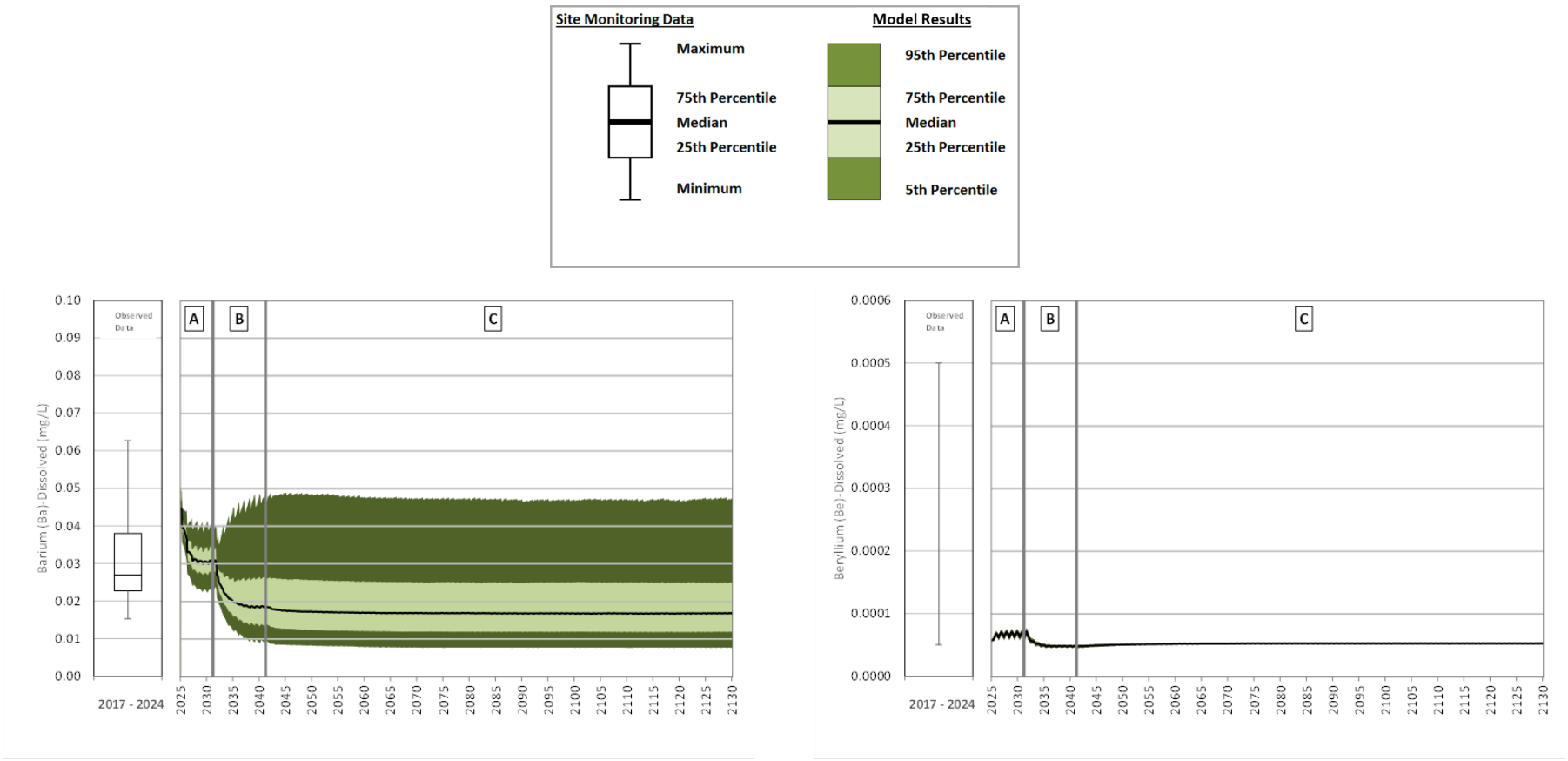
Figure B-40: Wight Pit Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

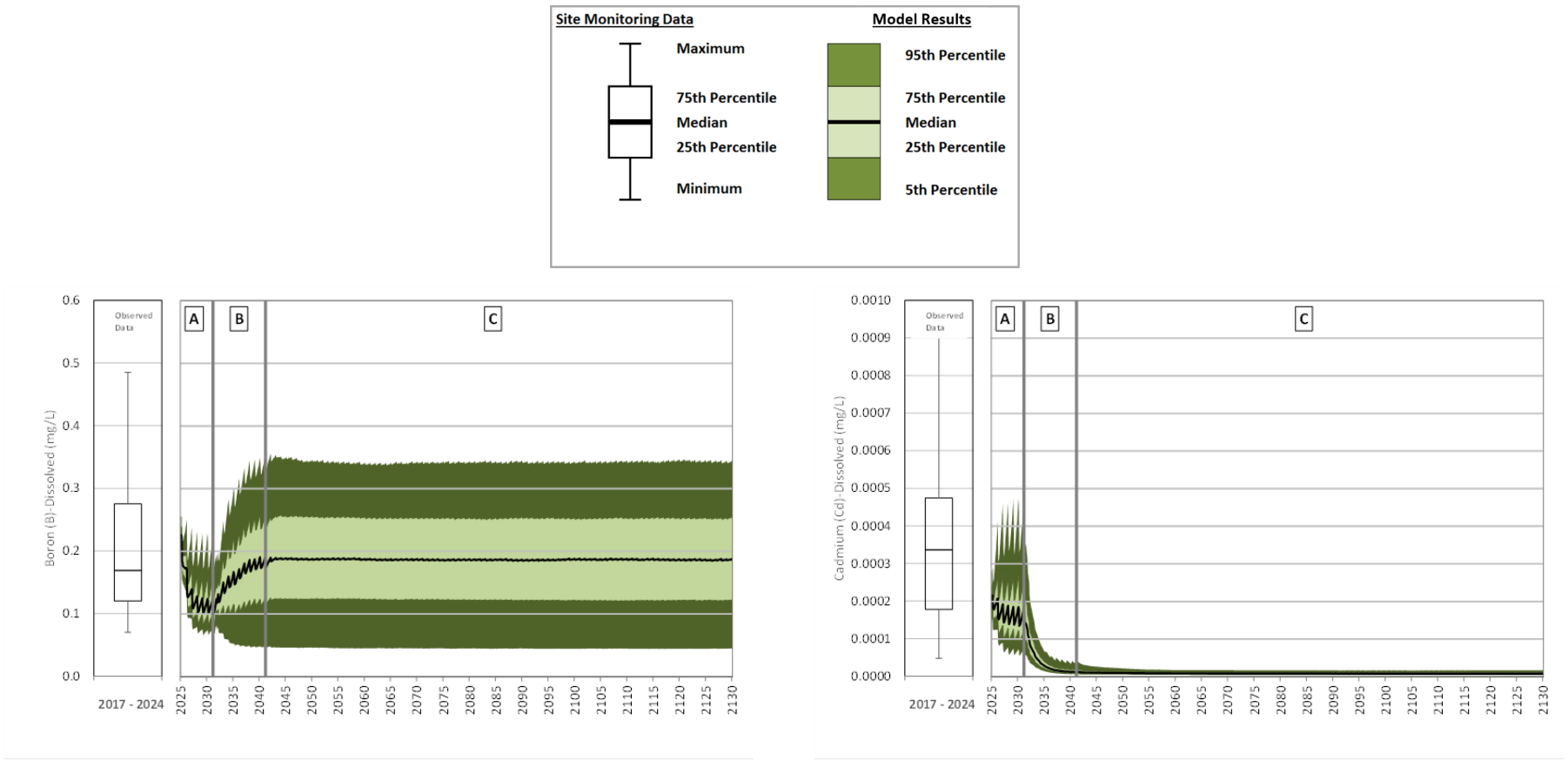
Figure B-41: Wight Pit Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

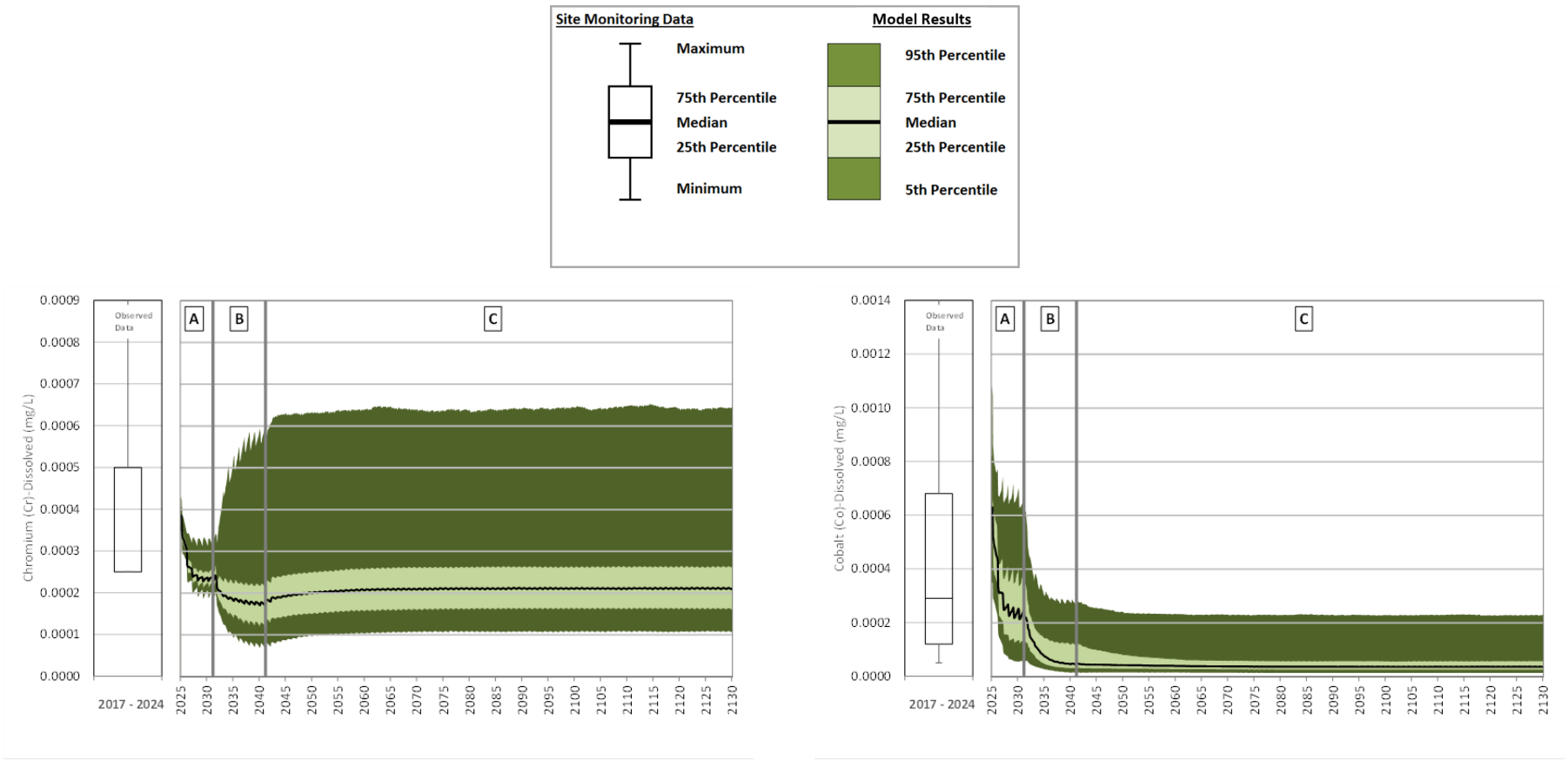
Figure B-42: Wight Pit Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

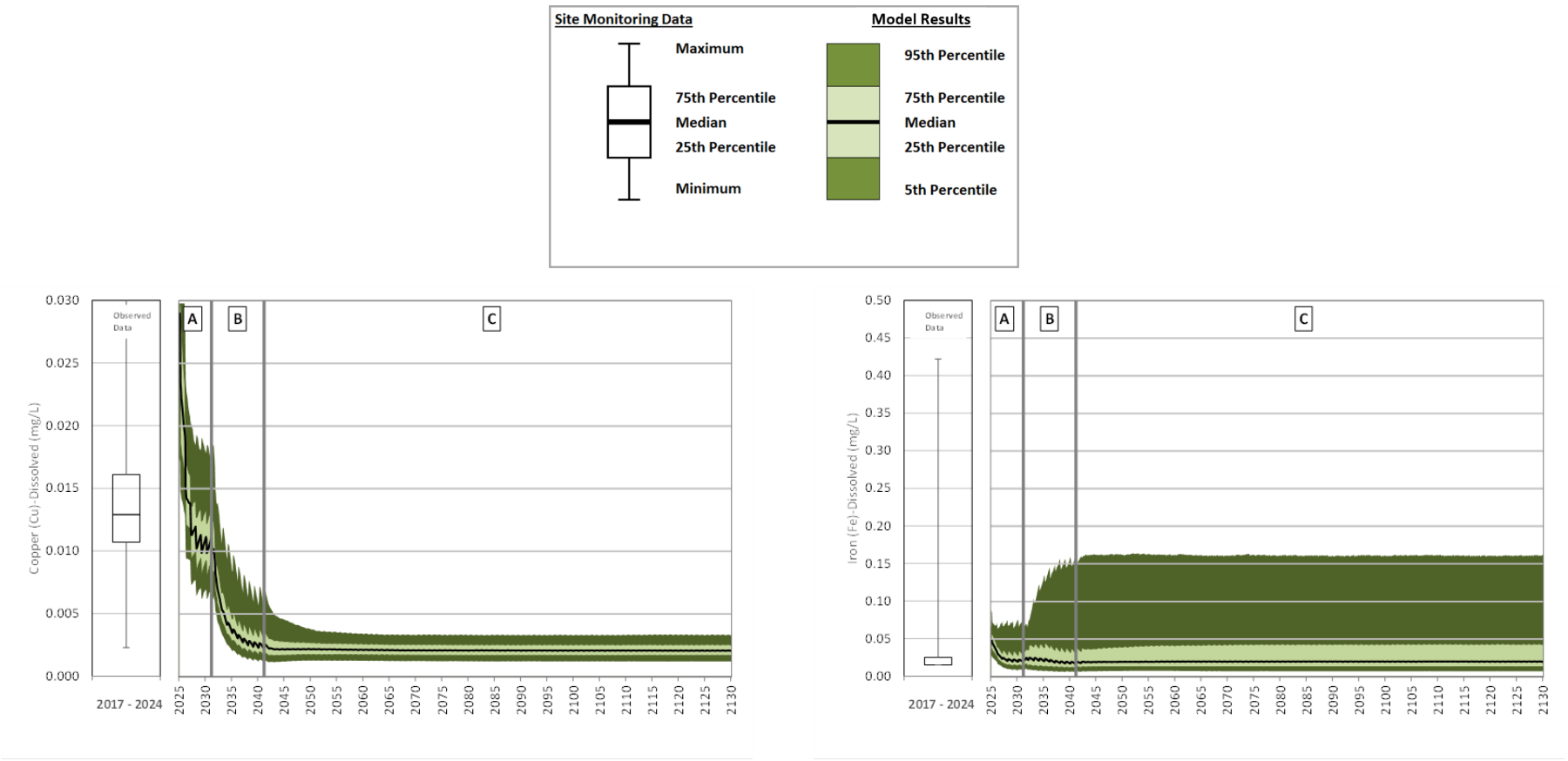
Figure B-43: Wight Pit Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

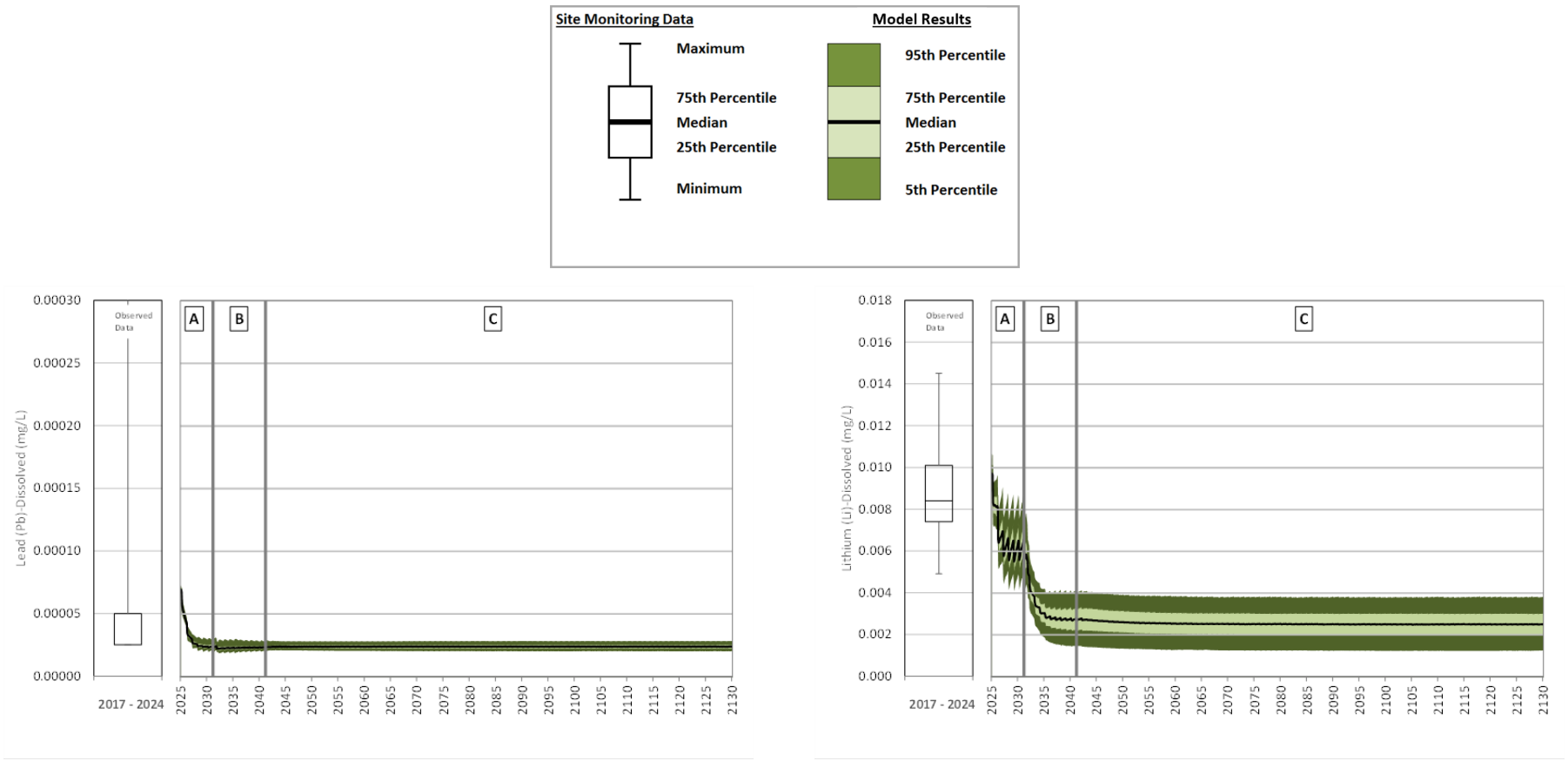
Figure B-44: Wight Pit Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

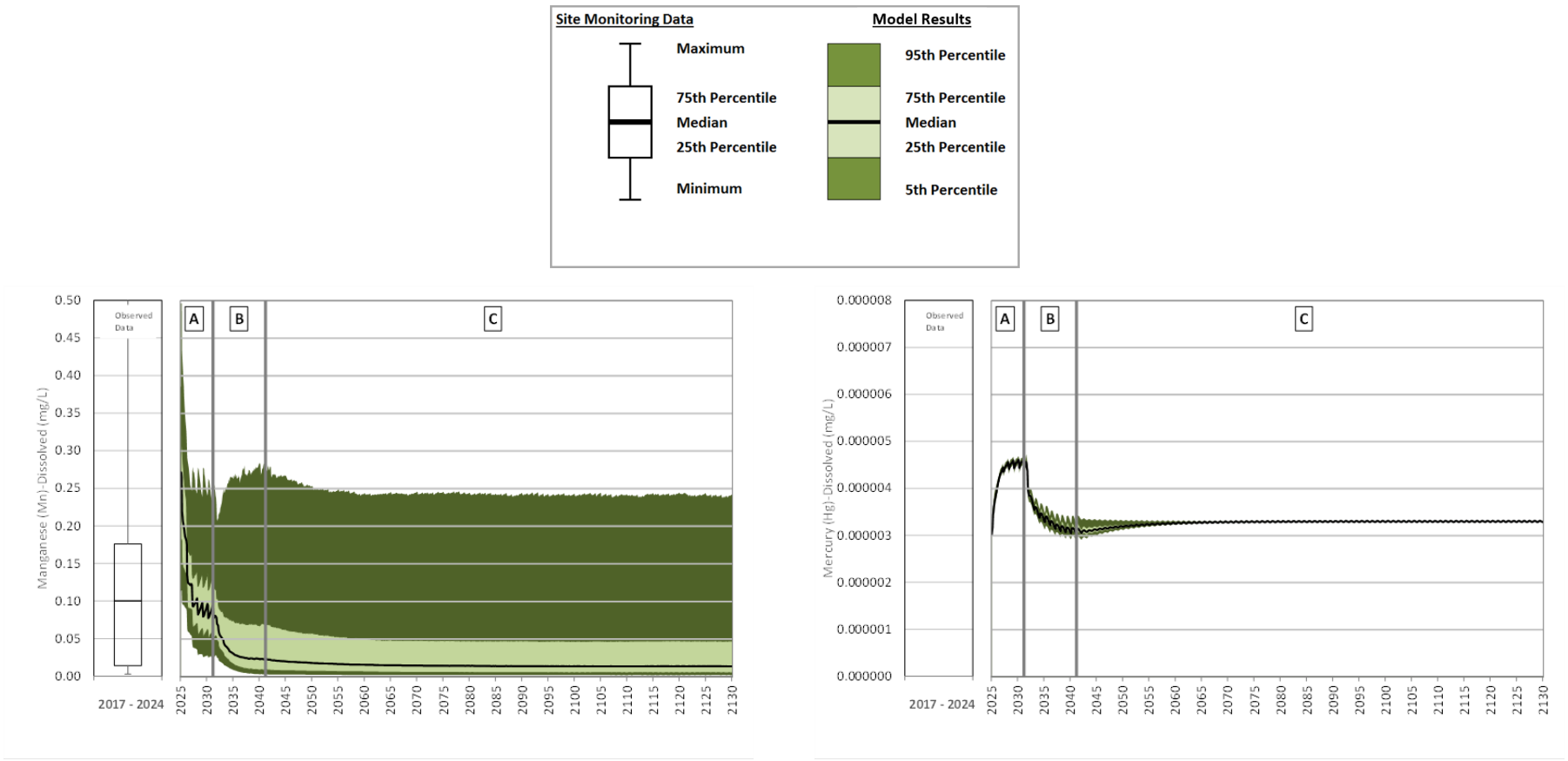
Figure B-45: Wight Pit Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

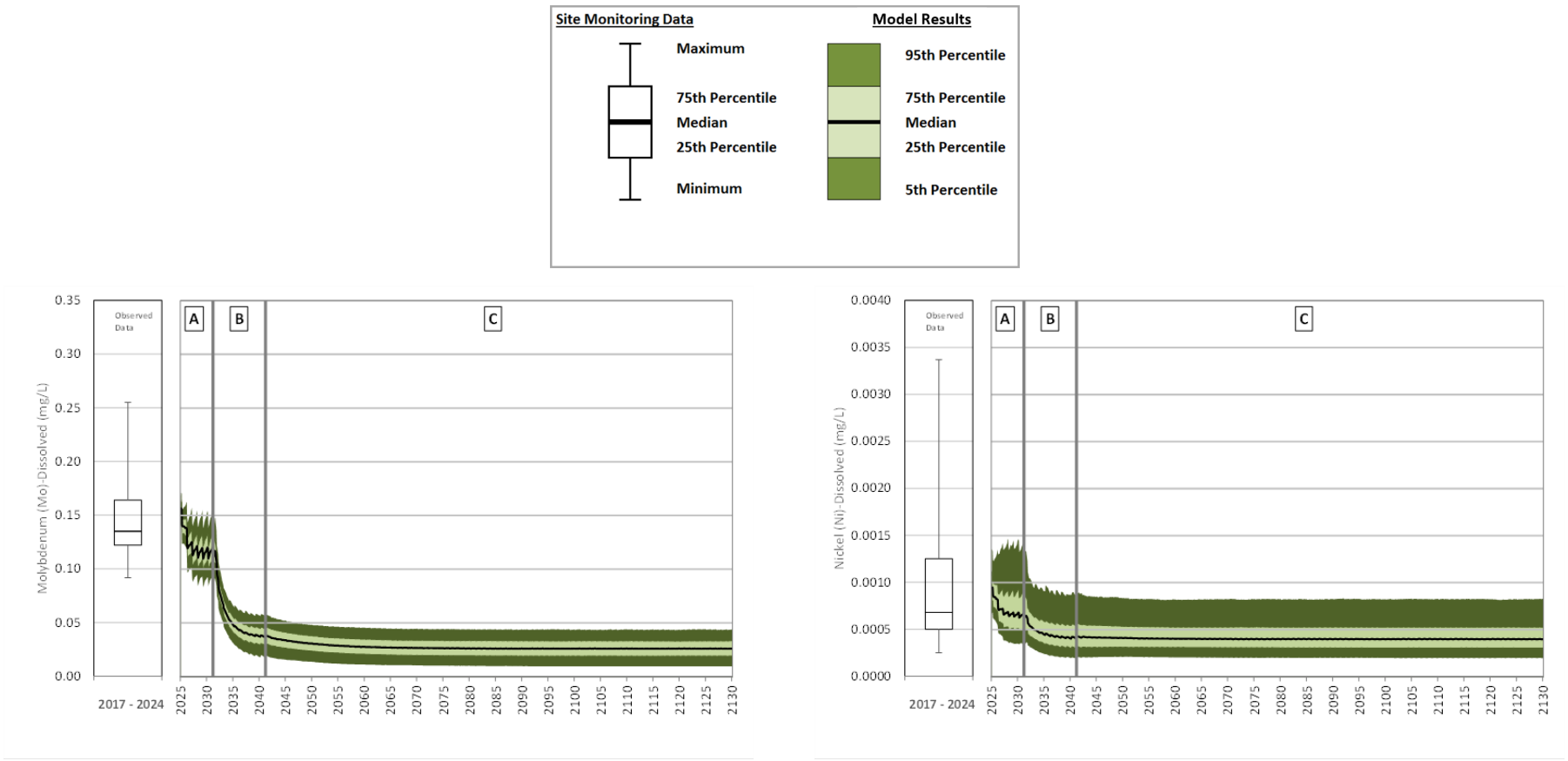
Figure B-46: Wight Pit Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

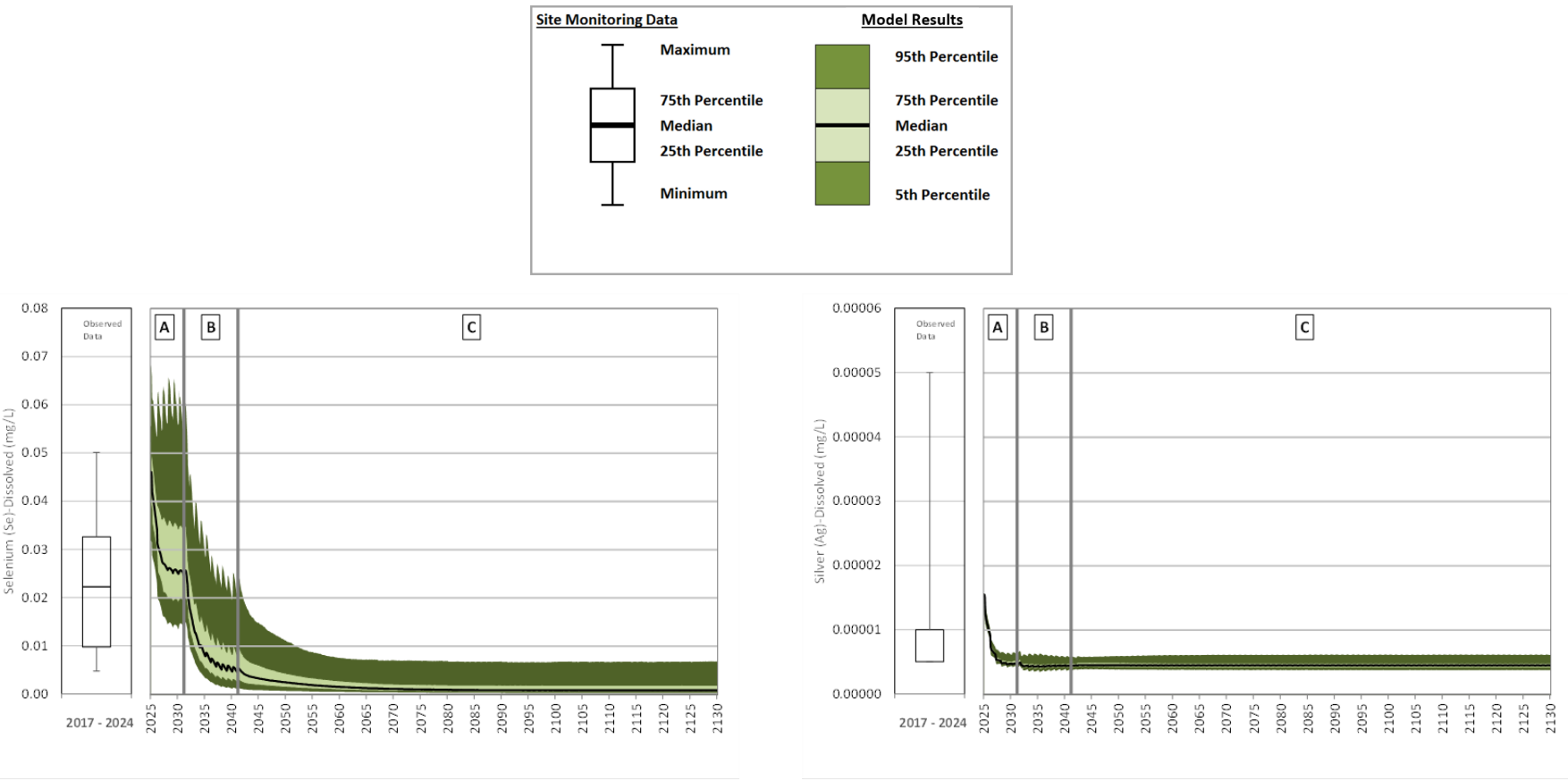
Figure B-47: Wight Pit Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

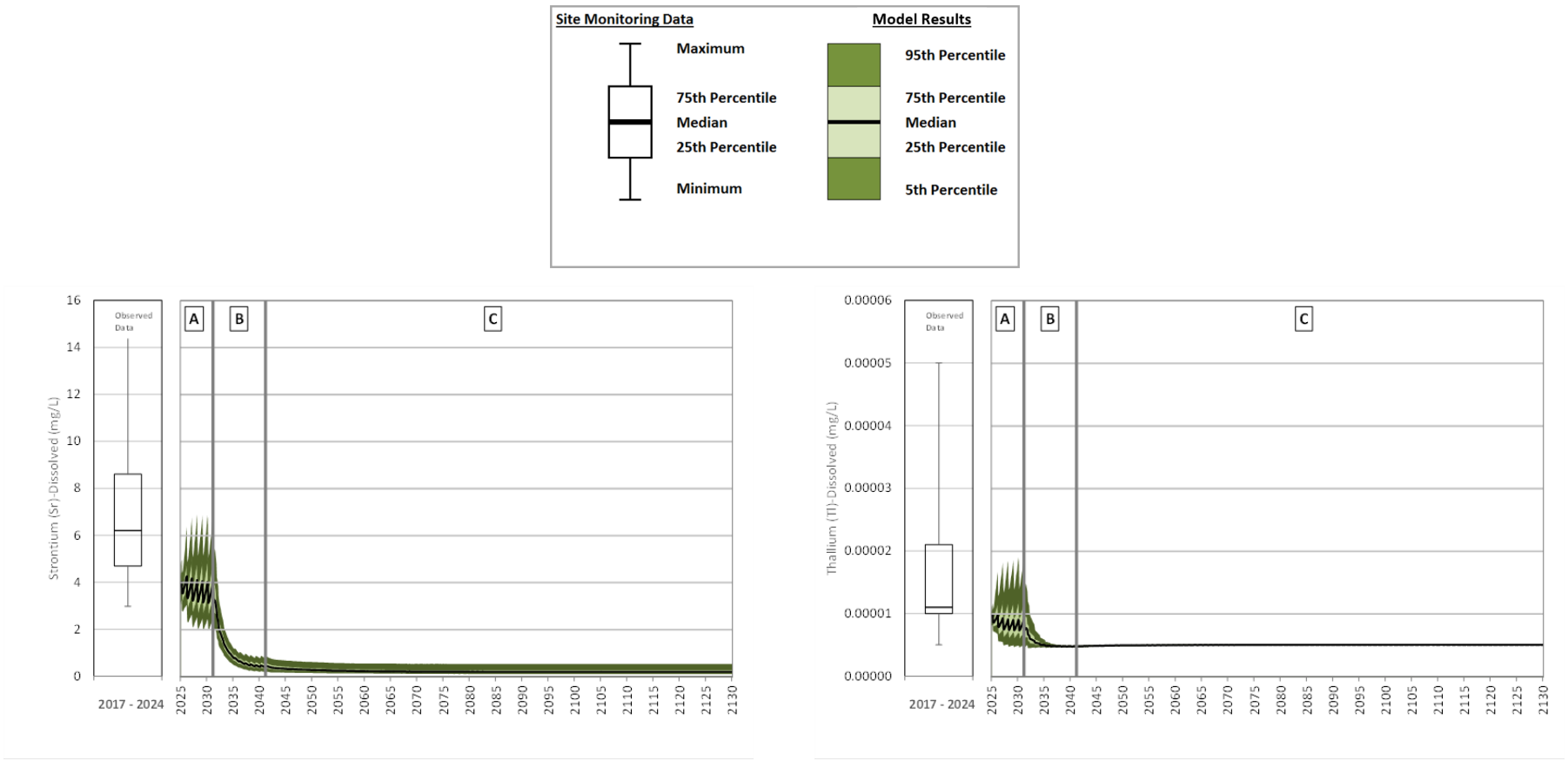
Figure B-48: Wight Pit Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

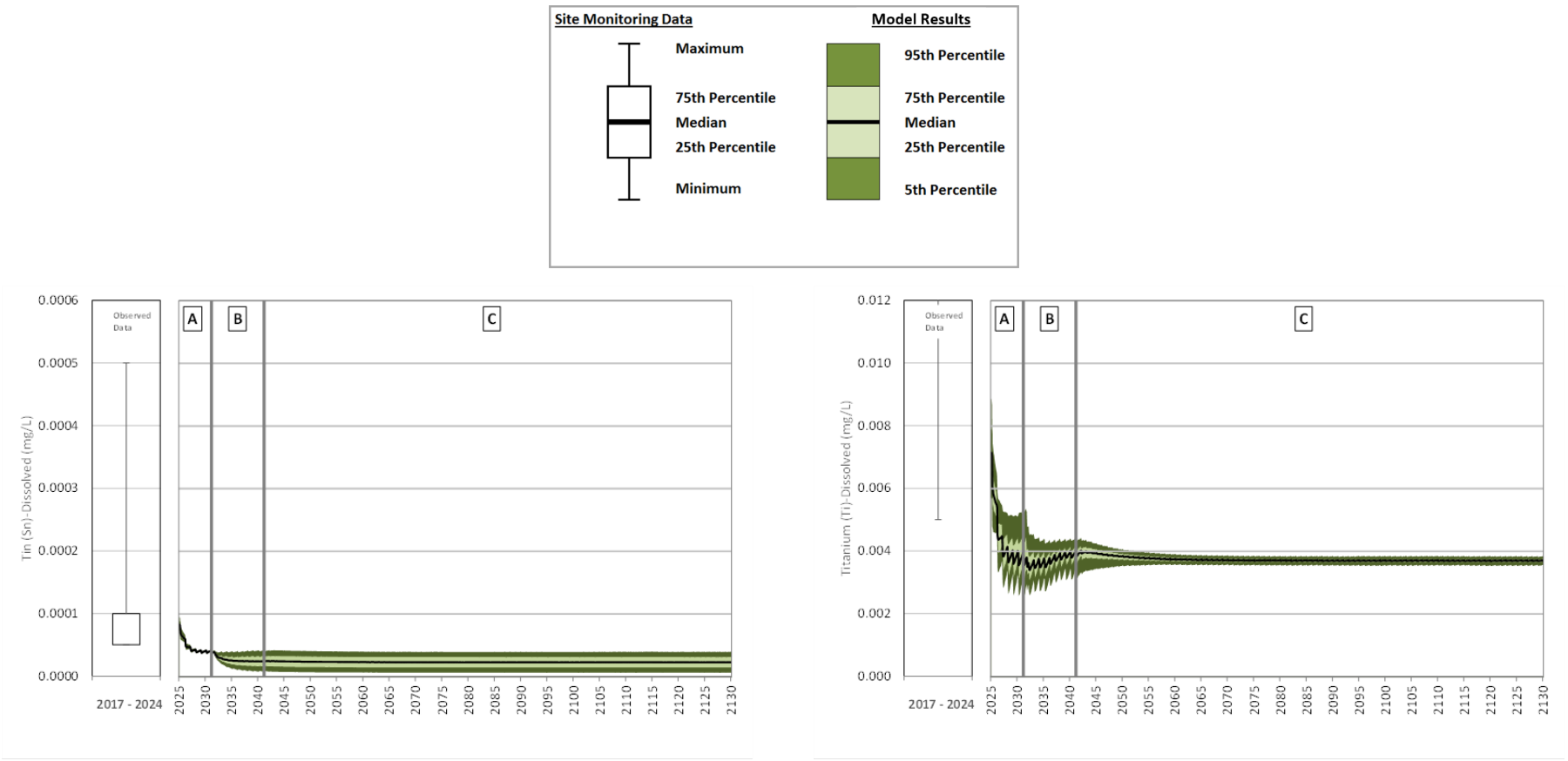
Figure B-49: Wight Pit Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

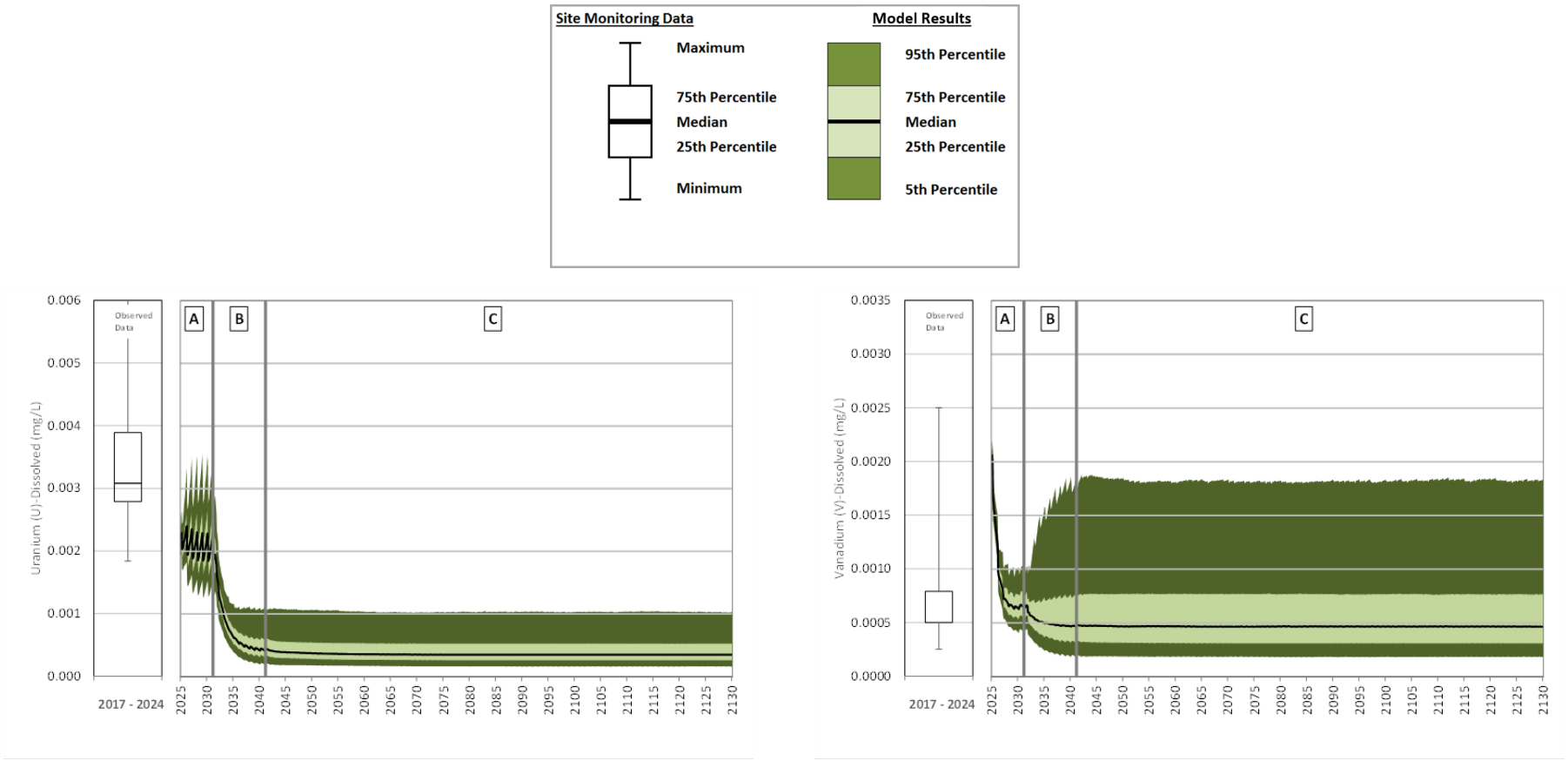
Figure B-50: Wight Pit Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved tin concentrations increase from operations to closure and post-closure due to a greater proportion of total inflows from groundwater. The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

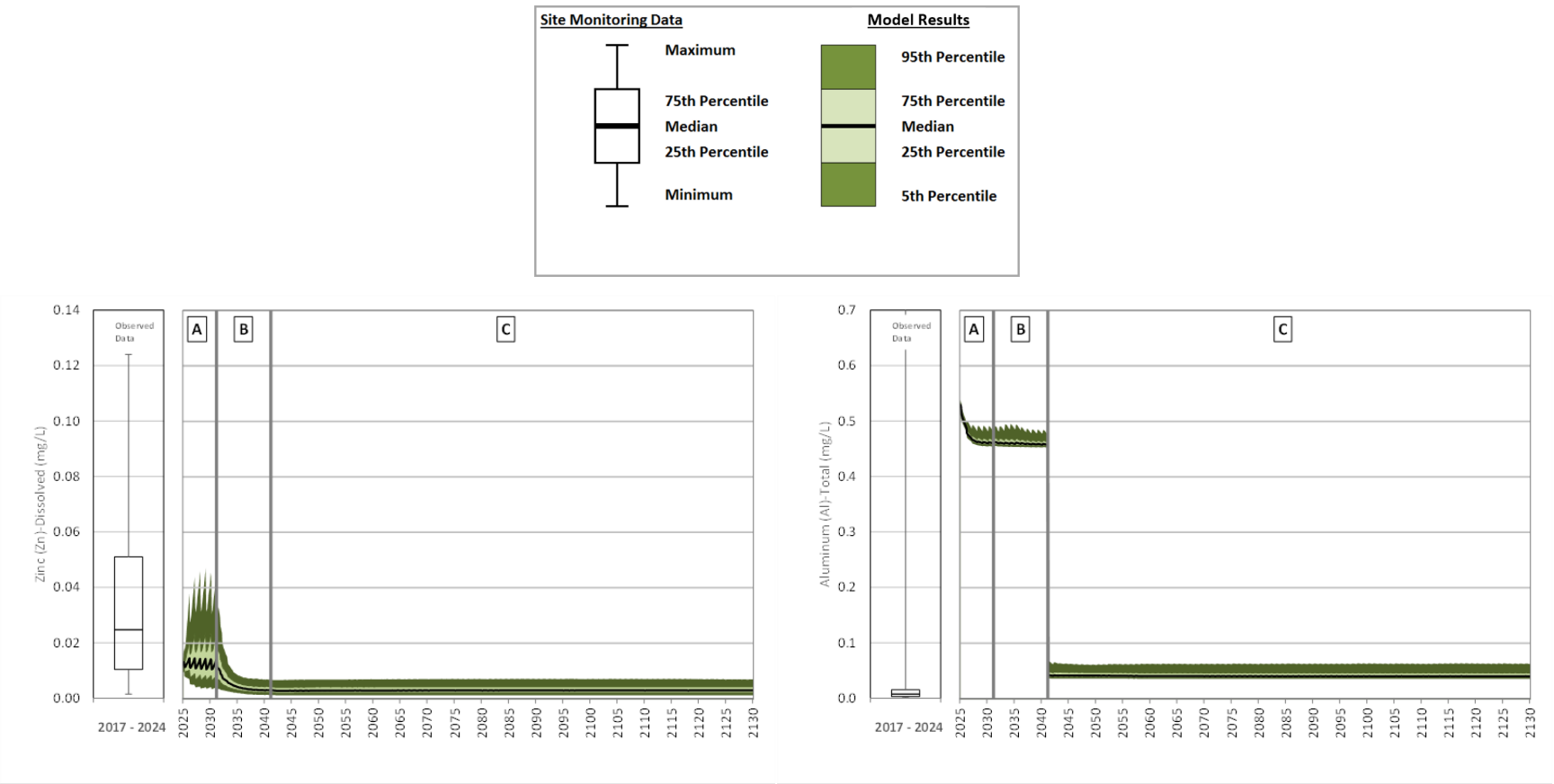
Figure B-51: Wight Pit Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

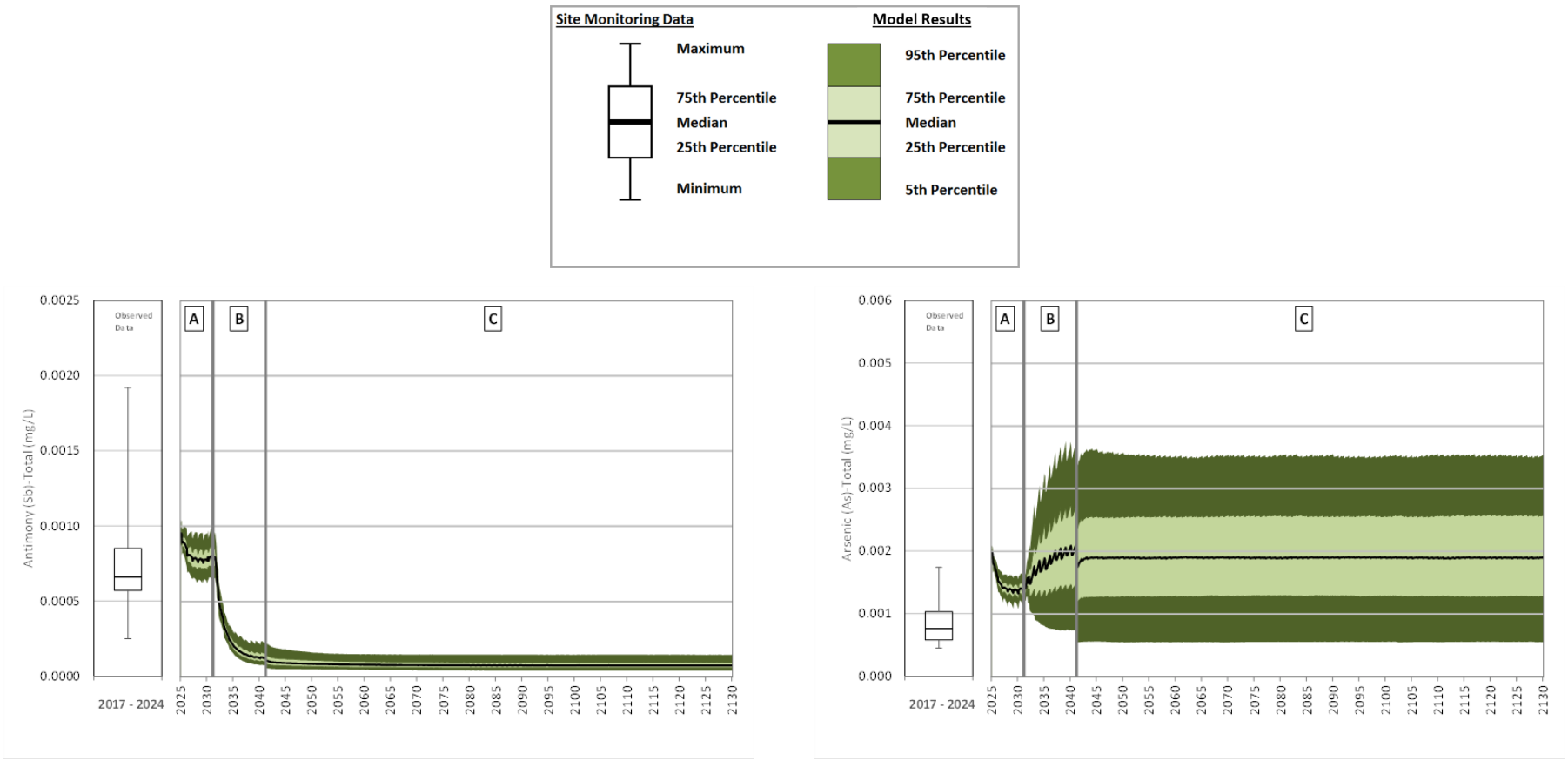
Figure B-52: Wight Pit Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

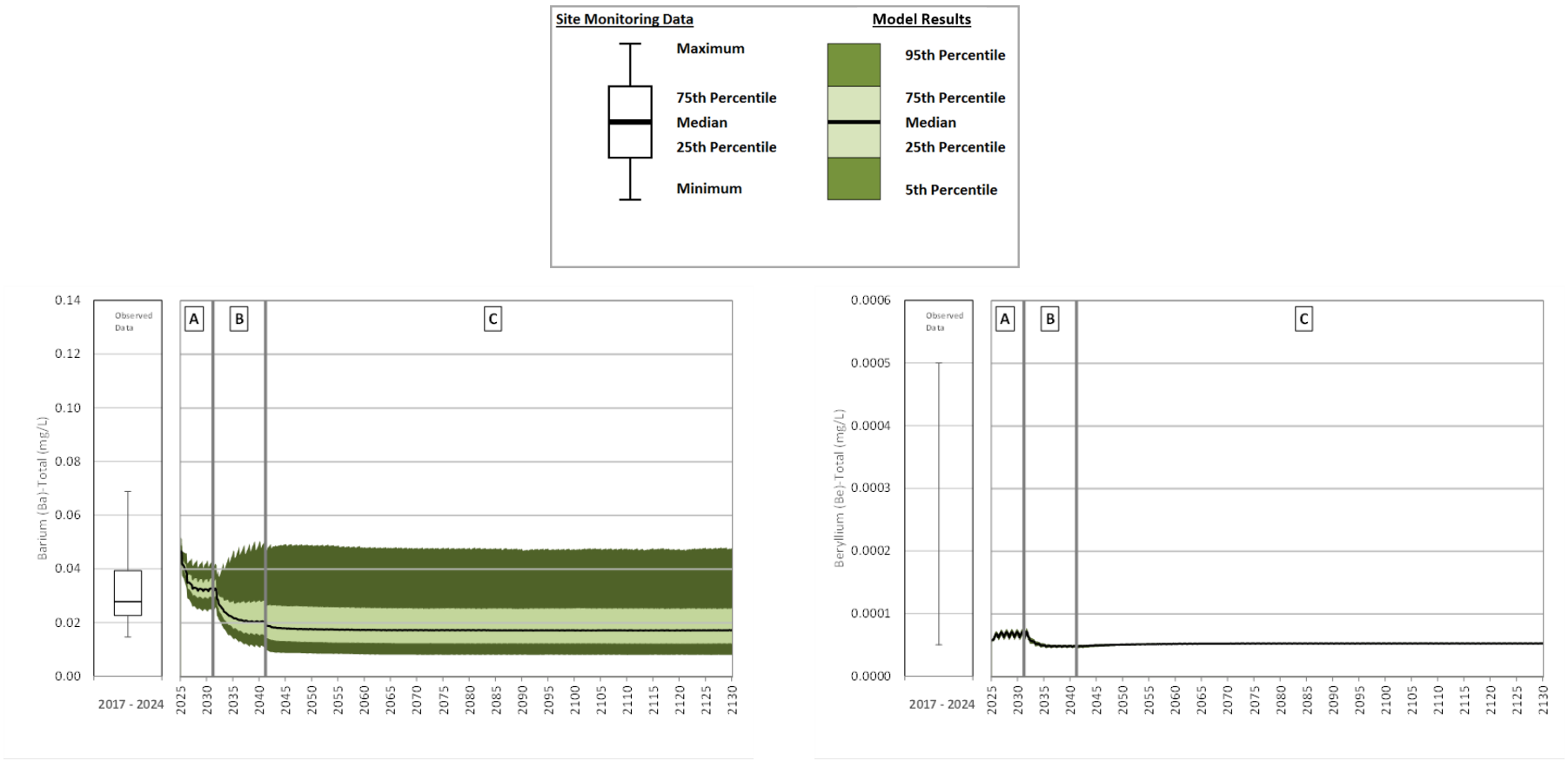
Figure B-53: Wight Pit Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

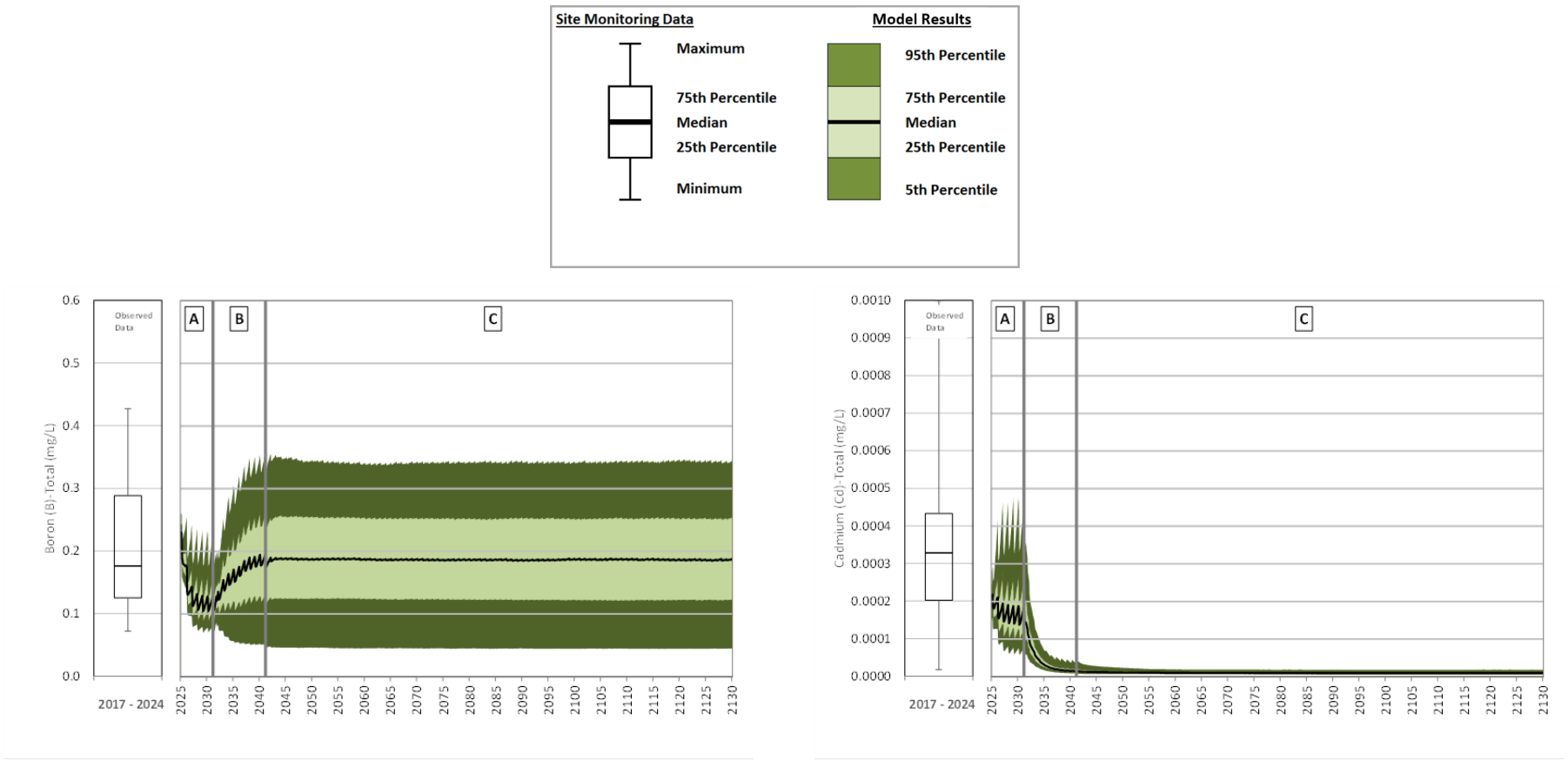
Figure B-54: Wight Pit Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

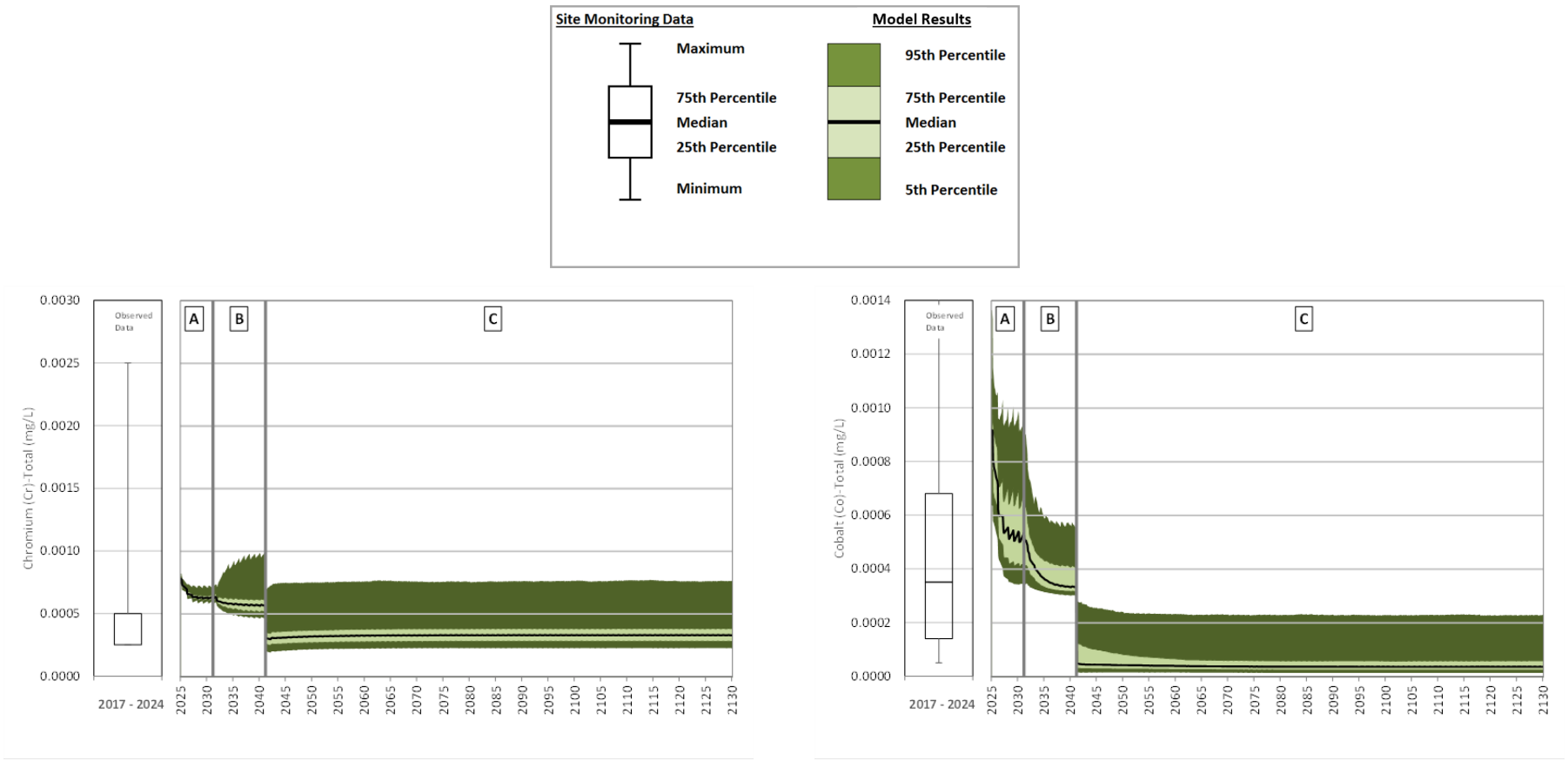
Figure B-55: Wight Pit Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

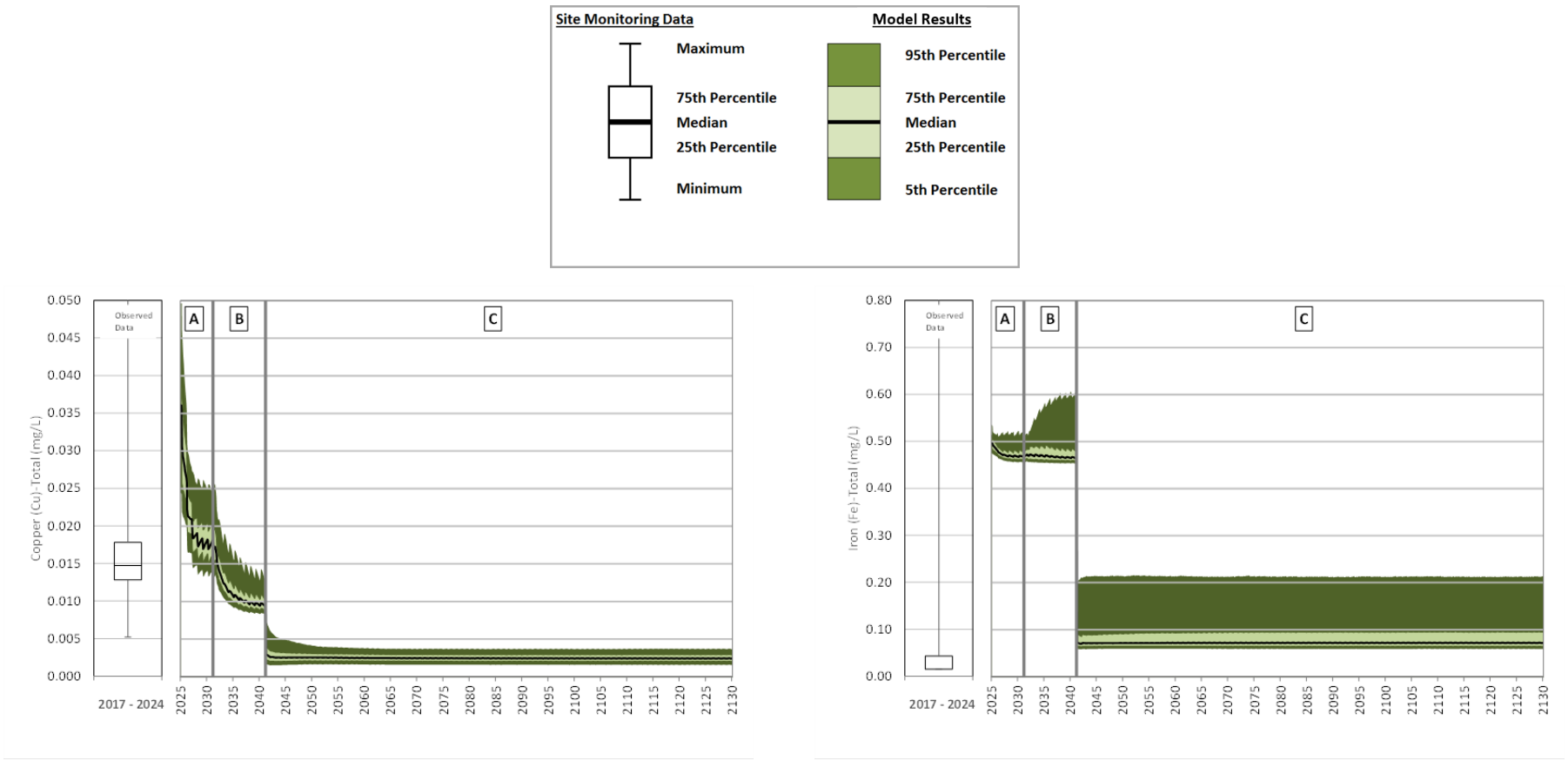
Figure B-56: Wight Pit Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

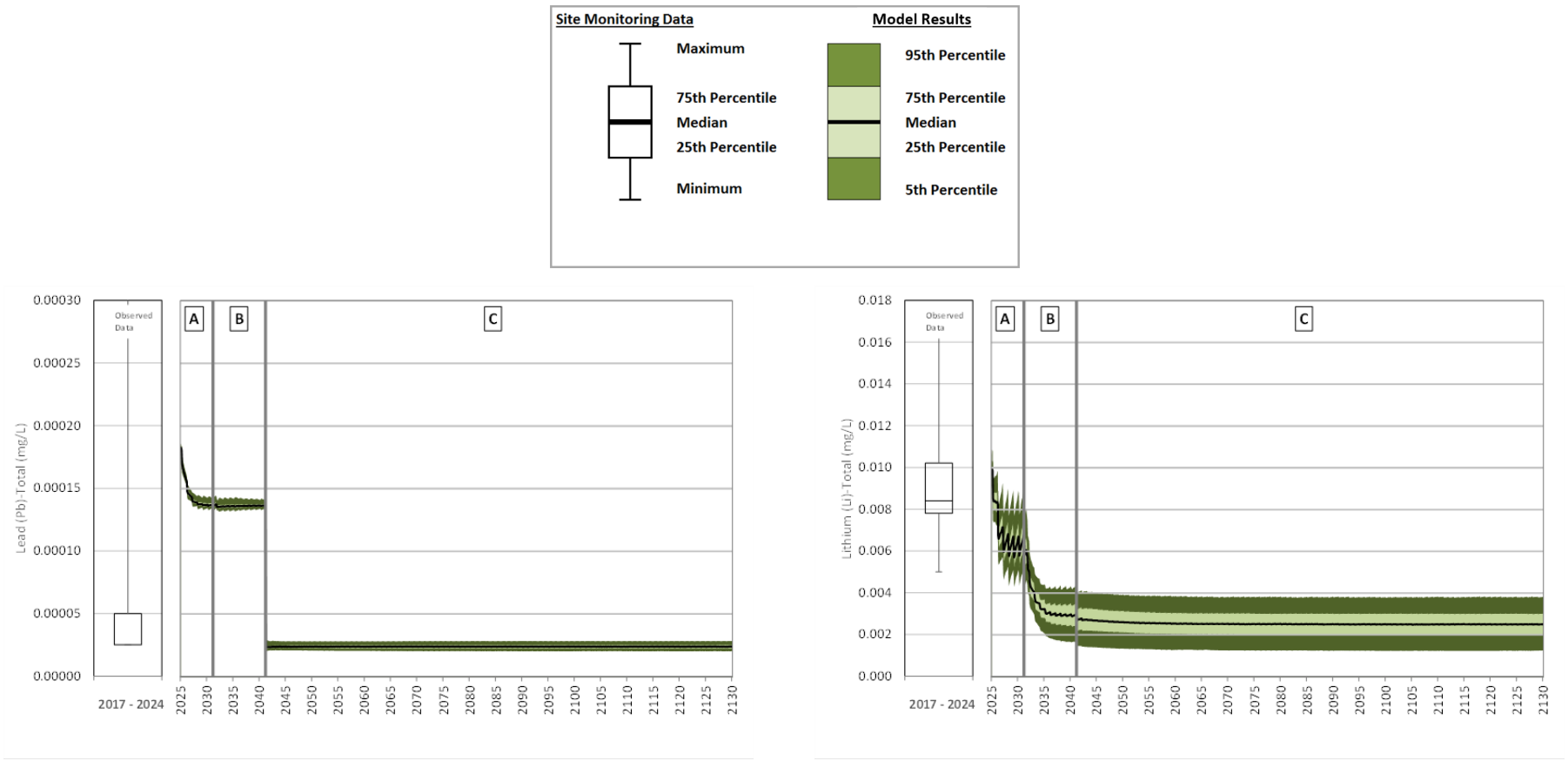
Figure B-57: Wight Pit Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

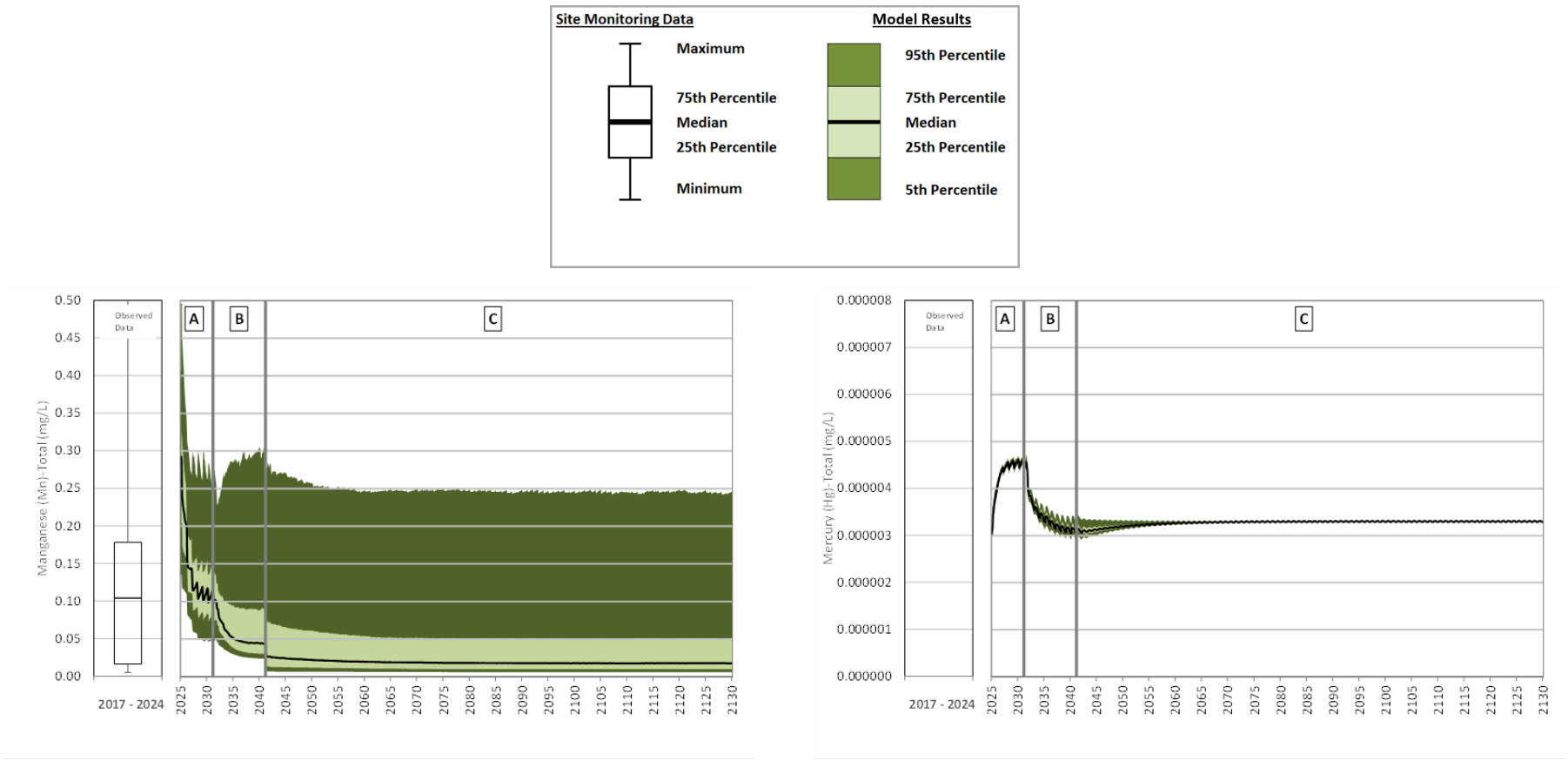
Figure B-58: Wight Pit Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

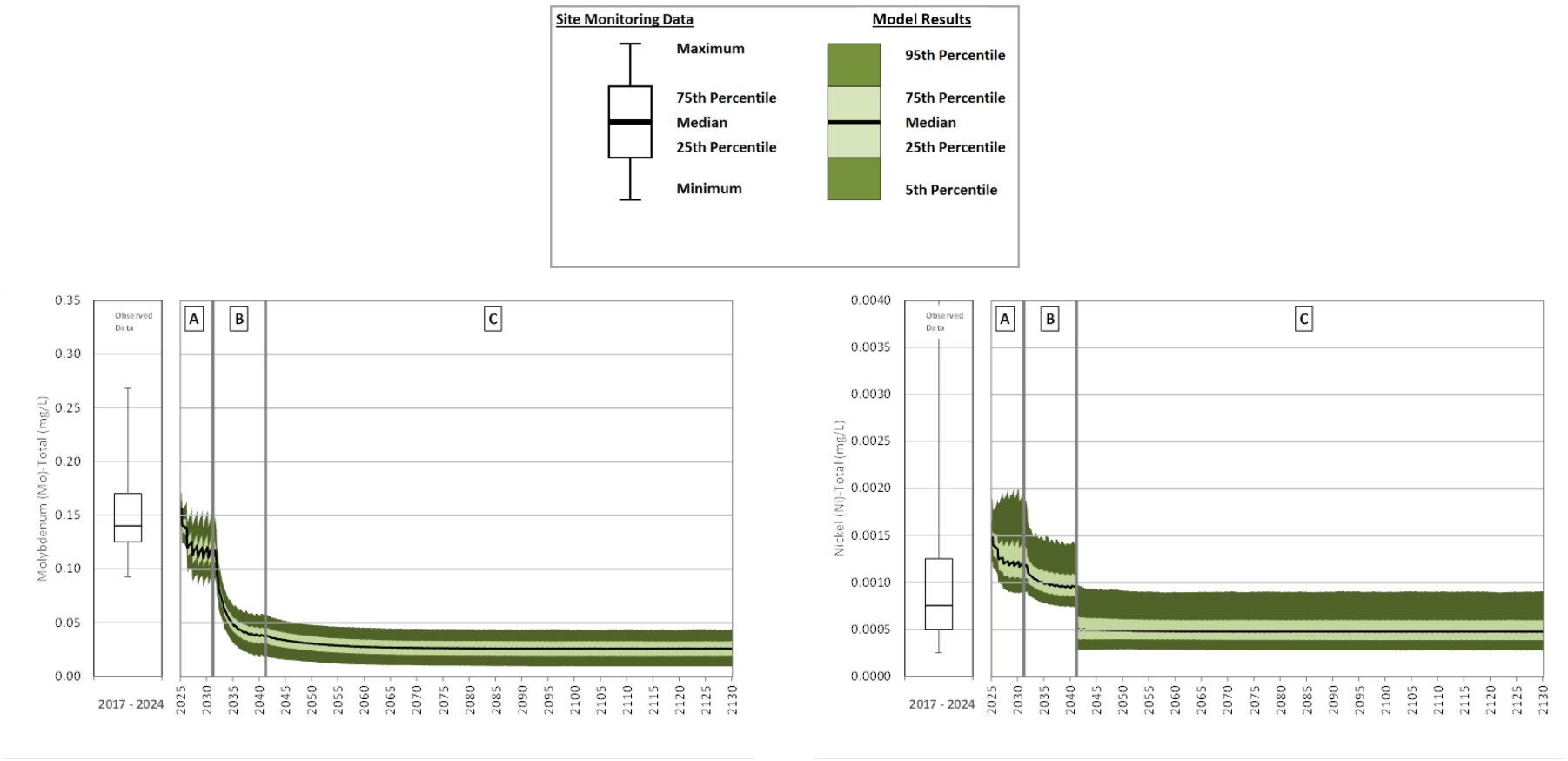
Figure B-59: Wight Pit Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

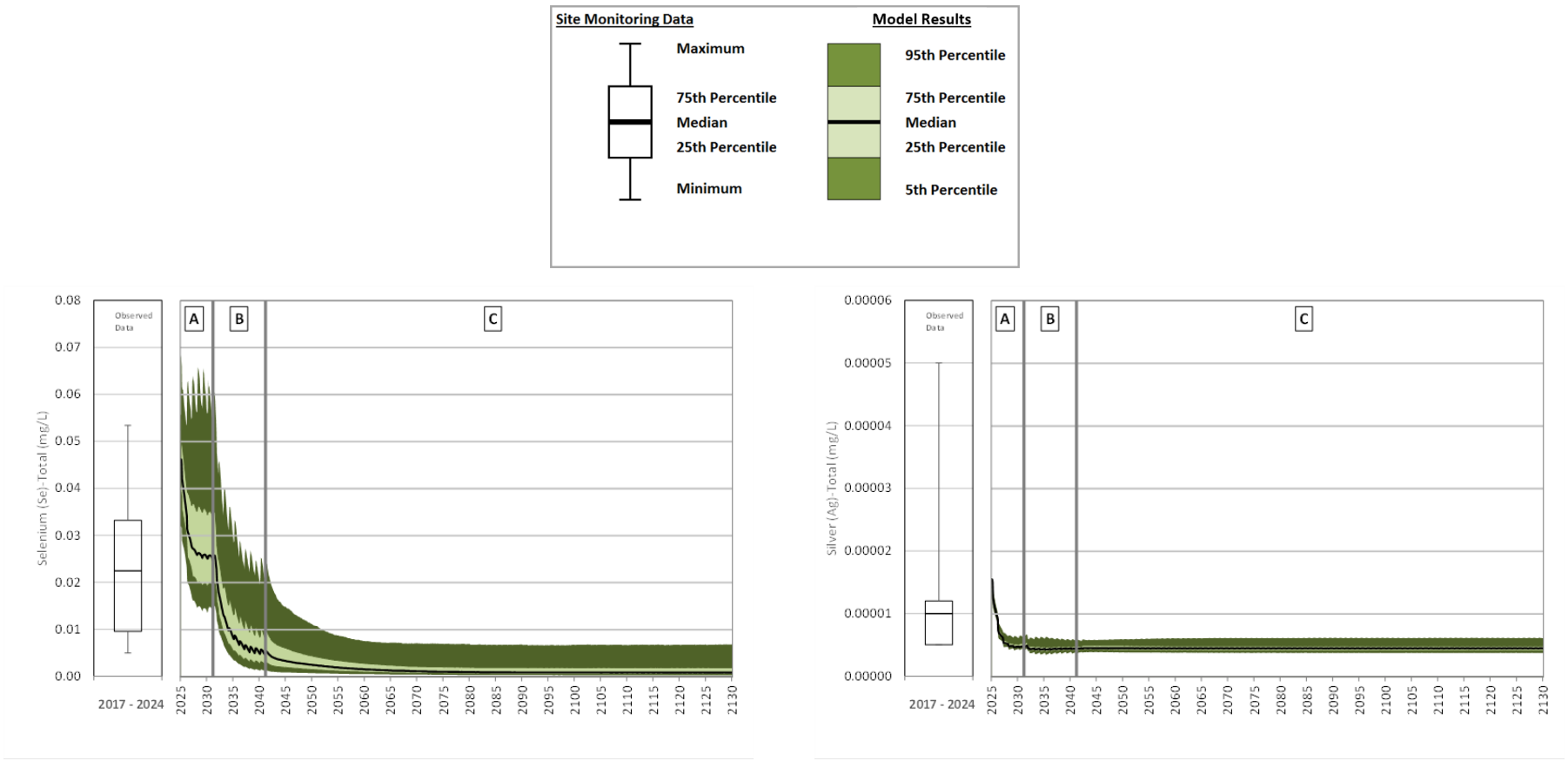
Figure B-60: Wight Pit Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

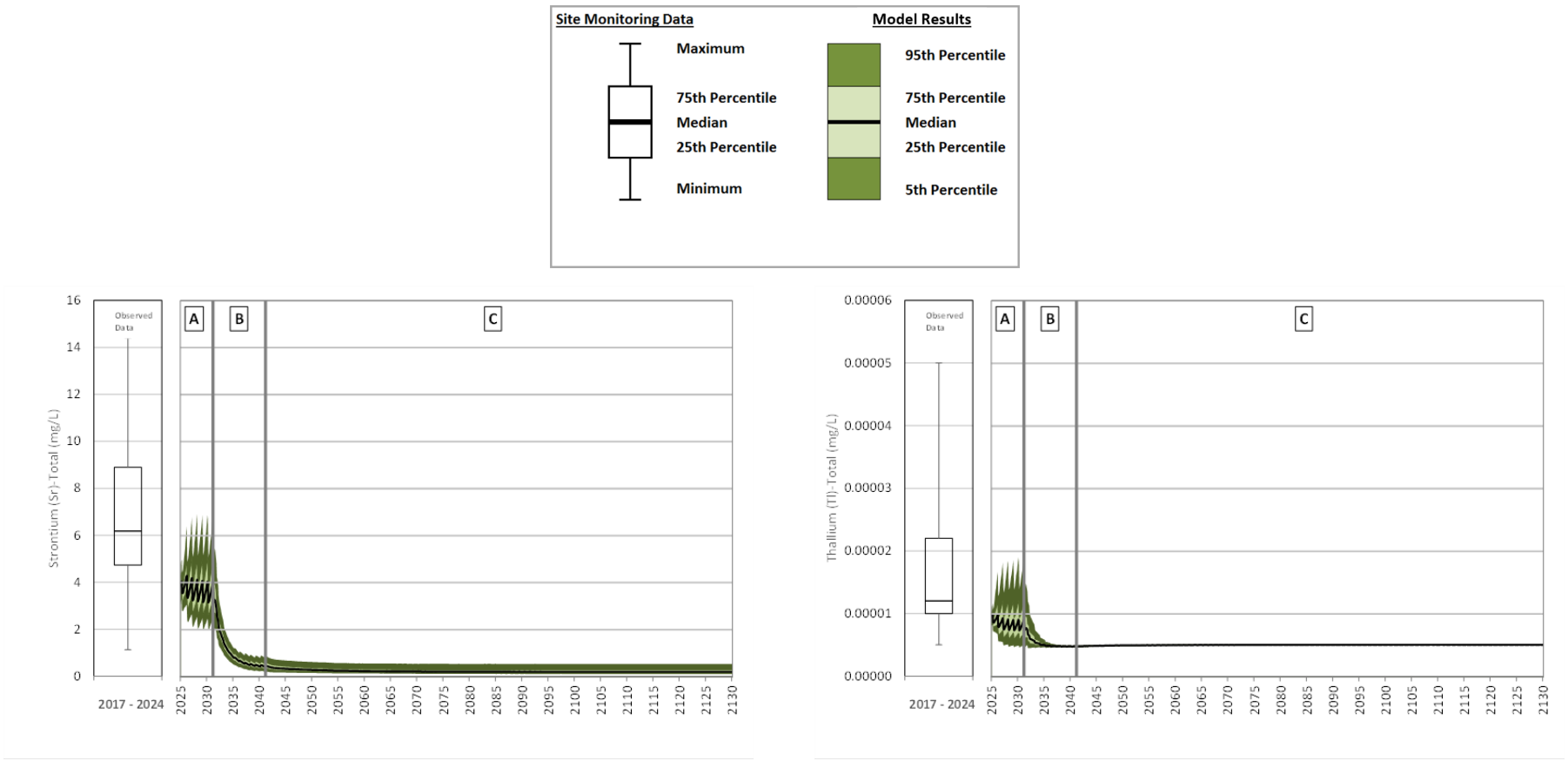
Figure B-61: Wight Pit Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

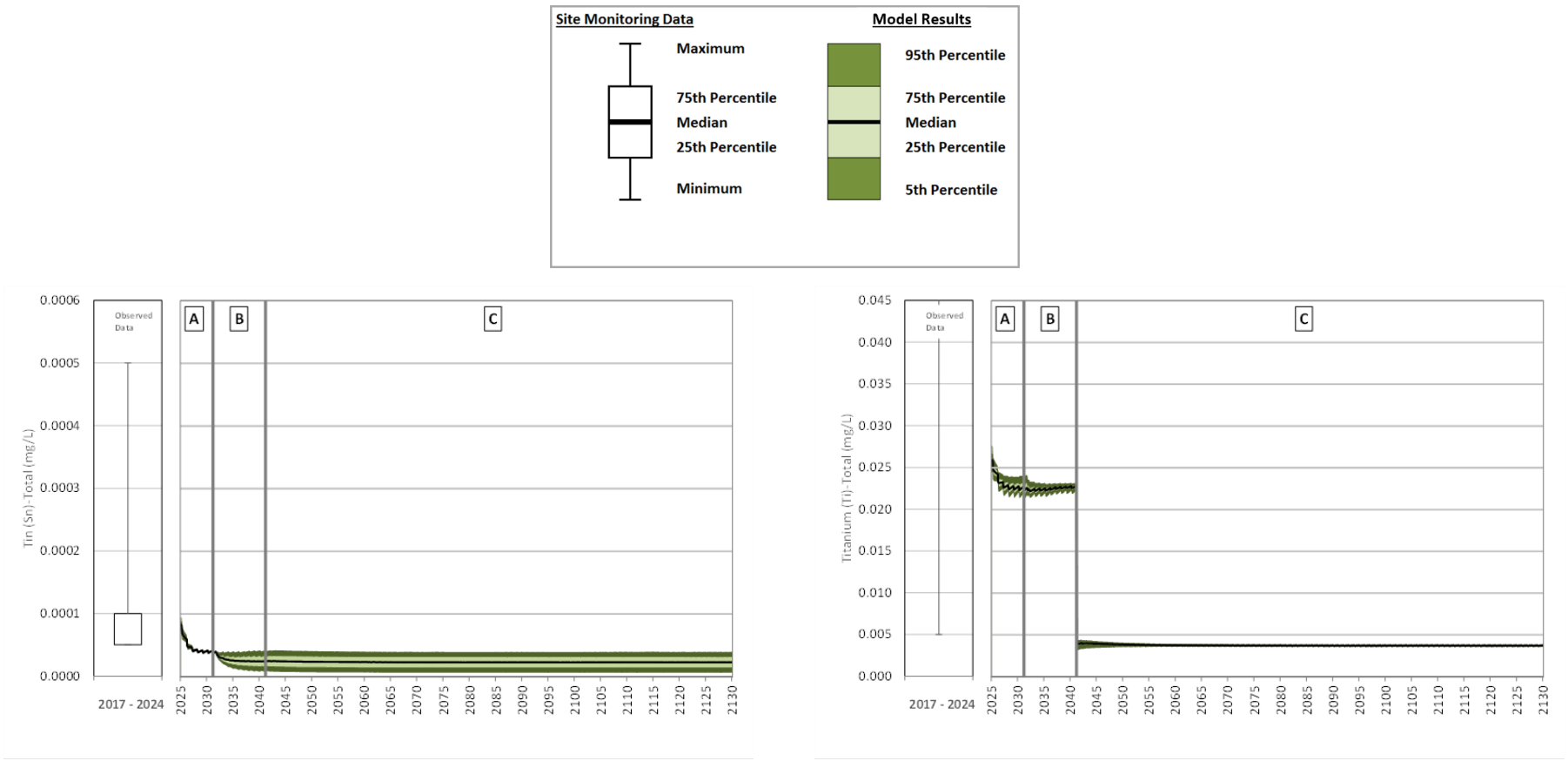
Figure B-62: Wight Pit Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

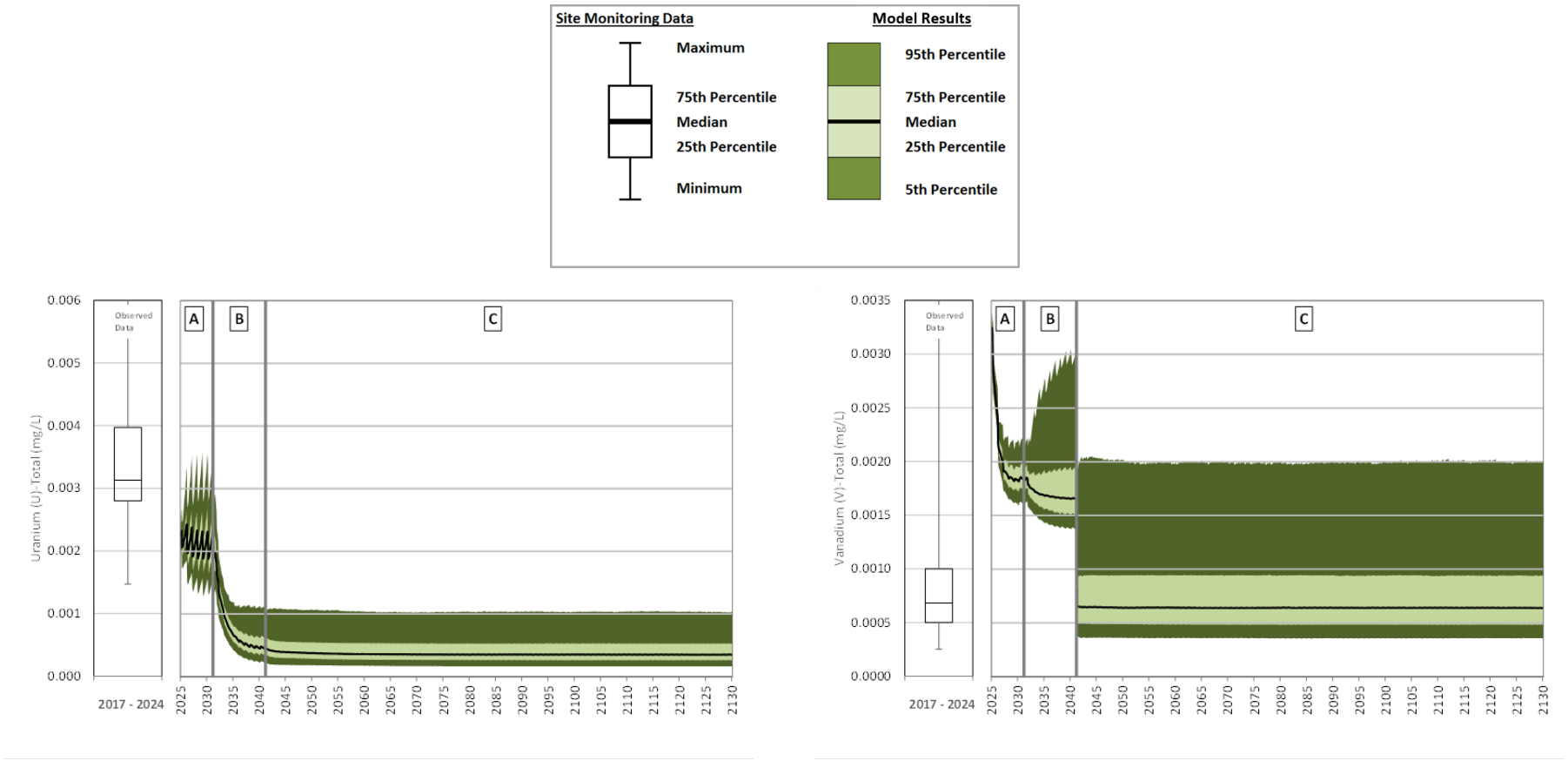
Figure B-63: Wight Pit Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved tin concentrations increase from operations to closure and post-closure due to a greater proportion of total inflows from groundwater. The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

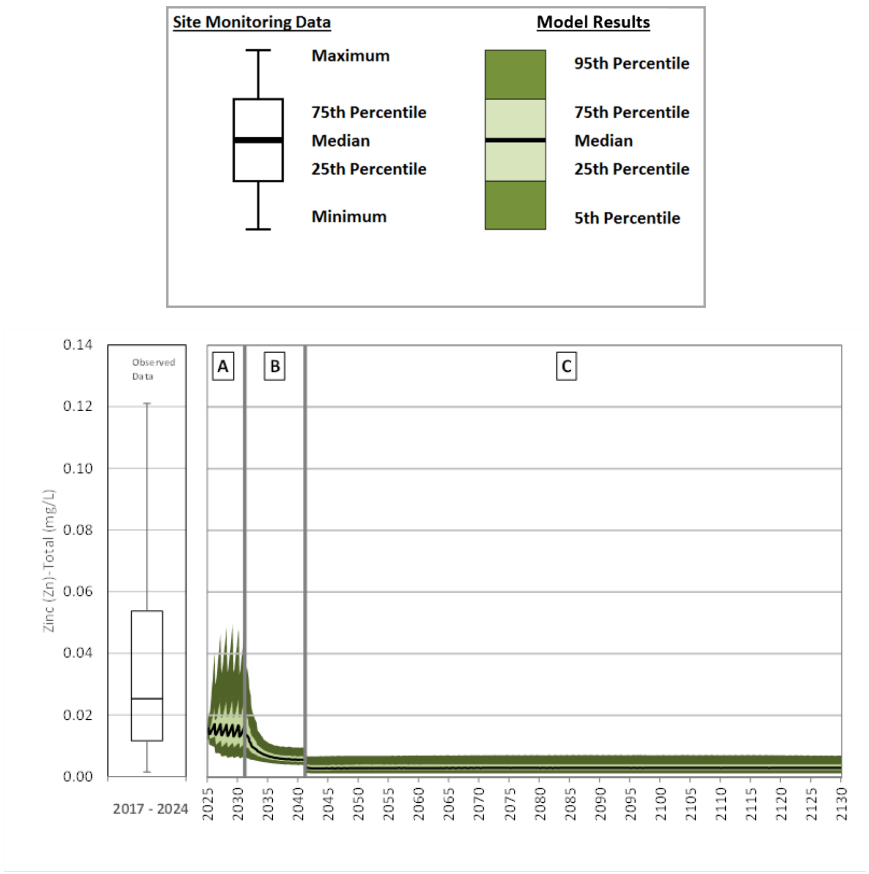
Figure B-64: Wight Pit Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-65: Wight Pit Operations, Closure and Post-closure – Total Uranium and Total Vanadium

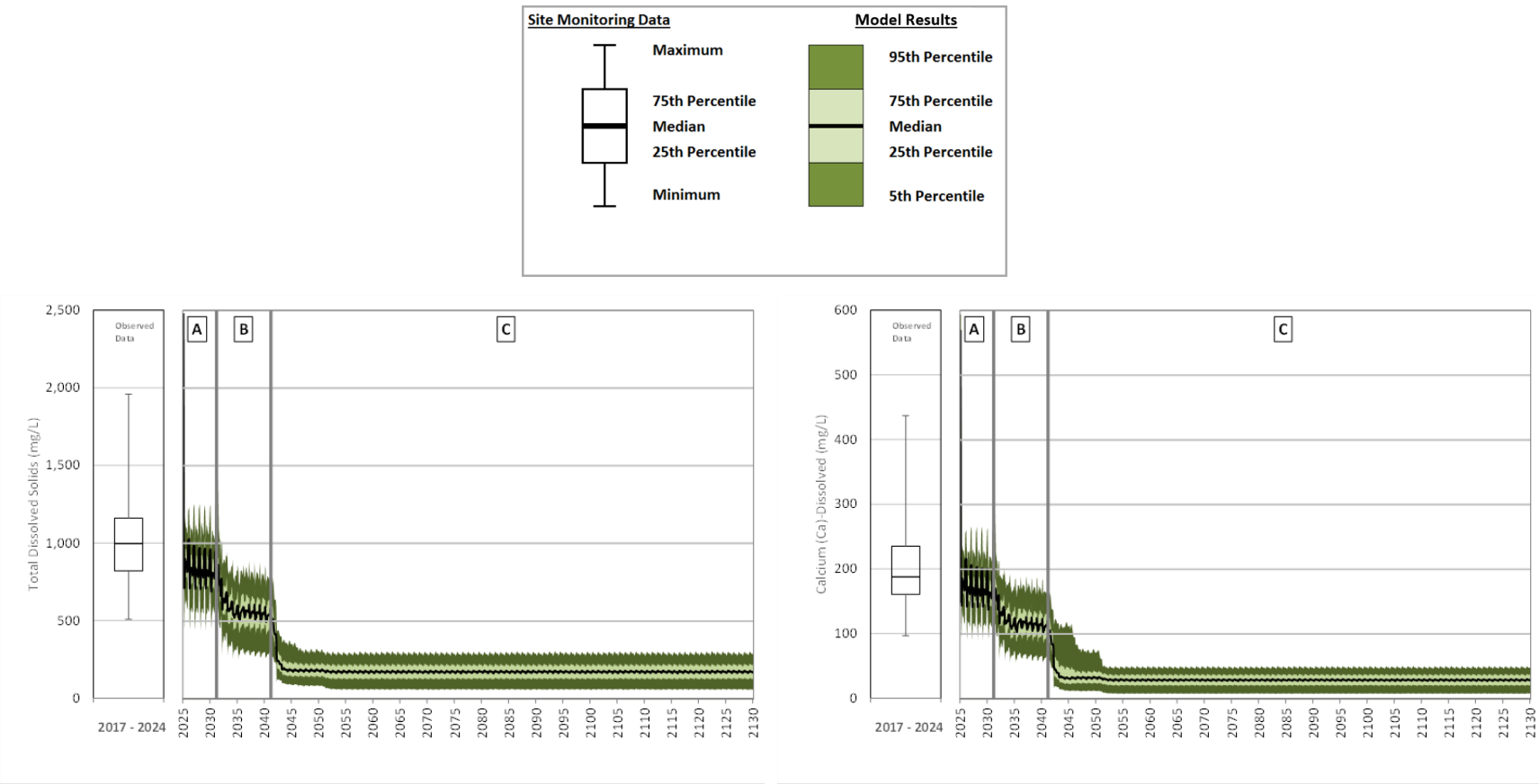


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-66: Wight Pit Operations, Closure and Post-closure – Total Zinc

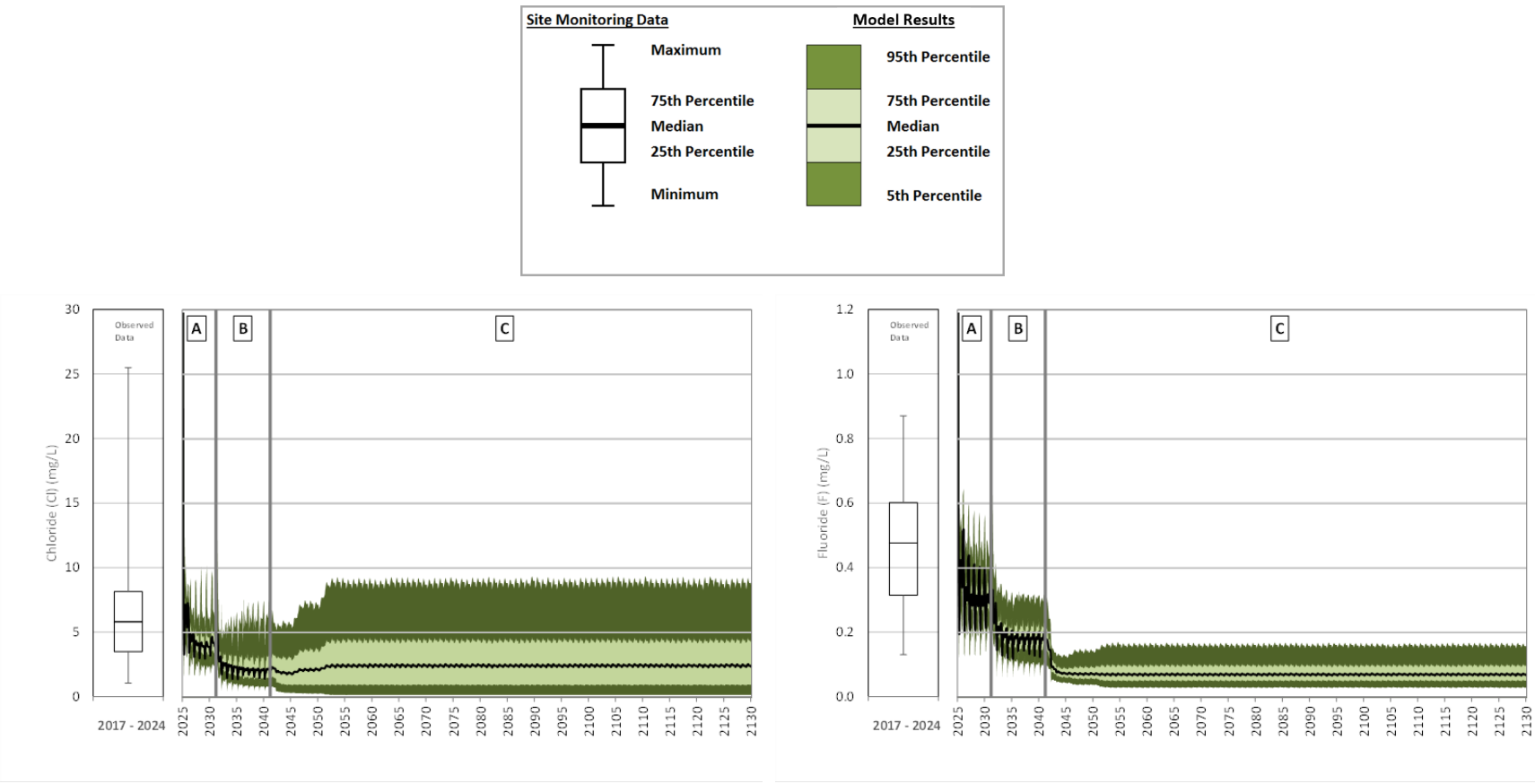
Central Collection Sump Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

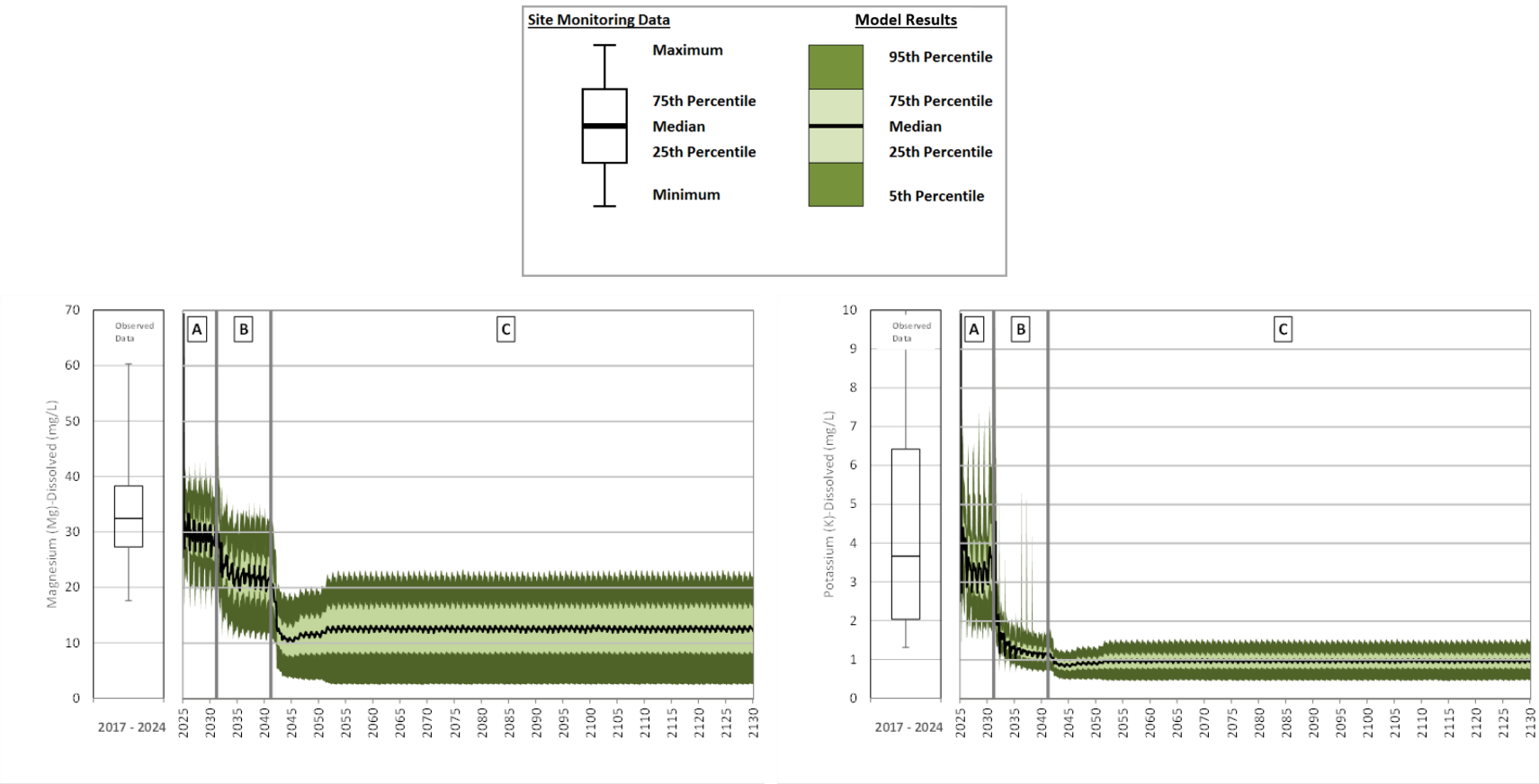
Figure B-67: Central Collection Sump Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

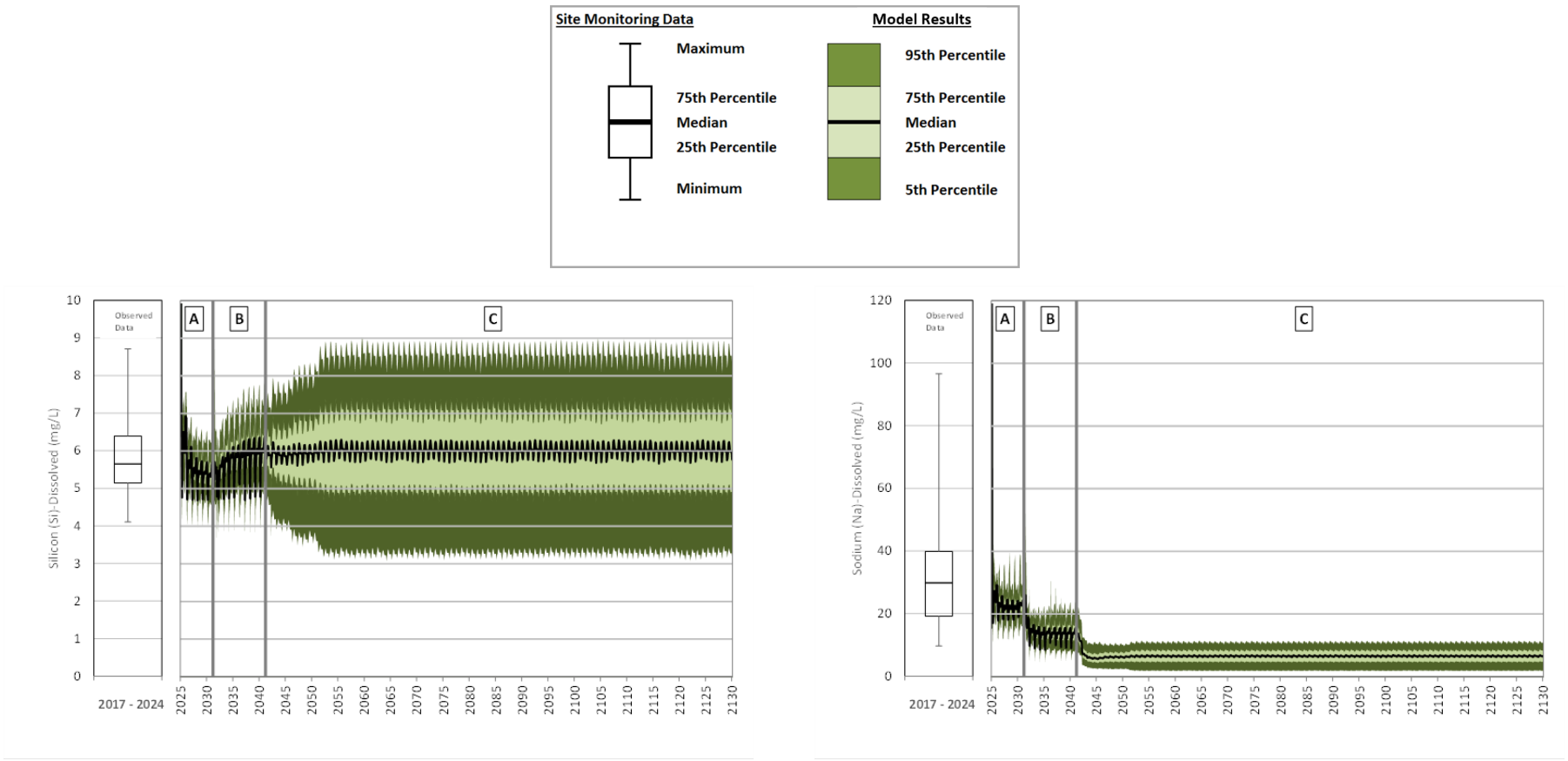
Figure B-68: Central Collection Sump Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

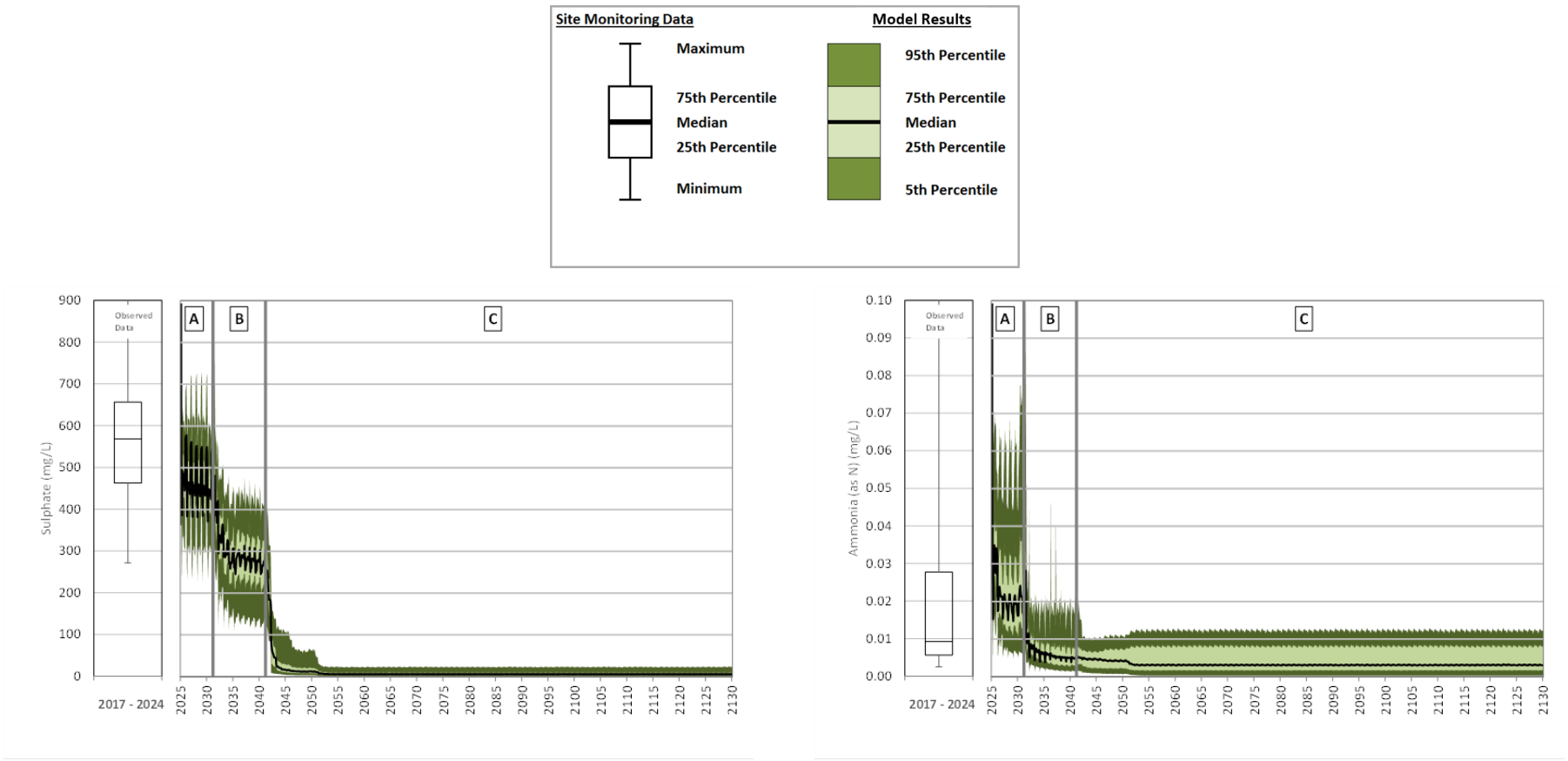
Figure B-69: Central Collection Sump Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The increase in silicon concentrations from operations to closure and post-closure is caused by runoff from areas that were assigned the disturbed water quality input being reclaimed and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum silicon concentrations than the disturbed water quality input. Sodium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

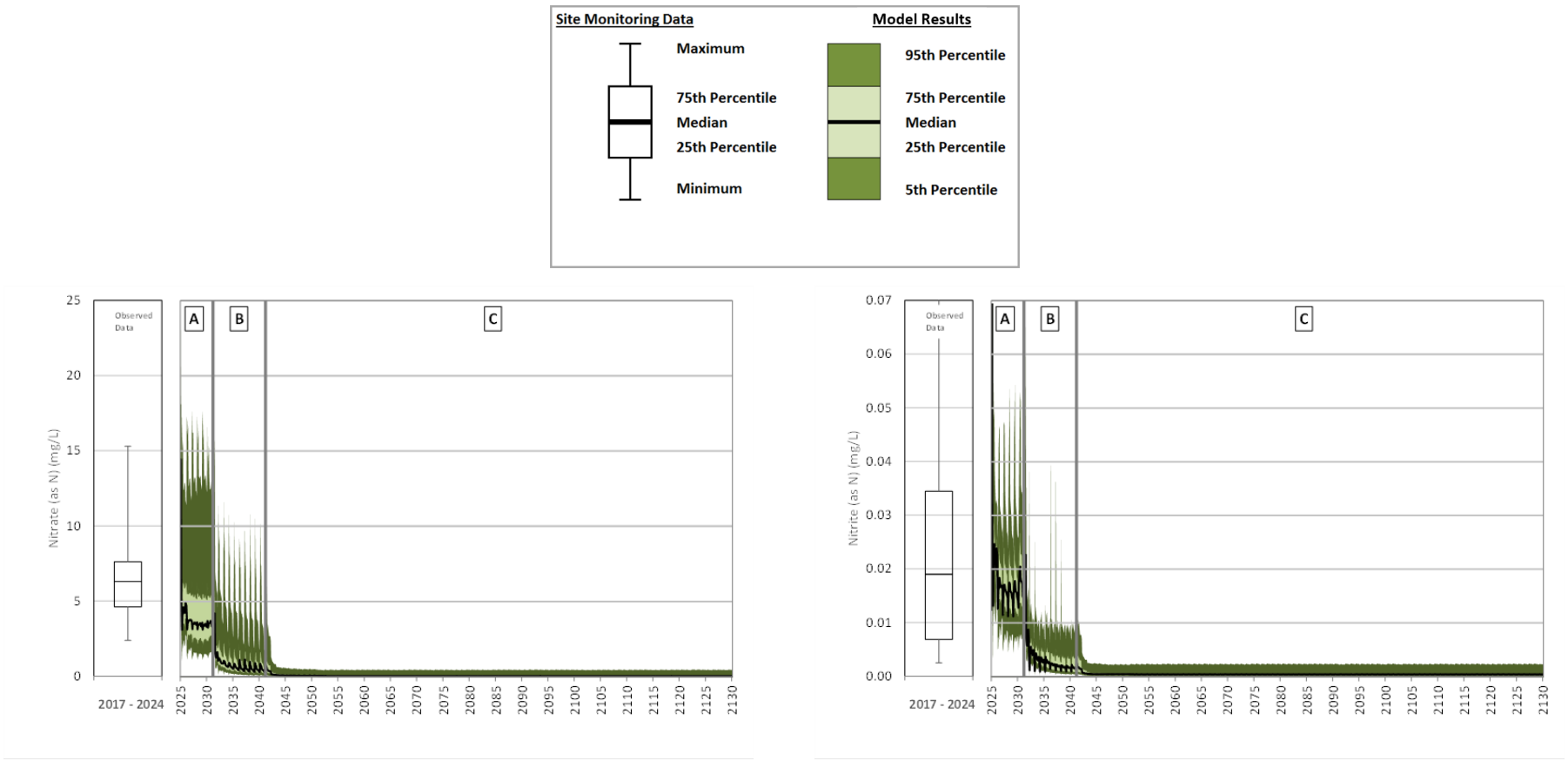
Figure B-70: Central Collection Sump Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

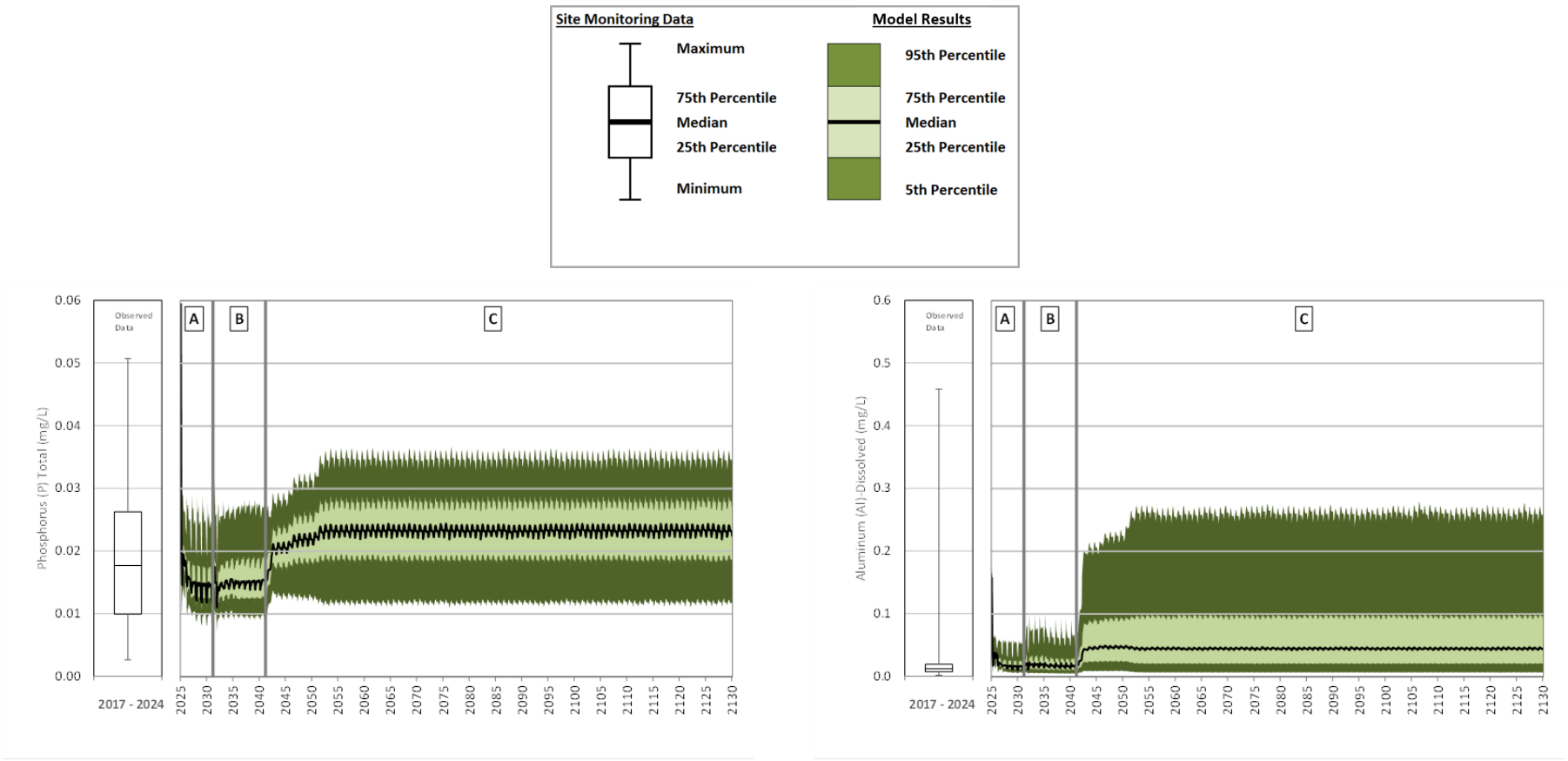
Figure B-71: Central Collection Sump Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

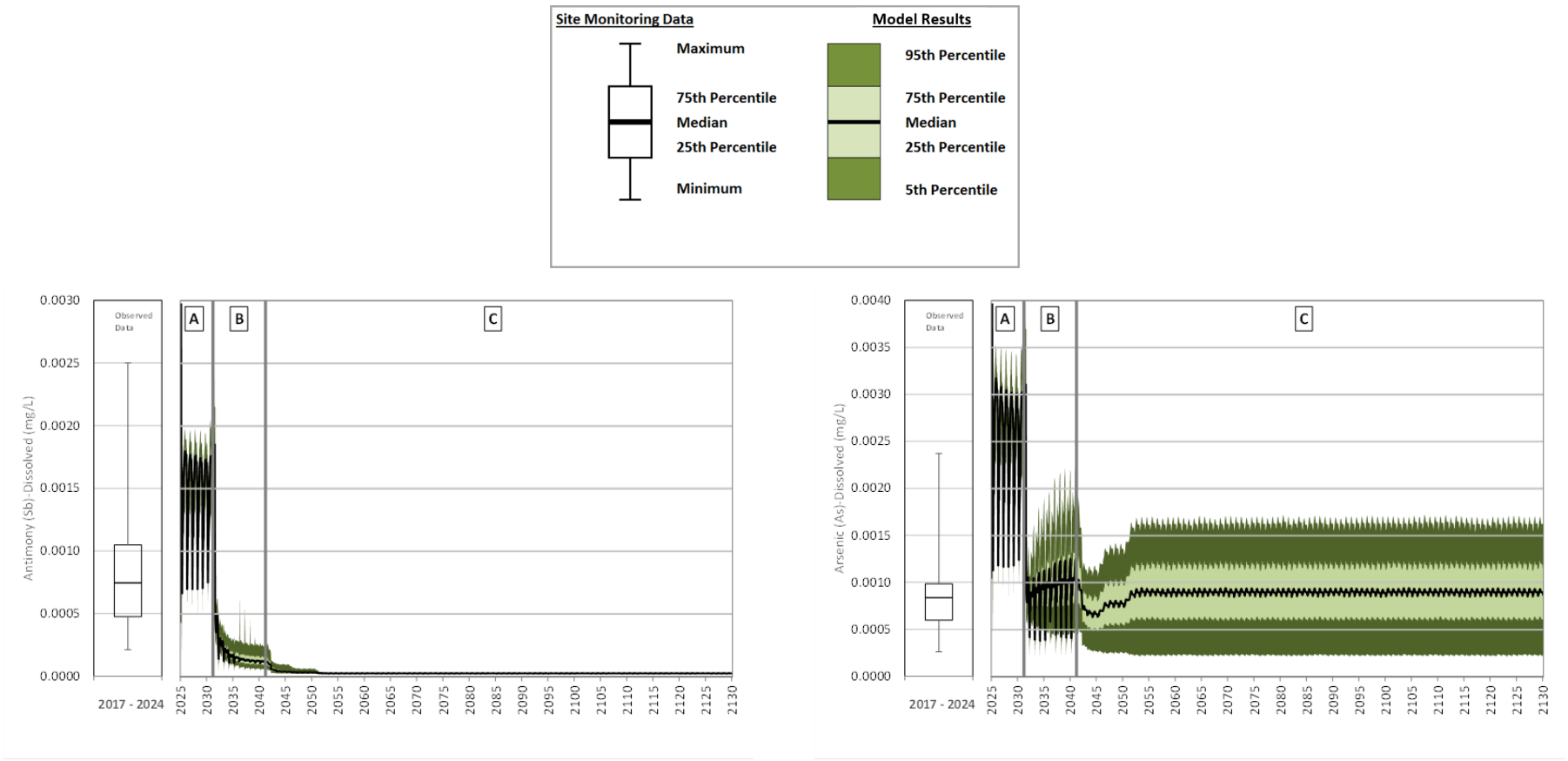
Figure B-72: Central Collection Sump Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus and dissolved aluminum concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the NAG waste rock and disturbed runoff water quality inputs.

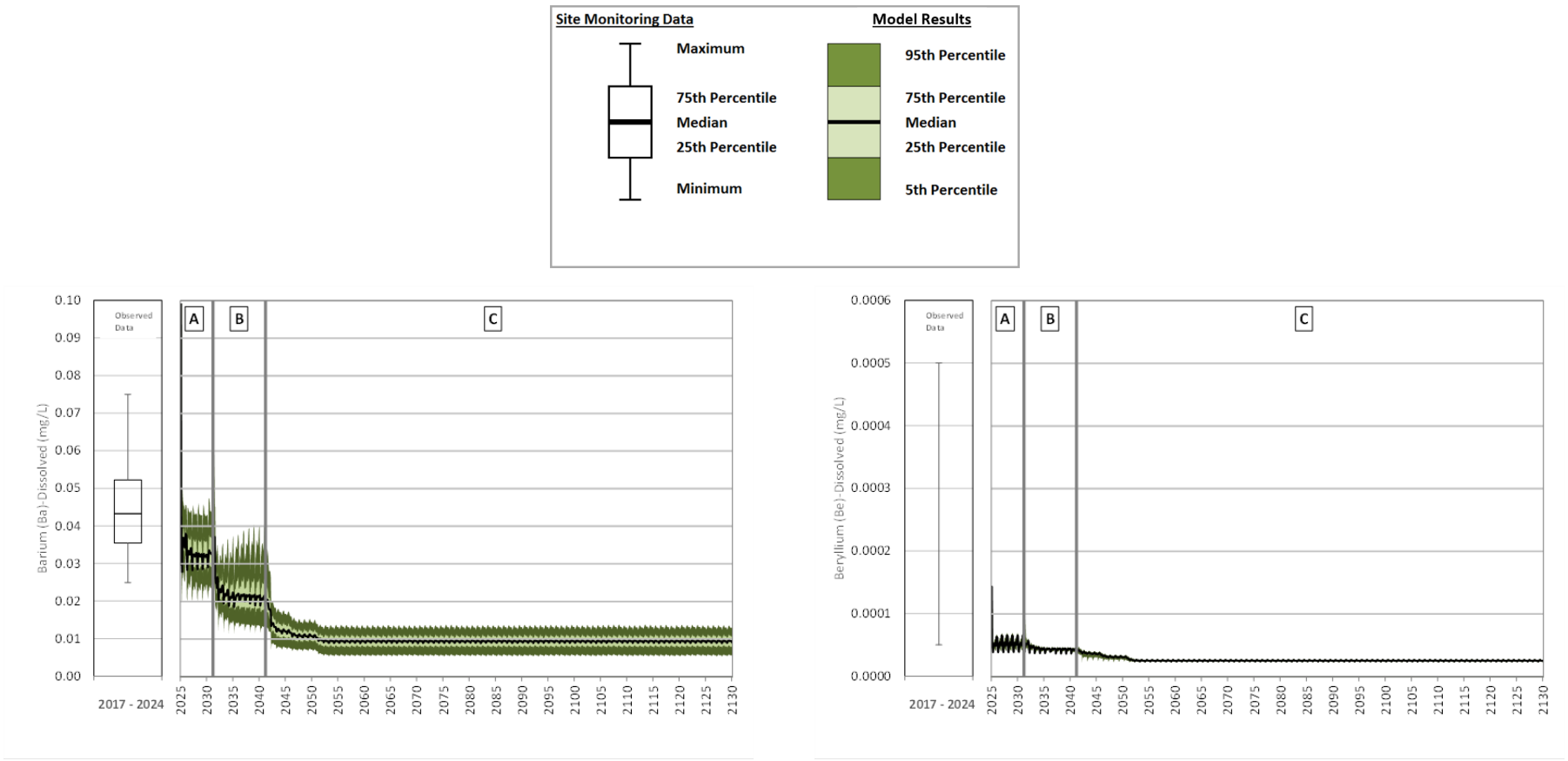
Figure B-73: Central Collection Sump Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

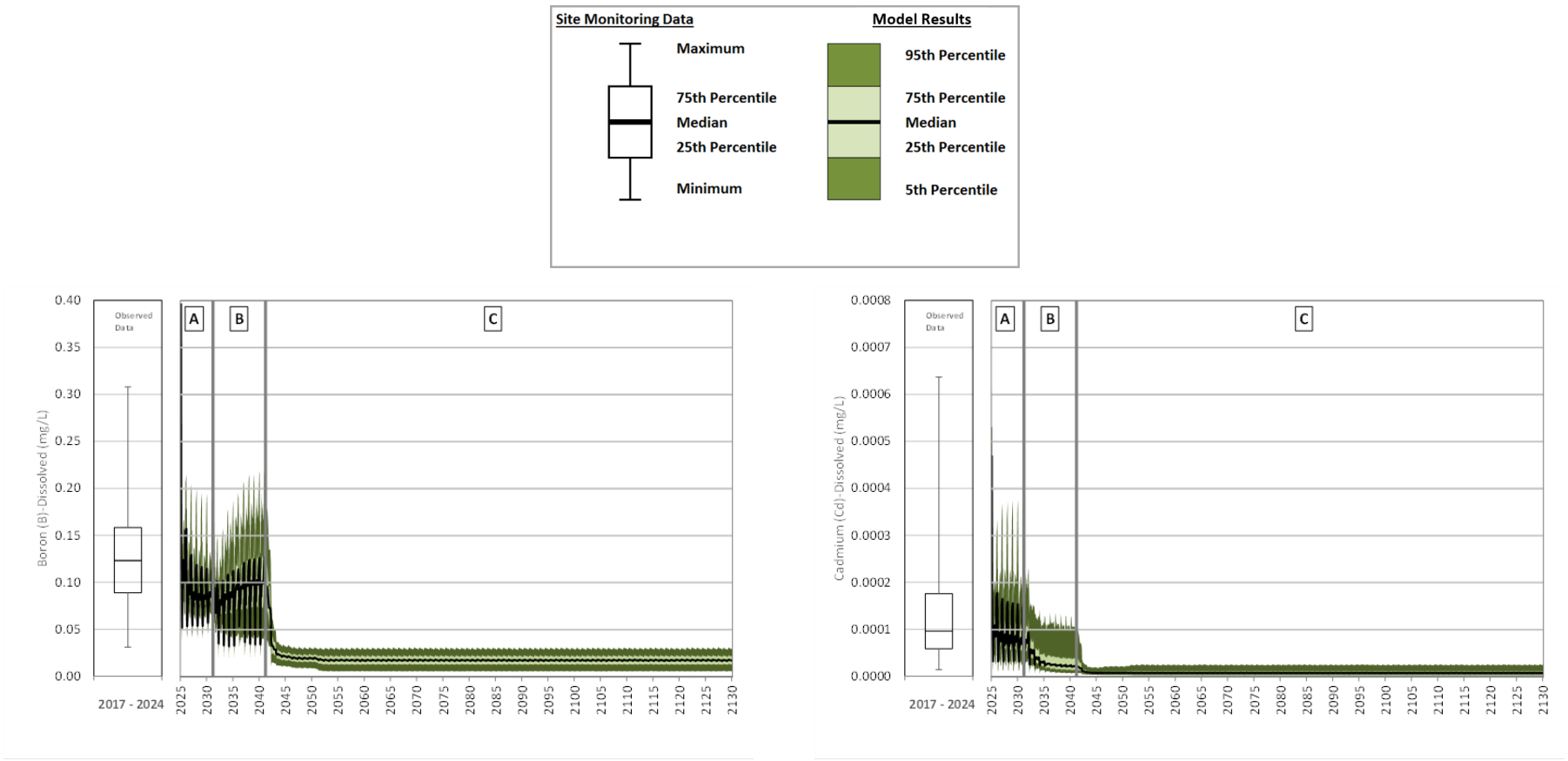
Figure B-74: Central Collection Sump Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

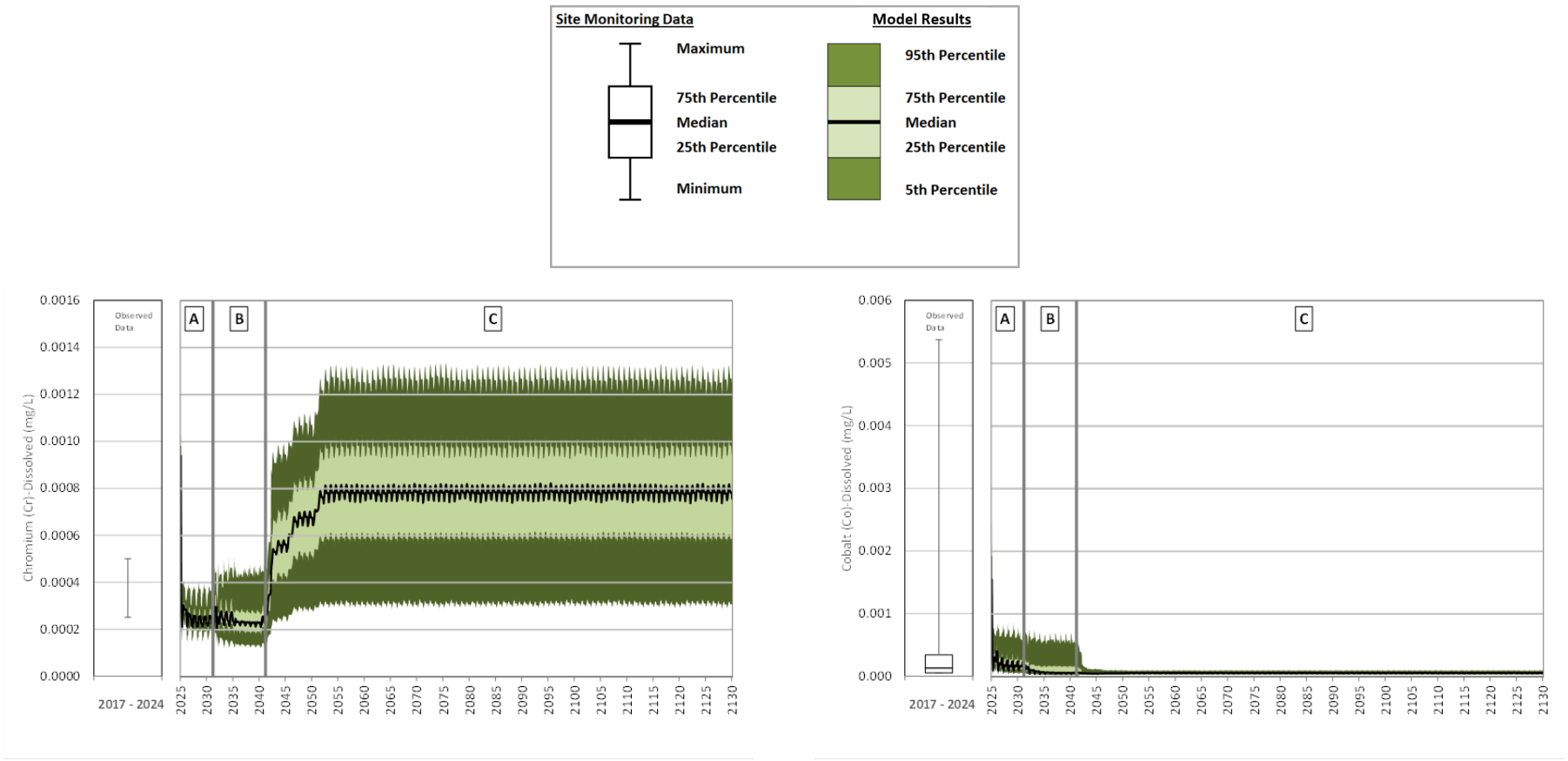
Figure B-75: Central Collection Sump Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

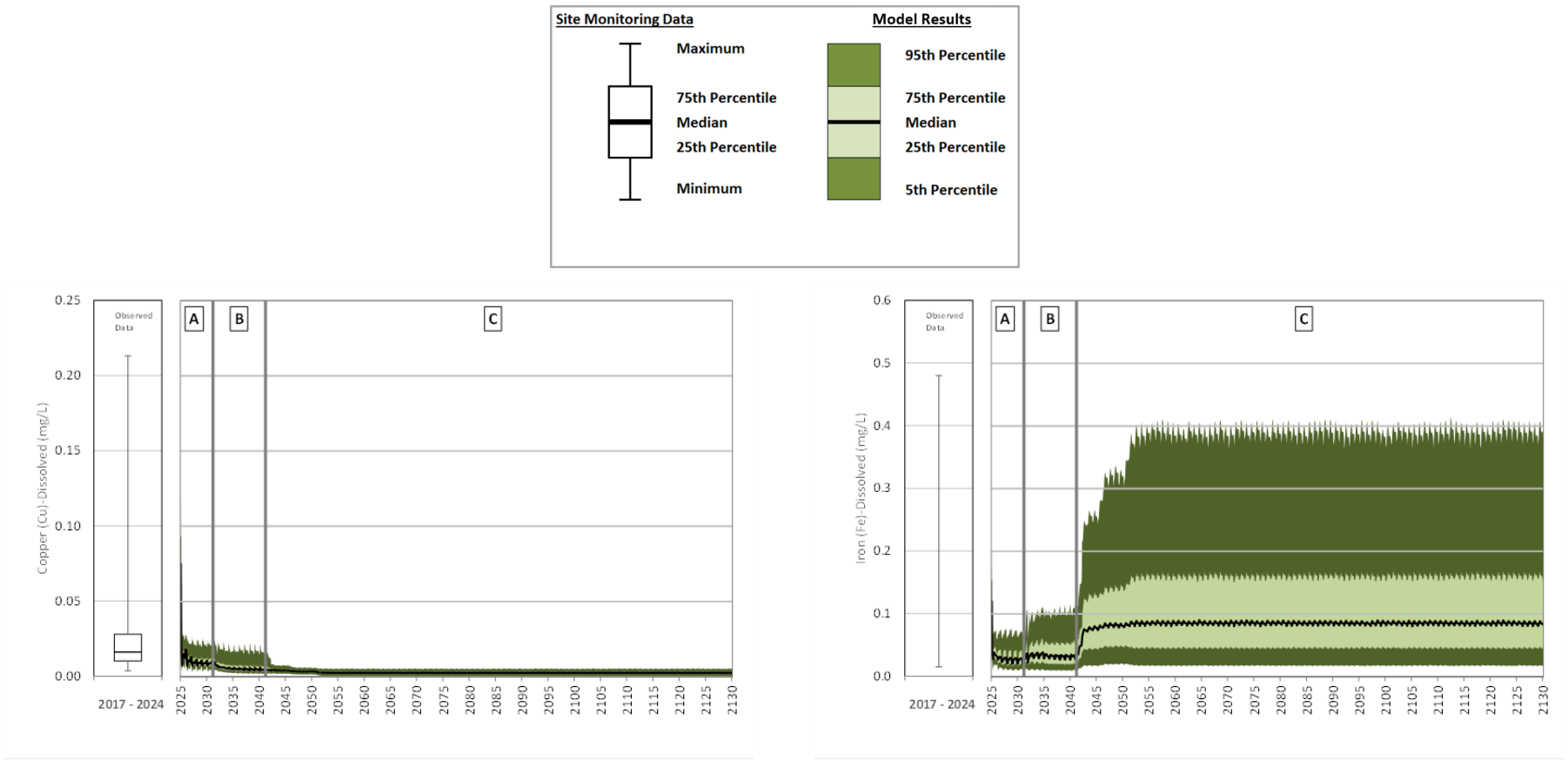
Figure B-76: Central Collection Sump Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

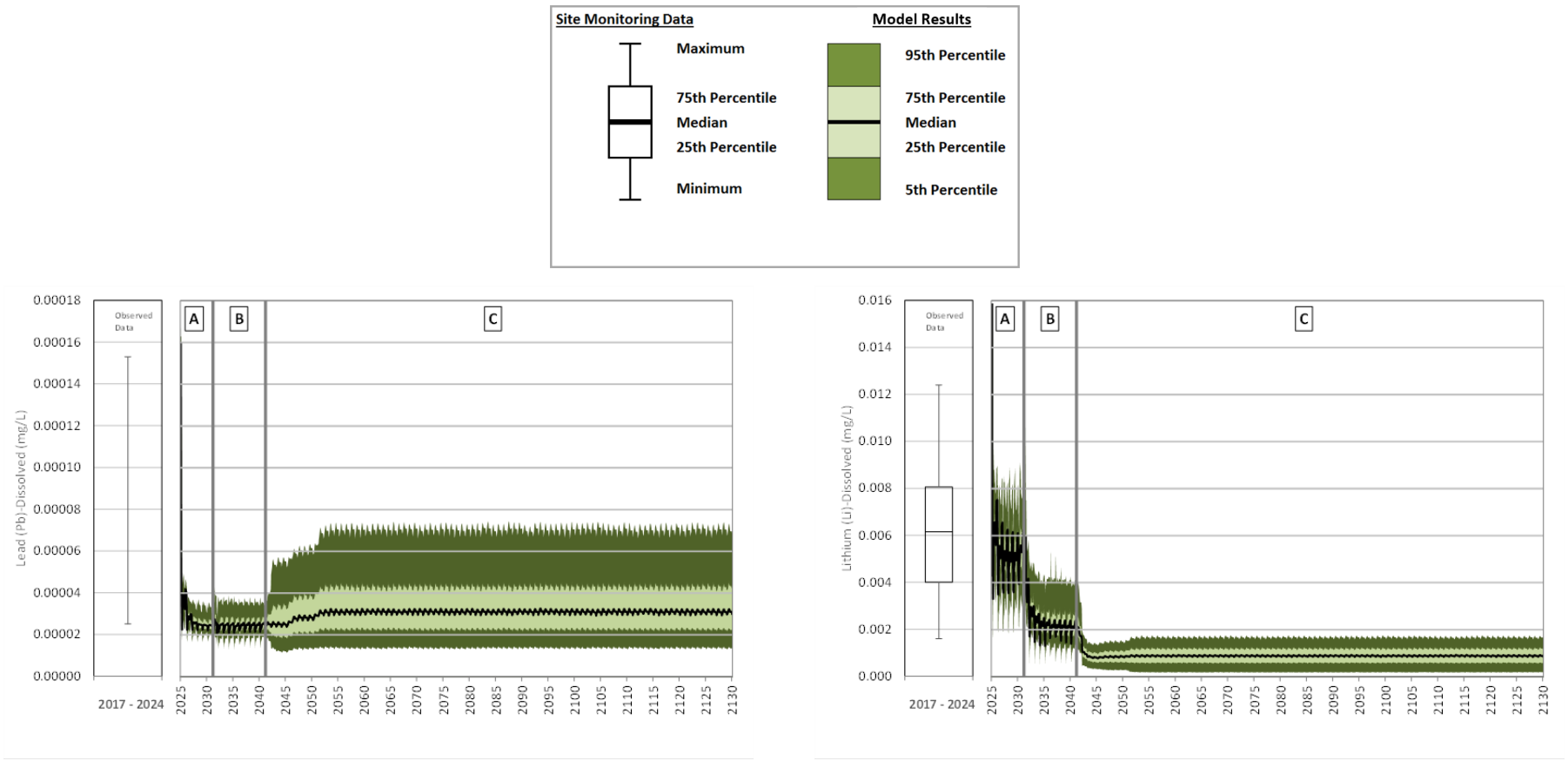
Figure B-77: Central Collection Sump Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Dissolved copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved iron concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved iron than the NAG waste rock and disturbed runoff water quality inputs.

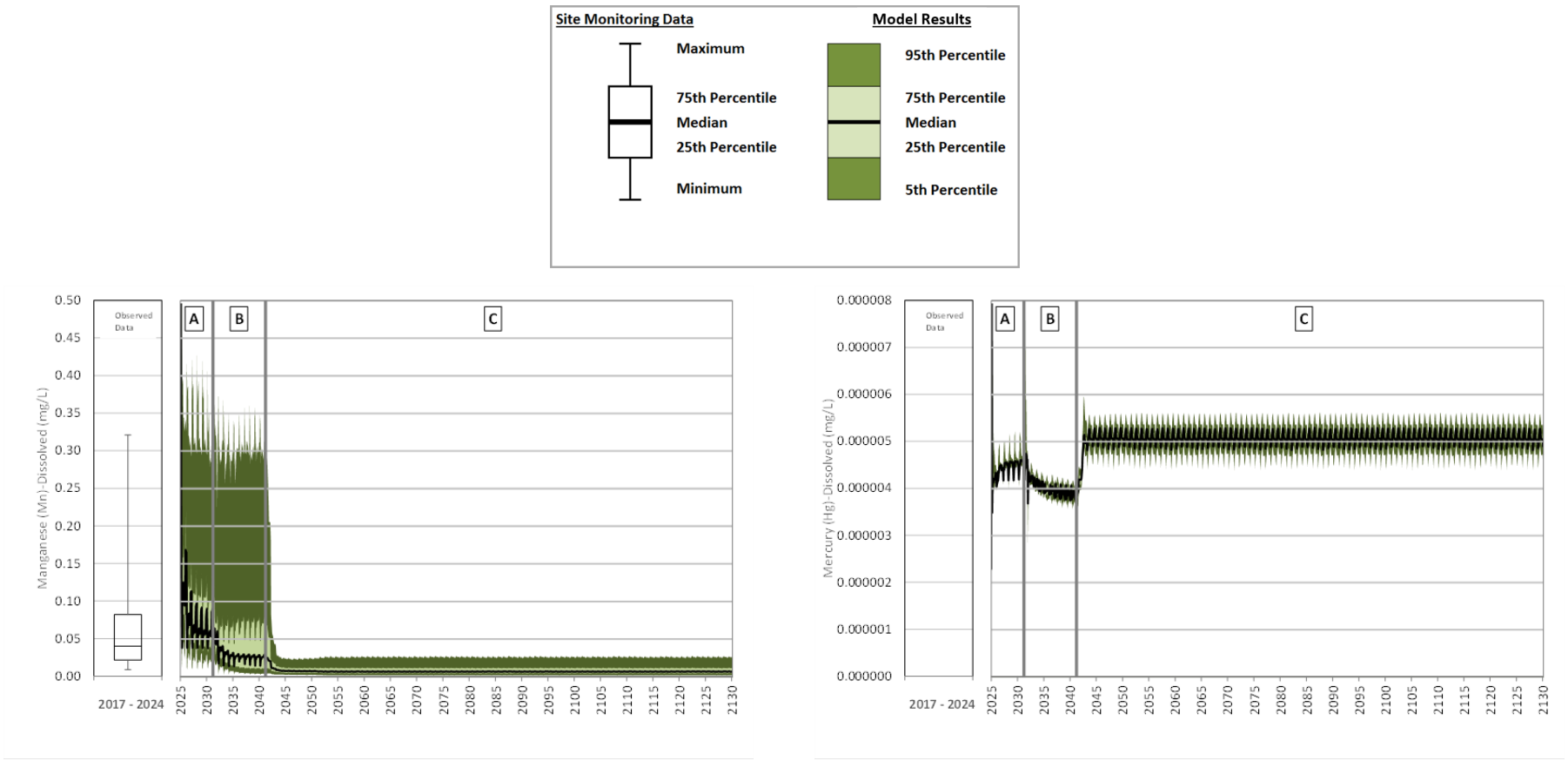
Figure B-78: Central Collection Sump Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Dissolved lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

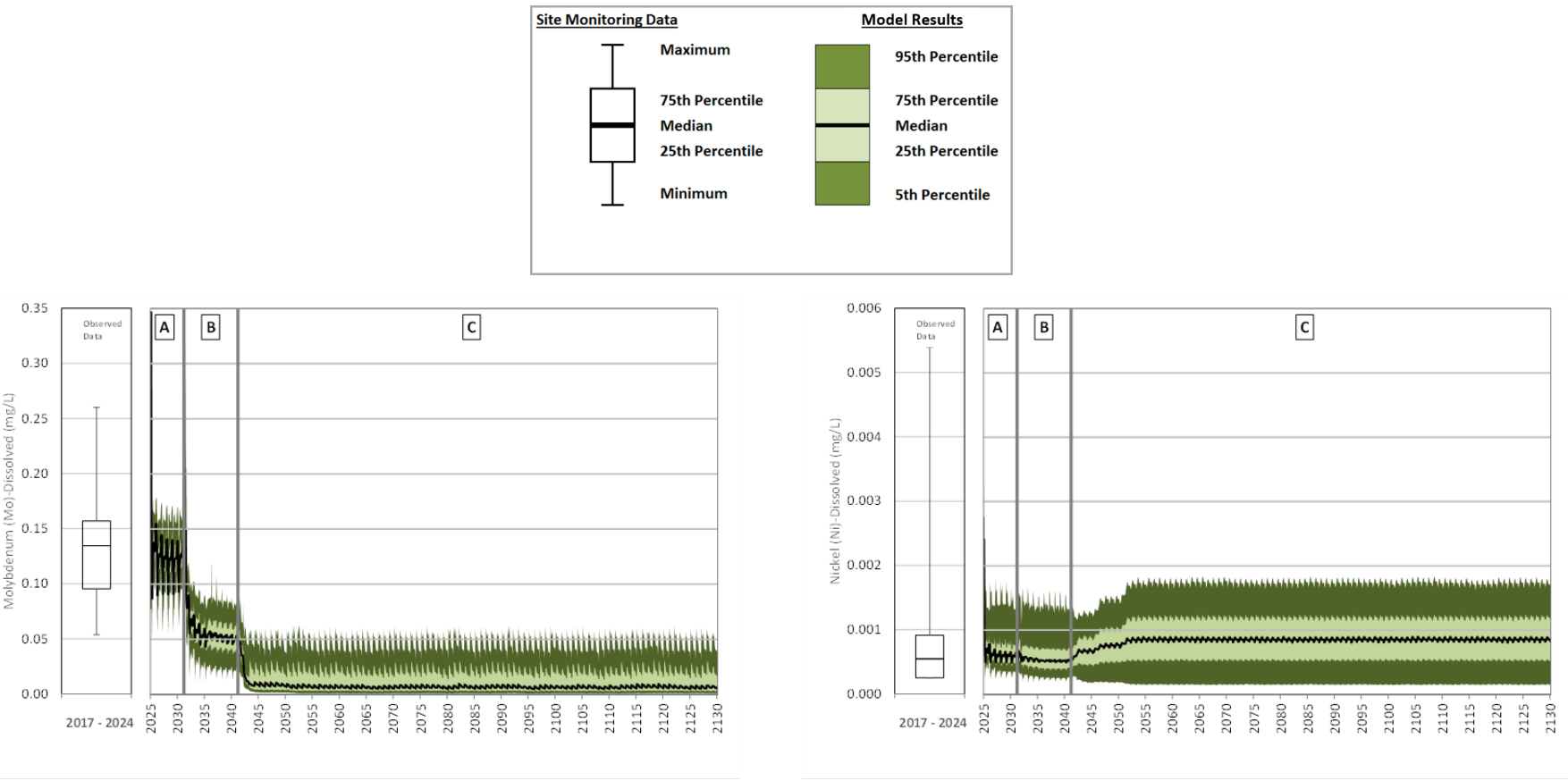
Figure B-79: Central Collection Sump Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

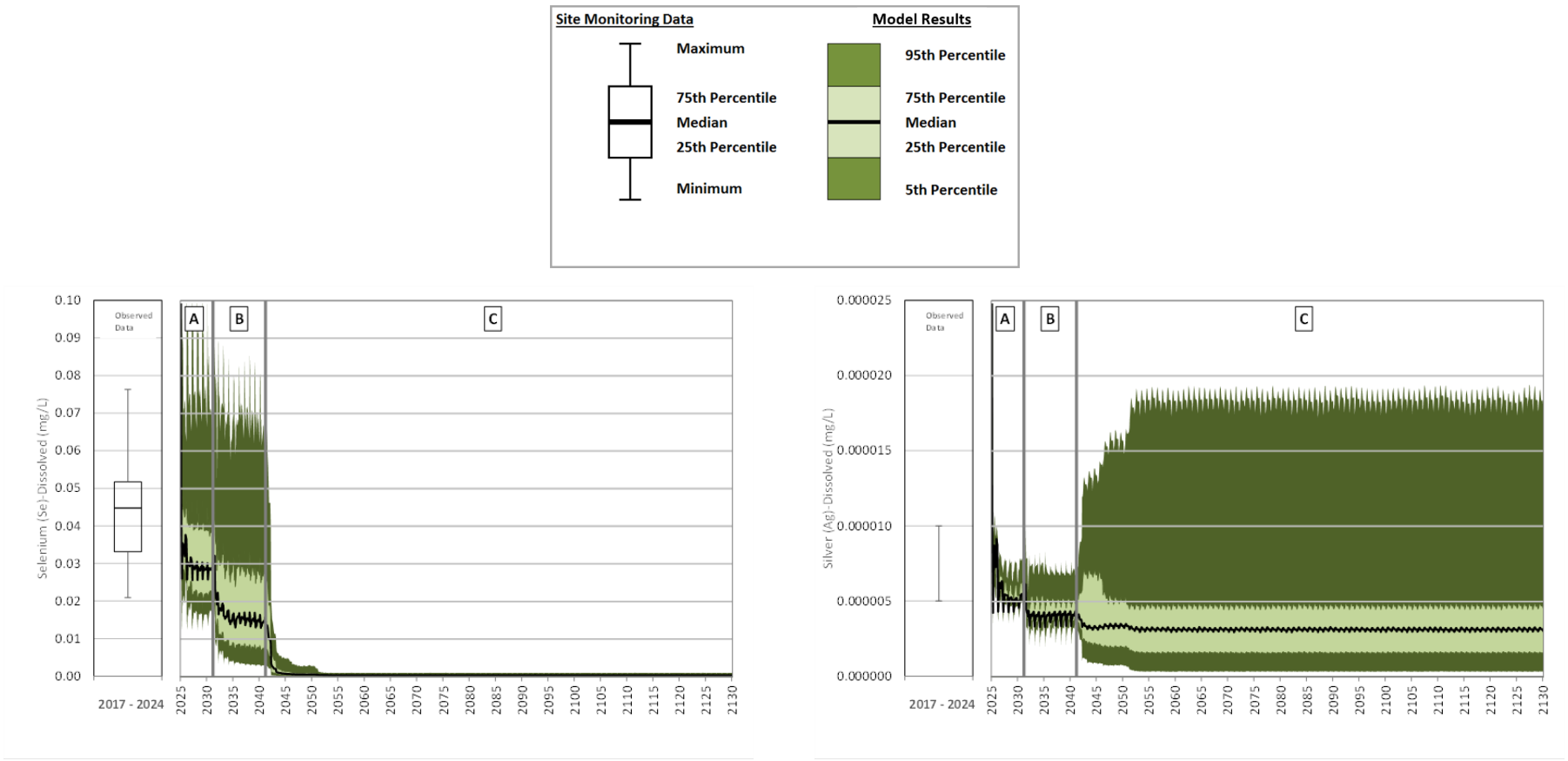
Figure B-80: Central Collection Sump Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved nickel concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs.

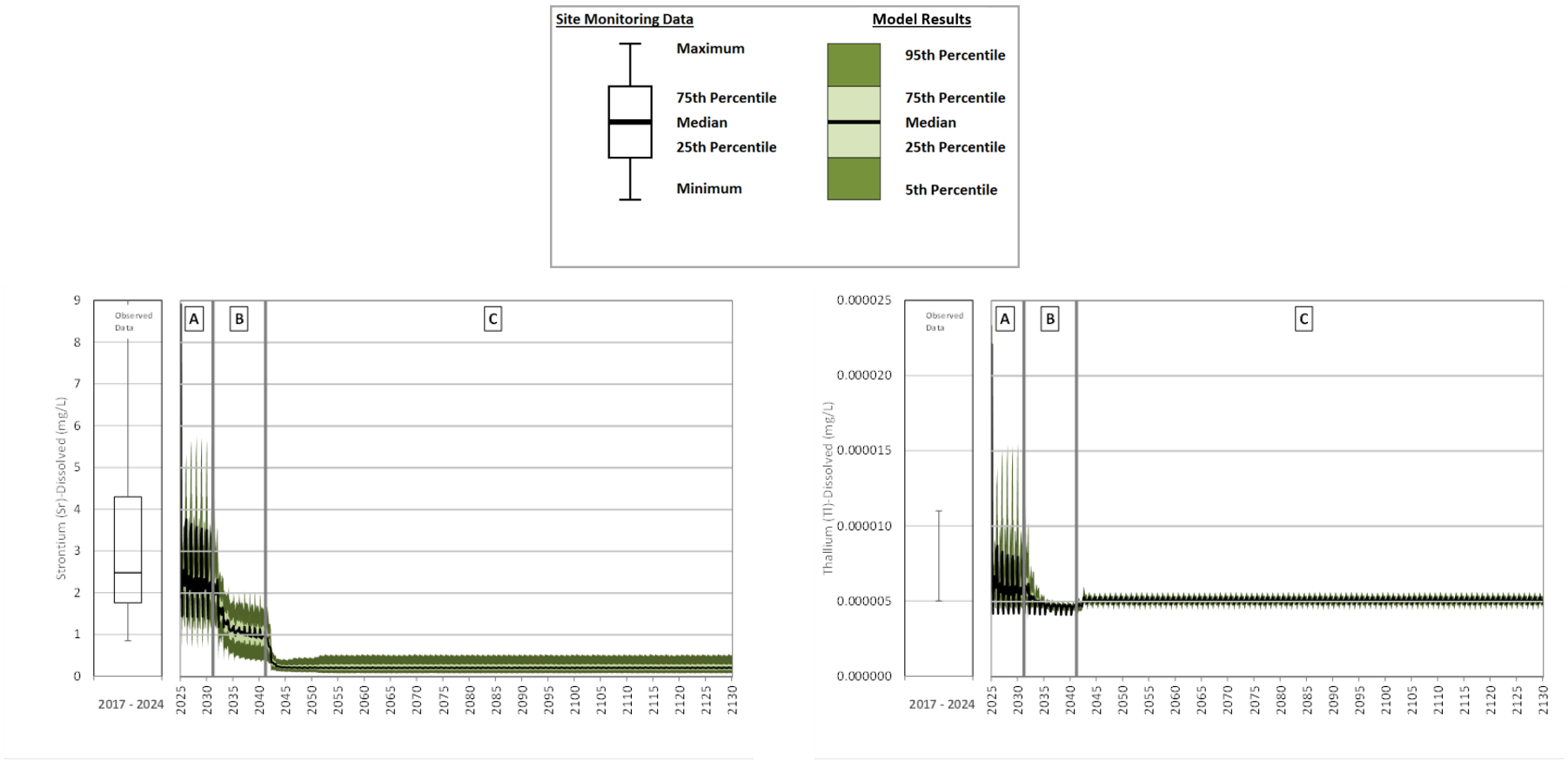
Figure B-81: Central Collection Sump Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs.

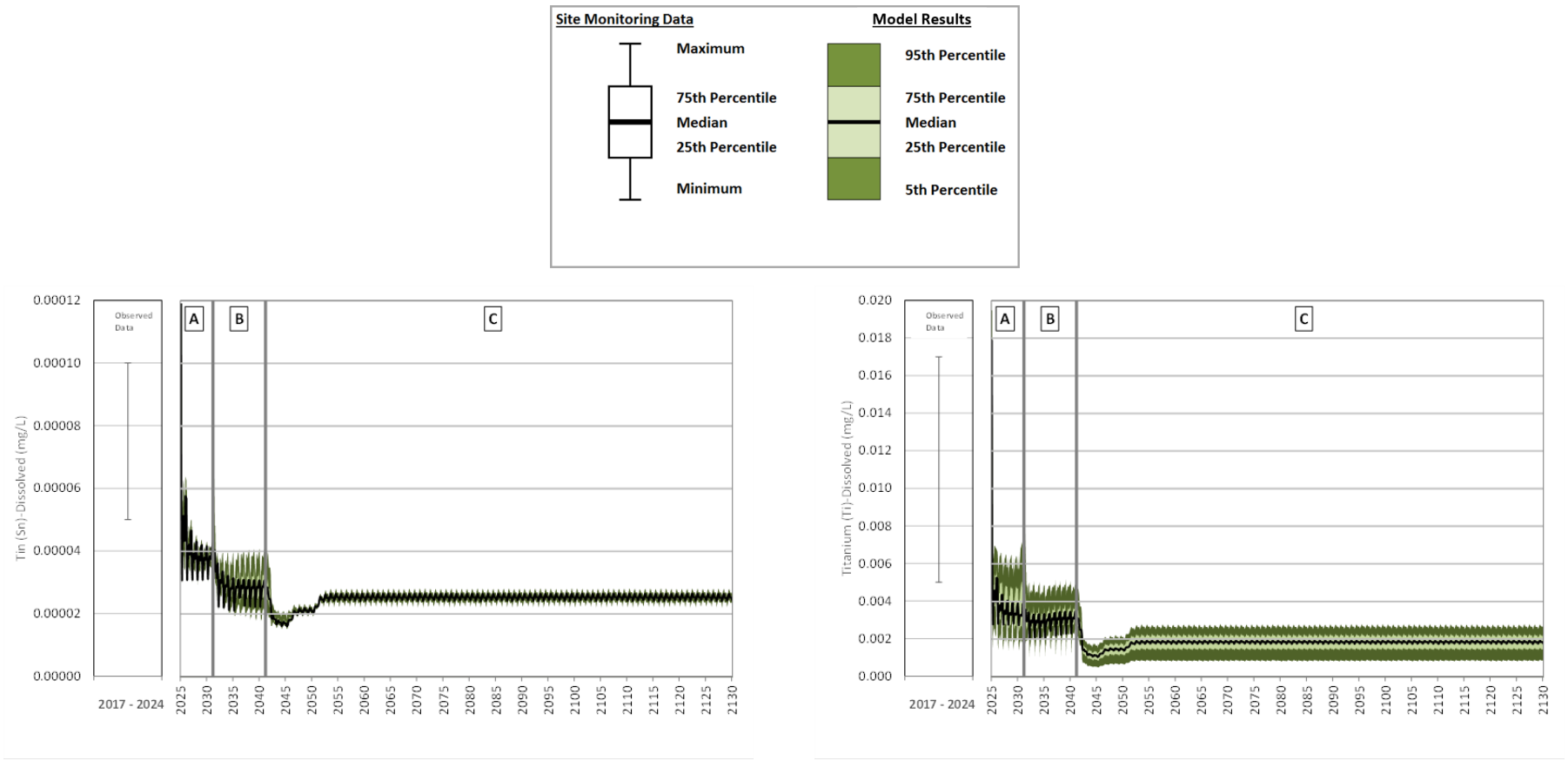
Figure B-82: Central Collection Sump Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

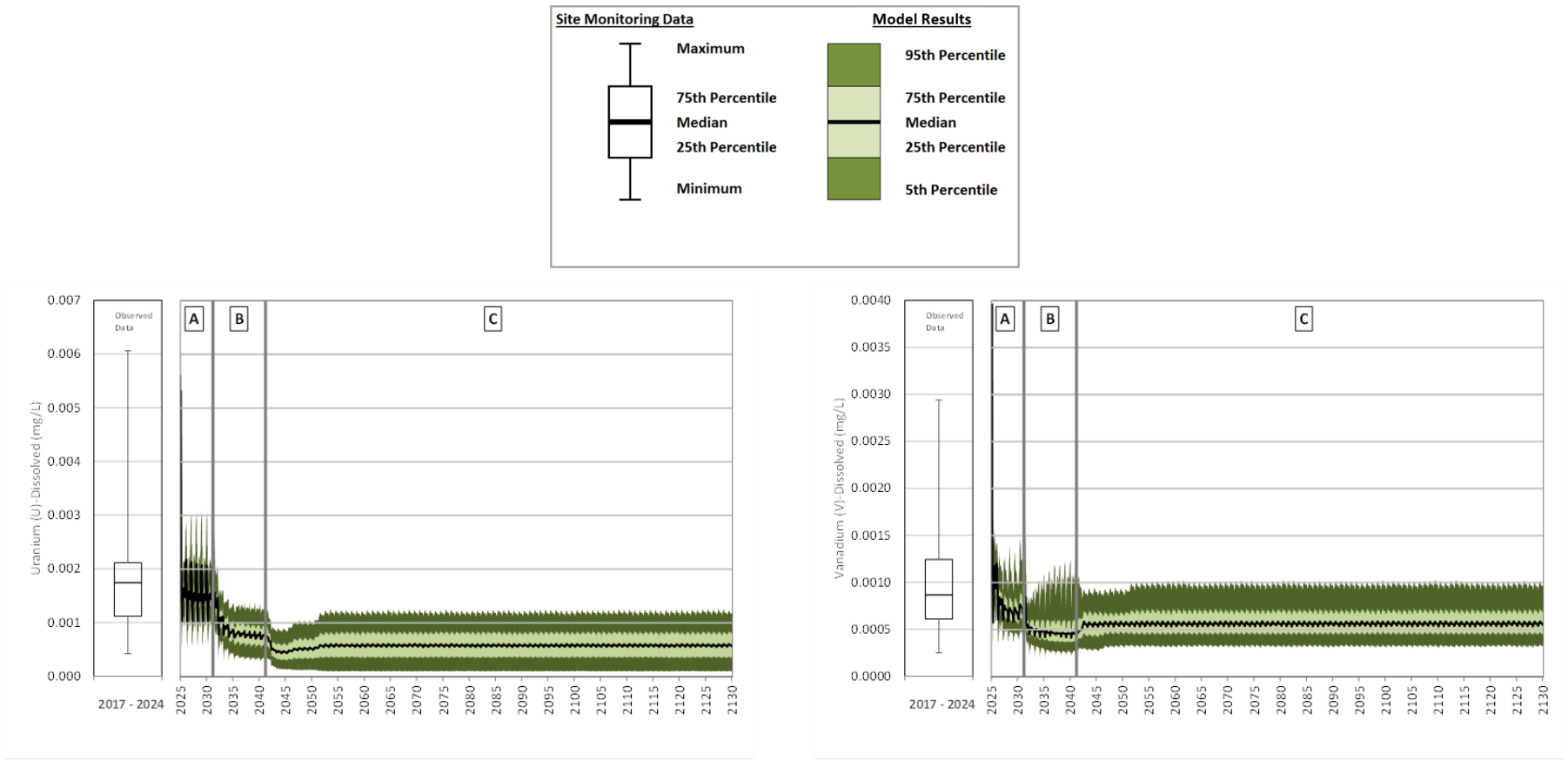
Figure B-83: Central Collection Sump Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

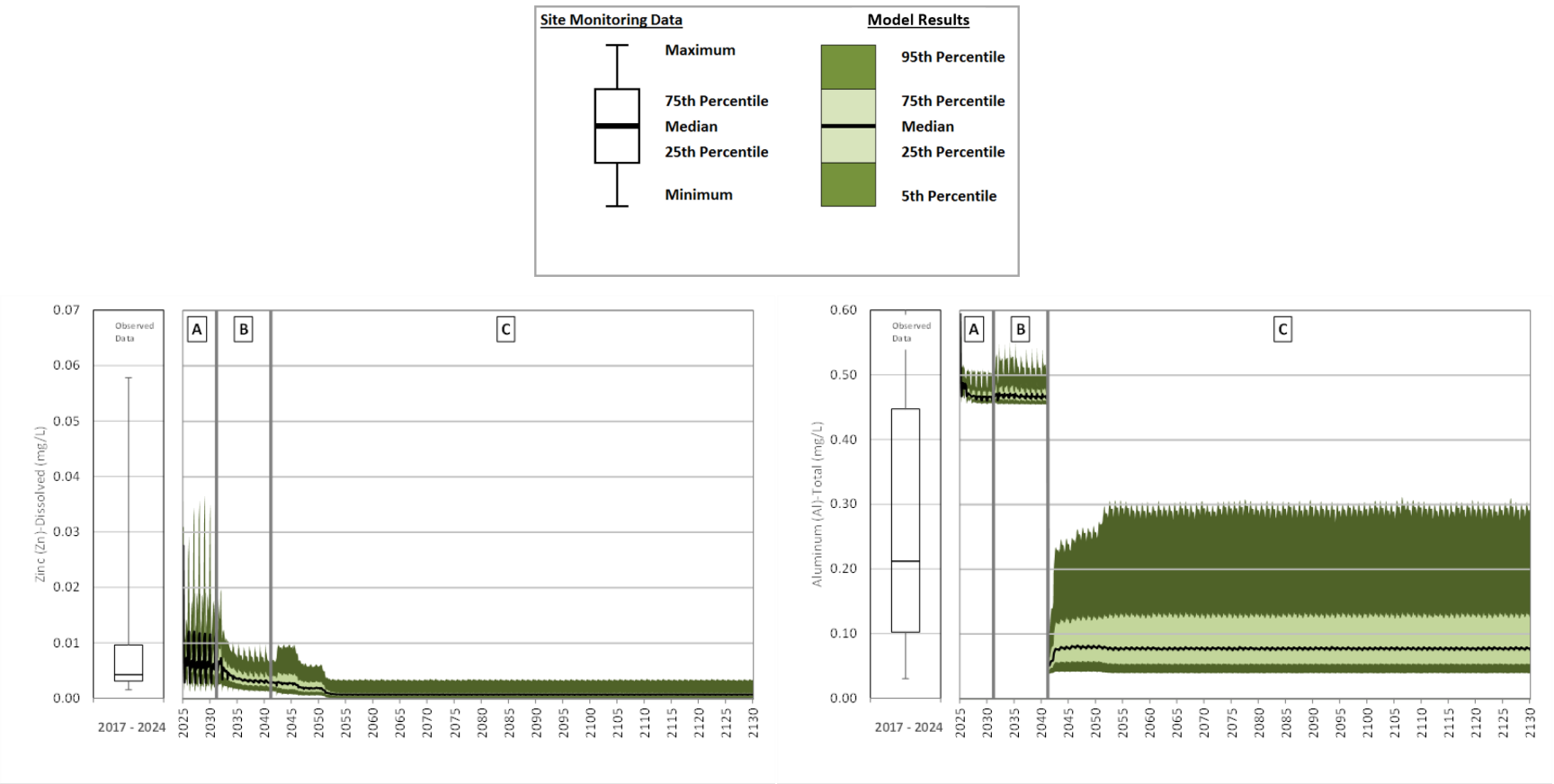
Figure B-84: Central Collection Sump Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

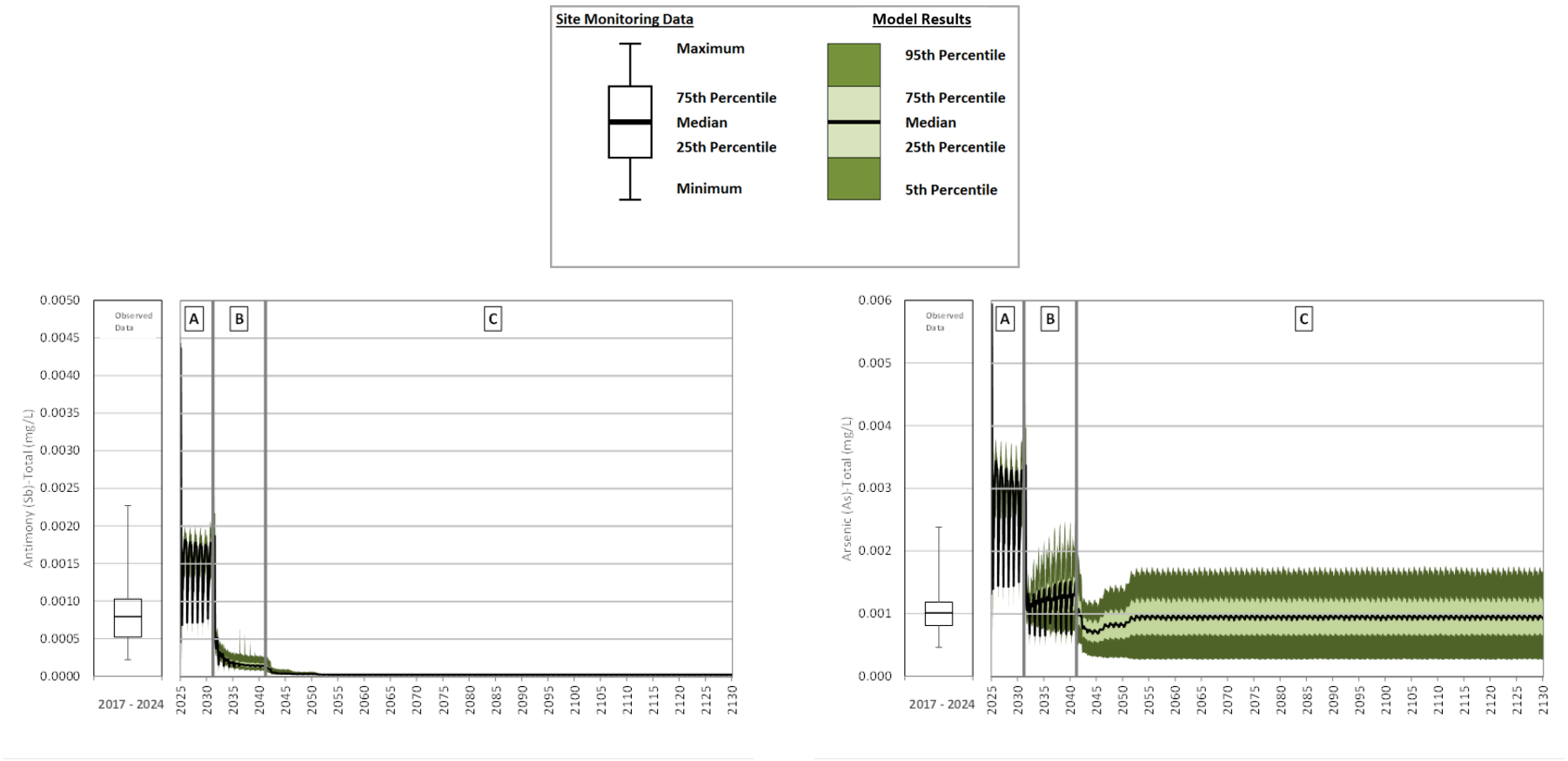
Figure B-85: Central Collection Sump Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

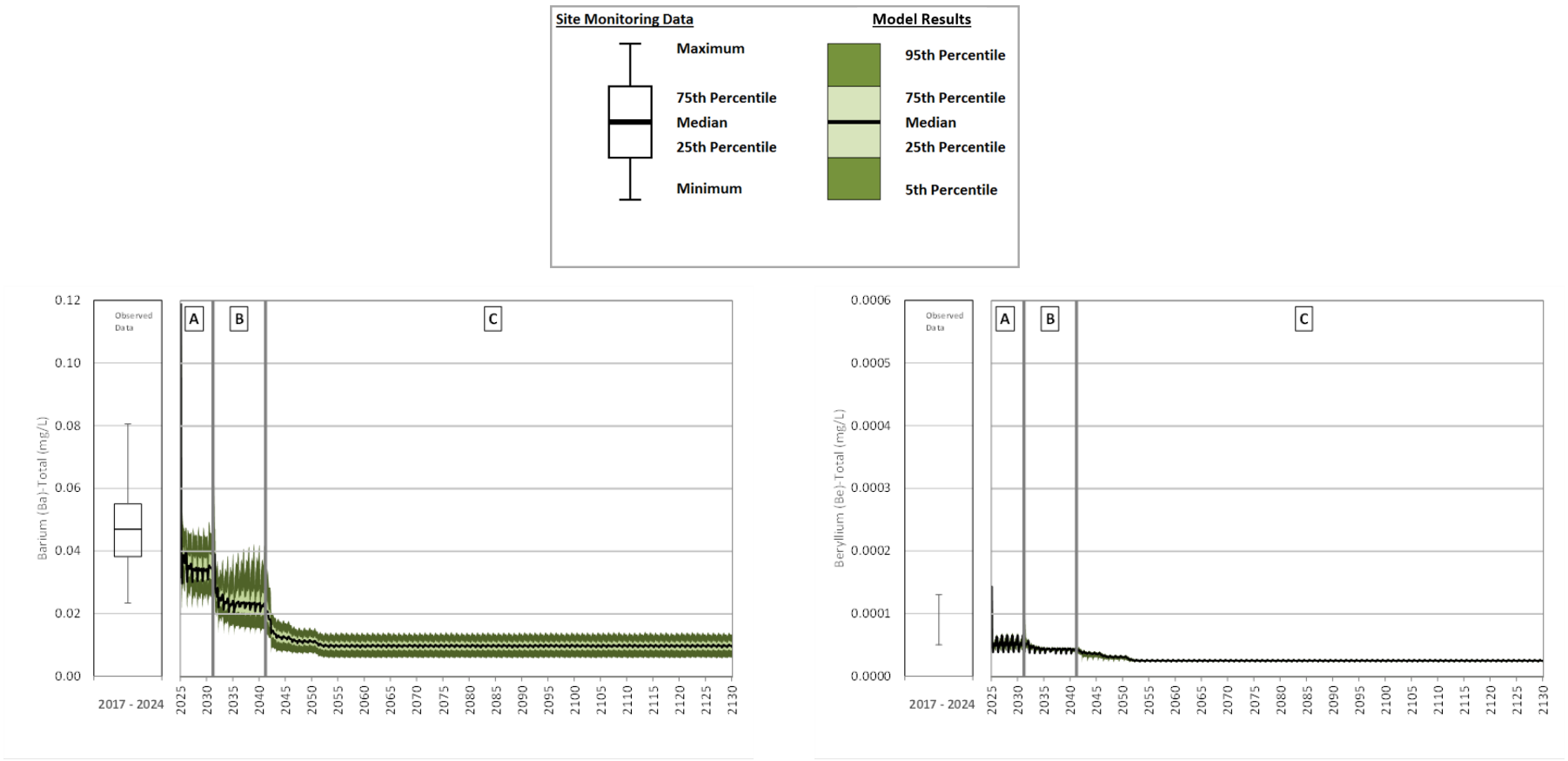
Figure B-86: Central Collection Sump Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

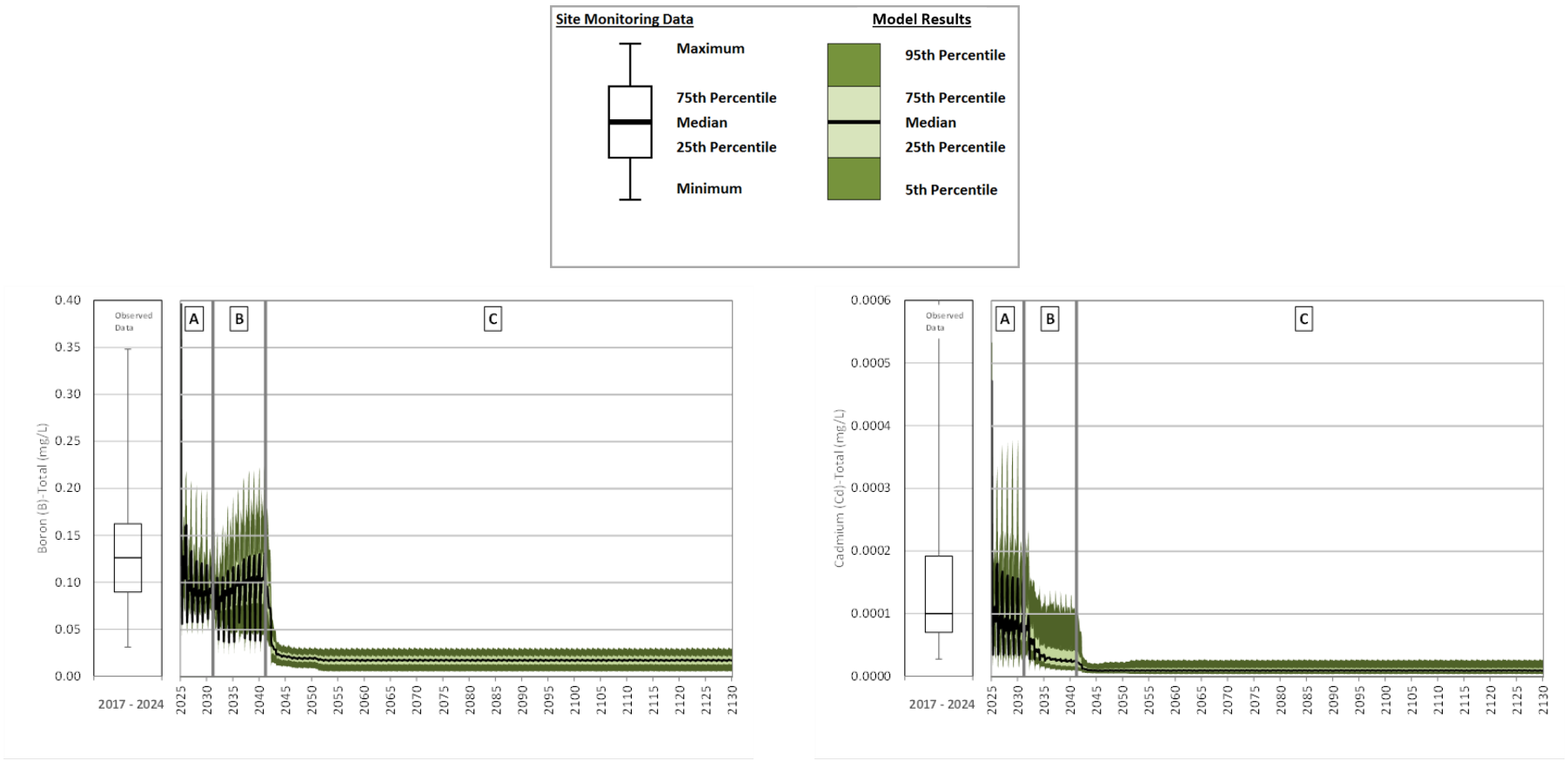
Figure B-87: Central Collection Sump Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

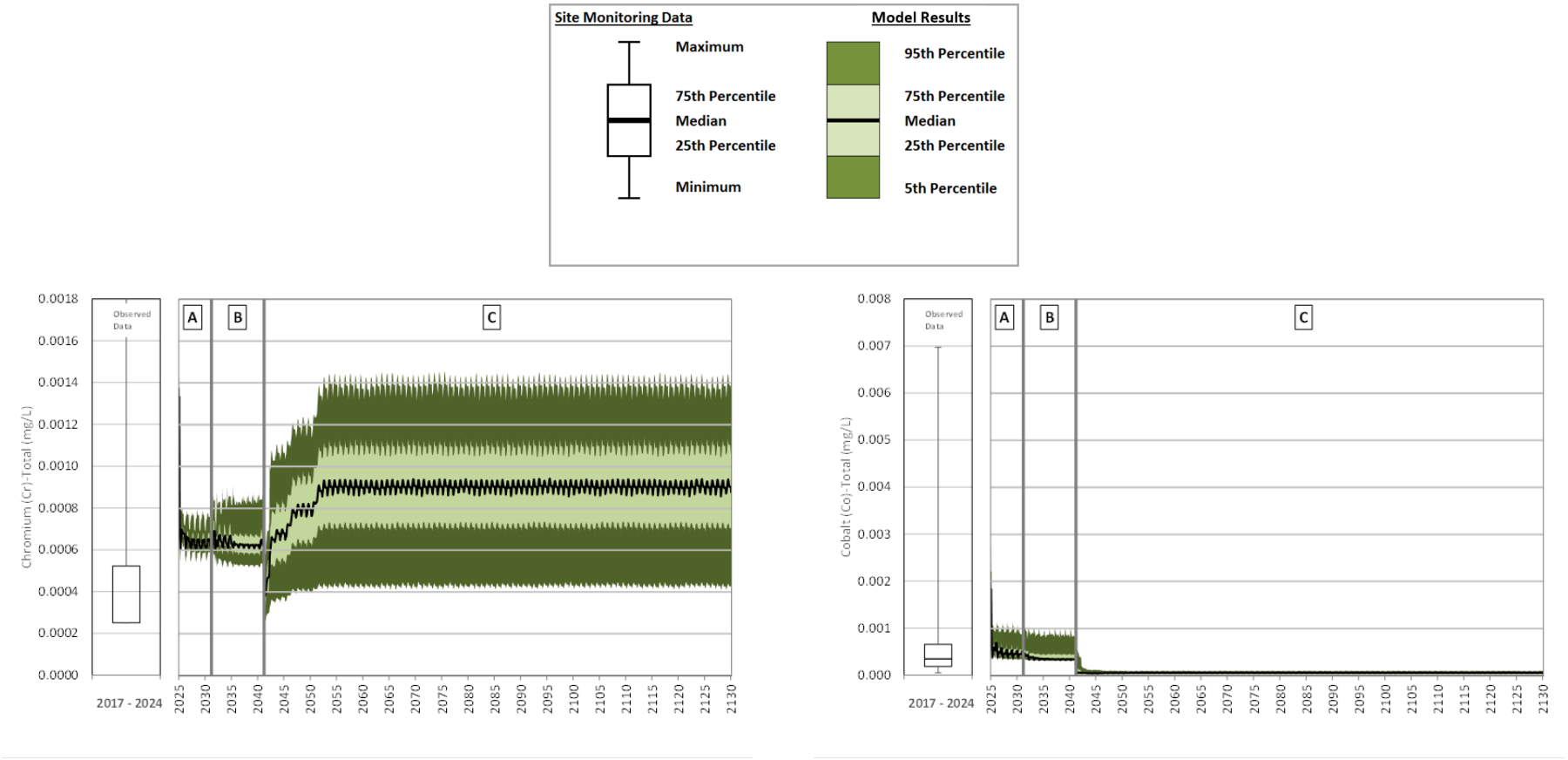
Figure B-88: Central Collection Sump Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

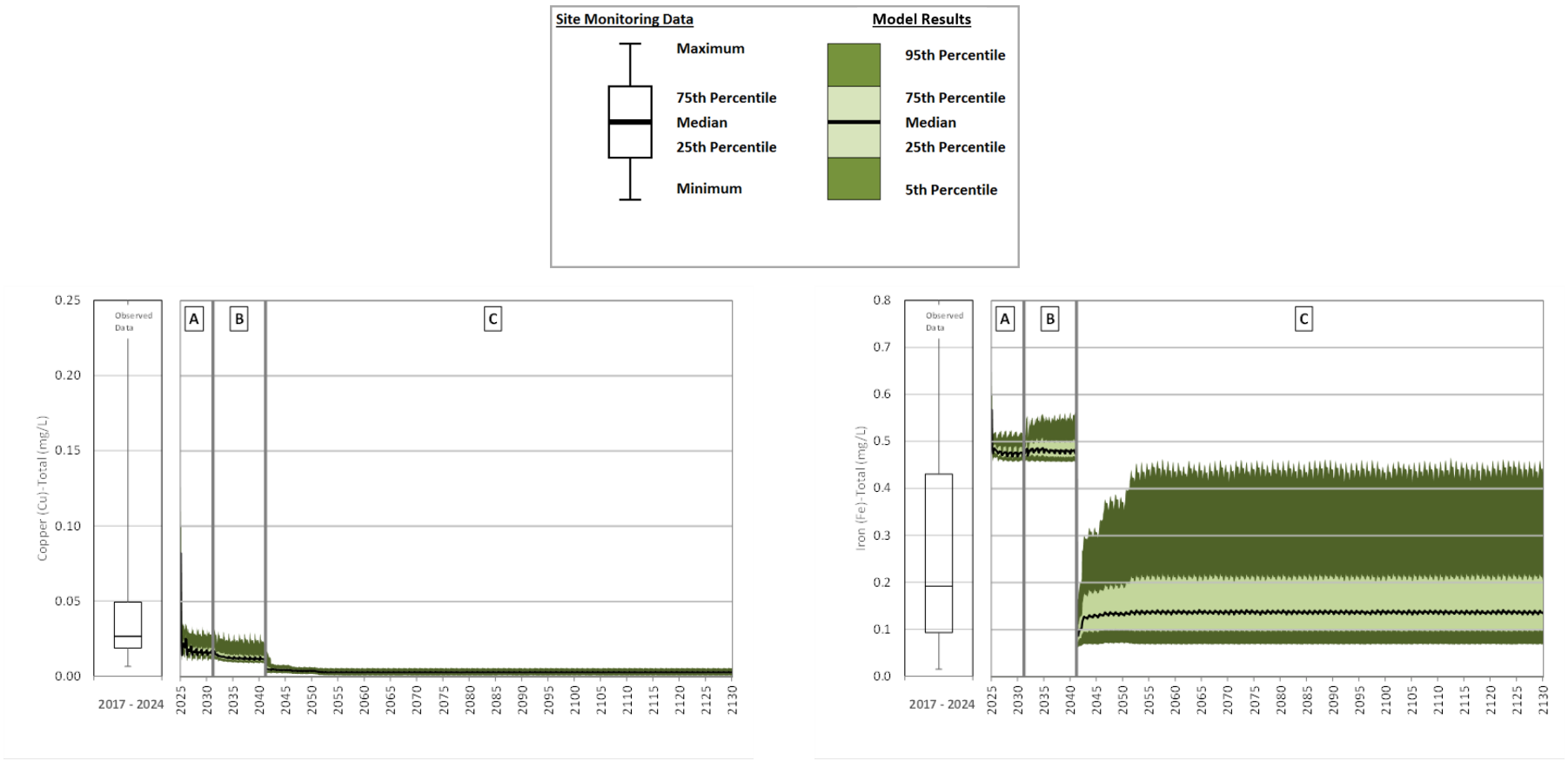
Figure B-89: Central Collection Sump Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

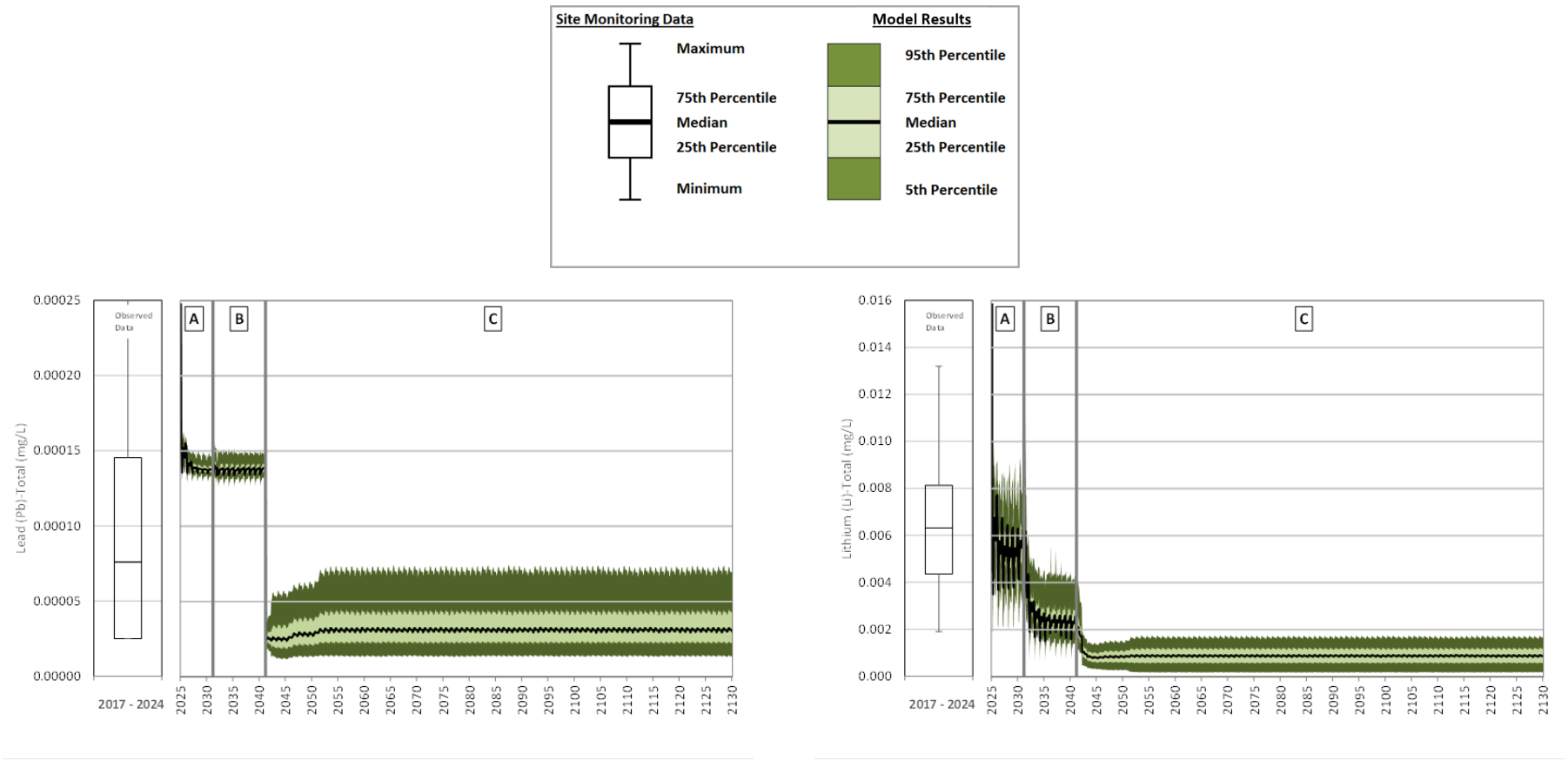
Figure B-90: Central Collection Sump Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Dissolved copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved iron concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved iron than the NAG waste rock and disturbed runoff water quality inputs.

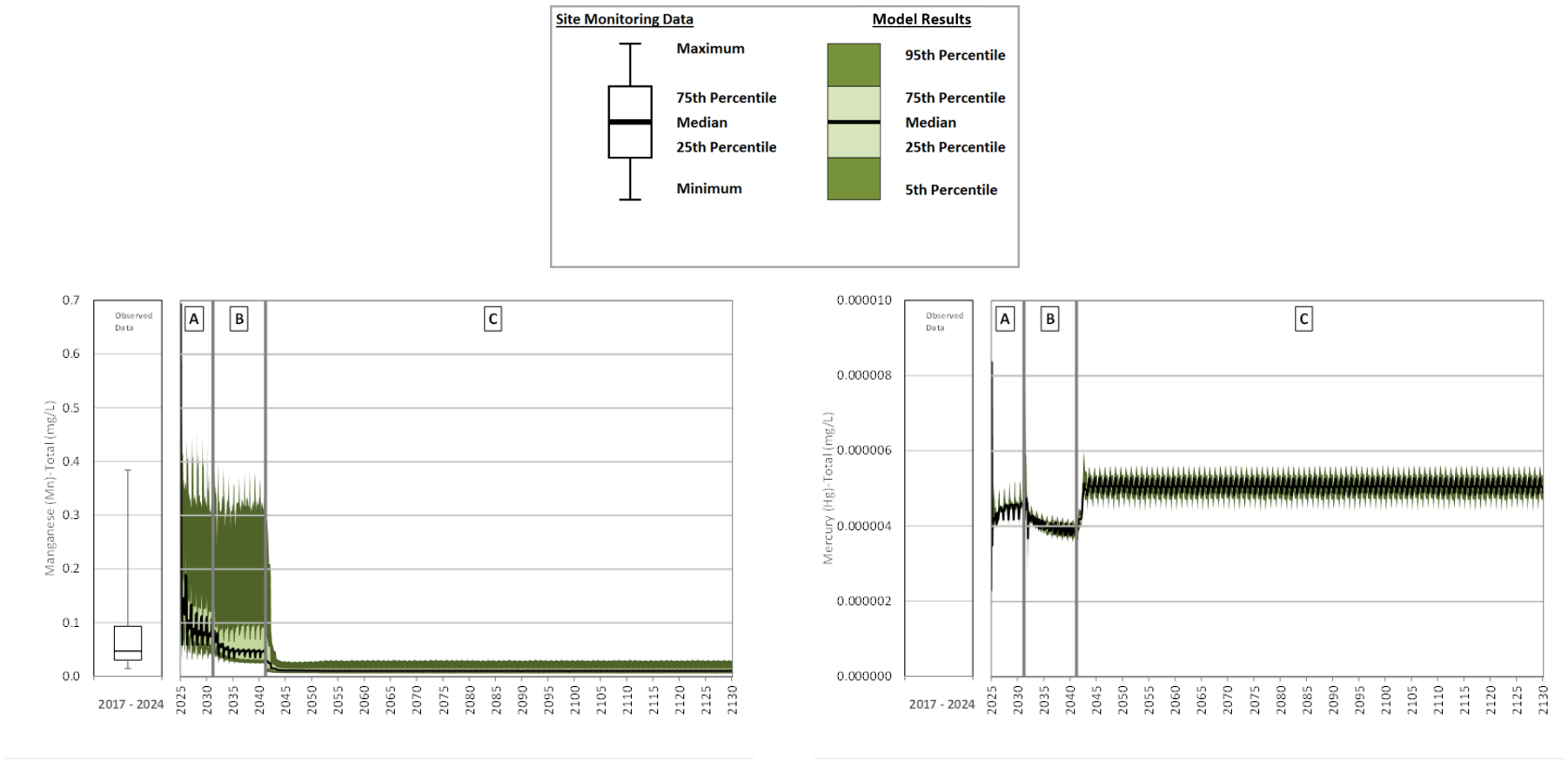
Figure B-91: Central Collection Sump Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Dissolved lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

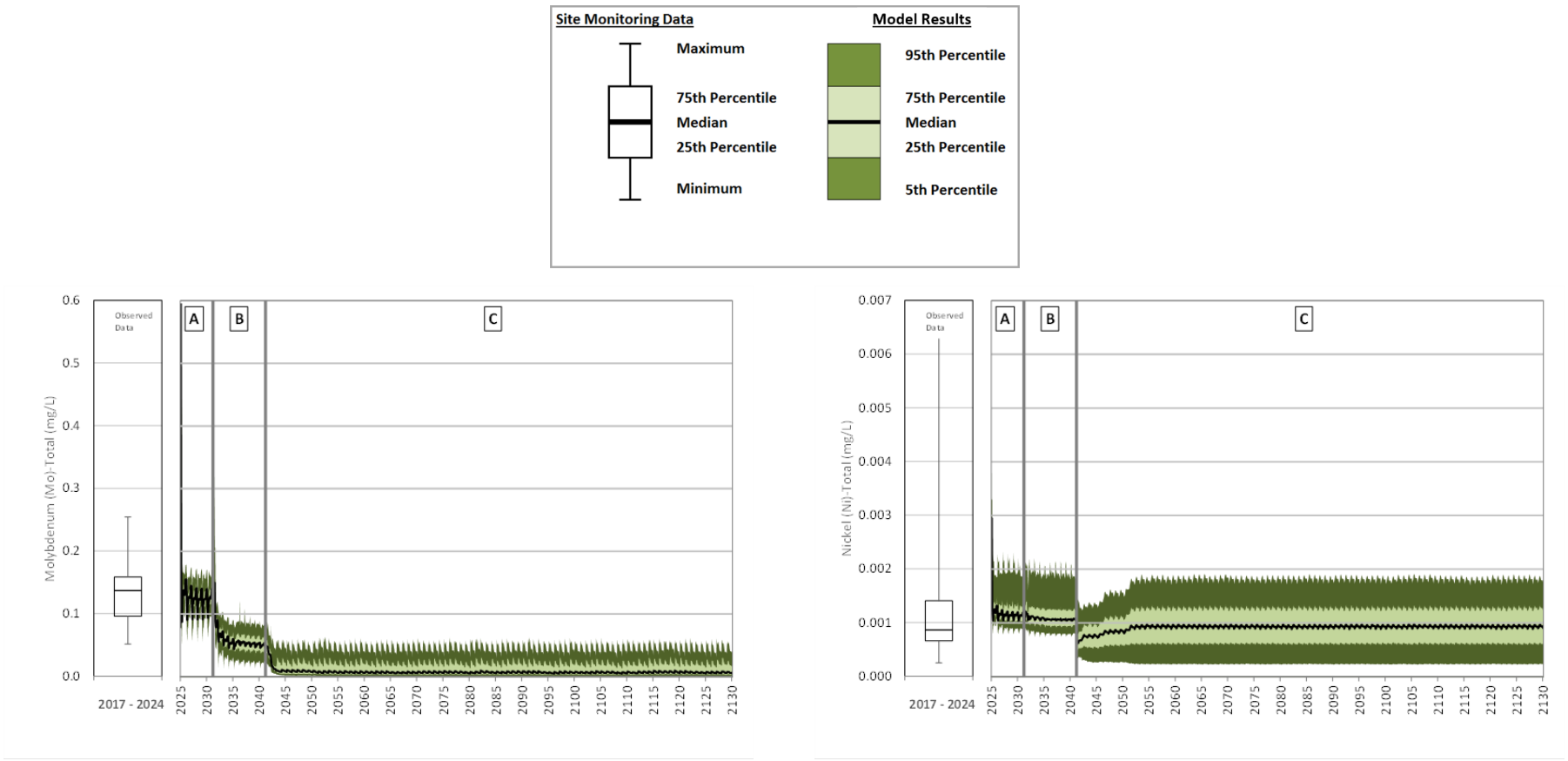
Figure B-92: Central Collection Sump Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

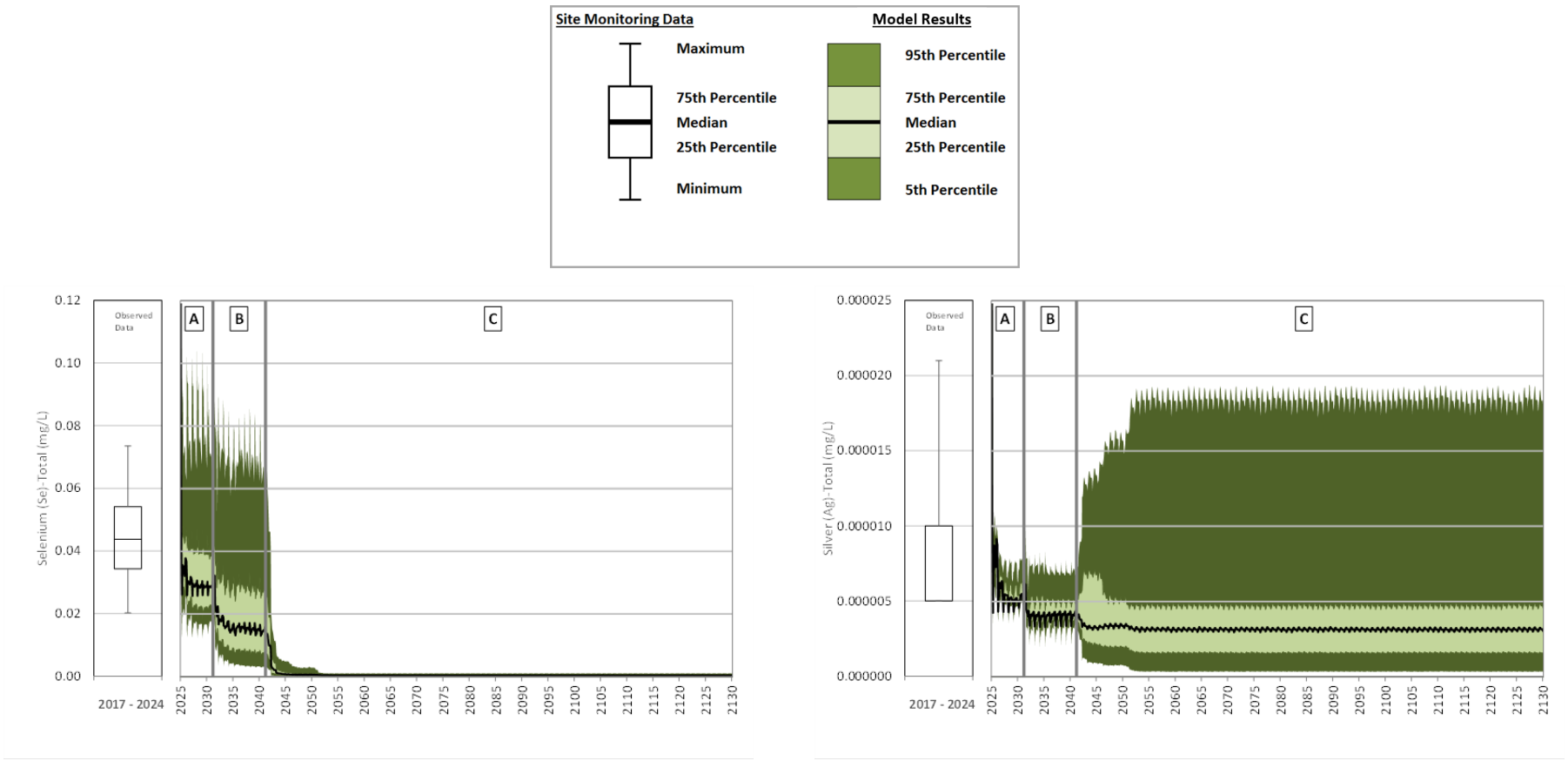
Figure B-93: Central Collection Sump Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved nickel concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs.

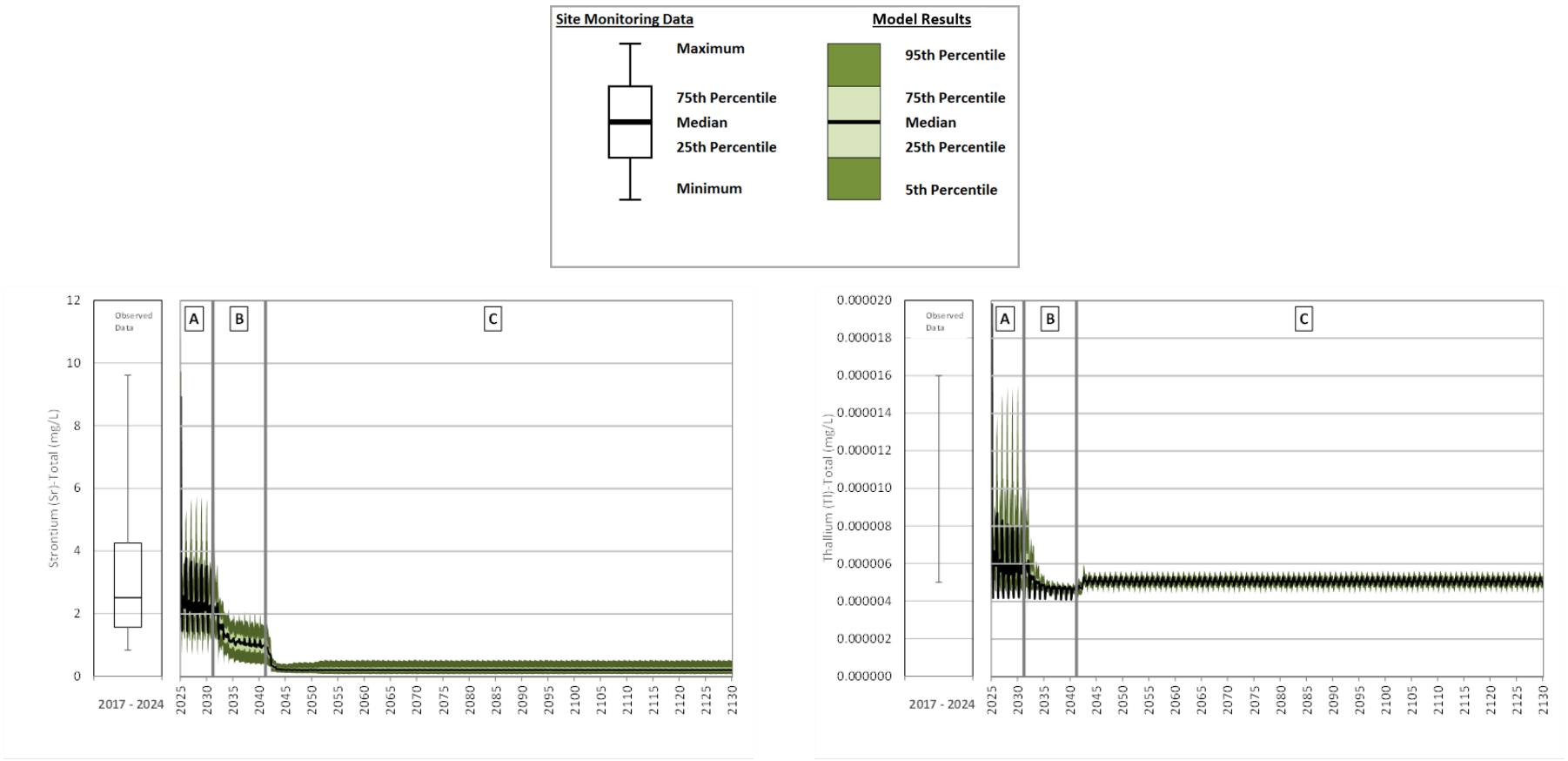
Figure B-94: Central Collection Sump Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs.

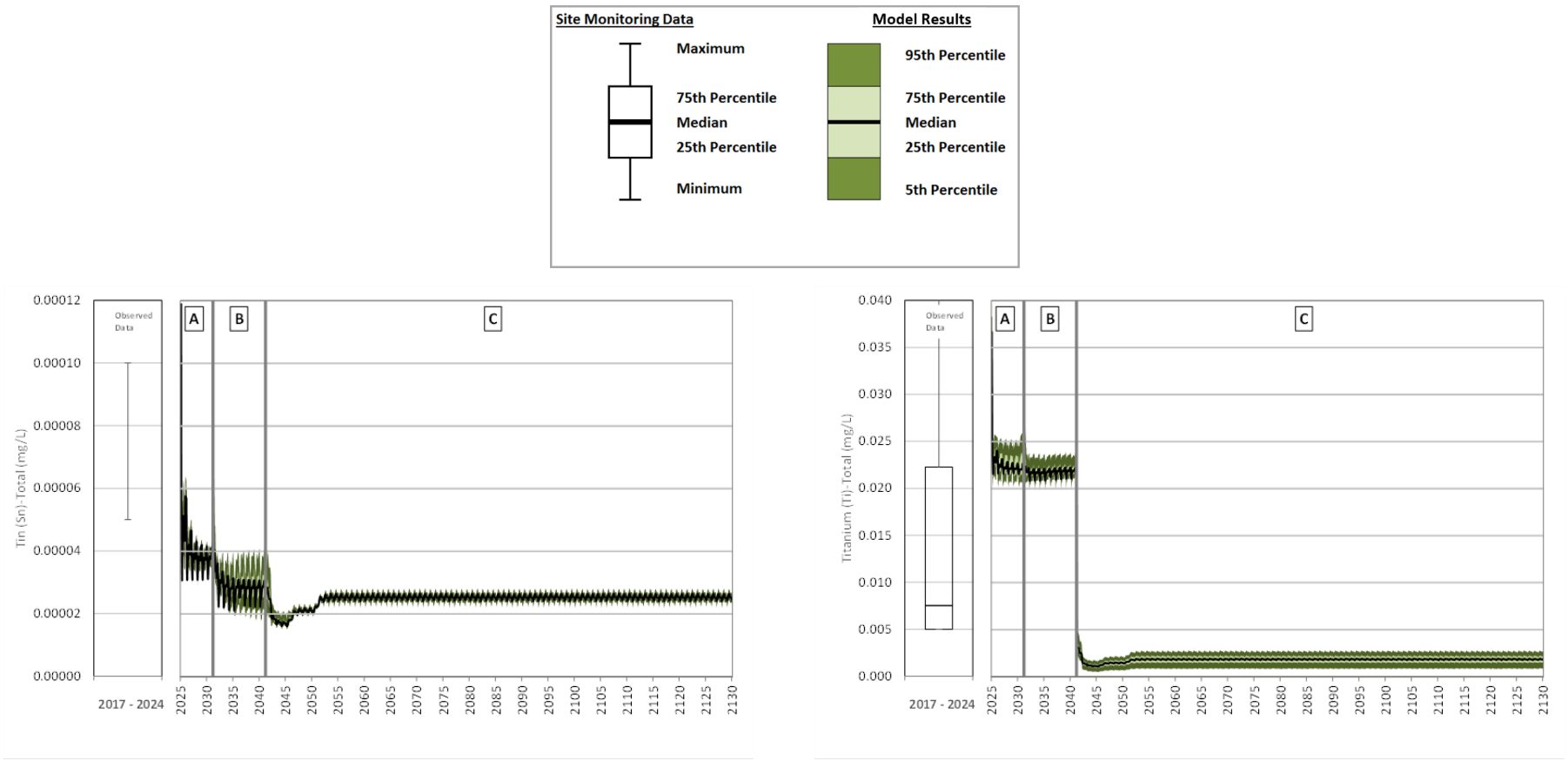
Figure B-95: Central Collection Sump Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

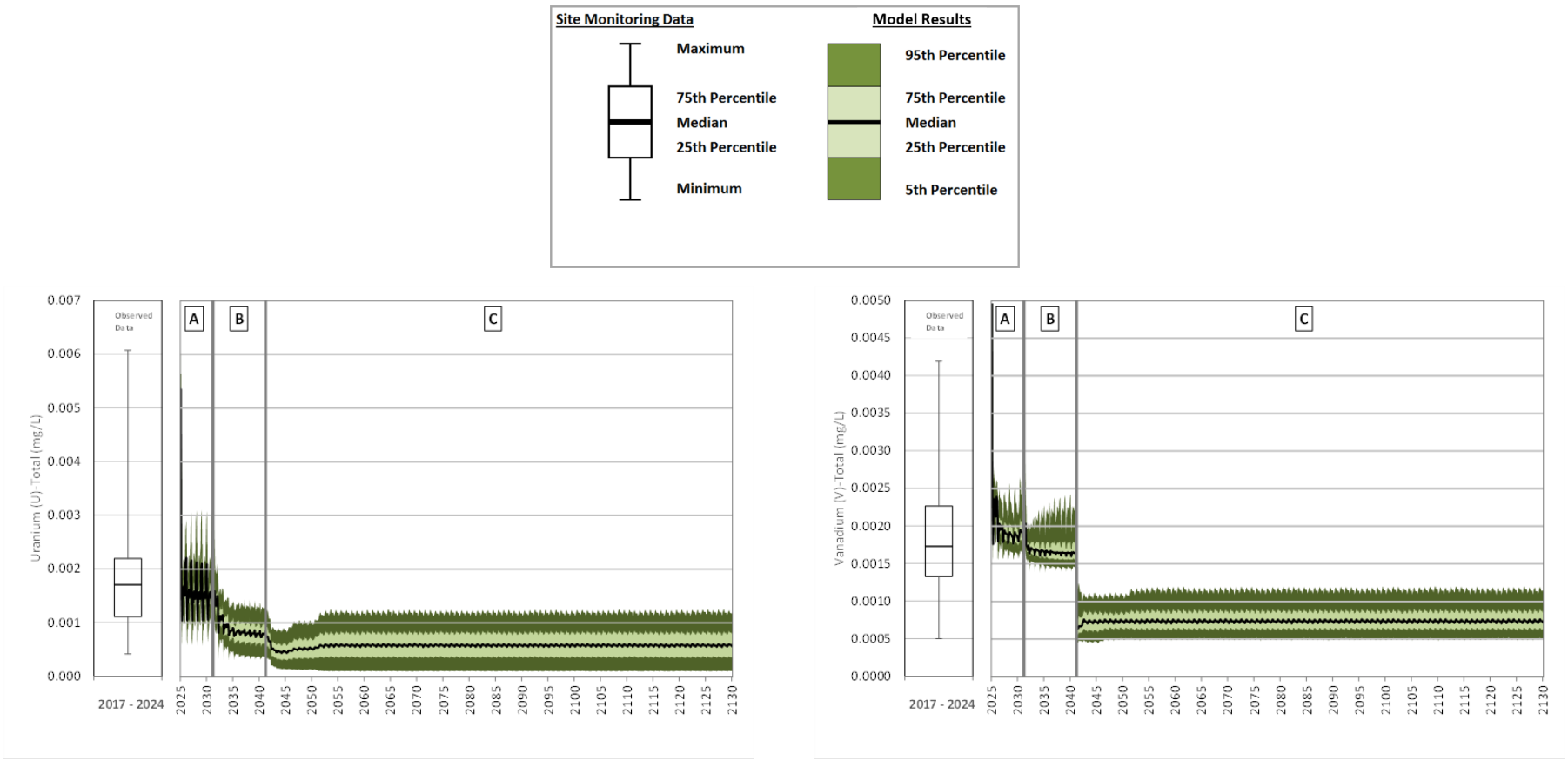
Figure B-96: Central Collection Sump Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

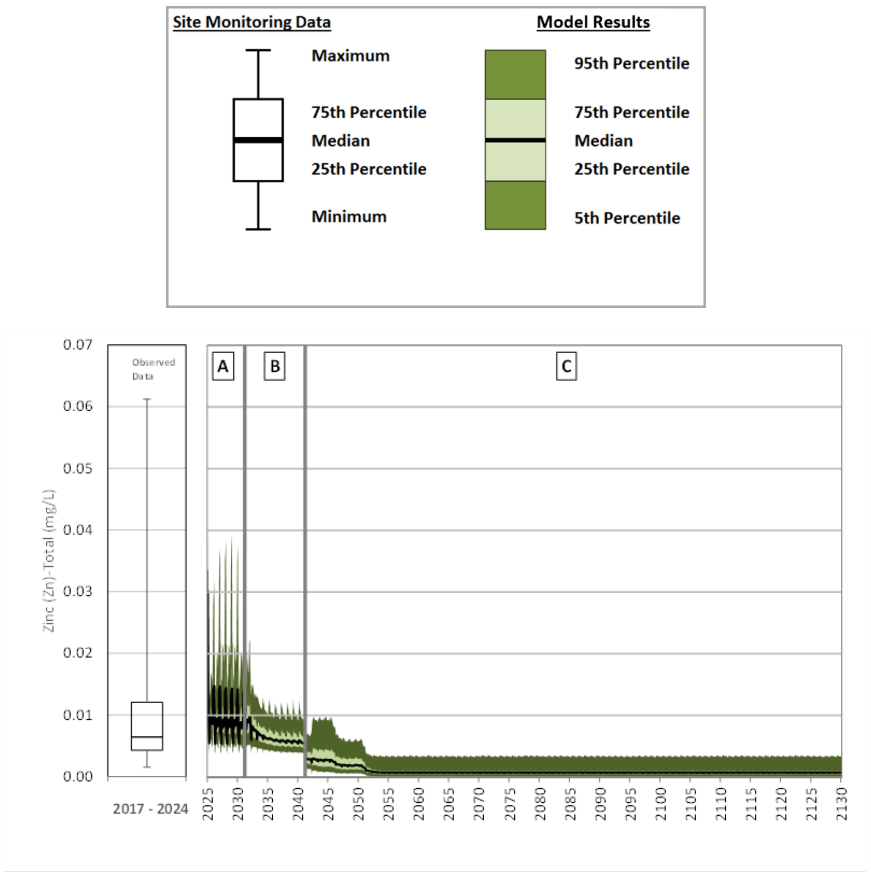
Figure B-97: Central Collection Sump Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-98: Central Collection Sump Operations, Closure and Post-closure – Total Uranium and Total Vanadium

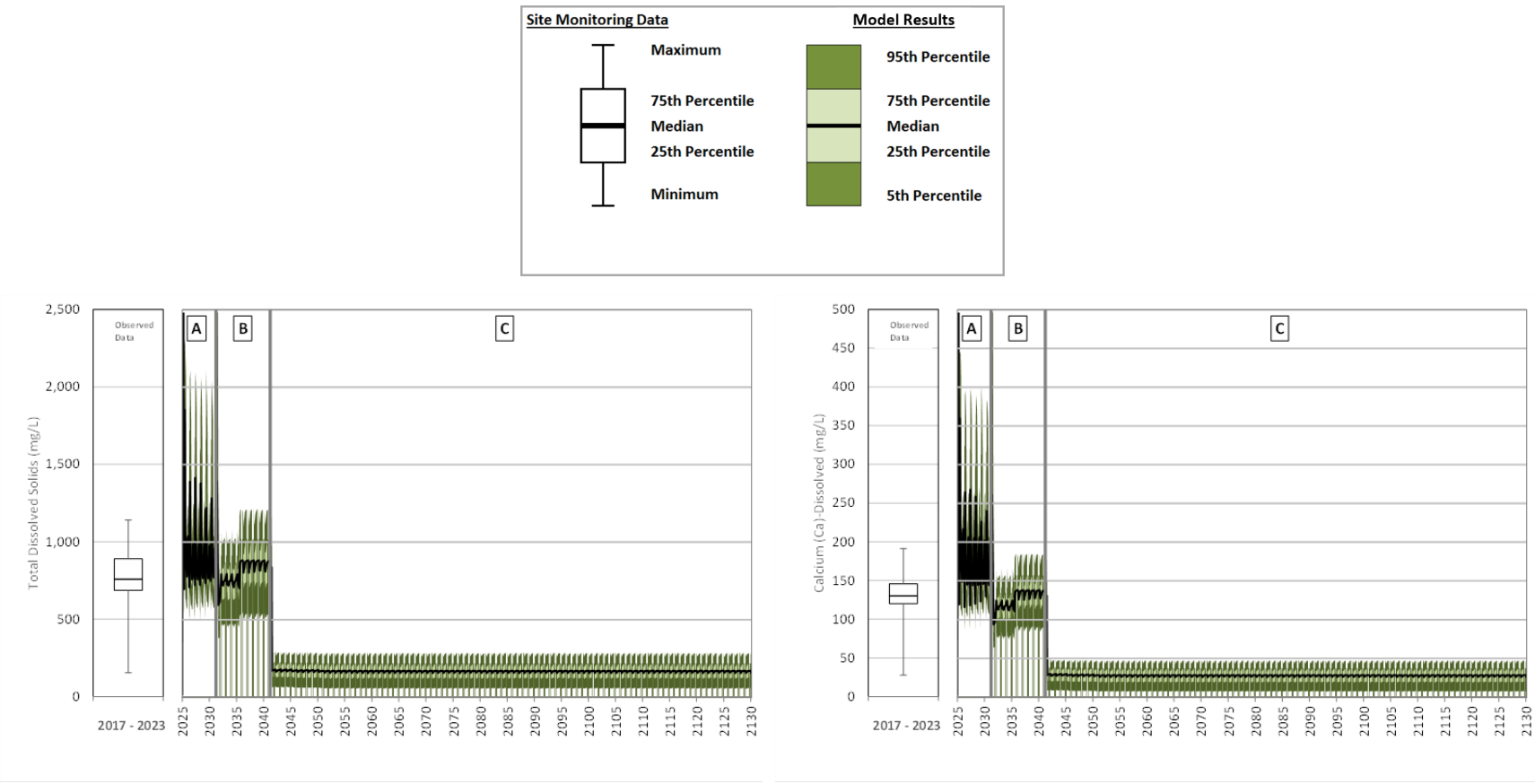


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-99: Central Collection Sump Operations, Closure and Post-closure – Total Zinc

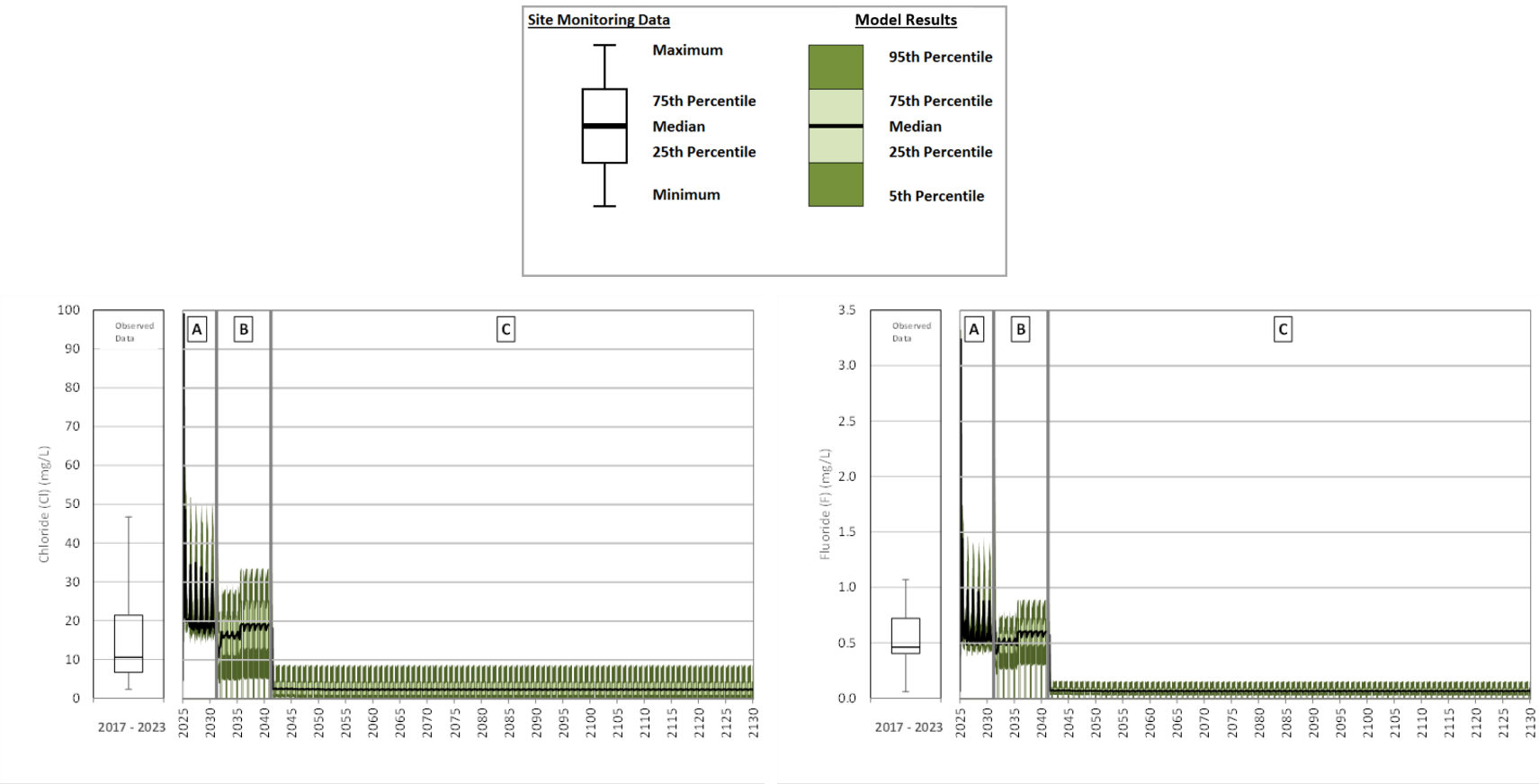
Tailings Storage Facility Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

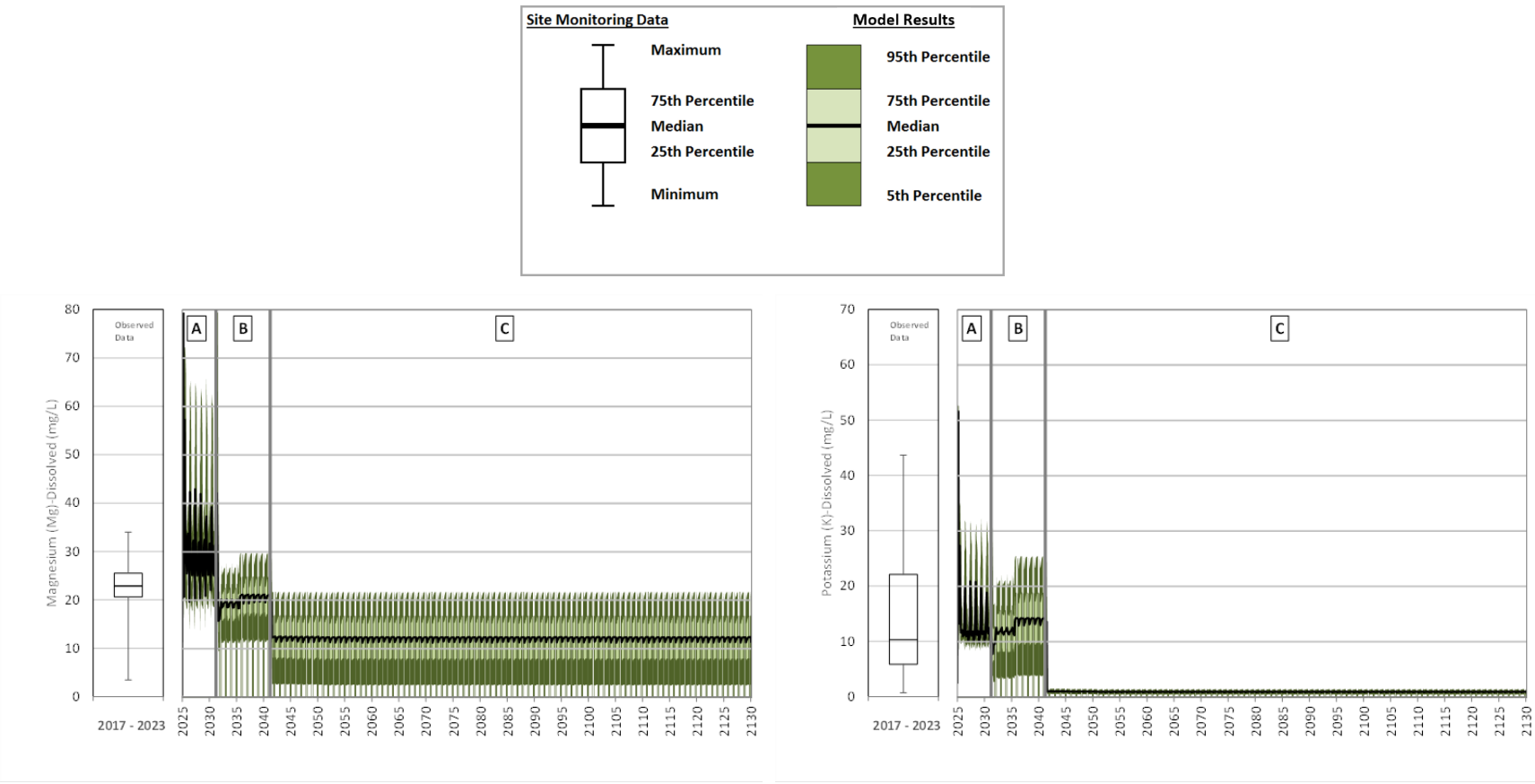
Figure B-100: Tailings Storage Facility Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

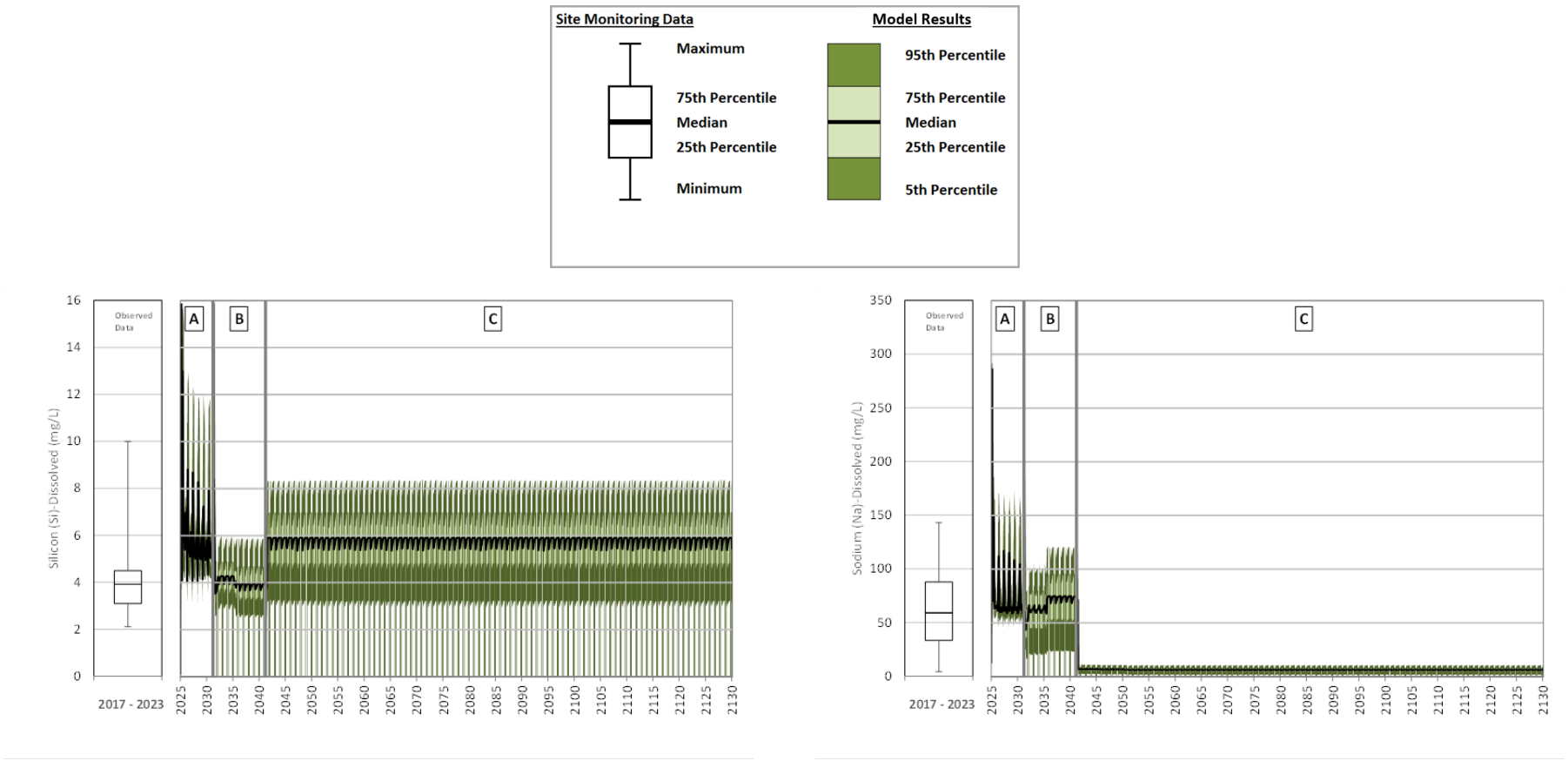
Figure B-101: Tailings Storage Facility Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

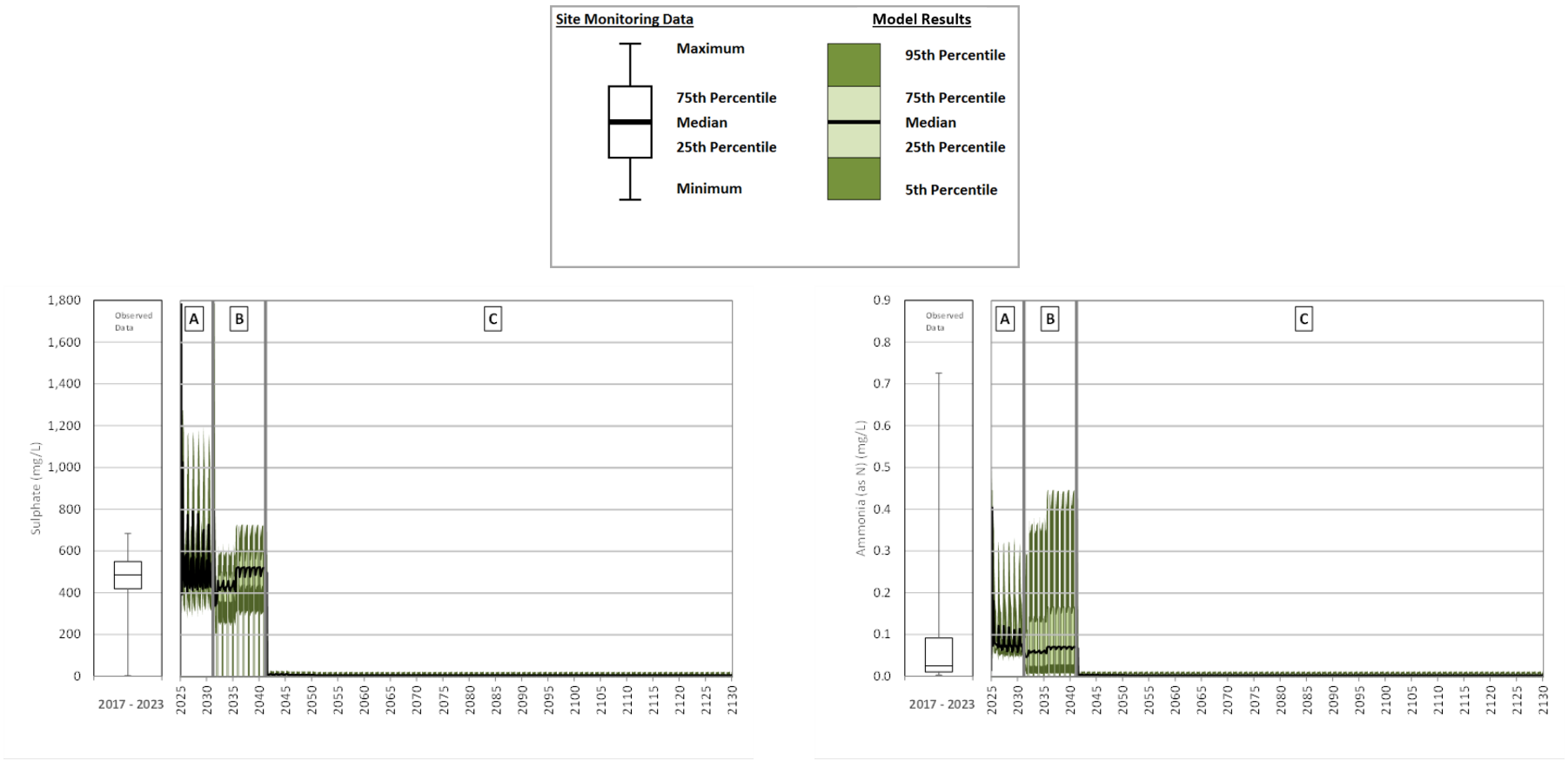
Figure B-102: Tailings Storage Facility Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The increase in silicon concentrations from closure to post-closure is caused by runoff from areas that were assigned the disturbed water quality input being reclaimed and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum silicon concentrations than the disturbed water quality input. Sodium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

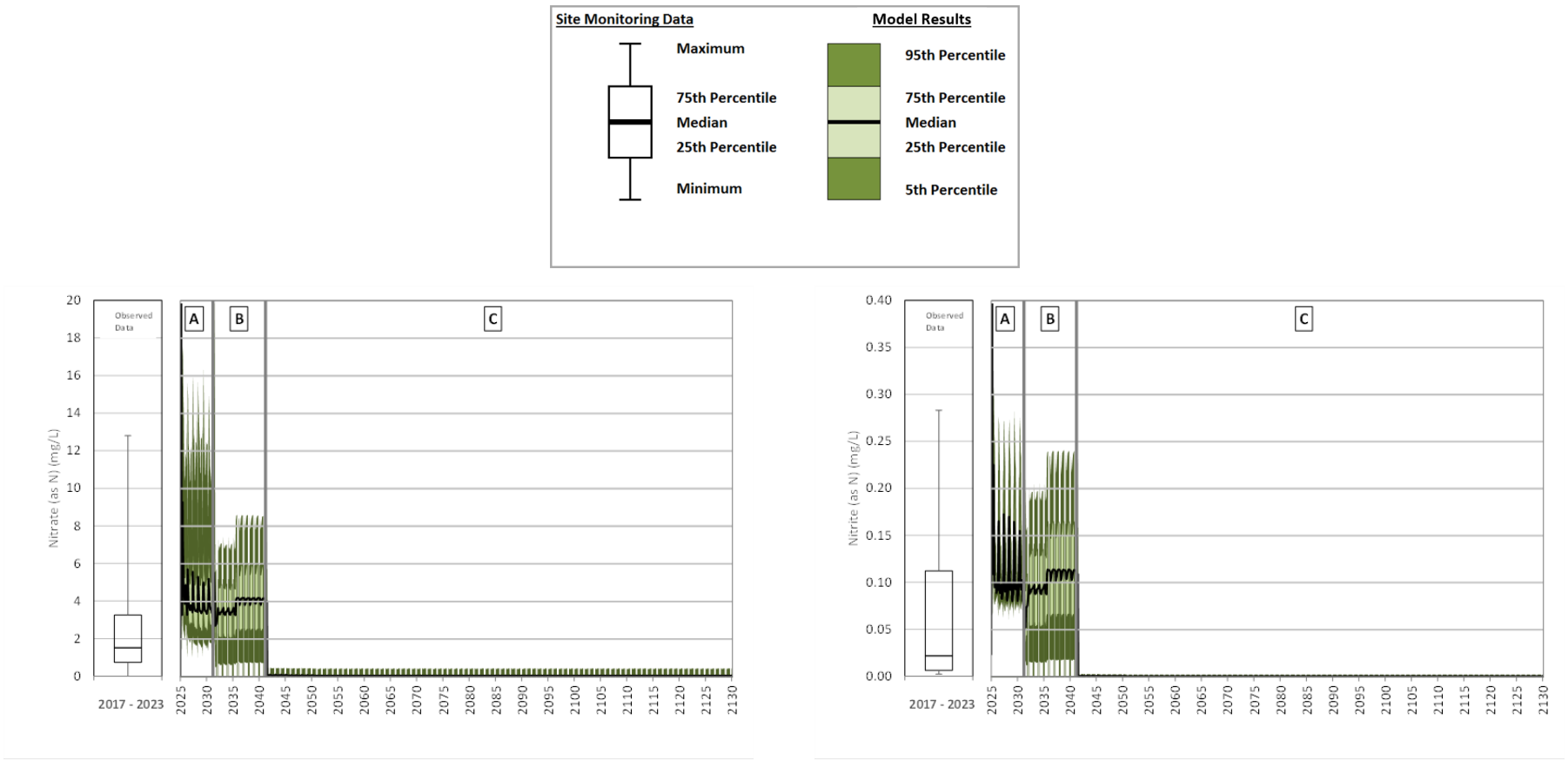
Figure B-103: Tailings Storage Facility Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: Sulphate concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in total ammonia concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the TSF. Lower total ammonia concentrations in the PETBP causes dilution of the total ammonia concentrations in the TSF during operations. Total ammonia concentrations decrease from closure to post-closure as runoff areas are remediated.

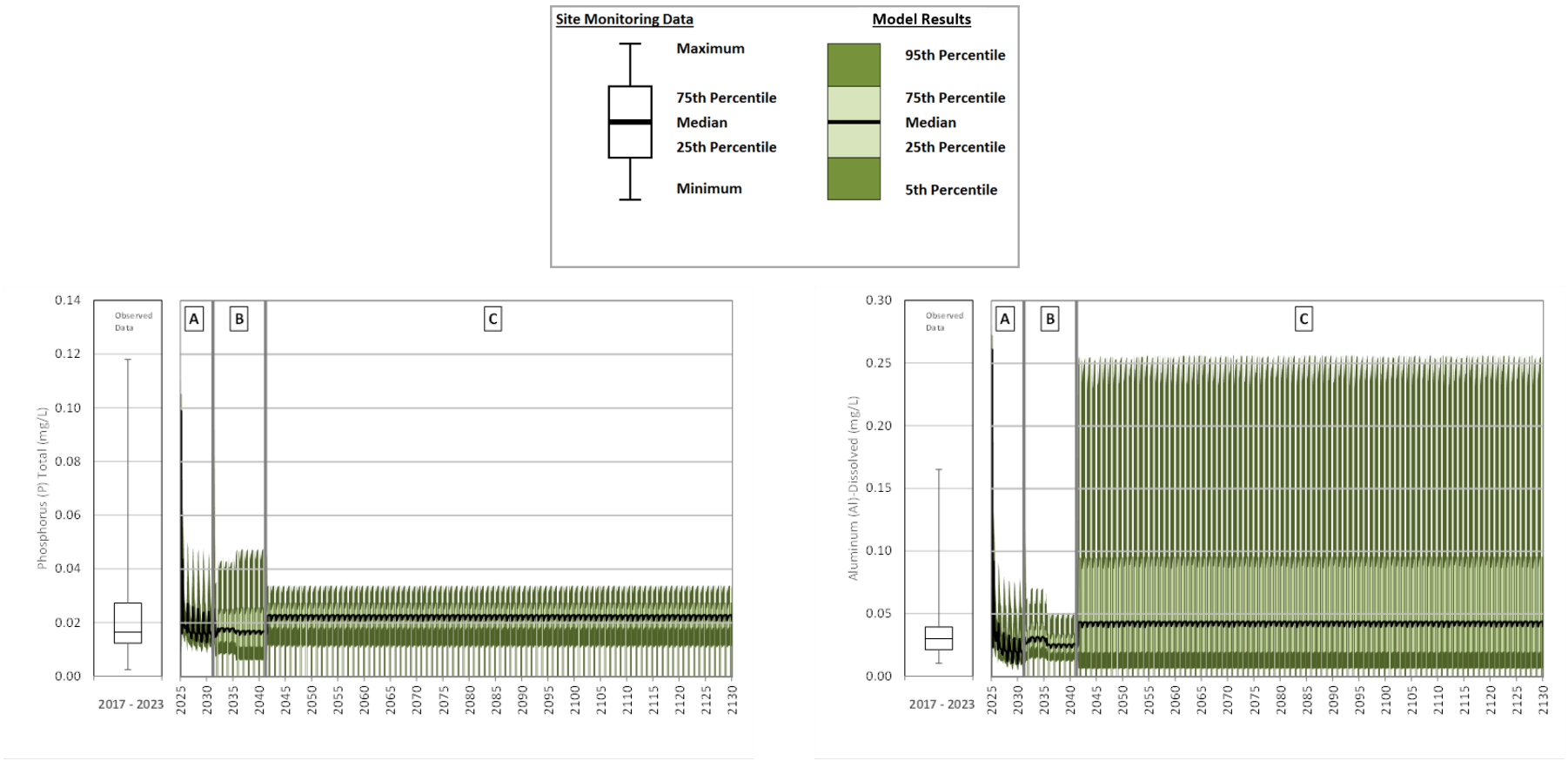
Figure B-104: Tailings Storage Facility Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The increase in nitrate concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the TSF. Lower nitrate concentrations in the PETBP causes dilution of the nitrate concentrations in the TSF during operations. Nitrate concentrations decrease from closure to post-closure as runoff areas are remediated. Nitrite concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

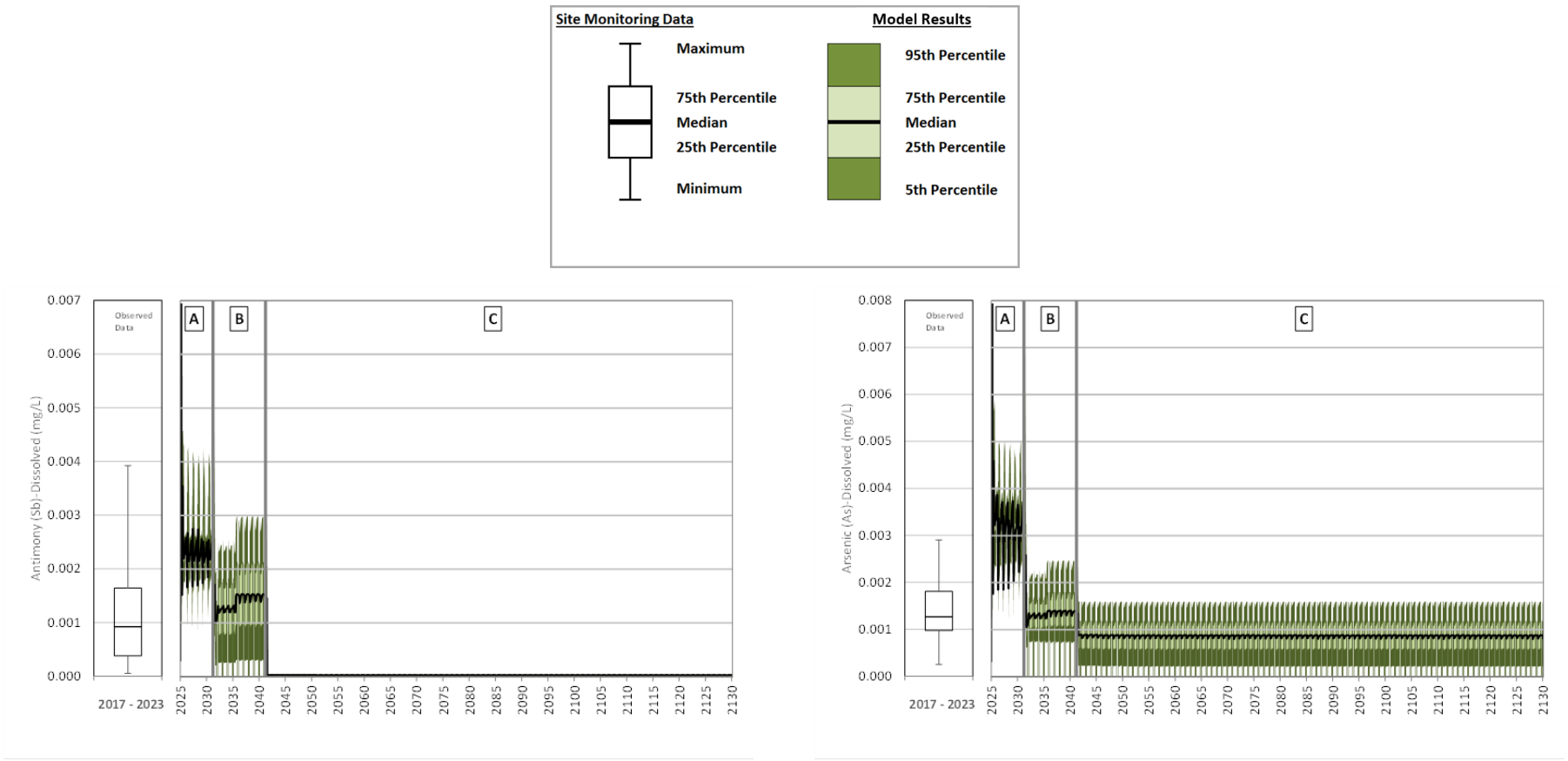
Figure B-105: Tailings Storage Facility Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus and dissolved aluminum concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the NAG waste rock and disturbed runoff water quality inputs.

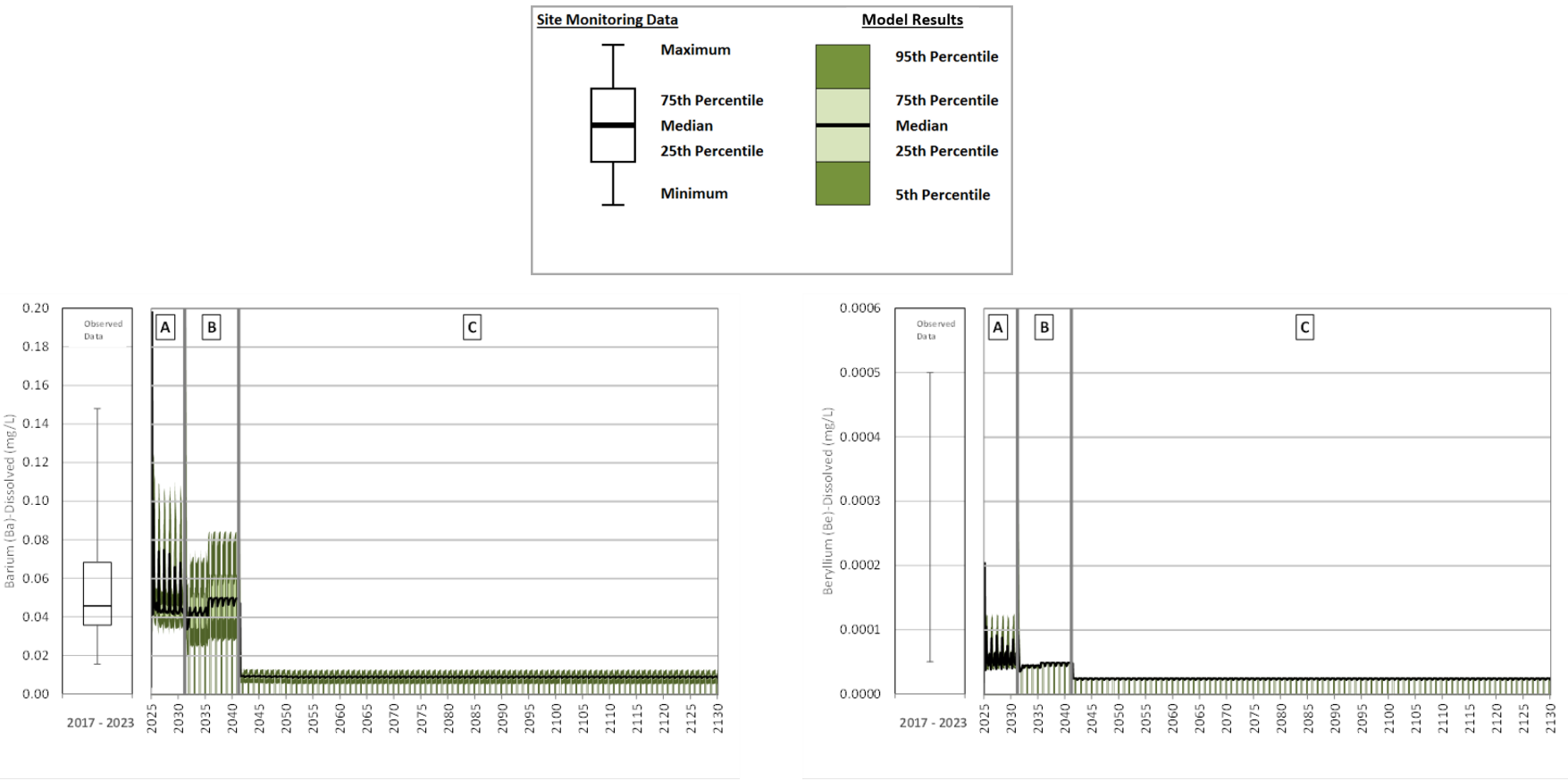
Figure B-106: Tailings Storage Facility Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

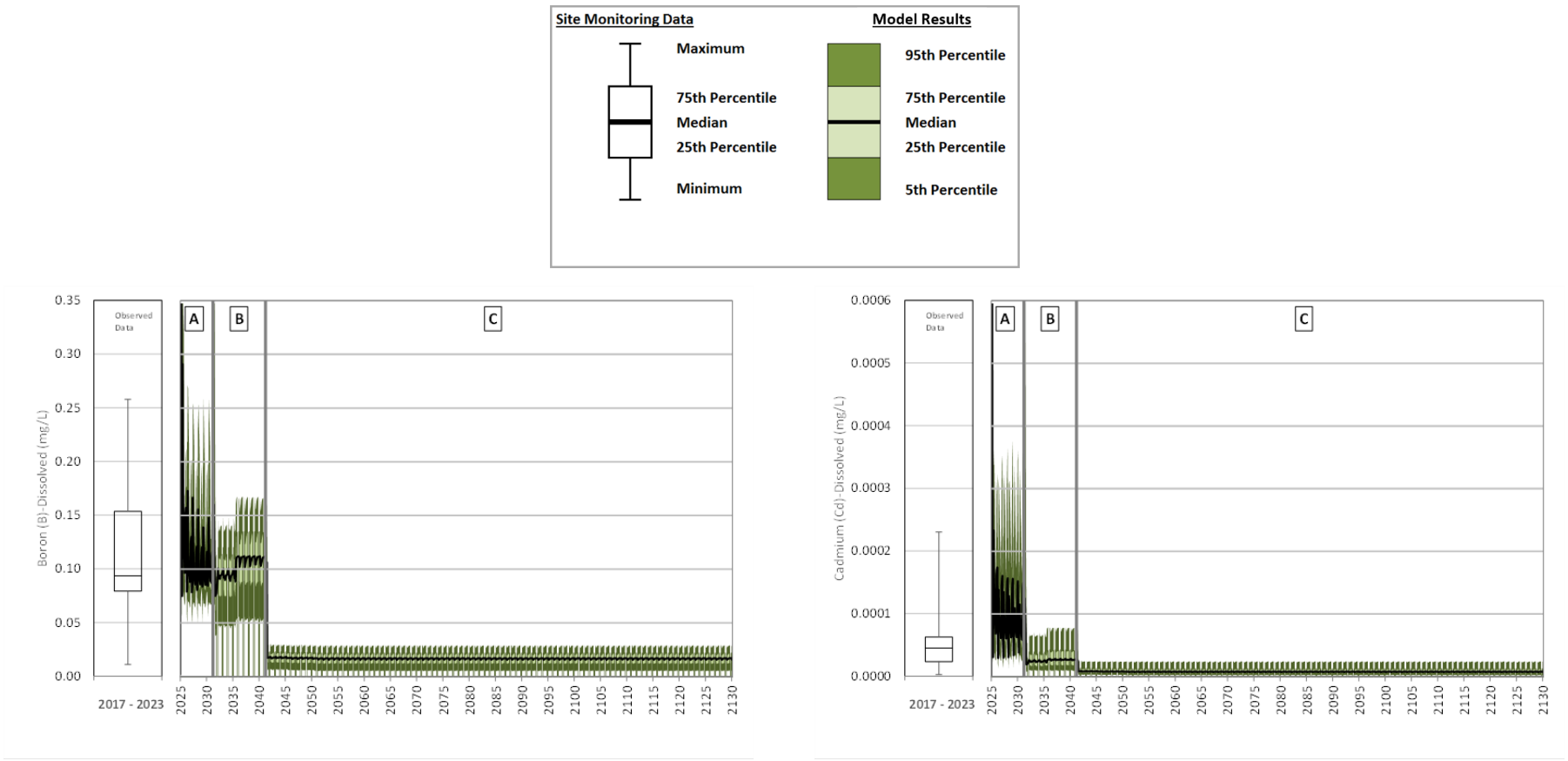
Figure B-107: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

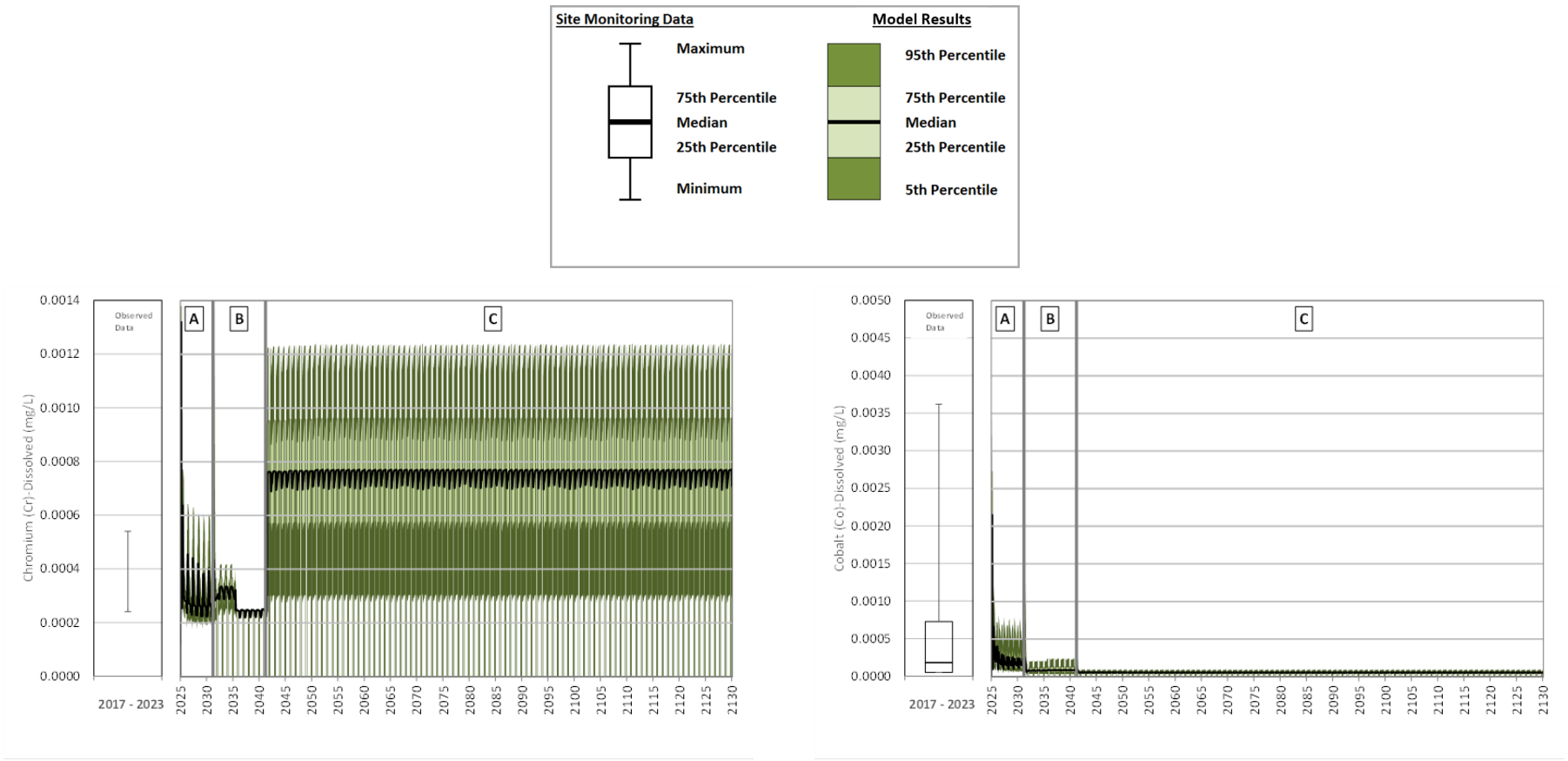
Figure B-108: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

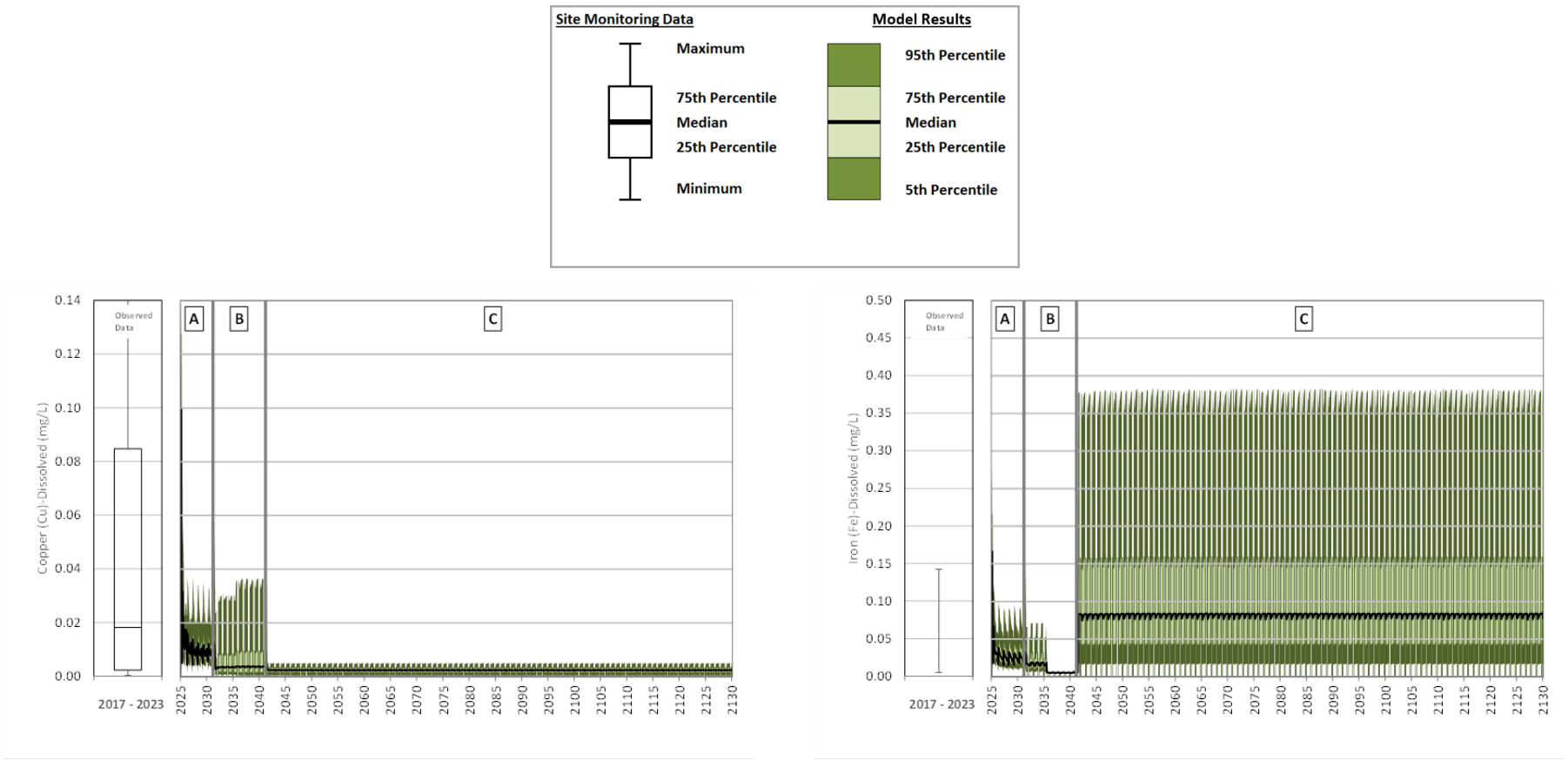
Figure B-109: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

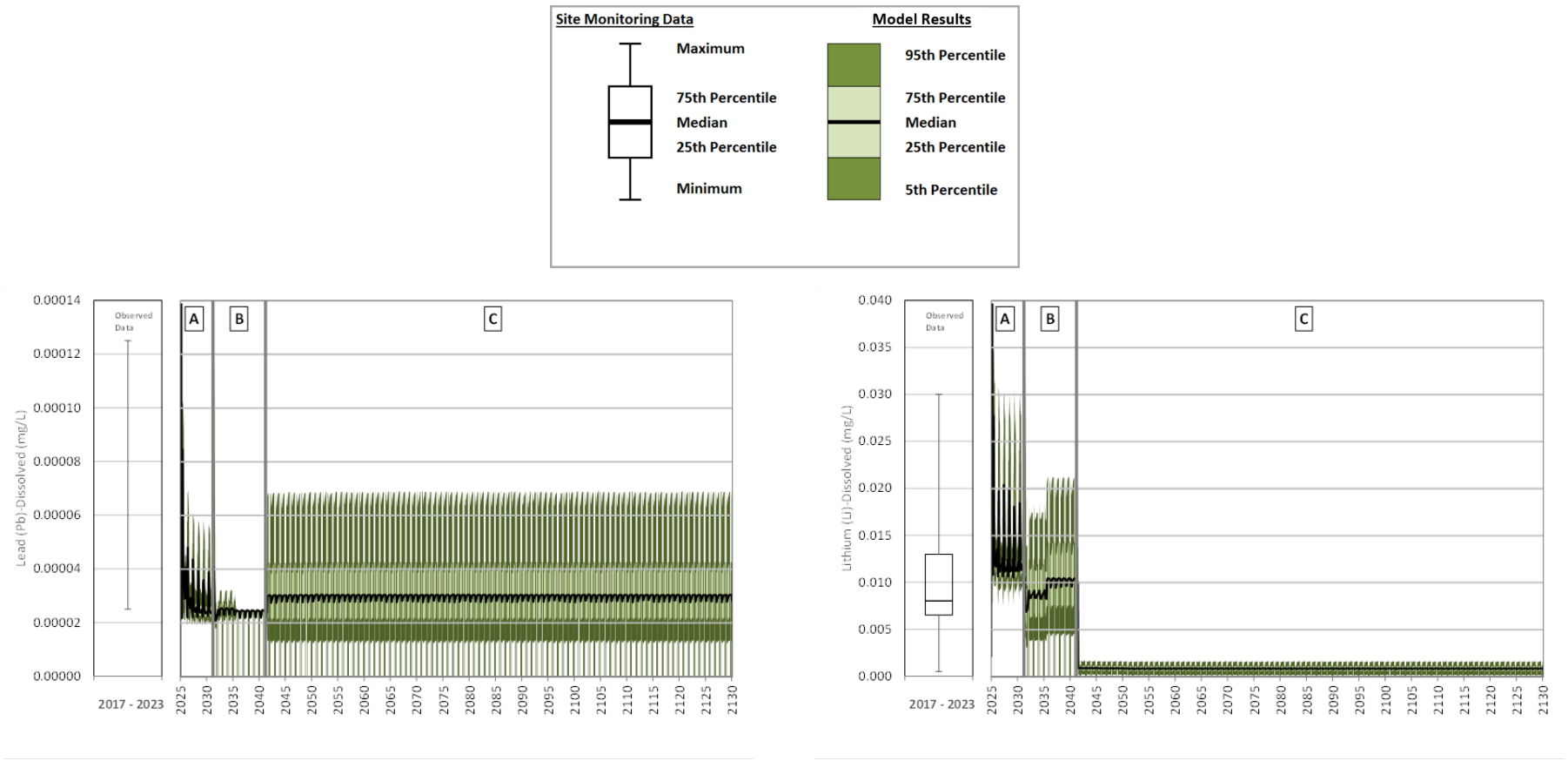
Figure B-110: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved copper concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the Tailings Storage Facility (TSF). Lower dissolved copper concentrations in the PETBP causes dilution of the dissolved copper concentrations in the TSF during operations. Dissolved copper concentrations decrease from closure to post-closure as runoff areas are remediated. The decrease in dissolved iron concentrations during closure is caused by the end of pumping from the PETBP to the TSF. Higher dissolved iron concentrations in the PETBP causes increased concentrations of dissolved iron concentrations in the TSF during operations. Dissolved iron concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input that has higher dissolved iron concentrations than contact water.

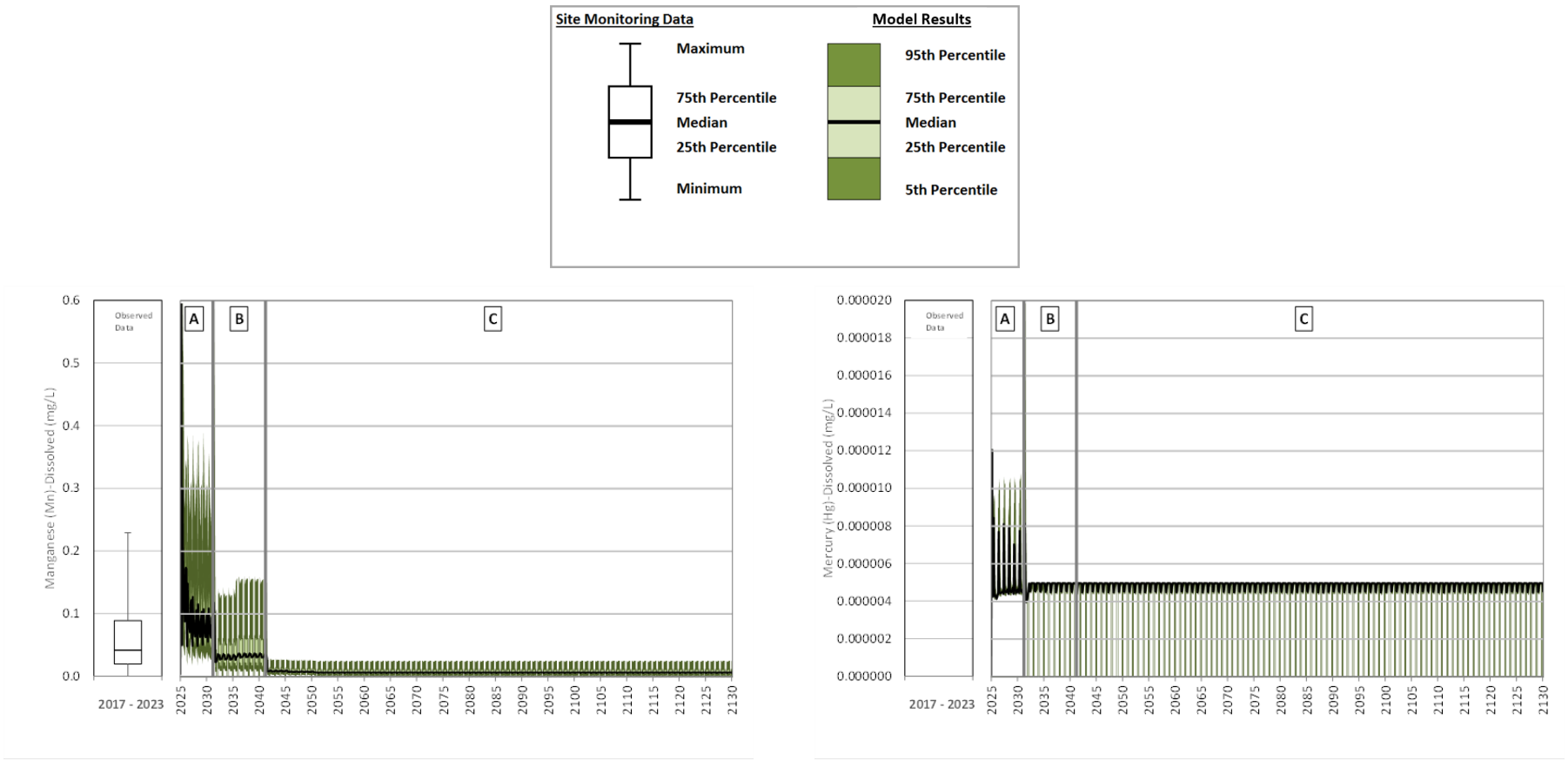
Figure B-111: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. The decrease in dissolved lithium concentrations from 2031 to 2032 is due to the end of pumping from the mill processing plant to the Tailings Storage Facility (TSF). The increase in dissolved lithium concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the TSF. Lower dissolved lithium concentrations in the PETBP causes dilution of the dissolved lithium concentrations in the TSF during operations. Dissolved lithium concentrations decrease from closure to post-closure as runoff areas are remediated.

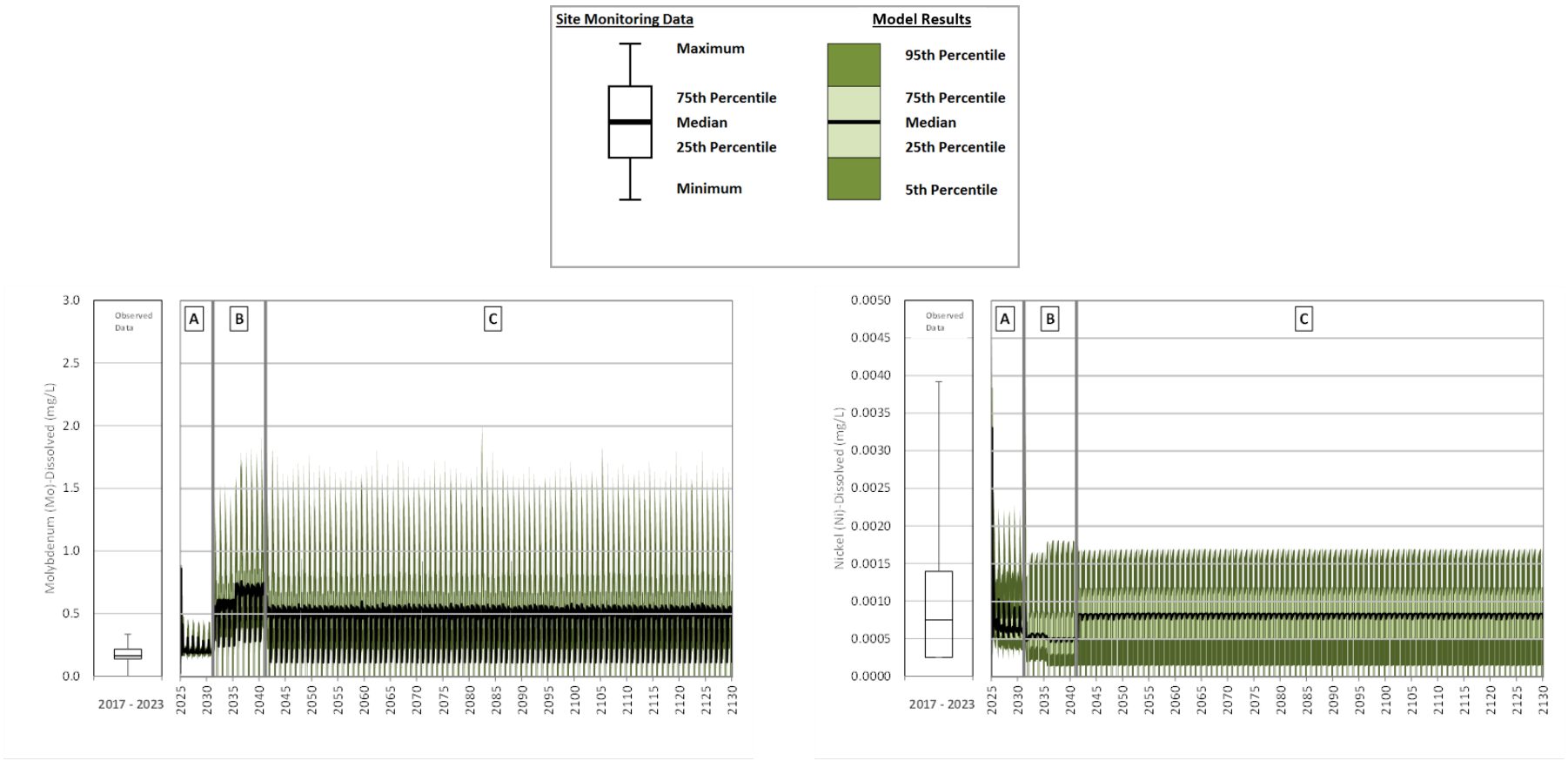
Figure B-112: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

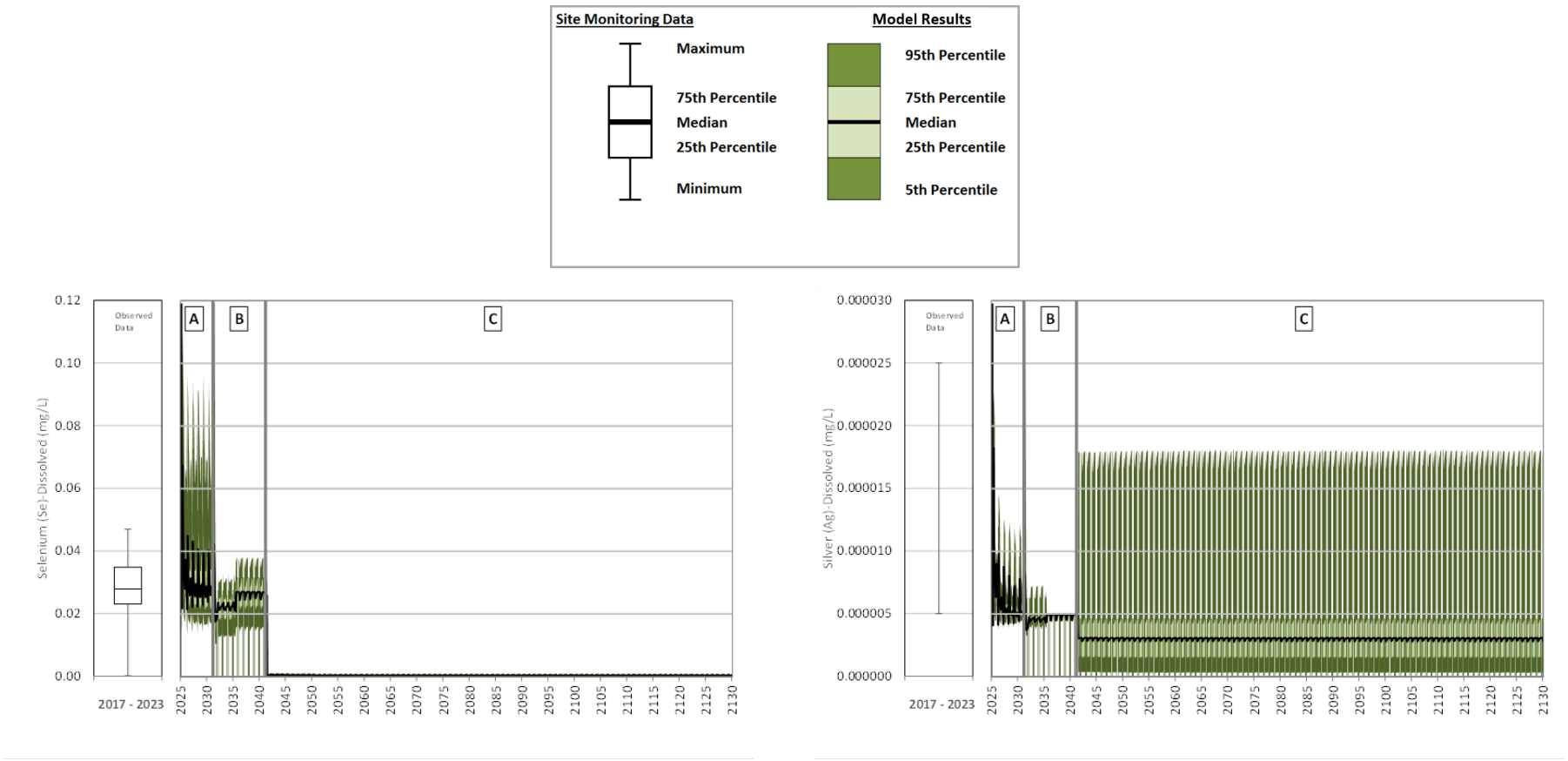
Figure B-113: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved nickel concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs.

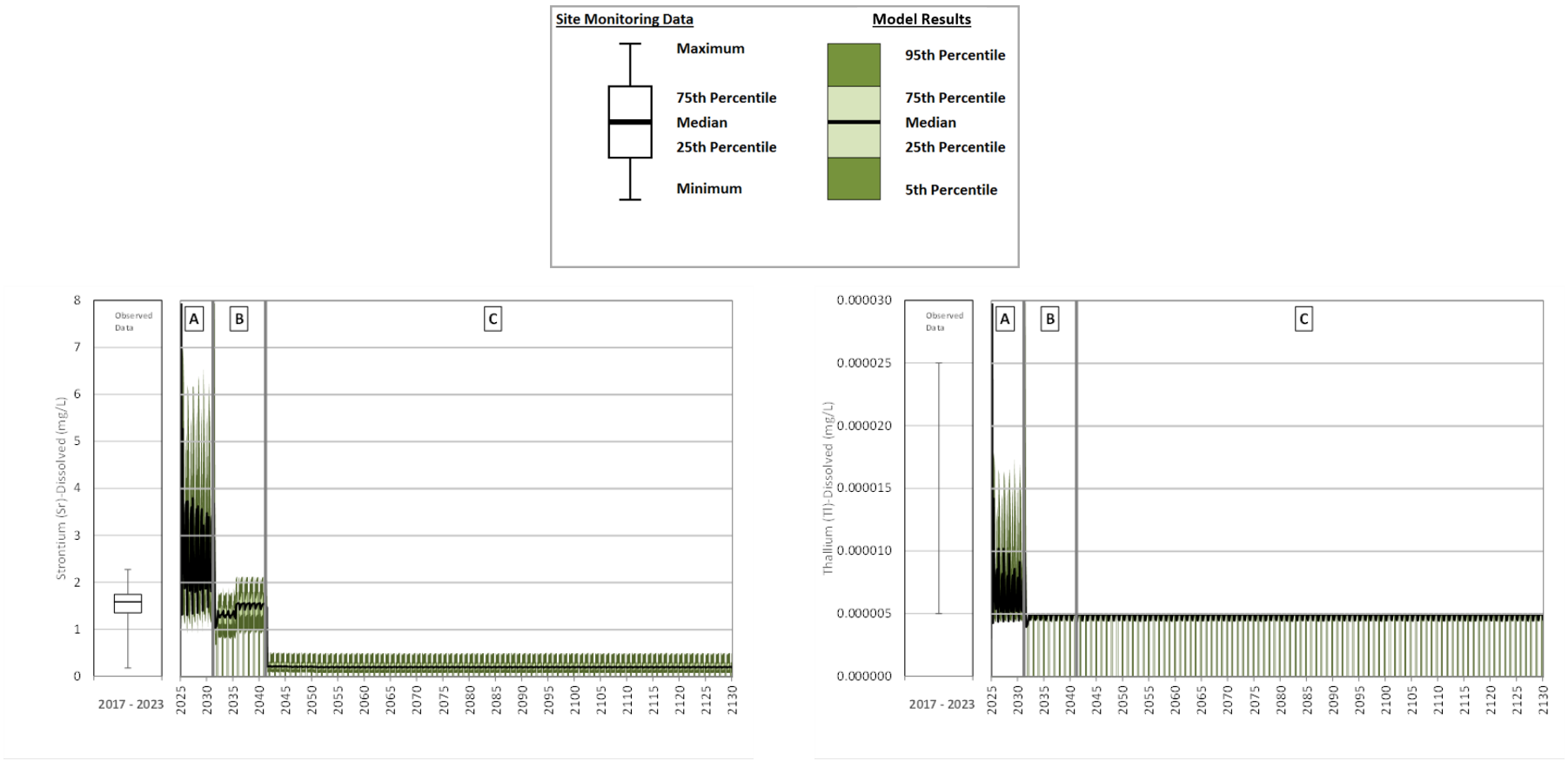
Figure B-114: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs.

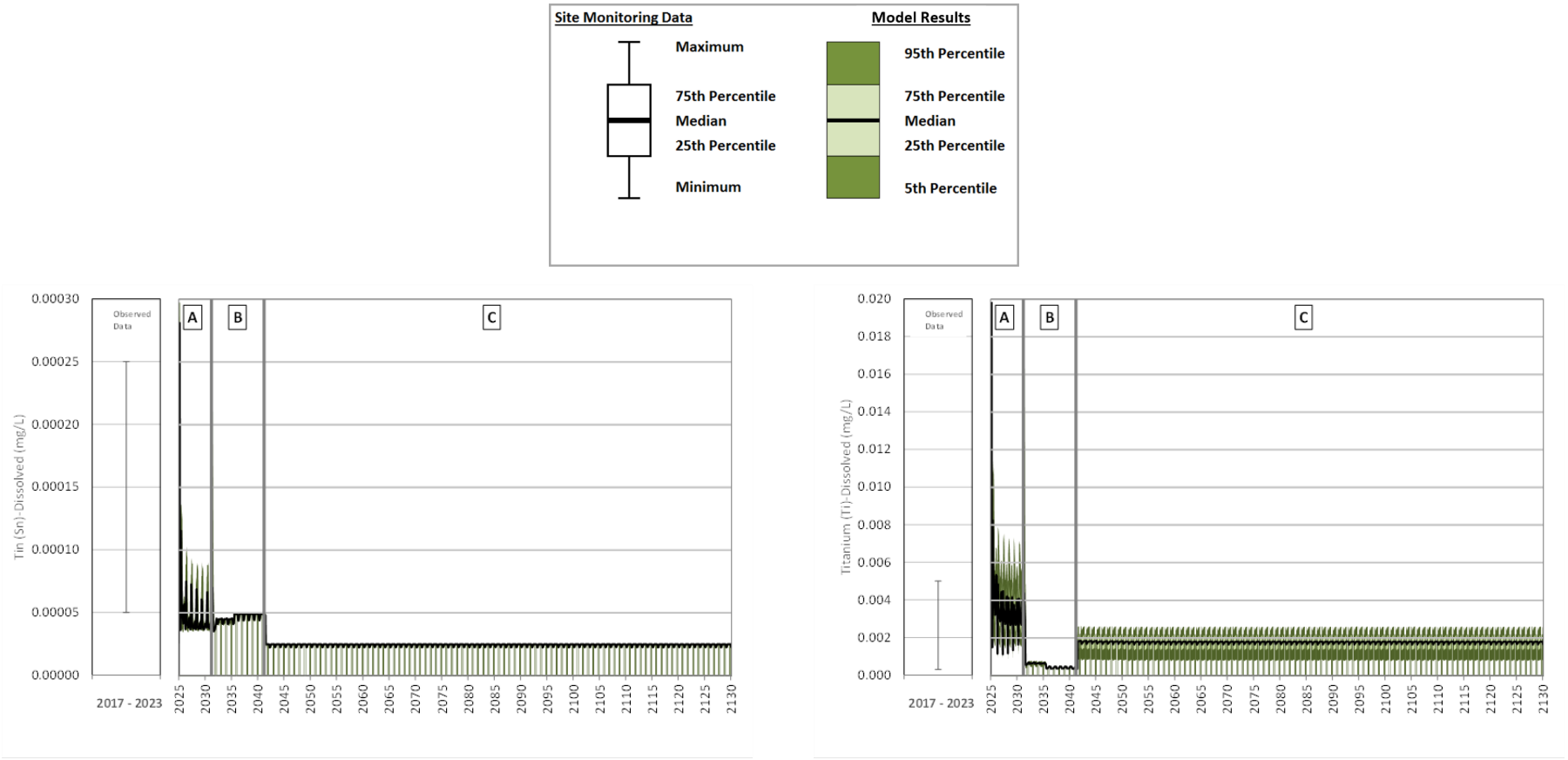
Figure B-115: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

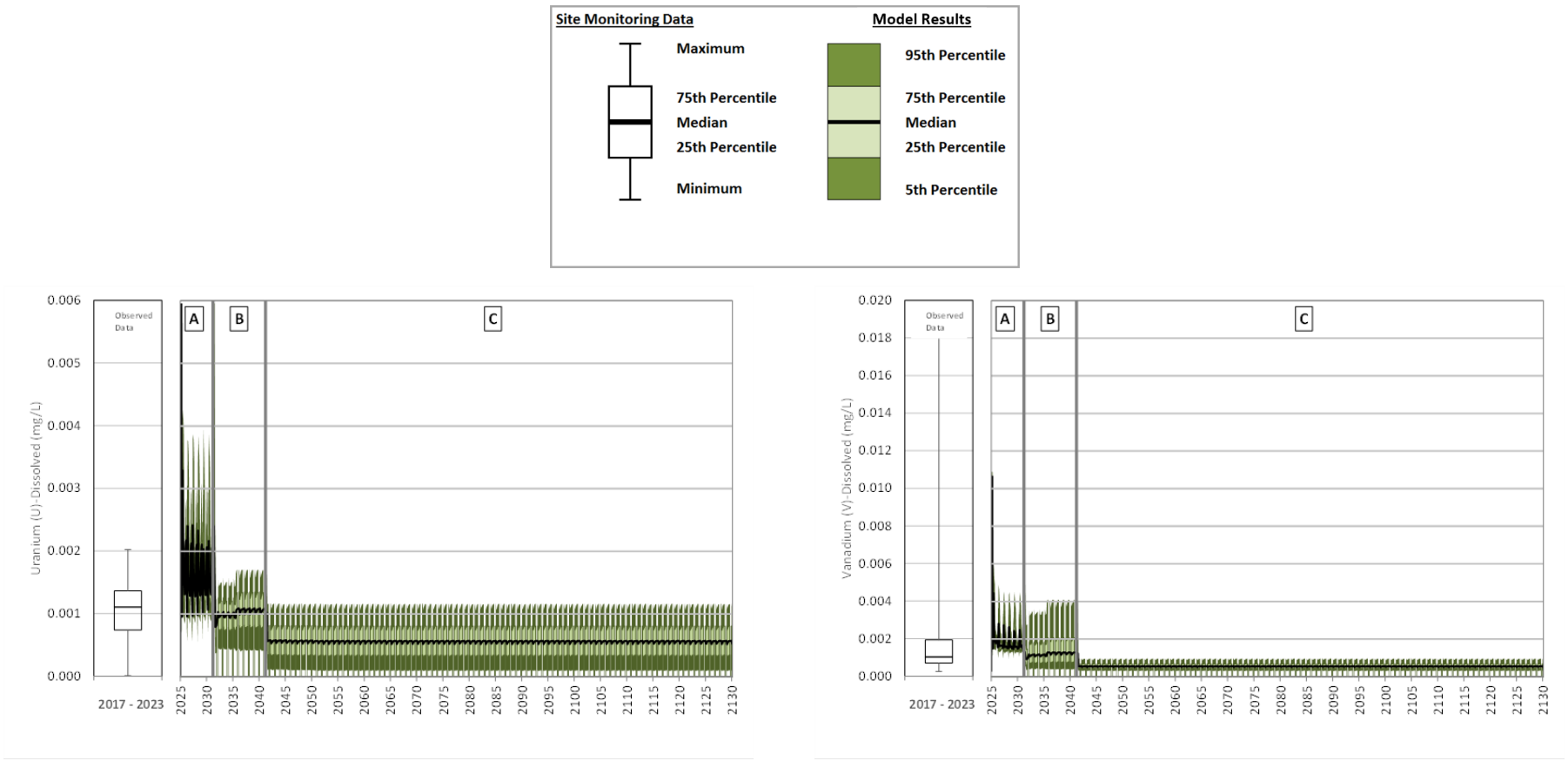
Figure B-116: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The increase in dissolved titanium concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the Tailings Storage Facility (TSF). Lower dissolved titanium concentrations in the PETBP causes dilution of the dissolved titanium concentrations in the TSF during operations. Dissolved titanium concentrations decrease from closure to post-closure as runoff areas are remediated.

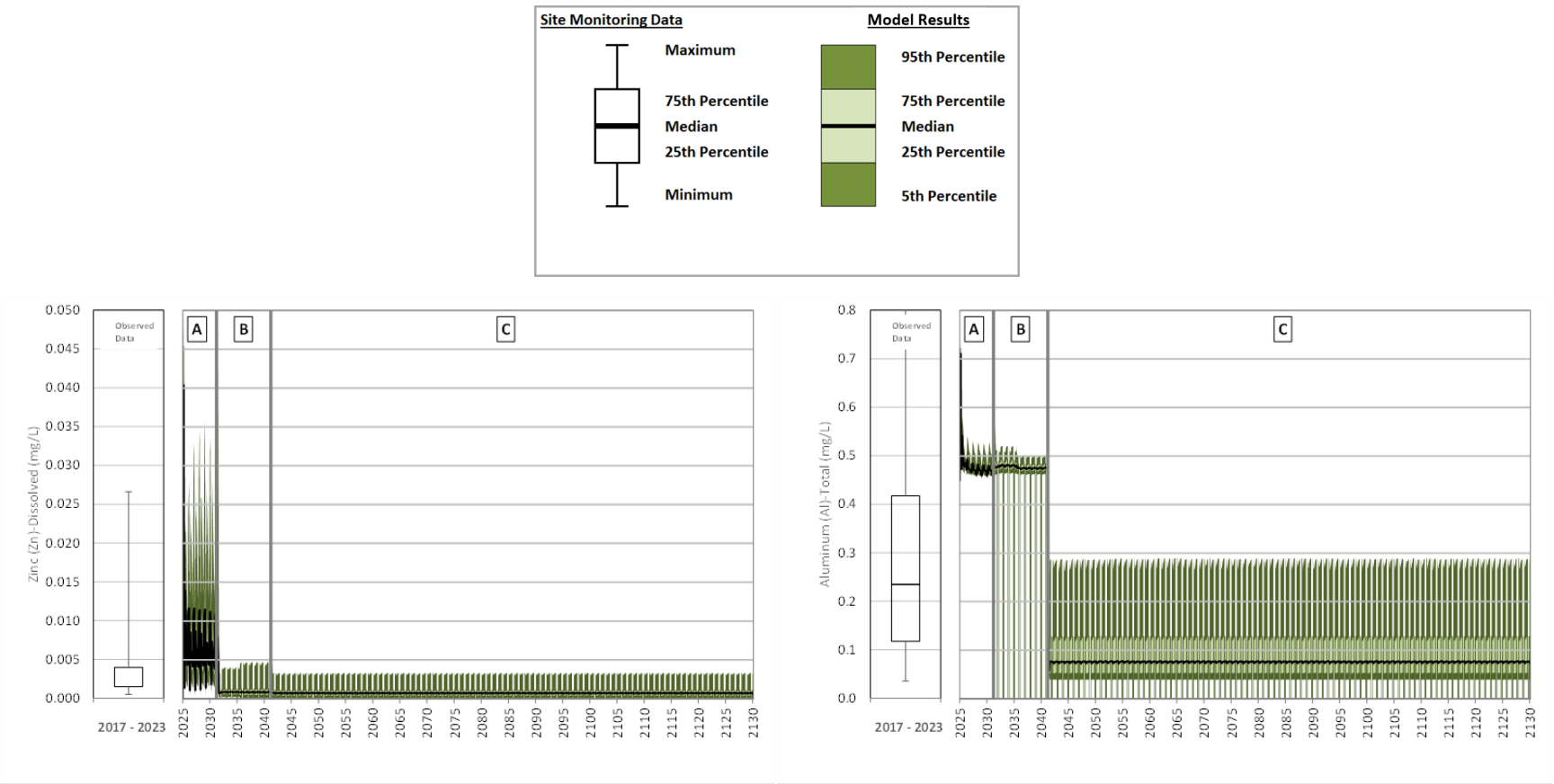
Figure B-117: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

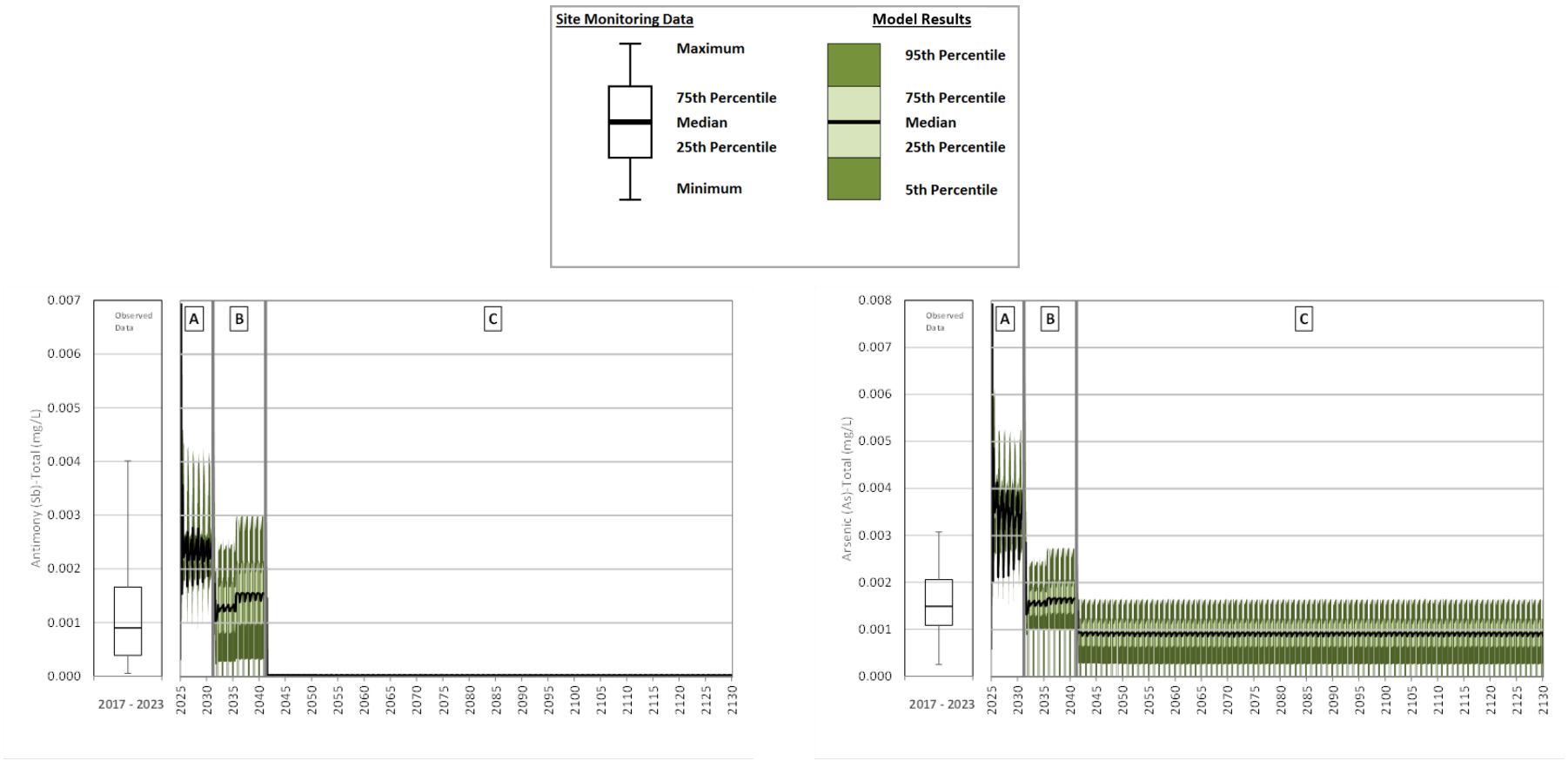
Figure B-118: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

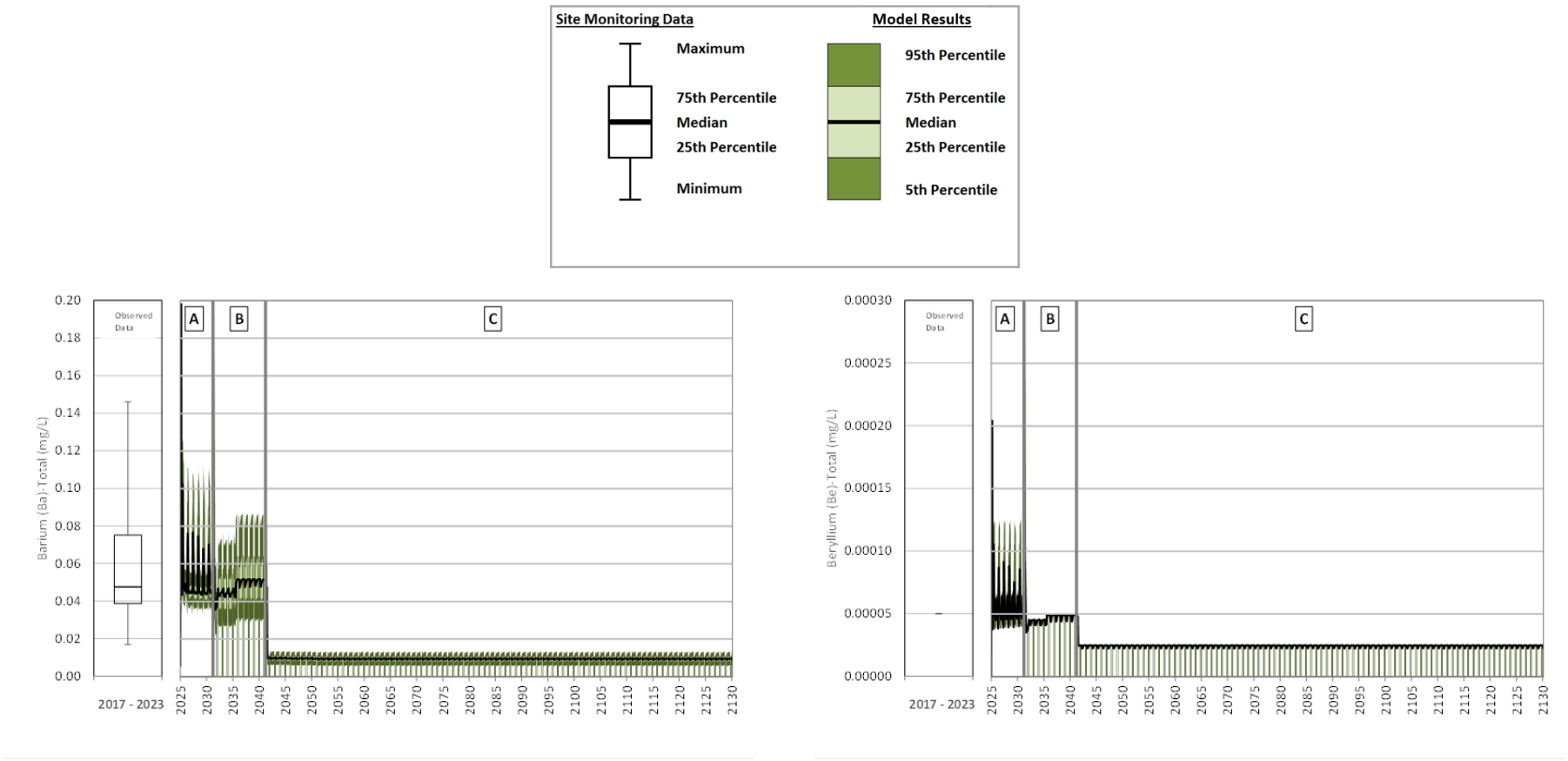
Figure B-119: Tailings Storage Facility Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

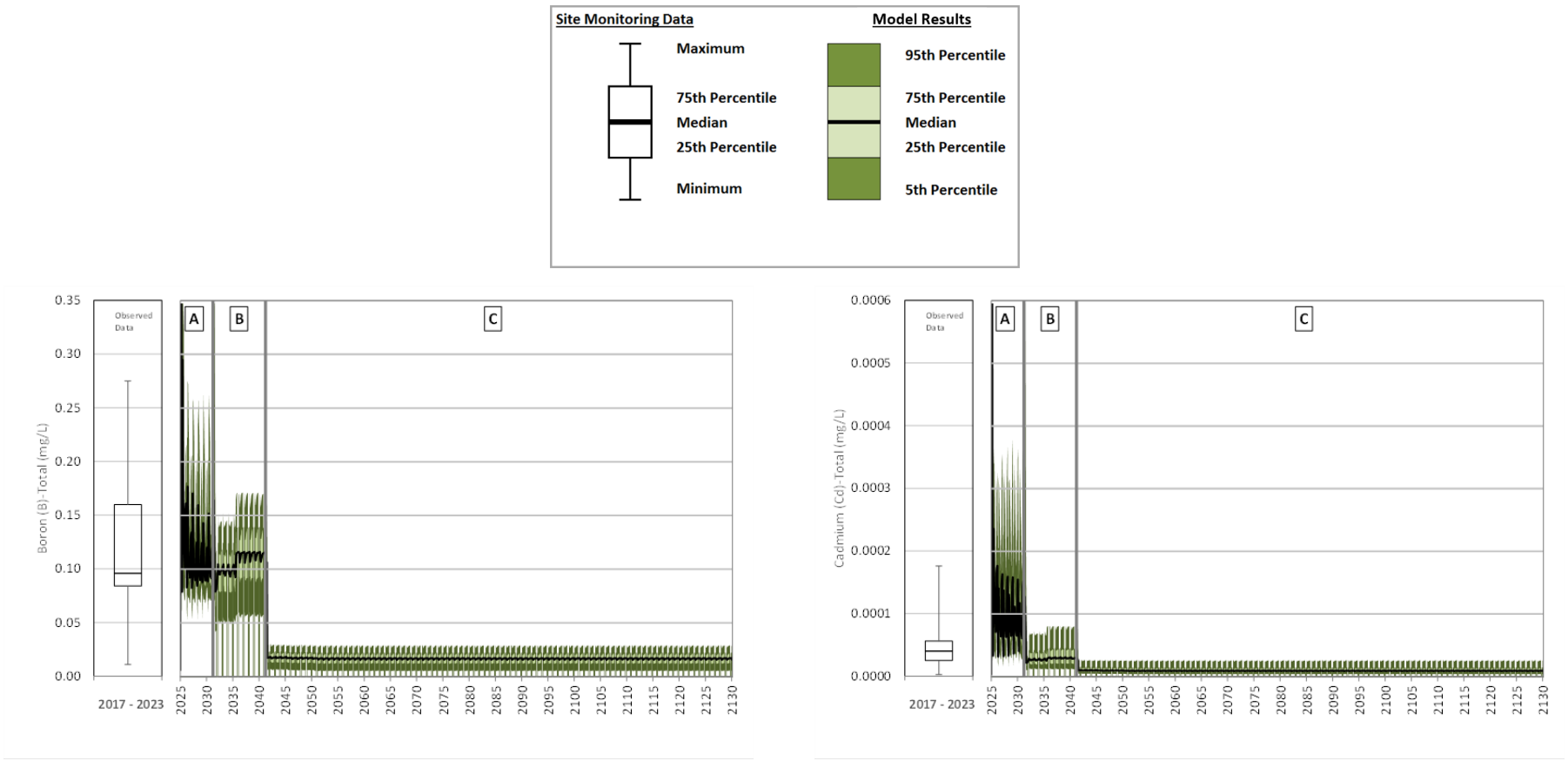
Figure B-120: Tailings Storage Facility Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

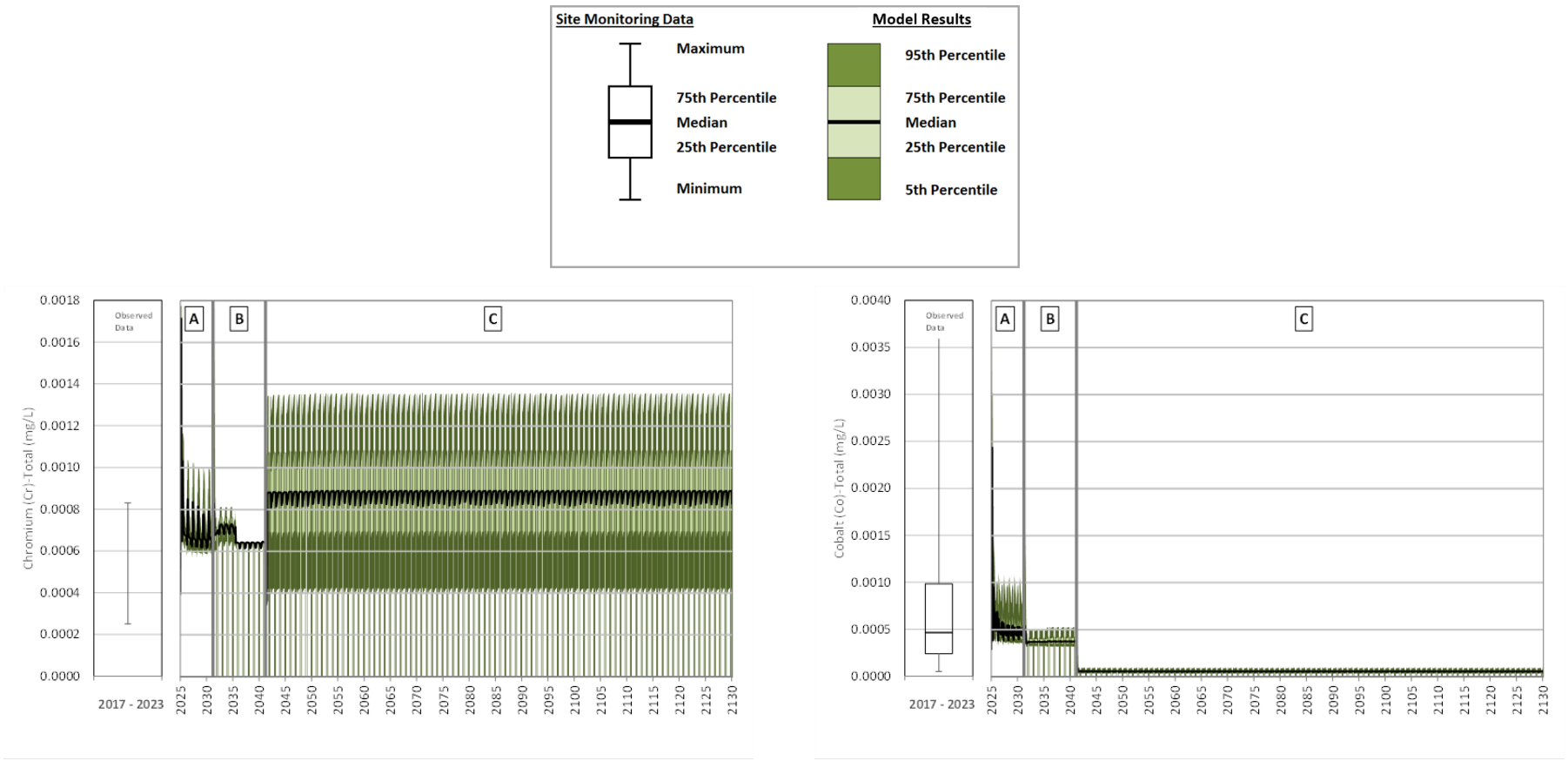
Figure B-121: Tailings Storage Facility Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

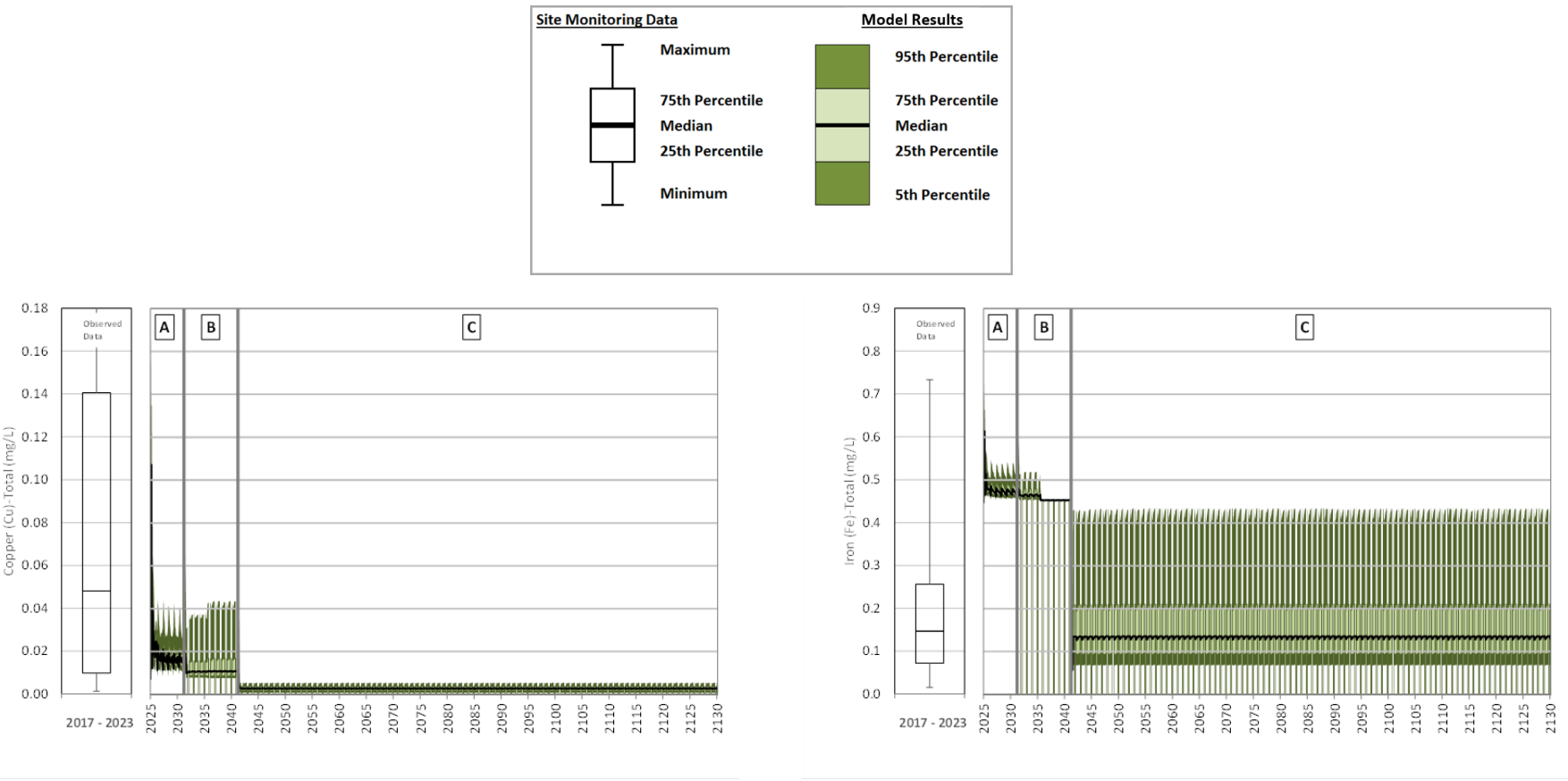
Figure B-122: Tailings Storage Facility Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Total chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the NAG waste rock and disturbed runoff water quality inputs. Total cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

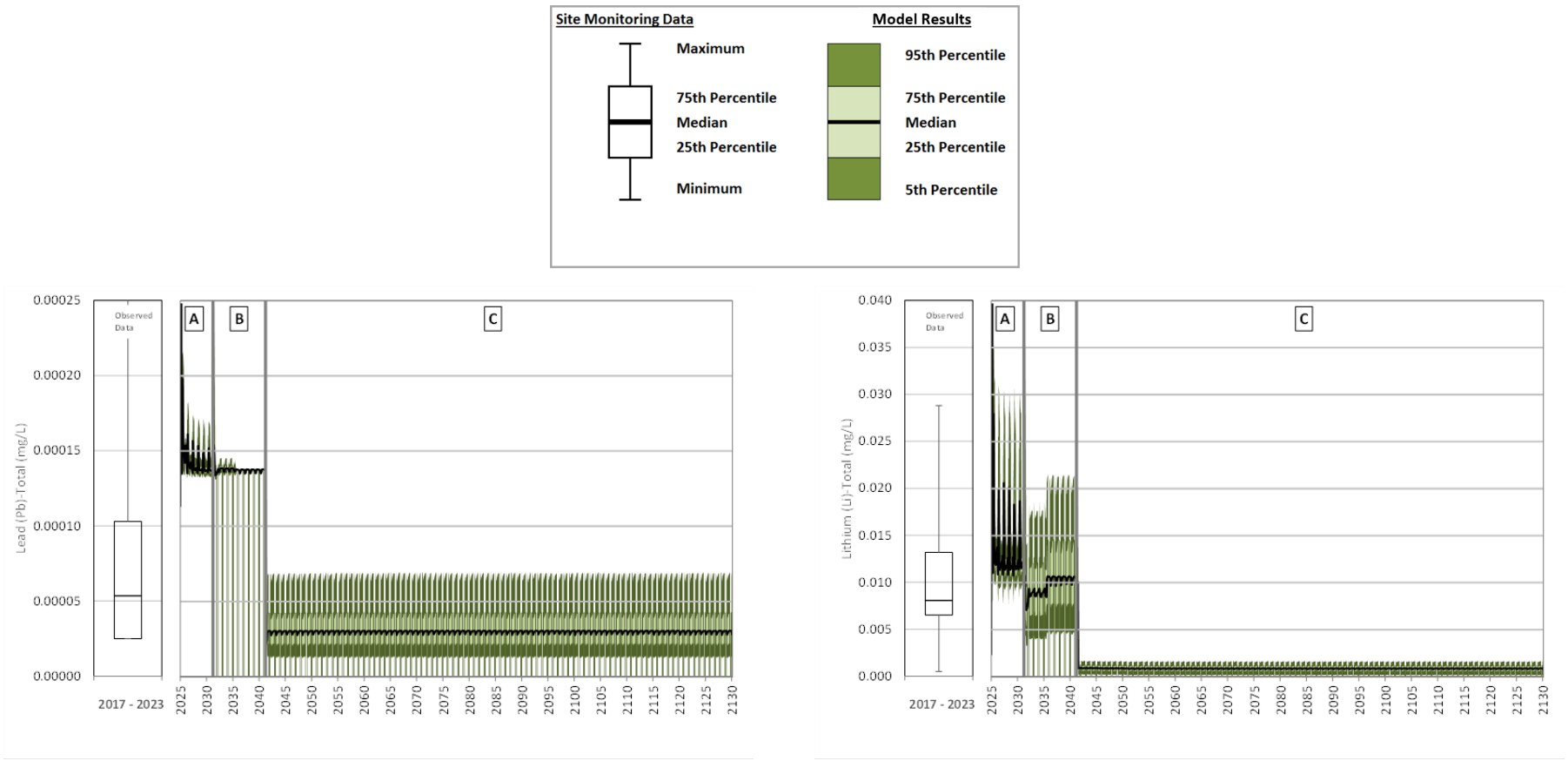
Figure B-123: Tailings Storage Facility Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

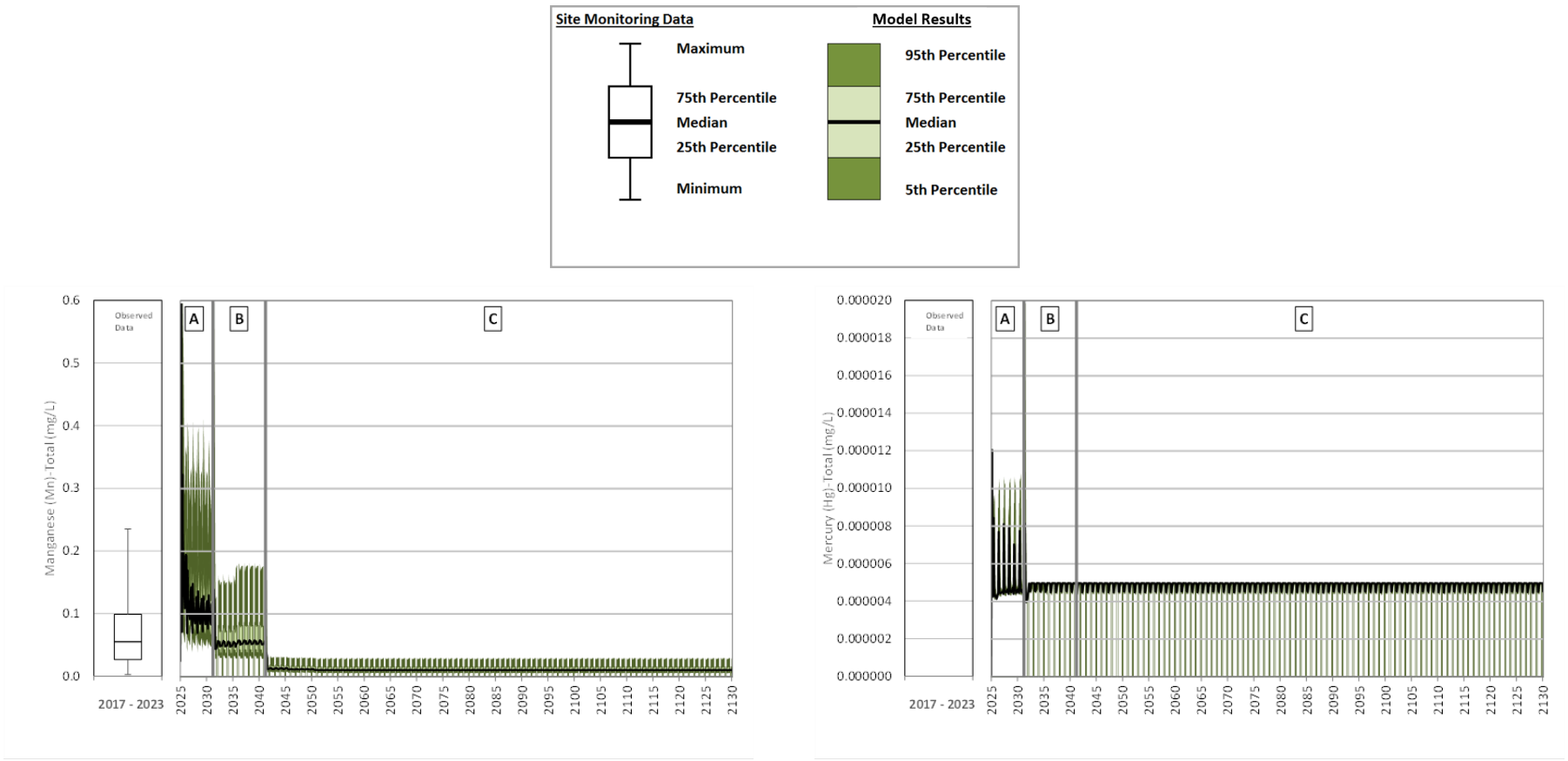
Figure B-124: Tailings Storage Facility Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: Total lead concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total lead than the NAG waste rock and disturbed runoff water quality inputs. The decrease in total lithium concentrations from 2031 to 2032 is due to the end of pumping from the mill processing plant to the Tailings Storage Facility (TSF). The increase in total lithium concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the TSF. Lower total lithium concentrations in the PETBP causes dilution of the total lithium concentrations in the TSF during operations. Total lithium concentrations decrease from closure to post-closure as runoff areas are remediated.

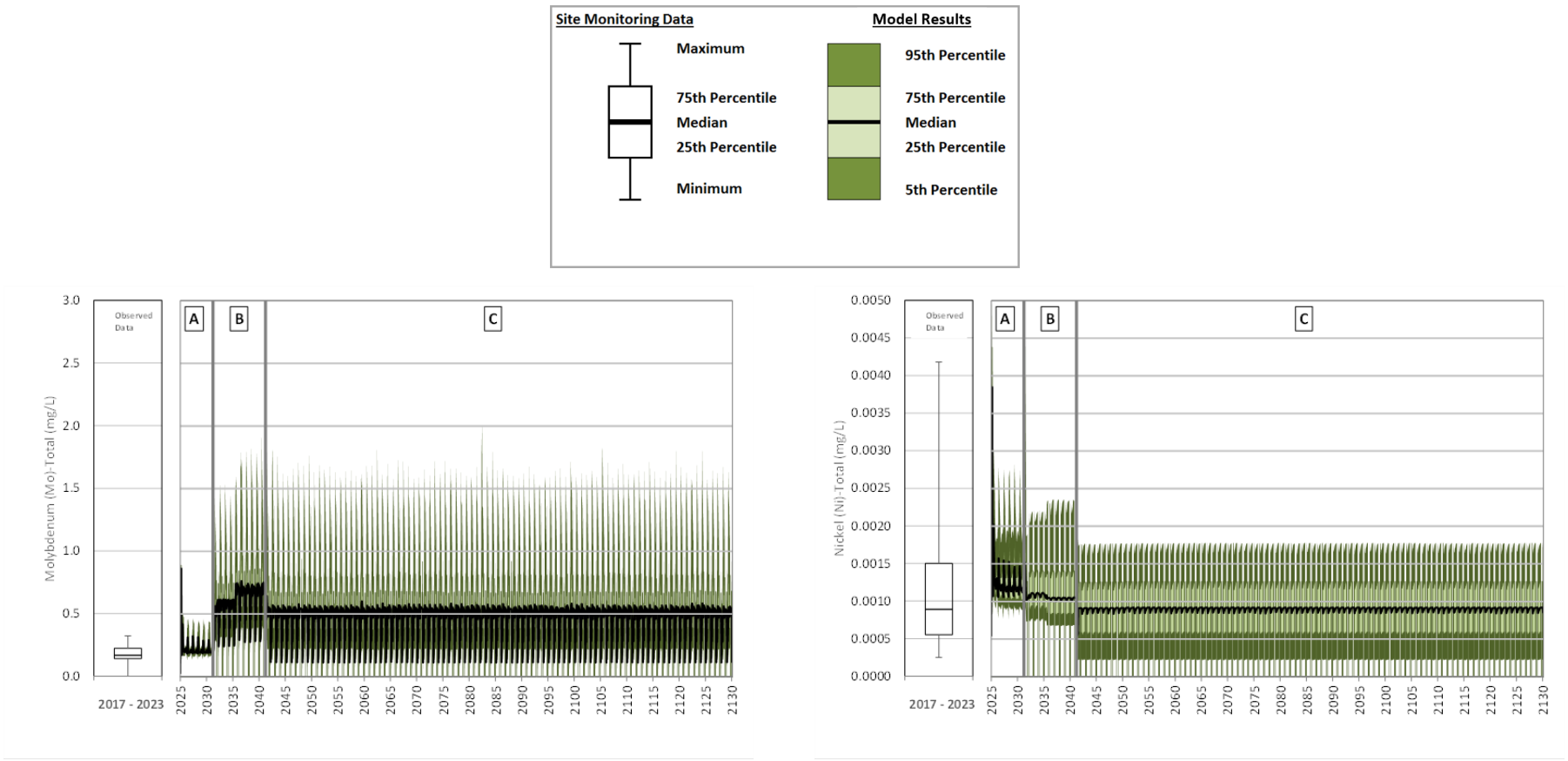
Figure B-125: Tailings Storage Facility Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

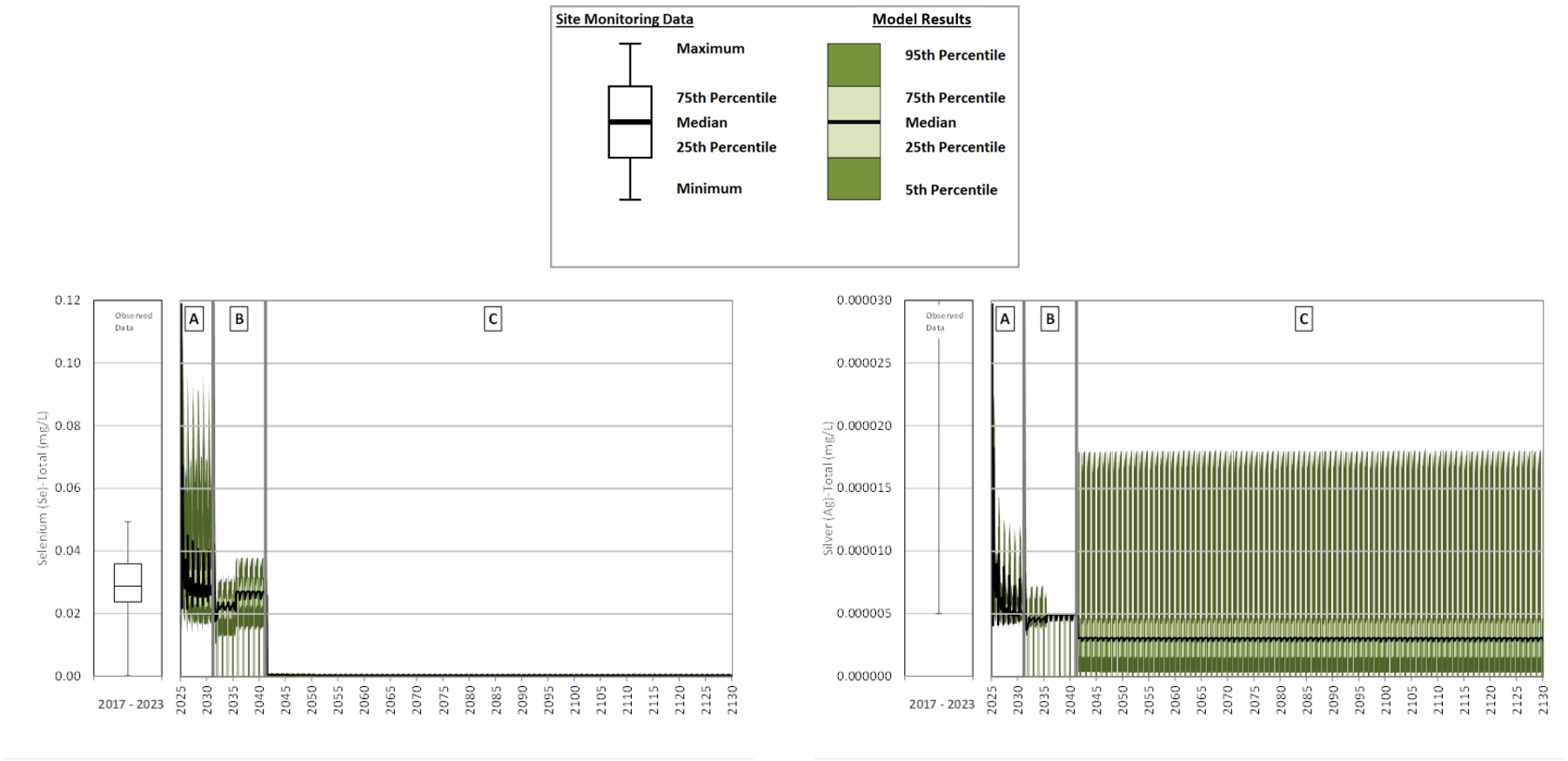
Figure B-126: Tailings Storage Facility Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: Total molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Total nickel concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the NAG waste rock and disturbed runoff water quality inputs.

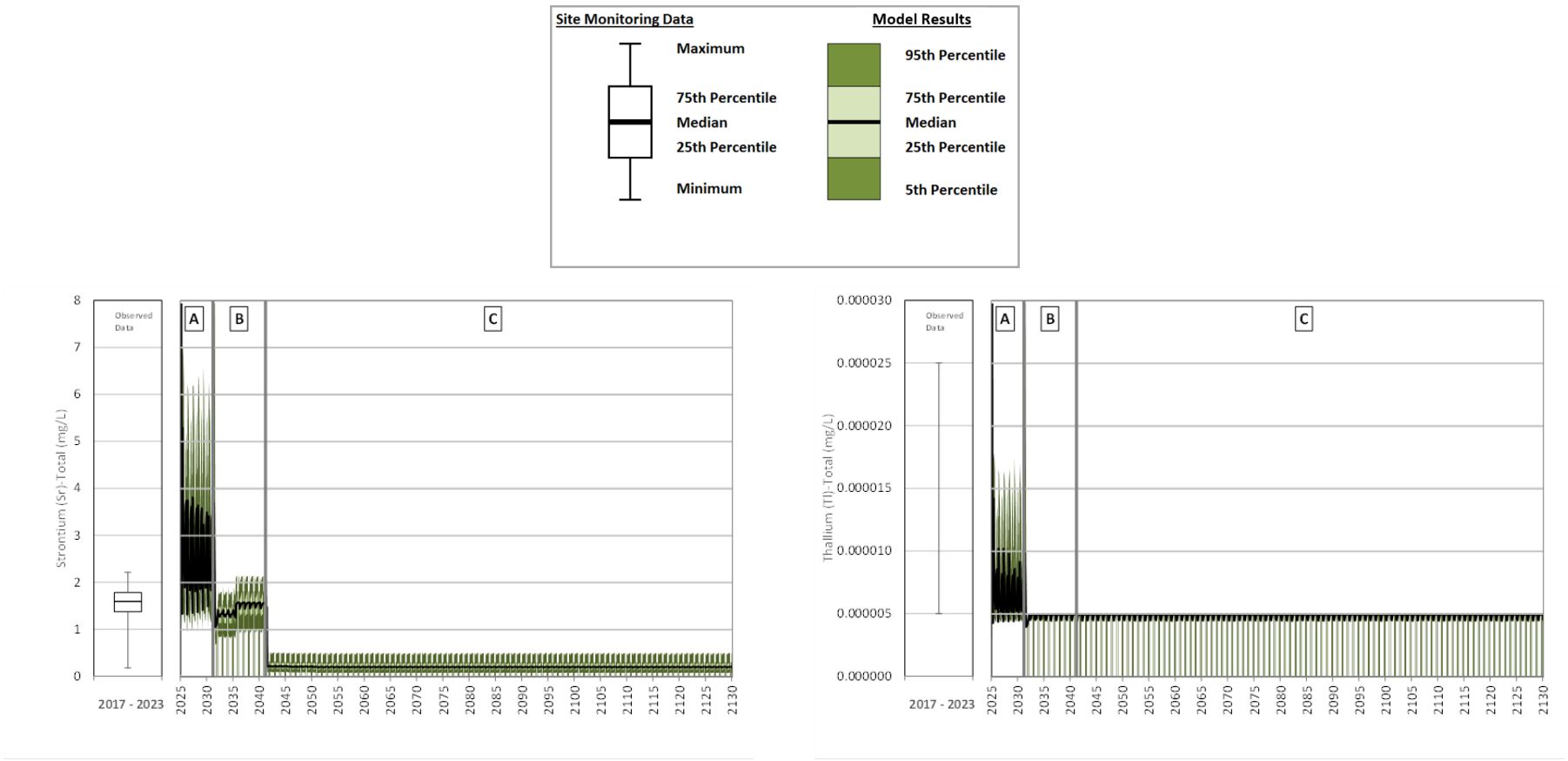
Figure B-127: Tailings Storage Facility Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: Total selenium concentrations decrease from closure to post-closure as runoff areas are remediated. Total silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the NAG waste rock and disturbed runoff water quality inputs.

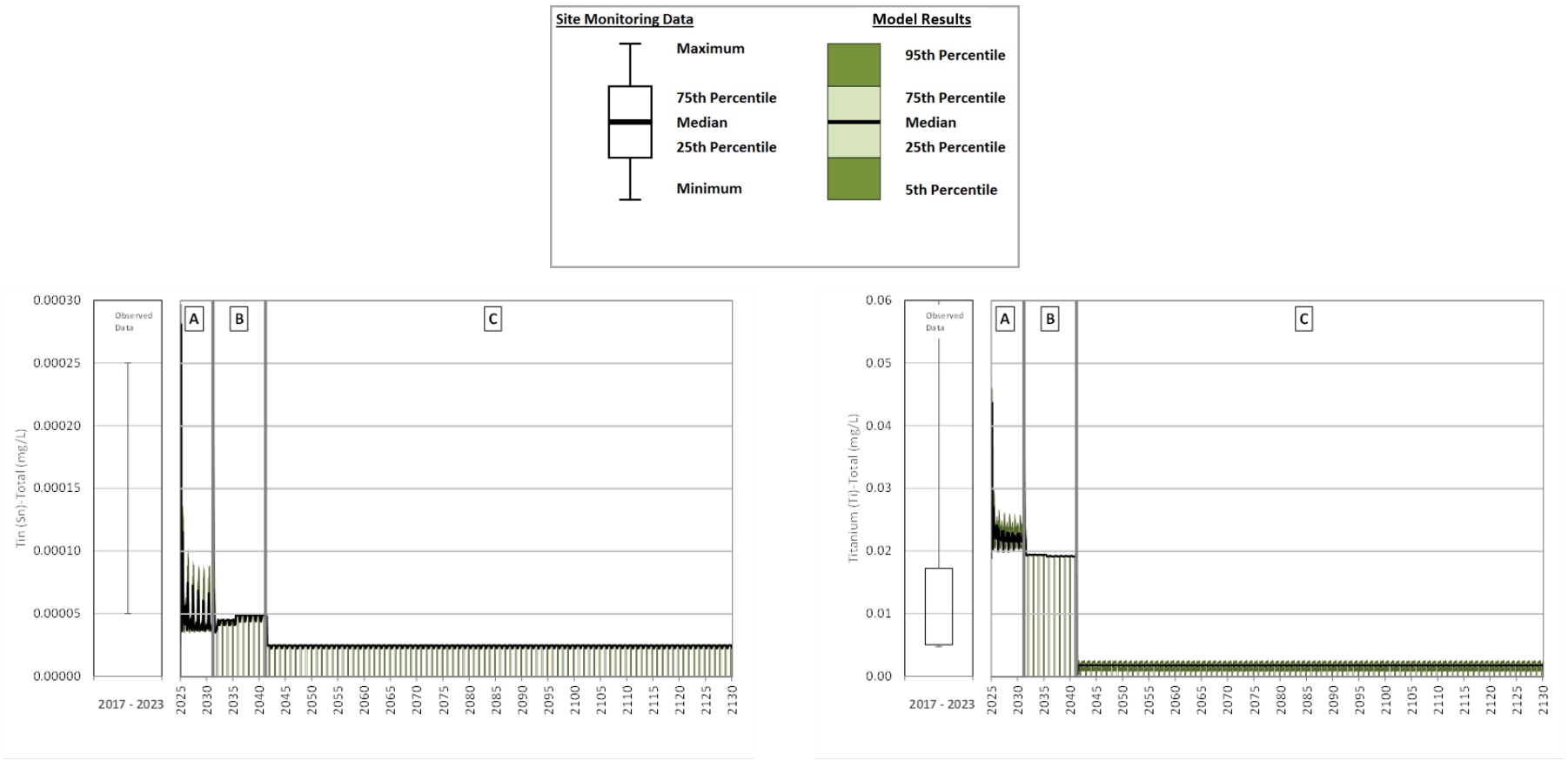
Figure B-128: Tailings Storage Facility Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

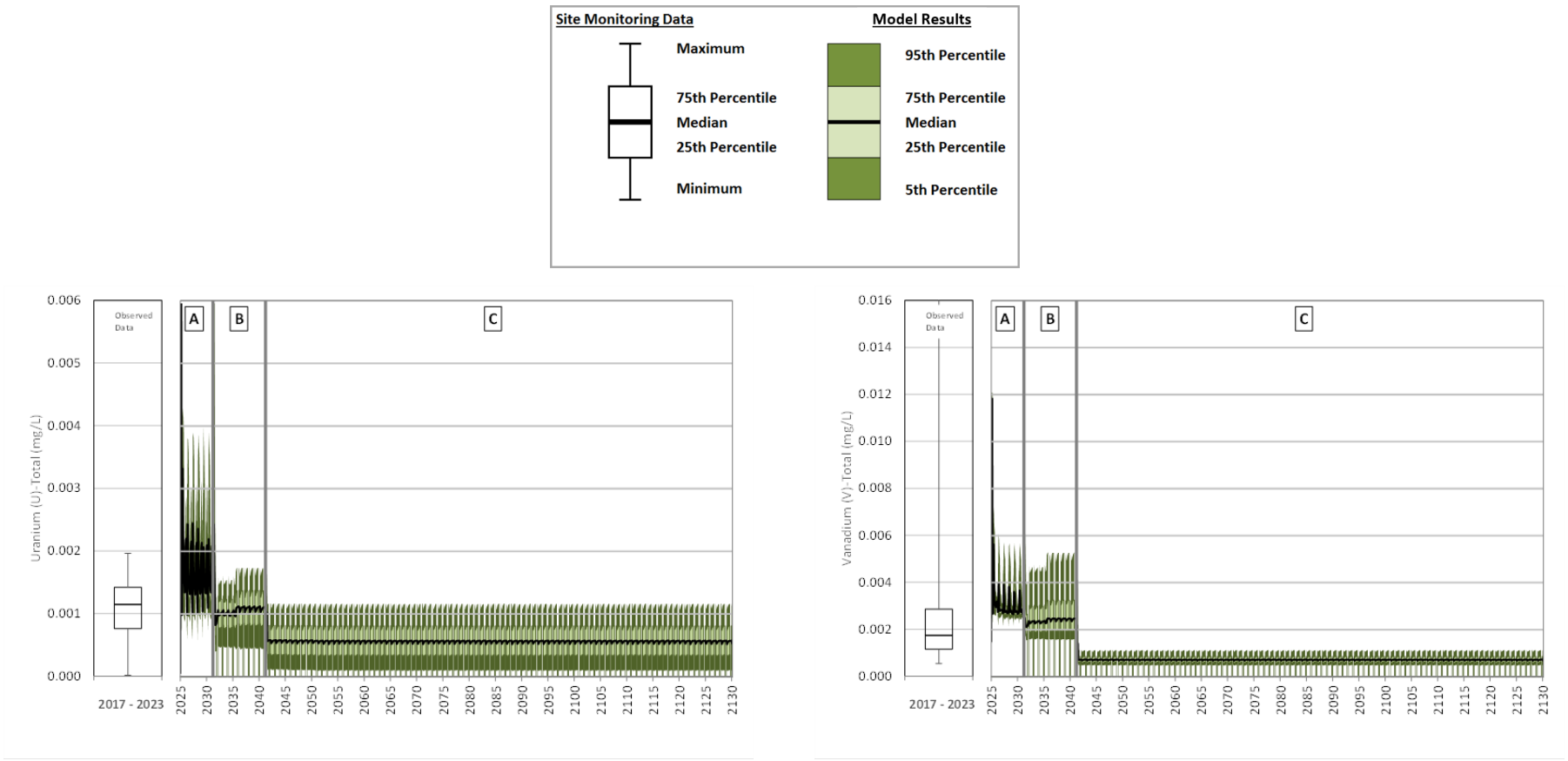
Figure B-129: Tailings Storage Facility Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The increase in total titanium concentrations during closure is caused by the end of pumping from the Perimeter Embankment Till Borrow Pond (PETBP) to the Tailings Storage Facility (TSF). Lower total titanium concentrations in the PETBP causes dilution of the total titanium concentrations in the TSF during operations. Total titanium concentrations decrease from closure to post-closure as runoff areas are remediated.

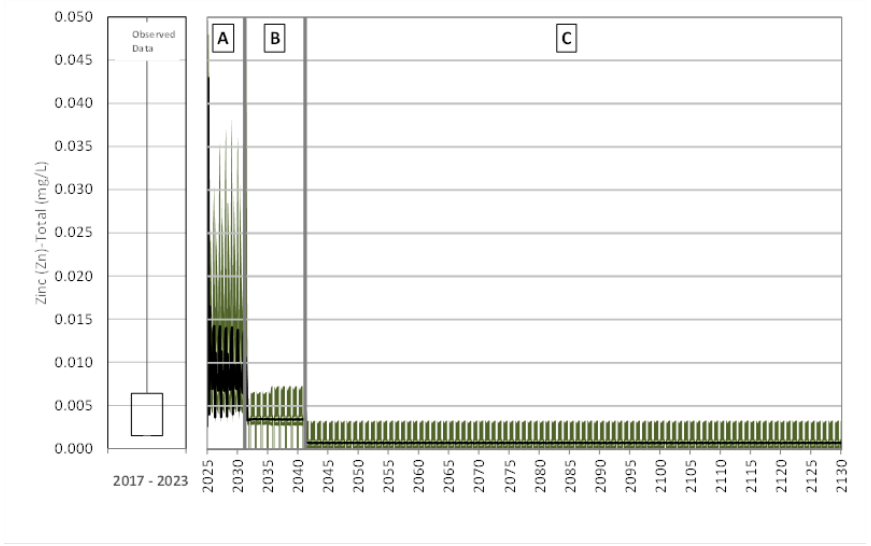
Figure B-130: Tailings Storage Facility Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-131: Tailings Storage Facility Operations, Closure and Post-closure – Total Uranium and Total Vanadium

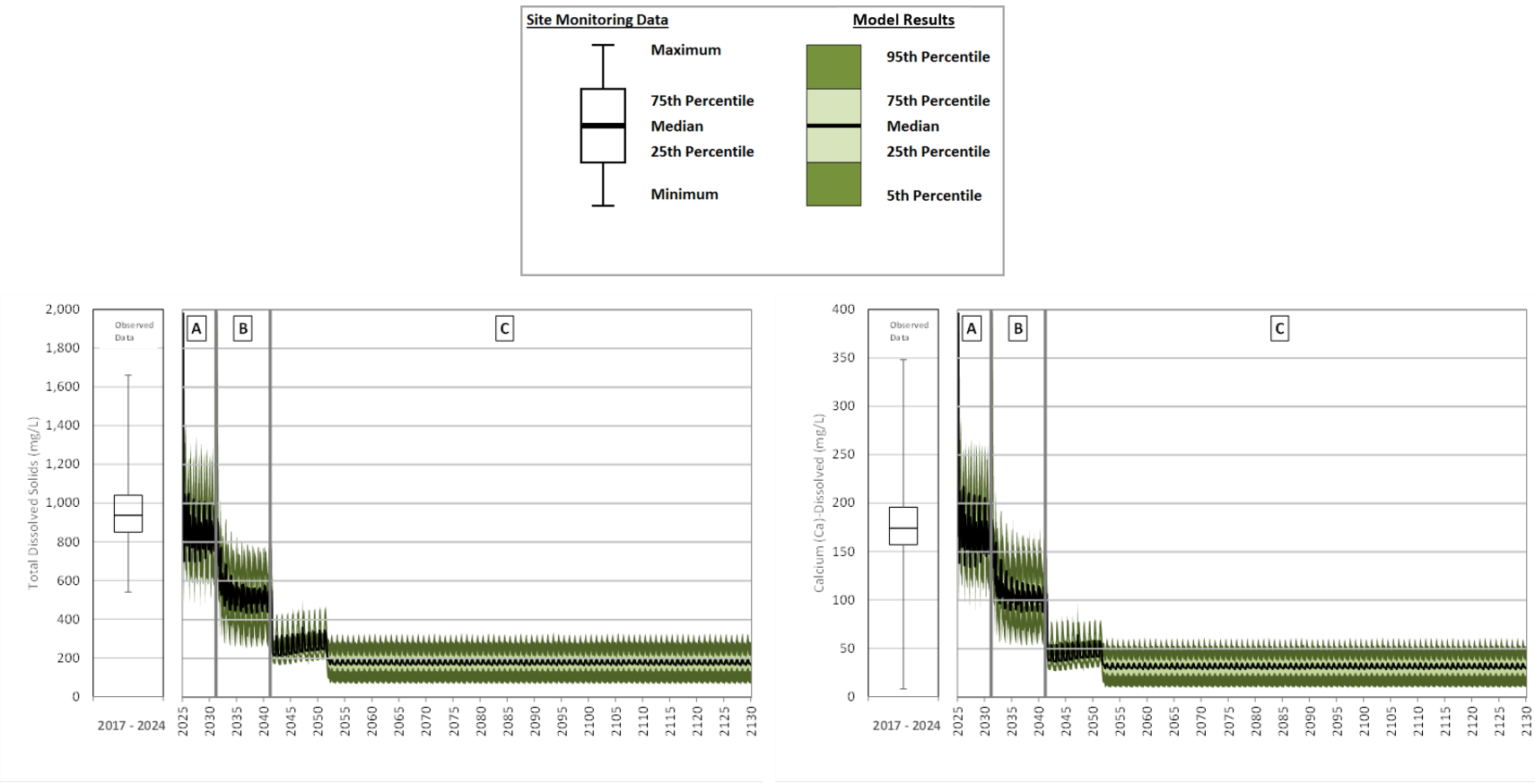


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-132: Tailings Storage Facility Operations, Closure and Post-closure – Total Zinc

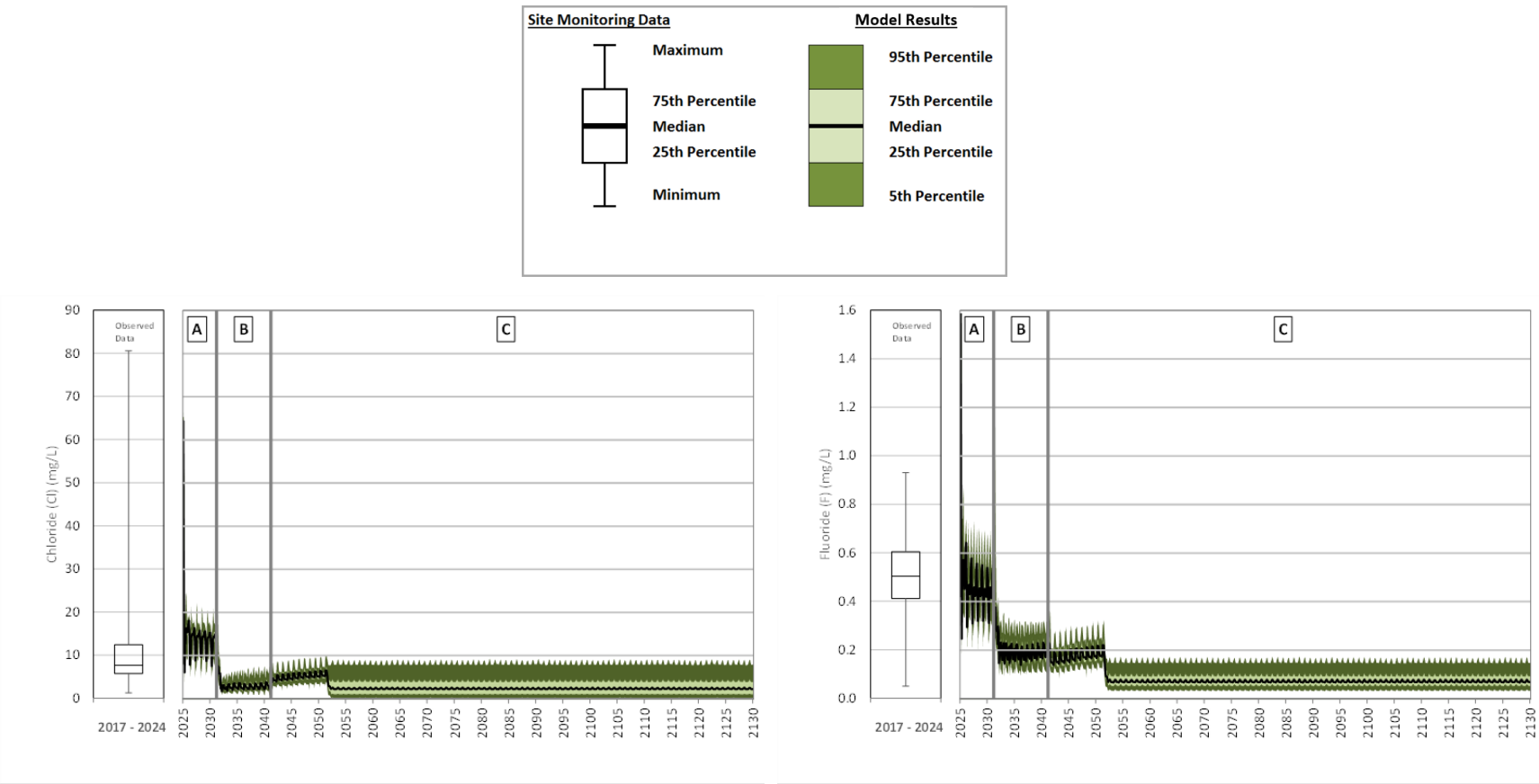
Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

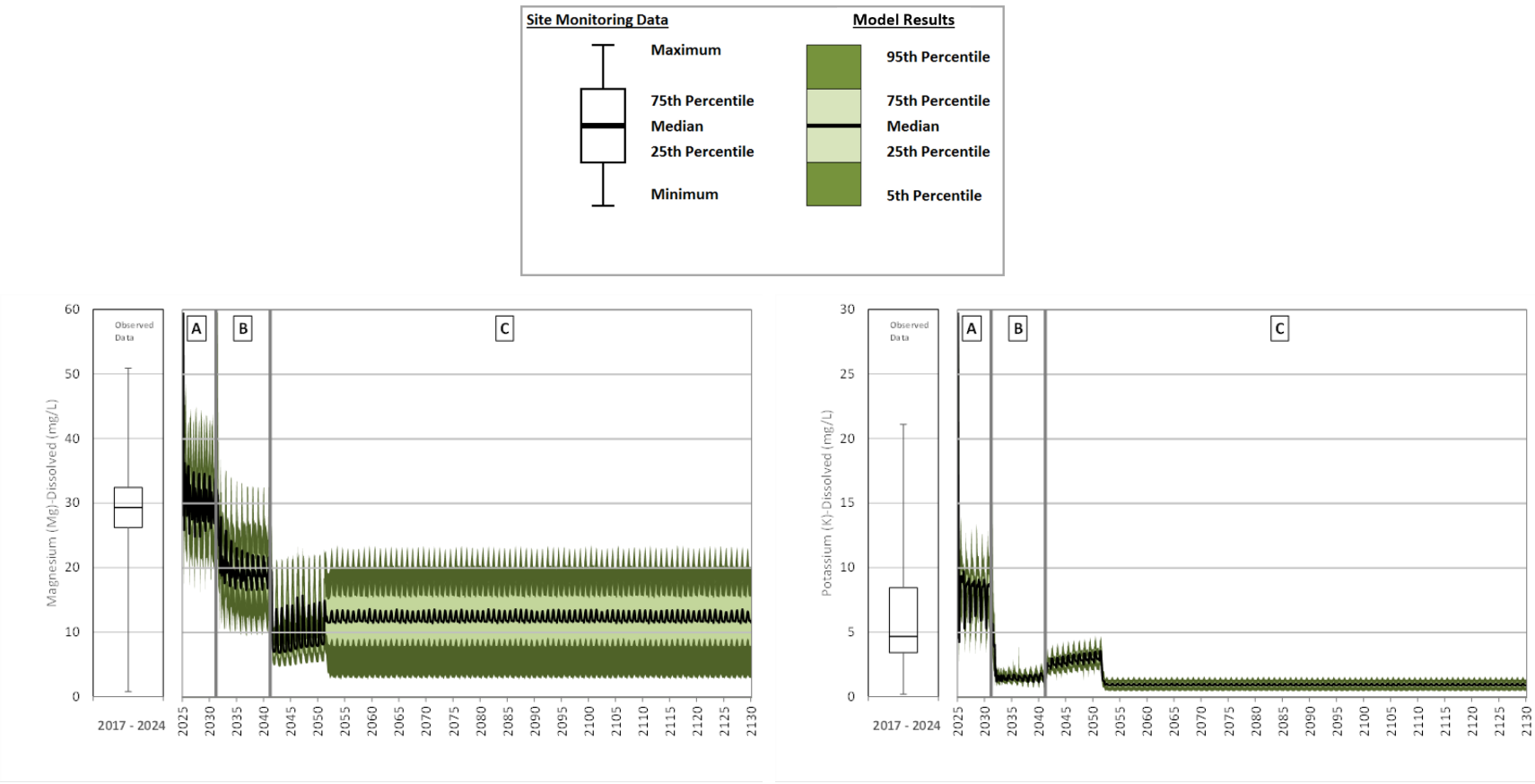
Figure B-133: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

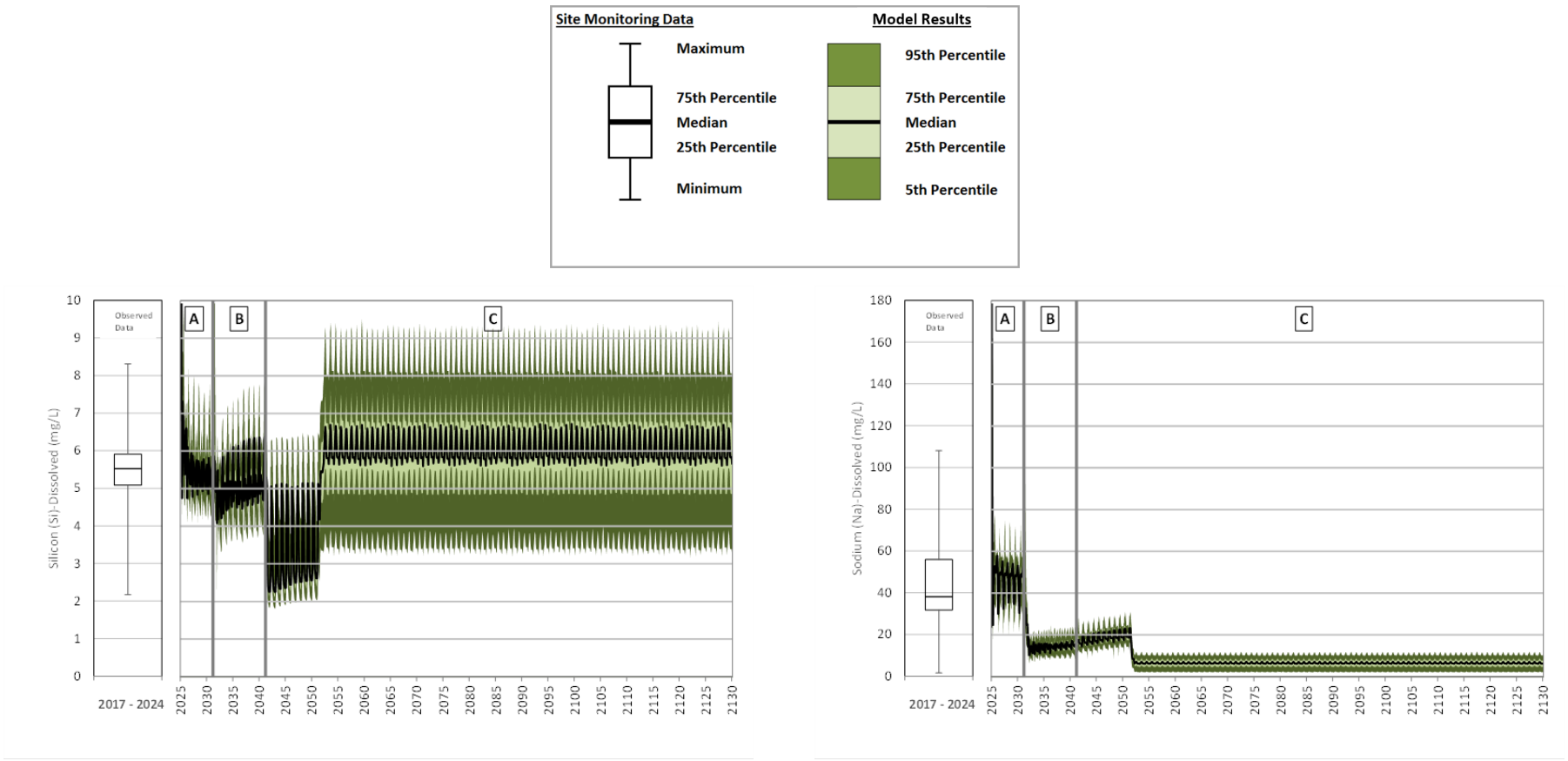
Figure B-134: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

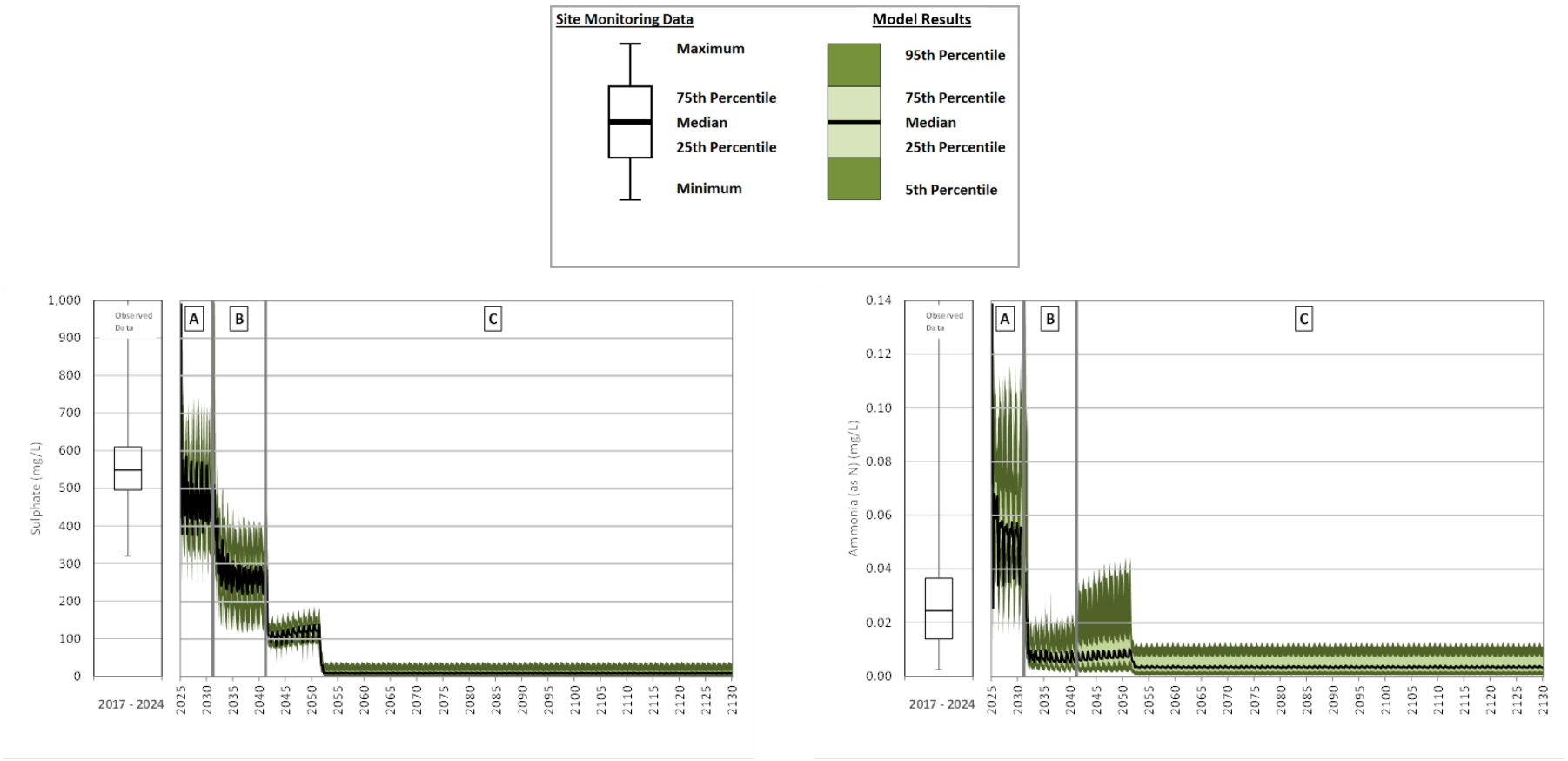
Figure B-135: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The increase in silicon concentrations from operations to closure and post-closure is caused by runoff from areas being reclaimed and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum silicon concentrations than the disturbed water quality input. Sodium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in sodium concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

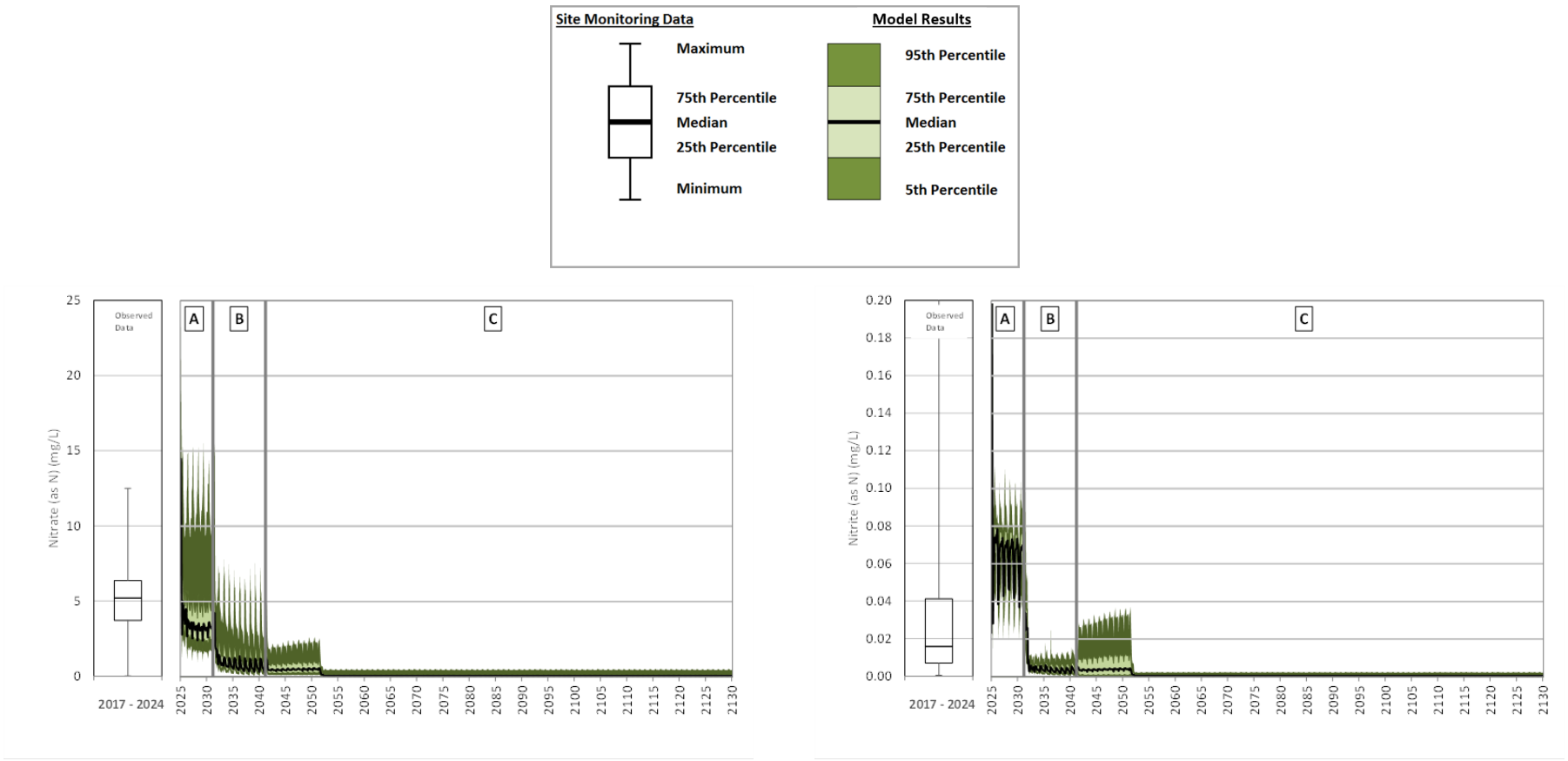
Figure B-136: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

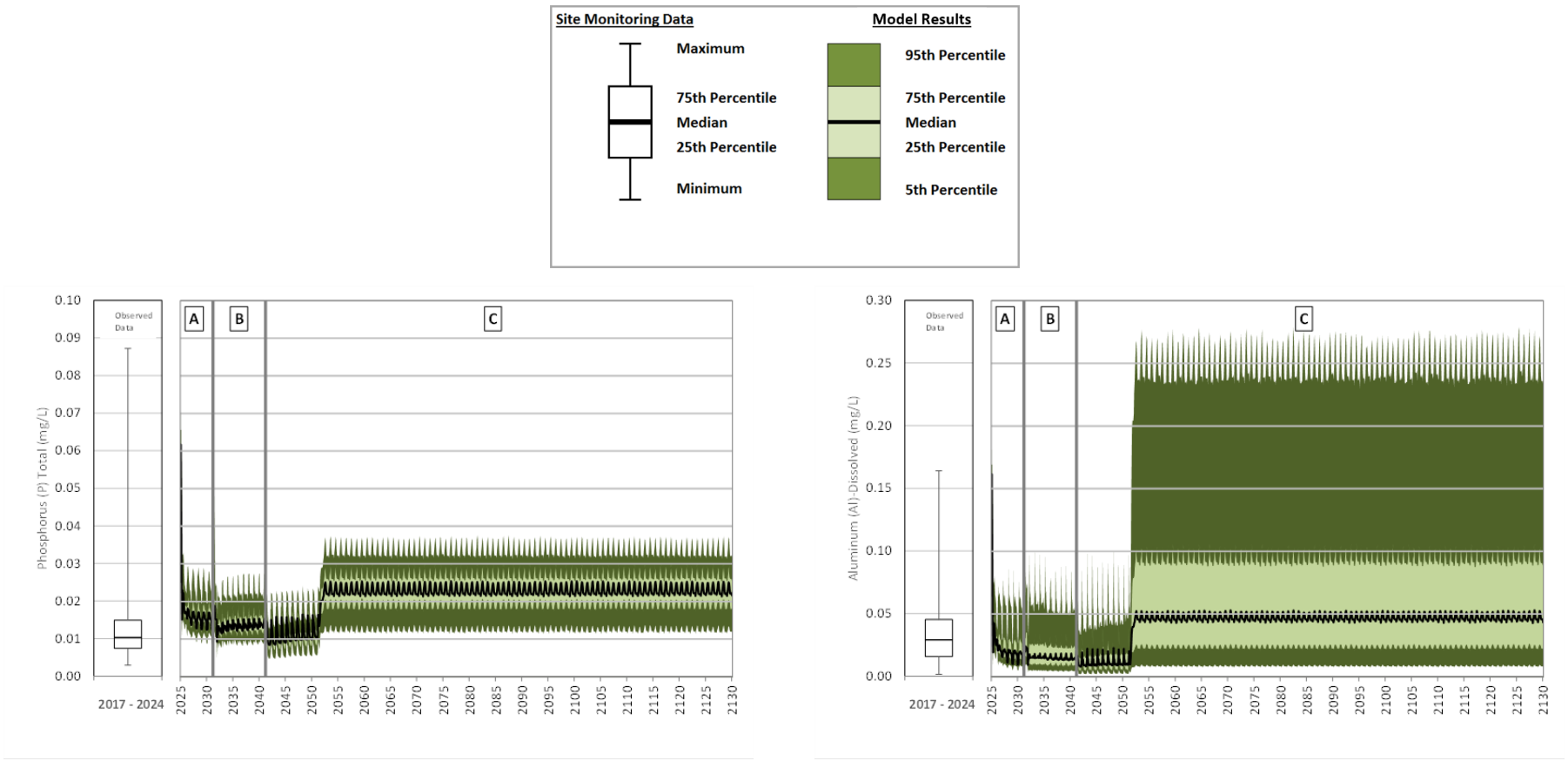
Figure B-137: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

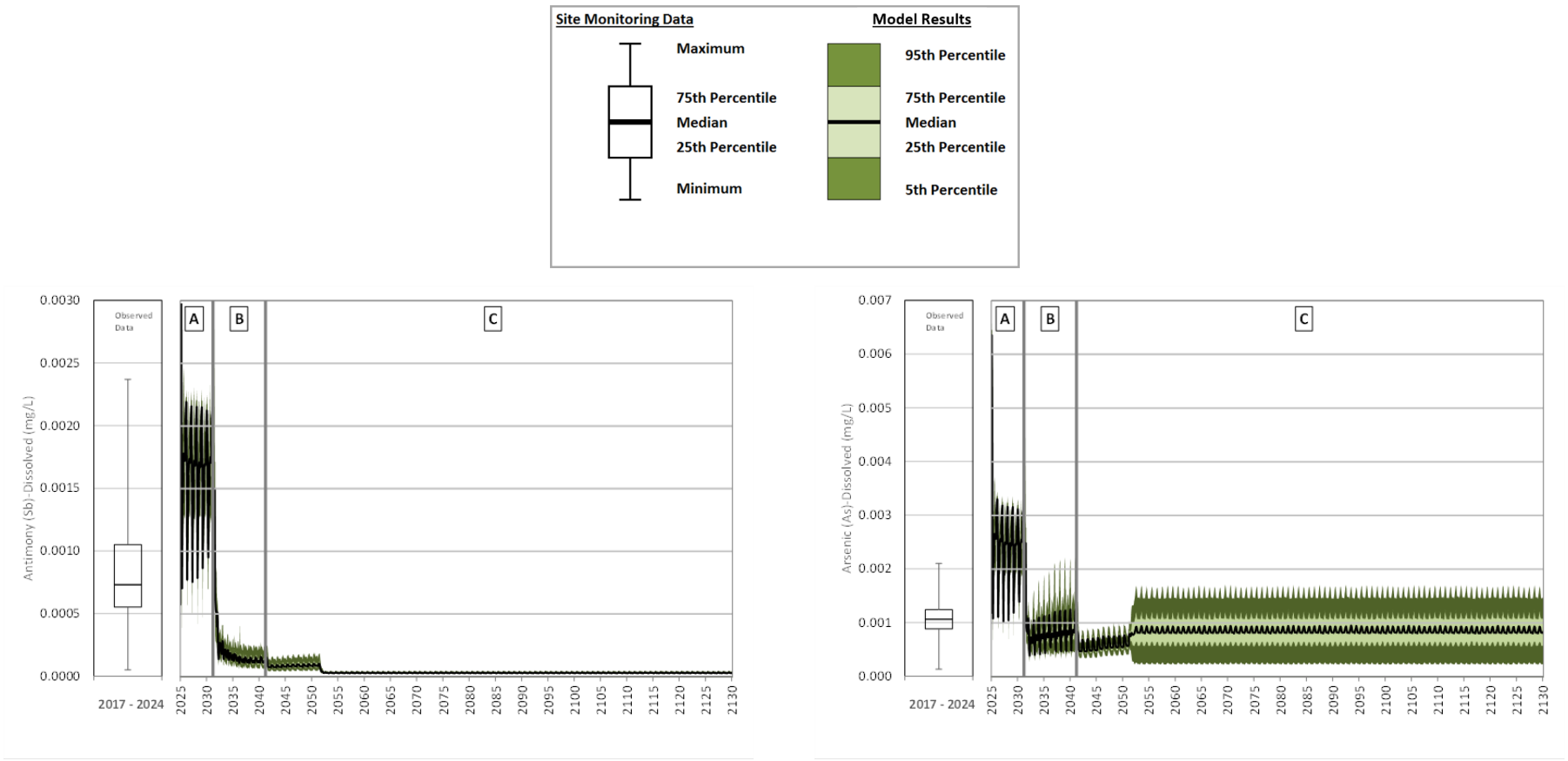
Figure B-138: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus and dissolved aluminum concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the NAG waste rock and disturbed runoff water quality inputs.

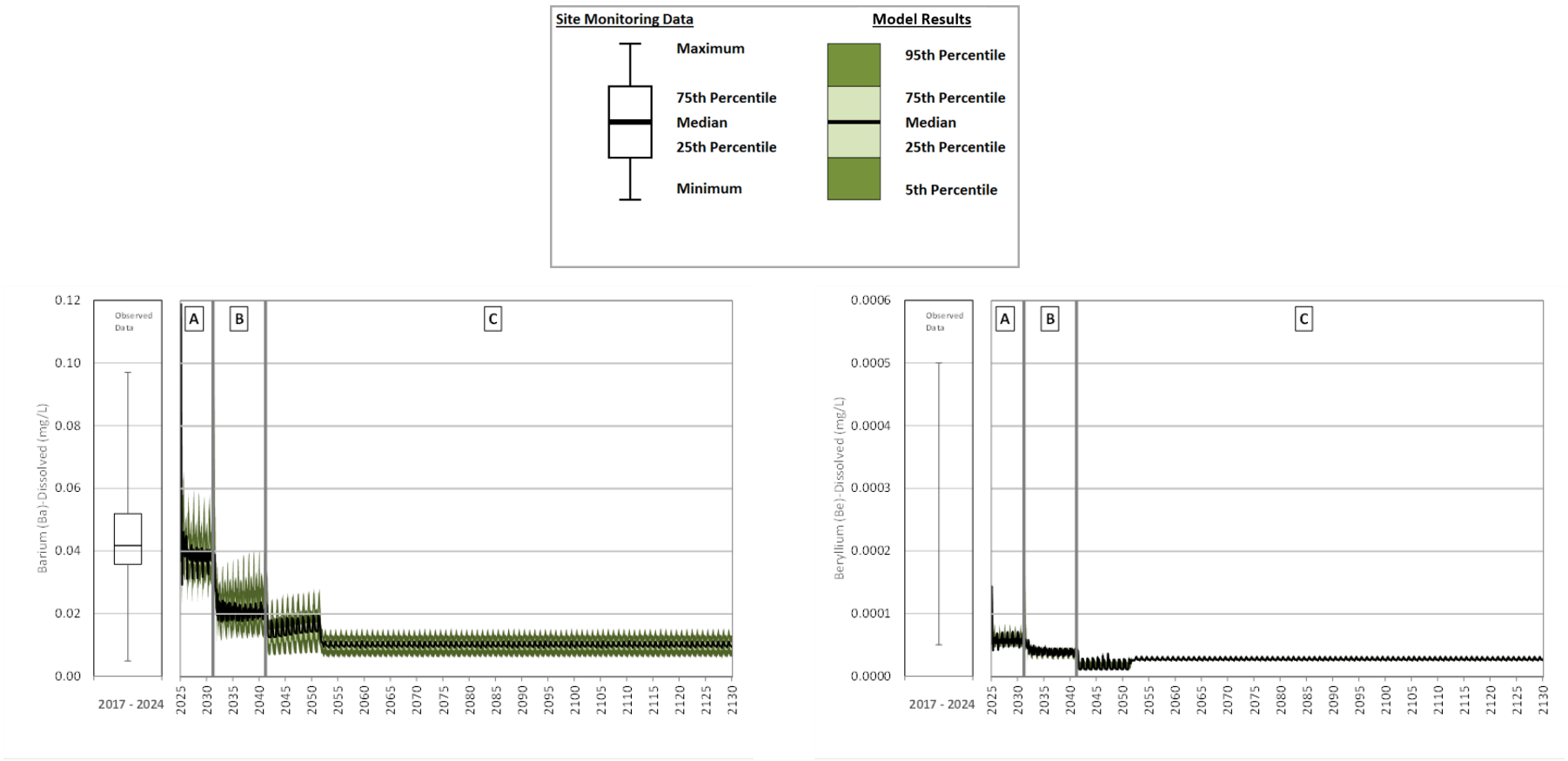
Figure B-139: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

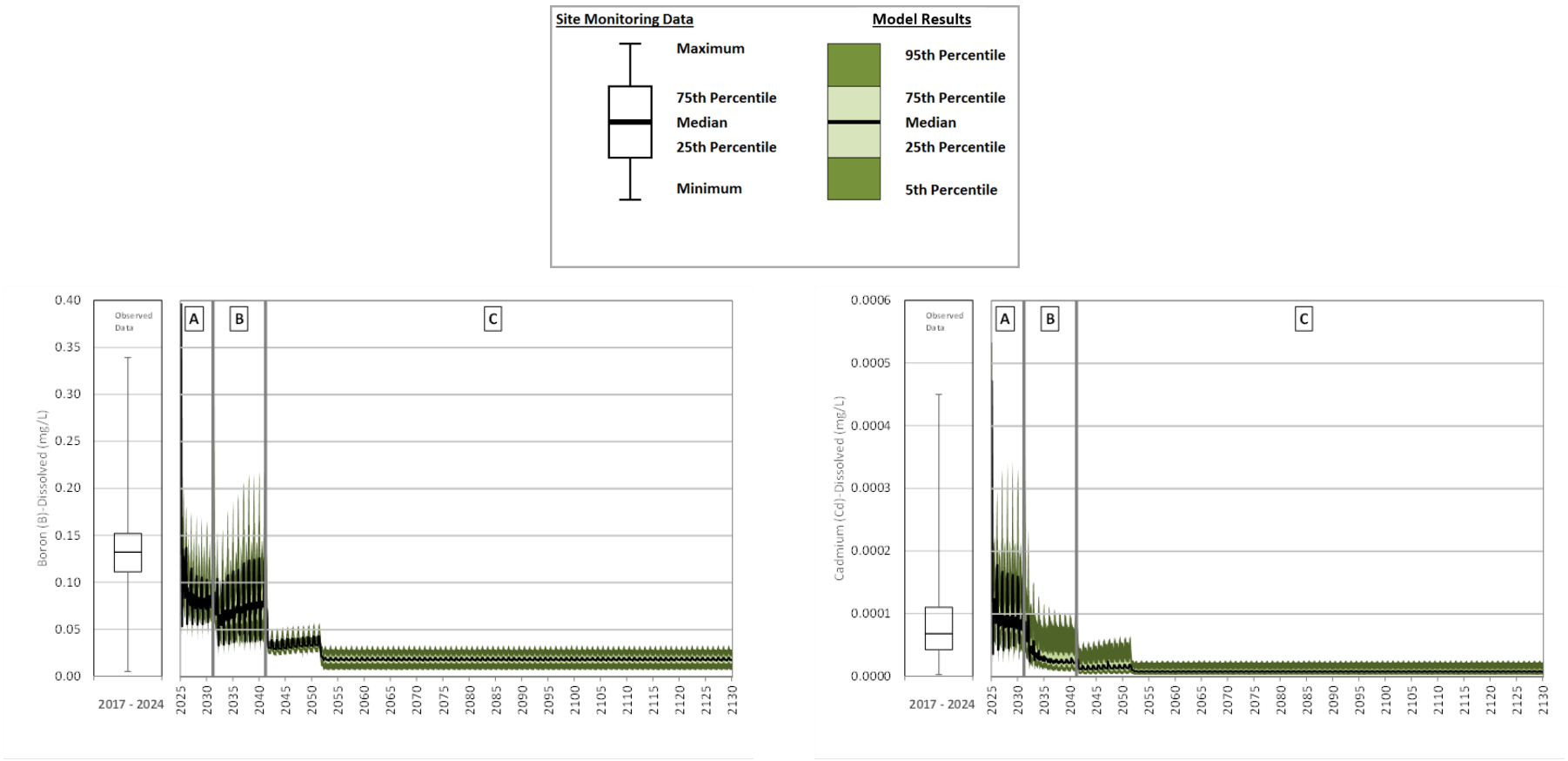
Figure B-140: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

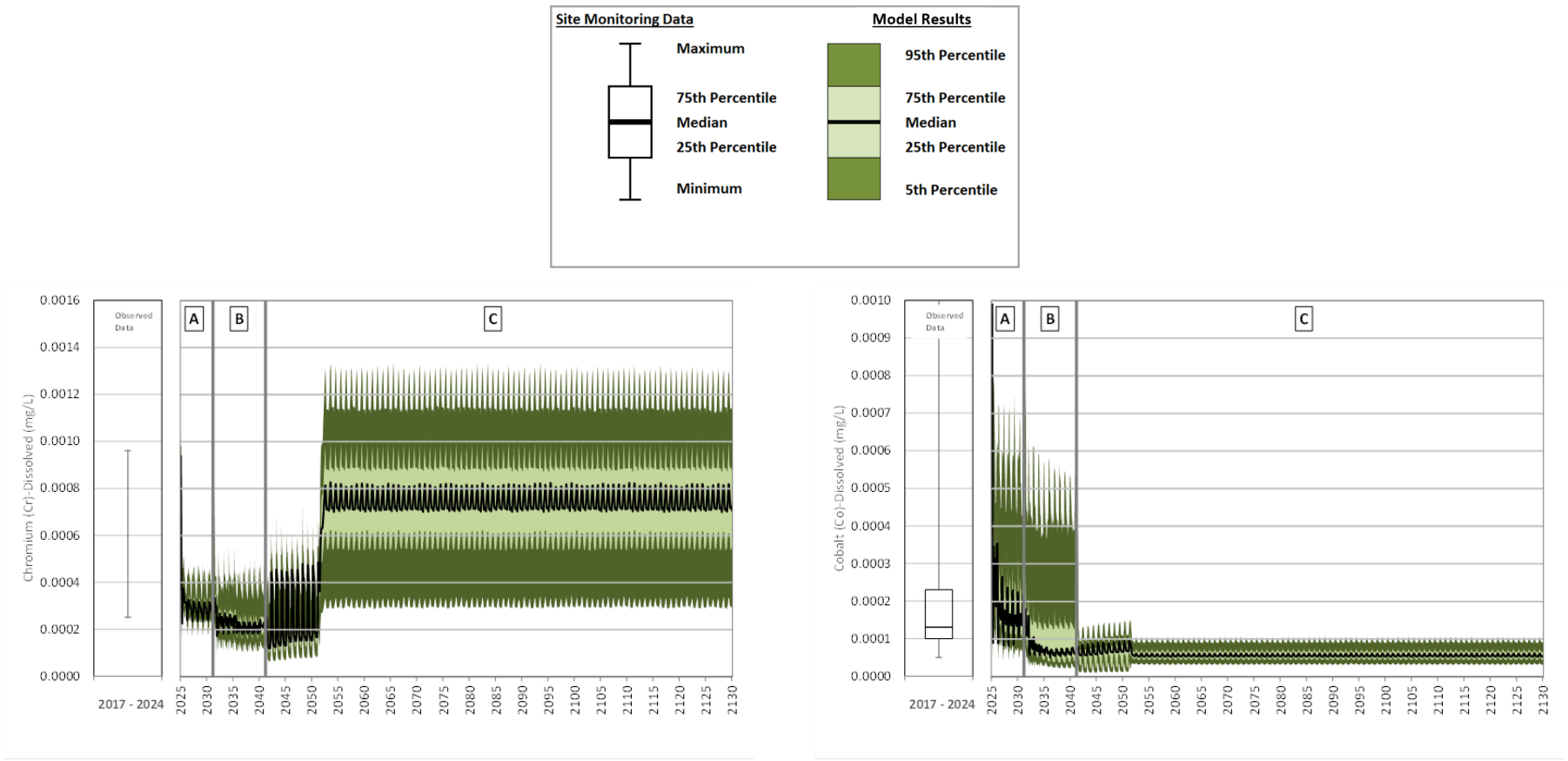
Figure B-141: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

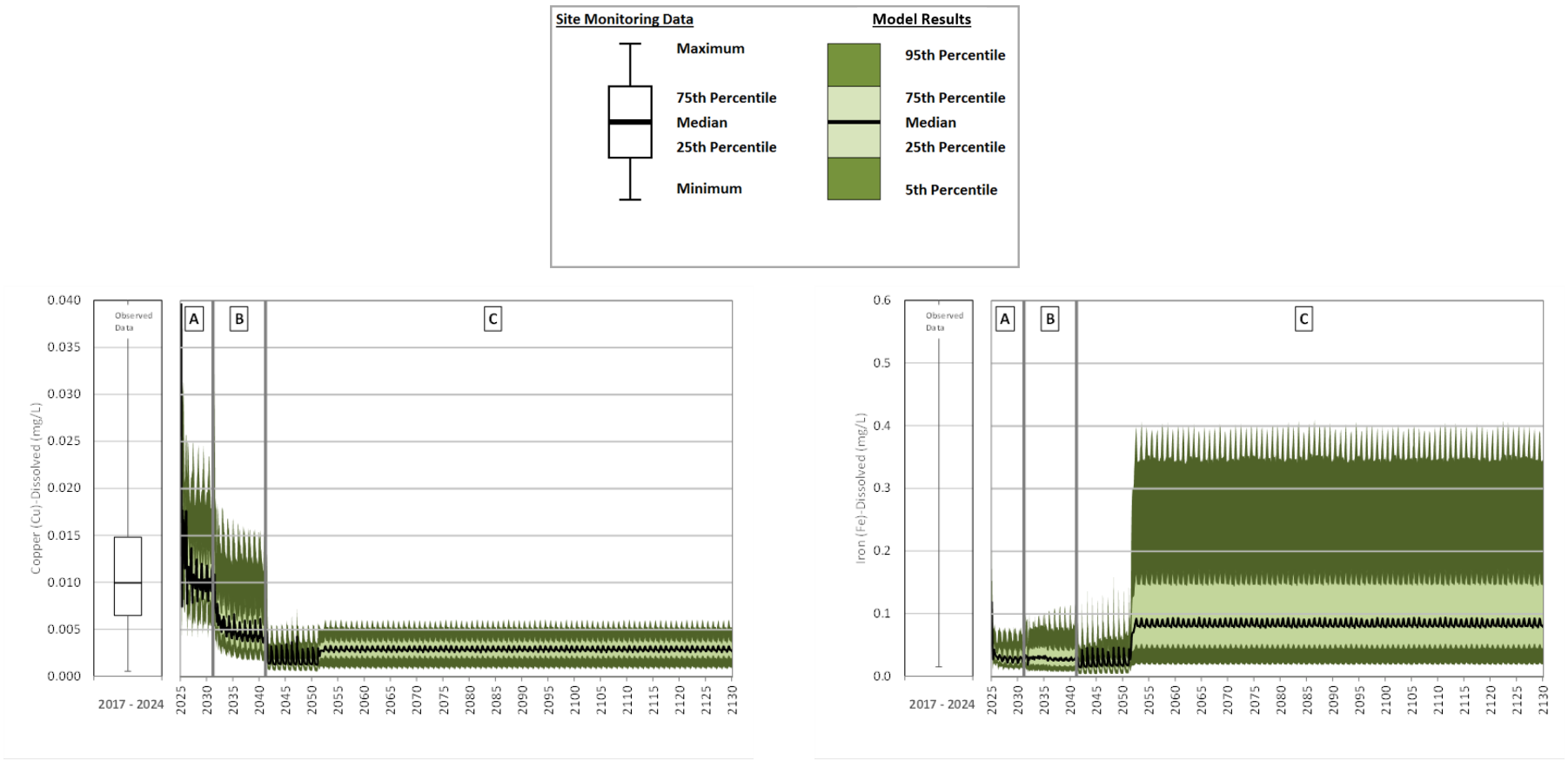
Figure B-142: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in dissolved cobalt concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

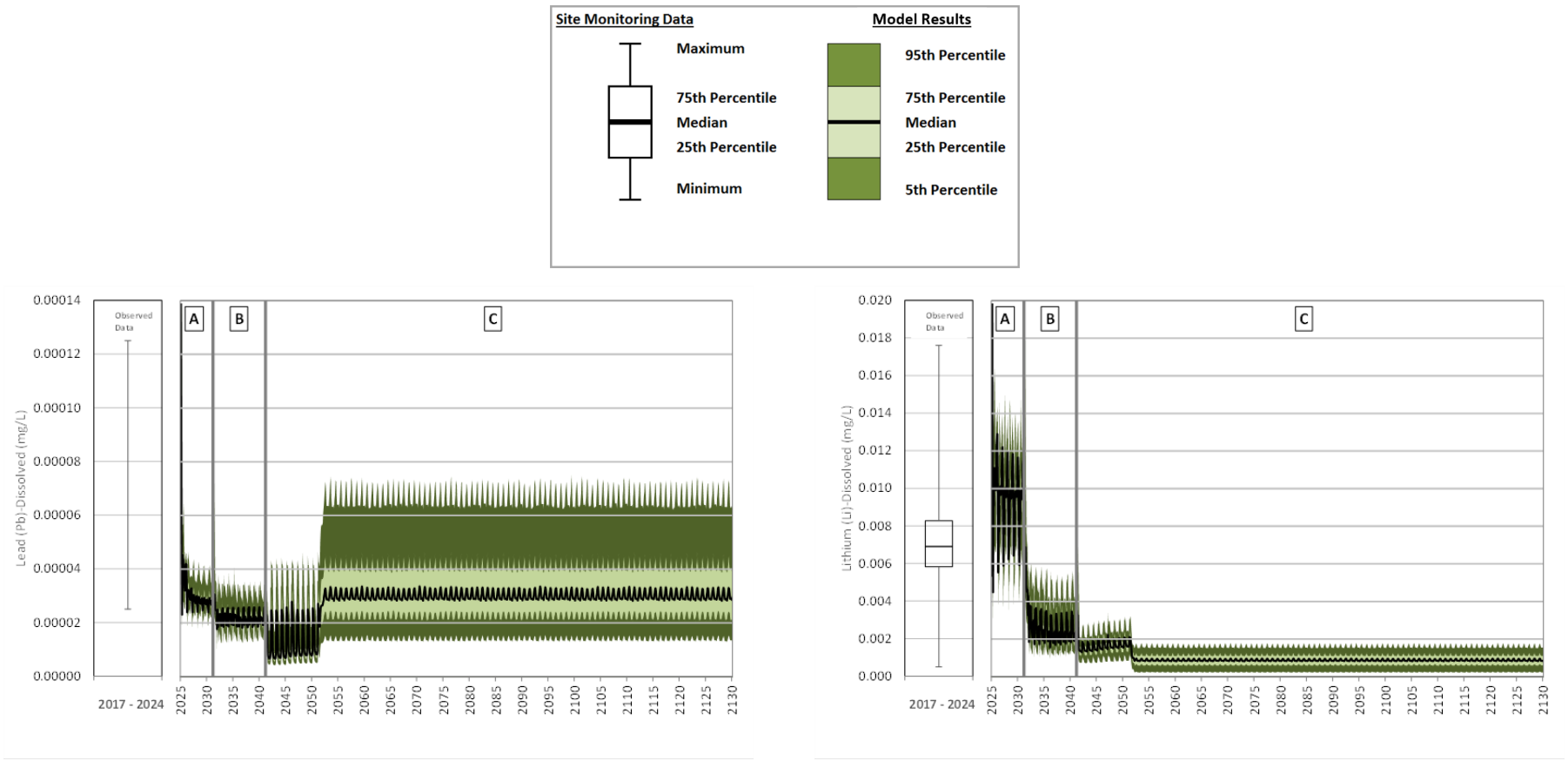
Figure B-143: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Dissolved copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved iron concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for dissolved iron than the NAG waste rock and disturbed runoff water quality inputs.

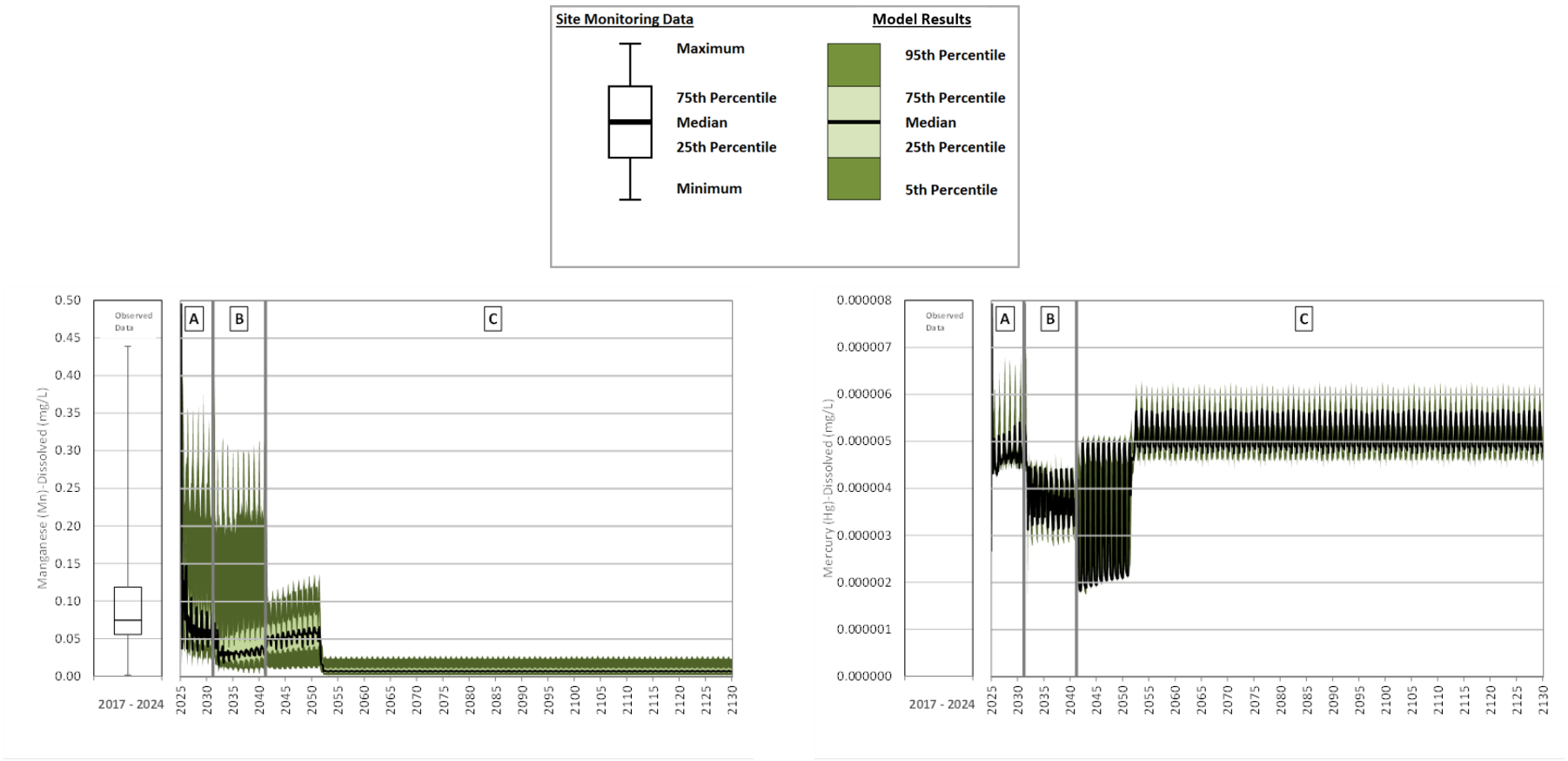
Figure B-144: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Dissolved lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in dissolved lithium concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

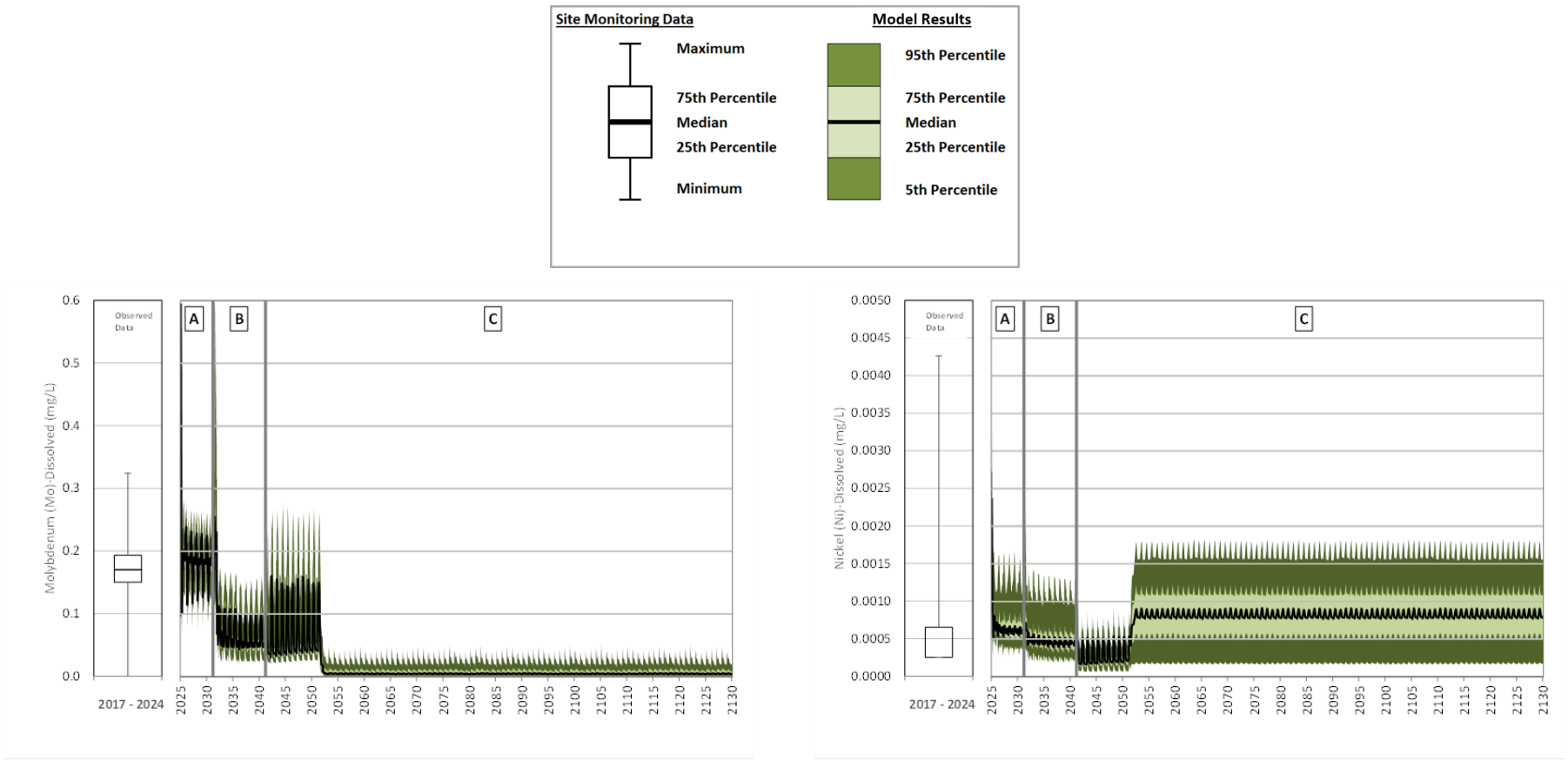
Figure B-145: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

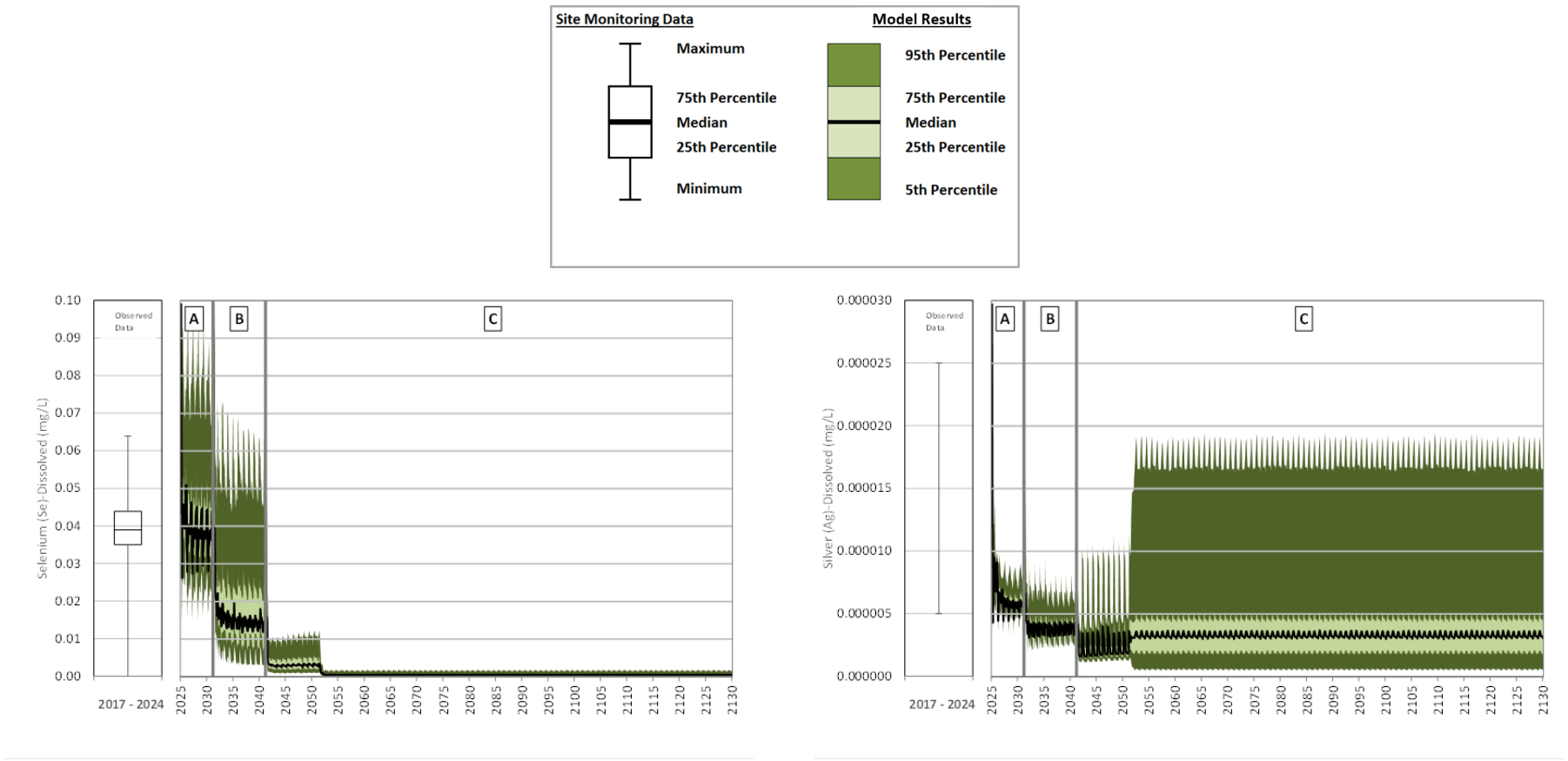
Figure B-146: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved nickel concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs. The increase in dissolved molybdenum concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

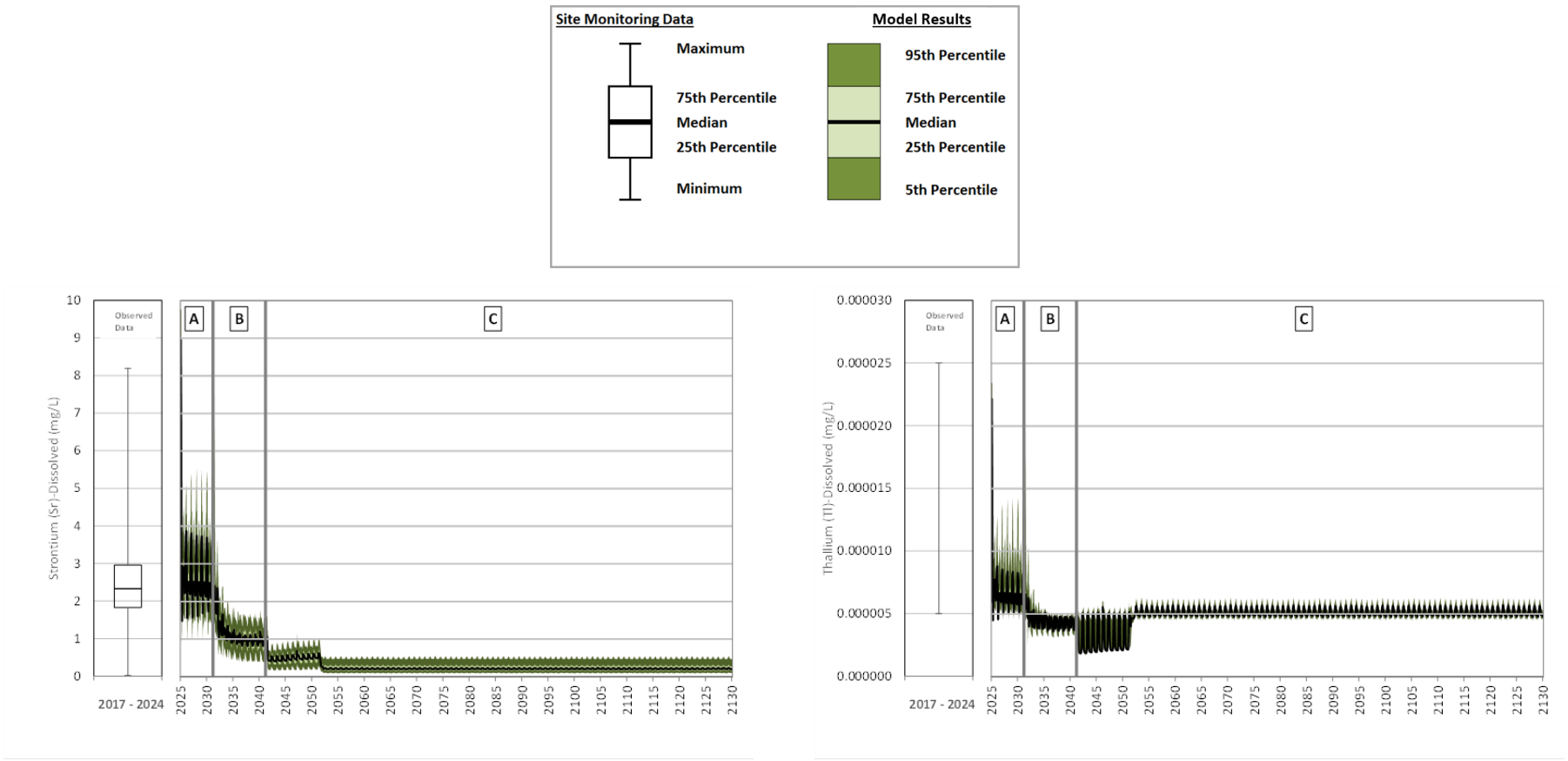
Figure B-147: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved silver concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs. The increase in dissolved selenium concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

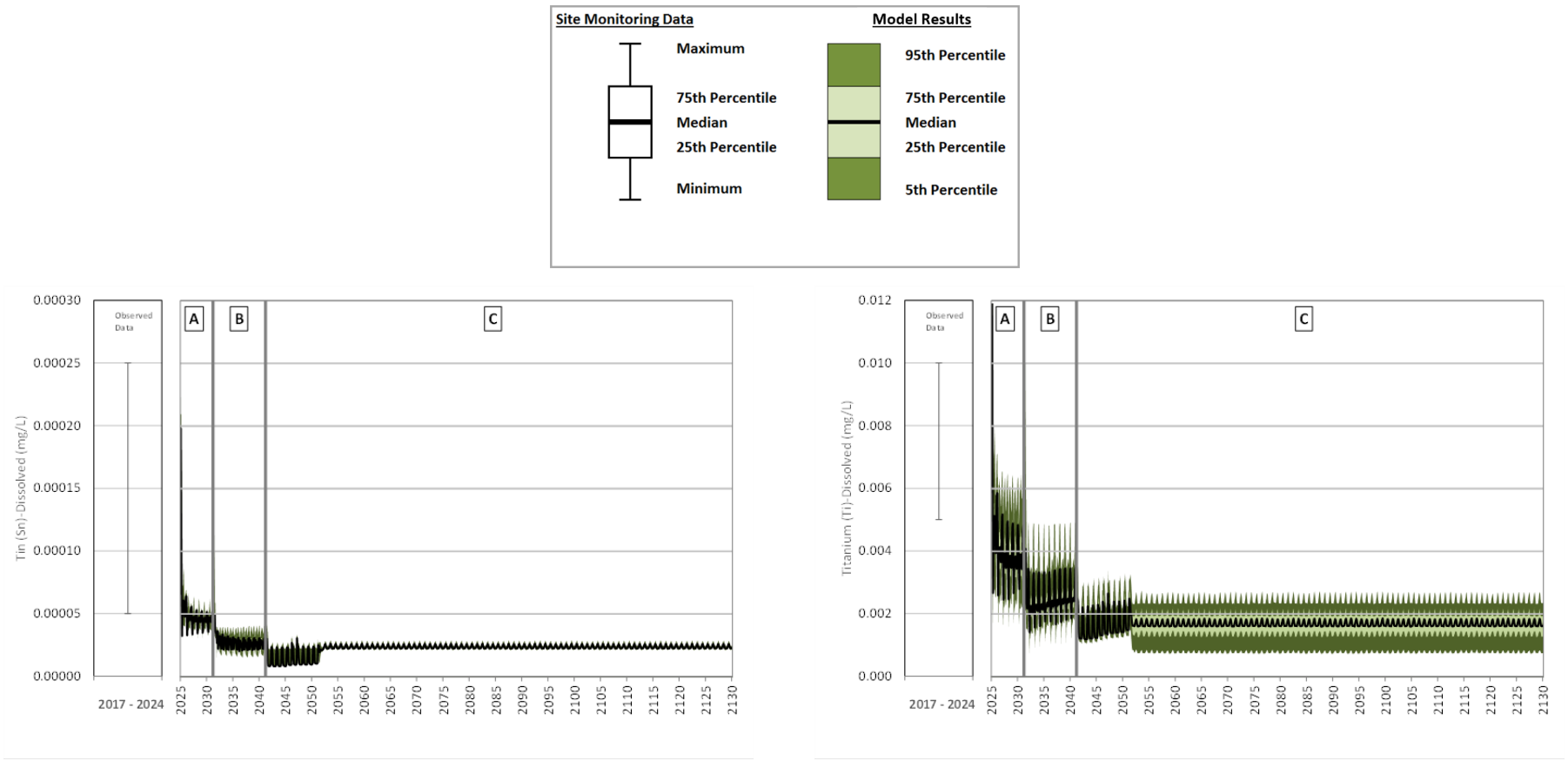
Figure B-148: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

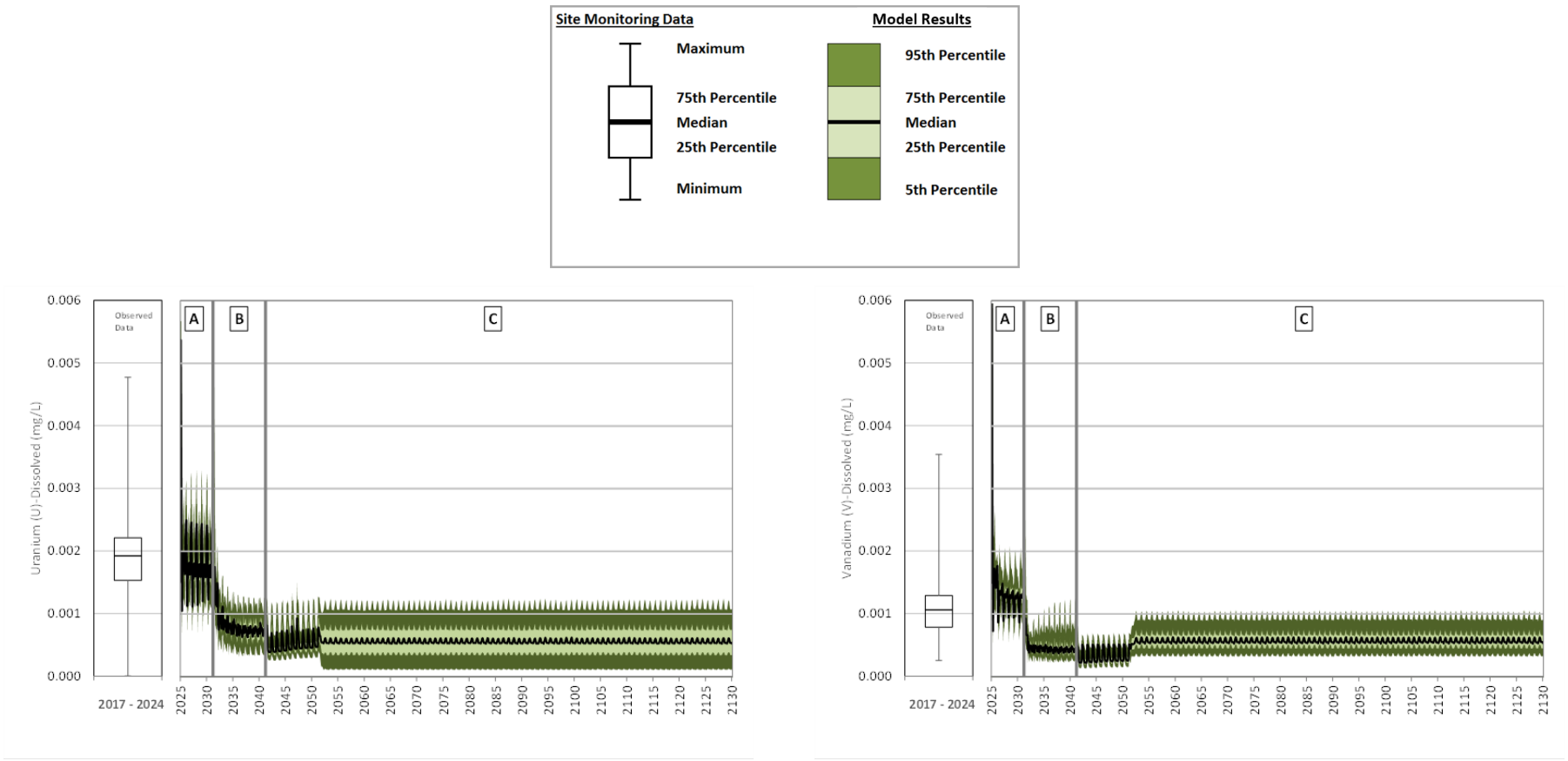
Figure B-149: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Dissolved titanium concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved titanium than the NAG waste rock and disturbed runoff water quality inputs. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

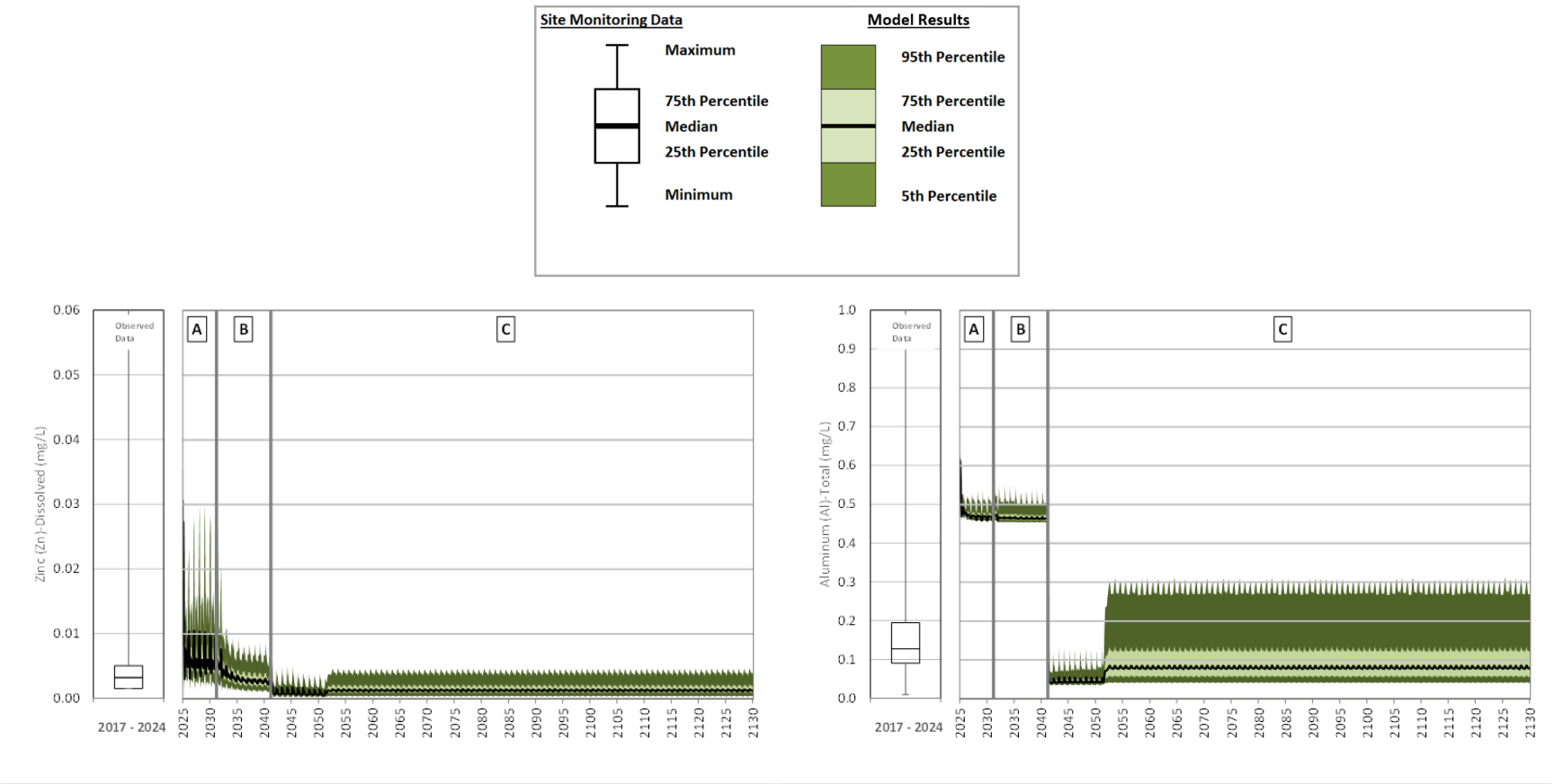
Figure B-150: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

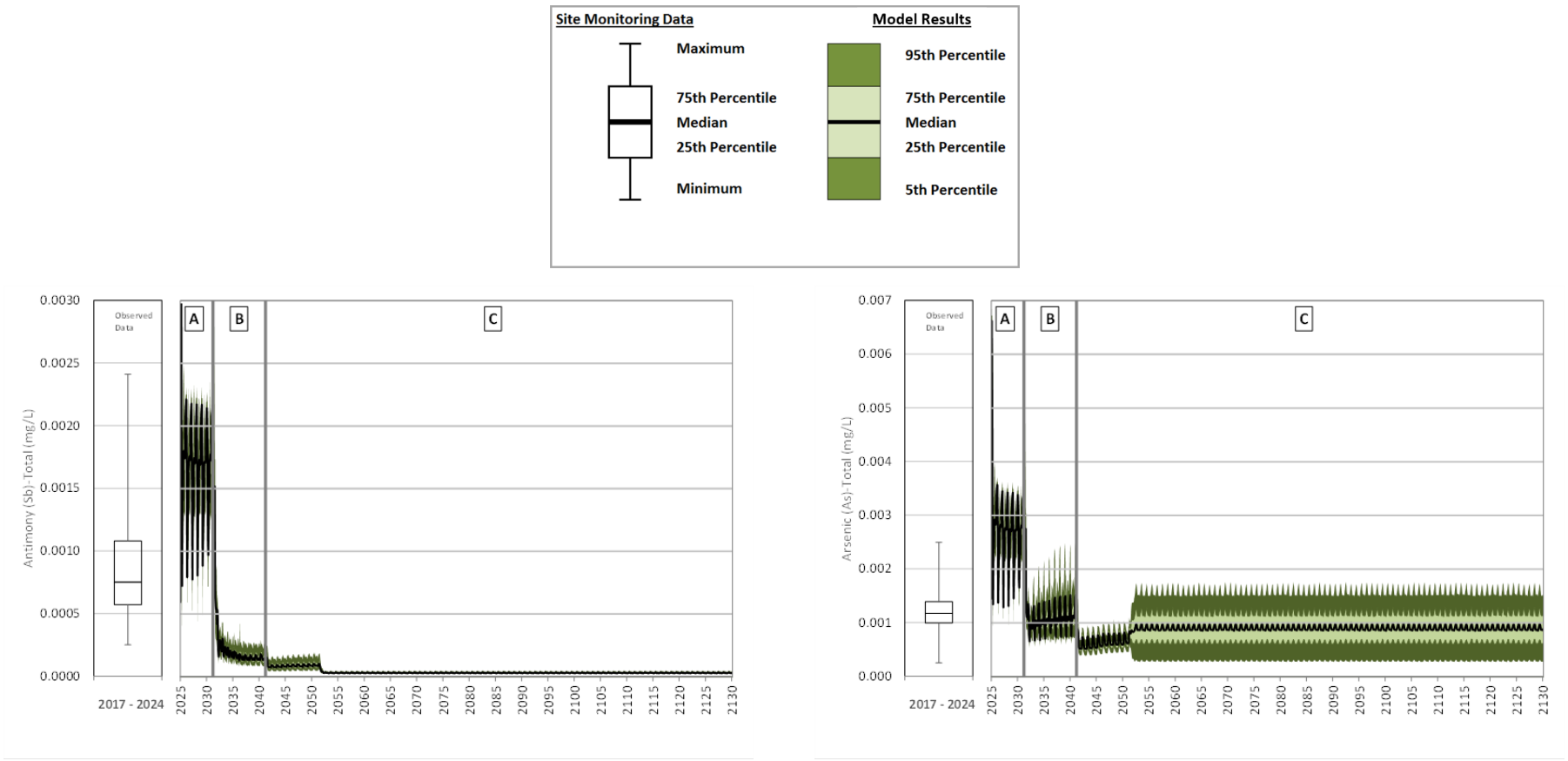
Figure B-151: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

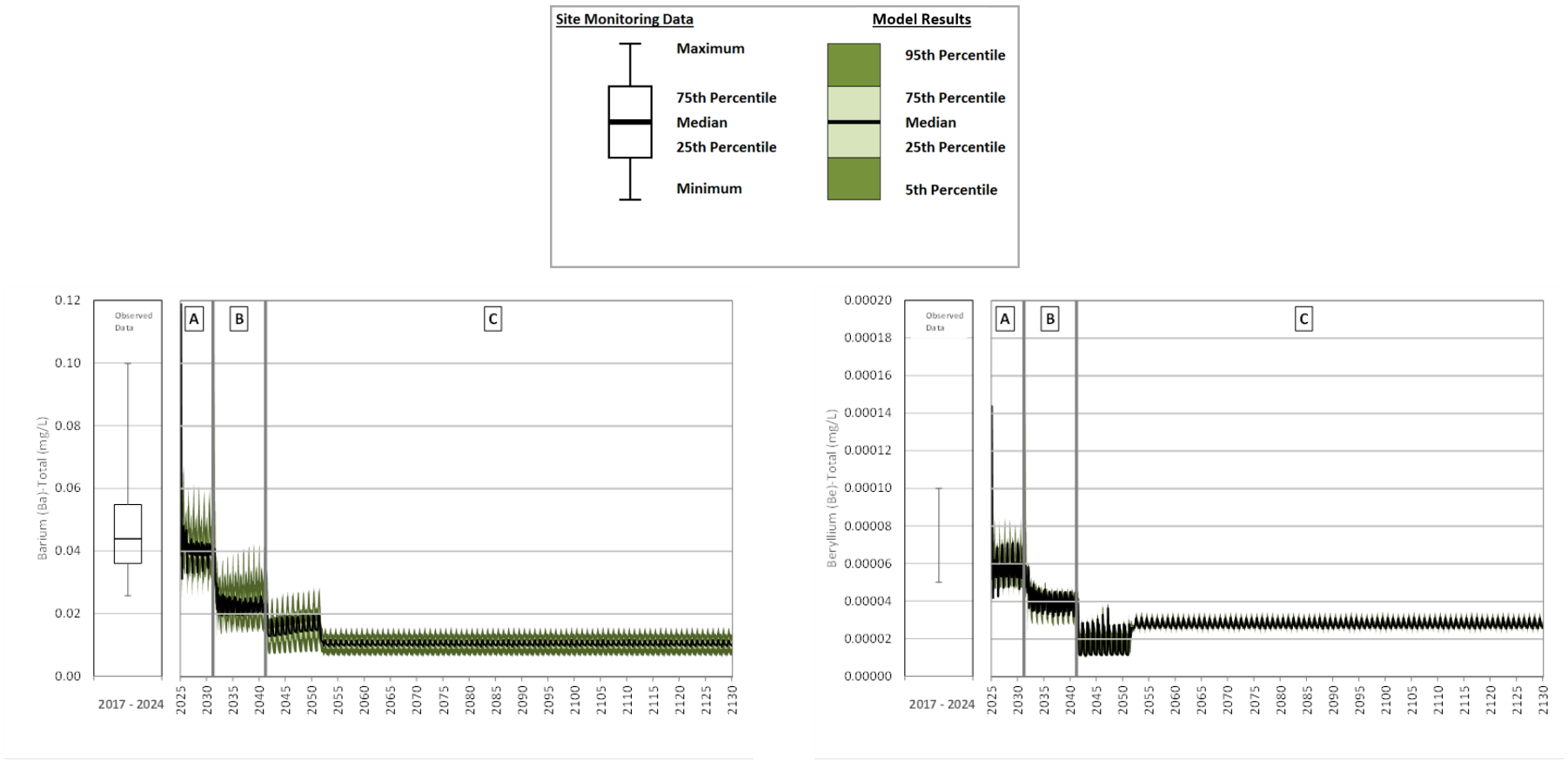
Figure B-152: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

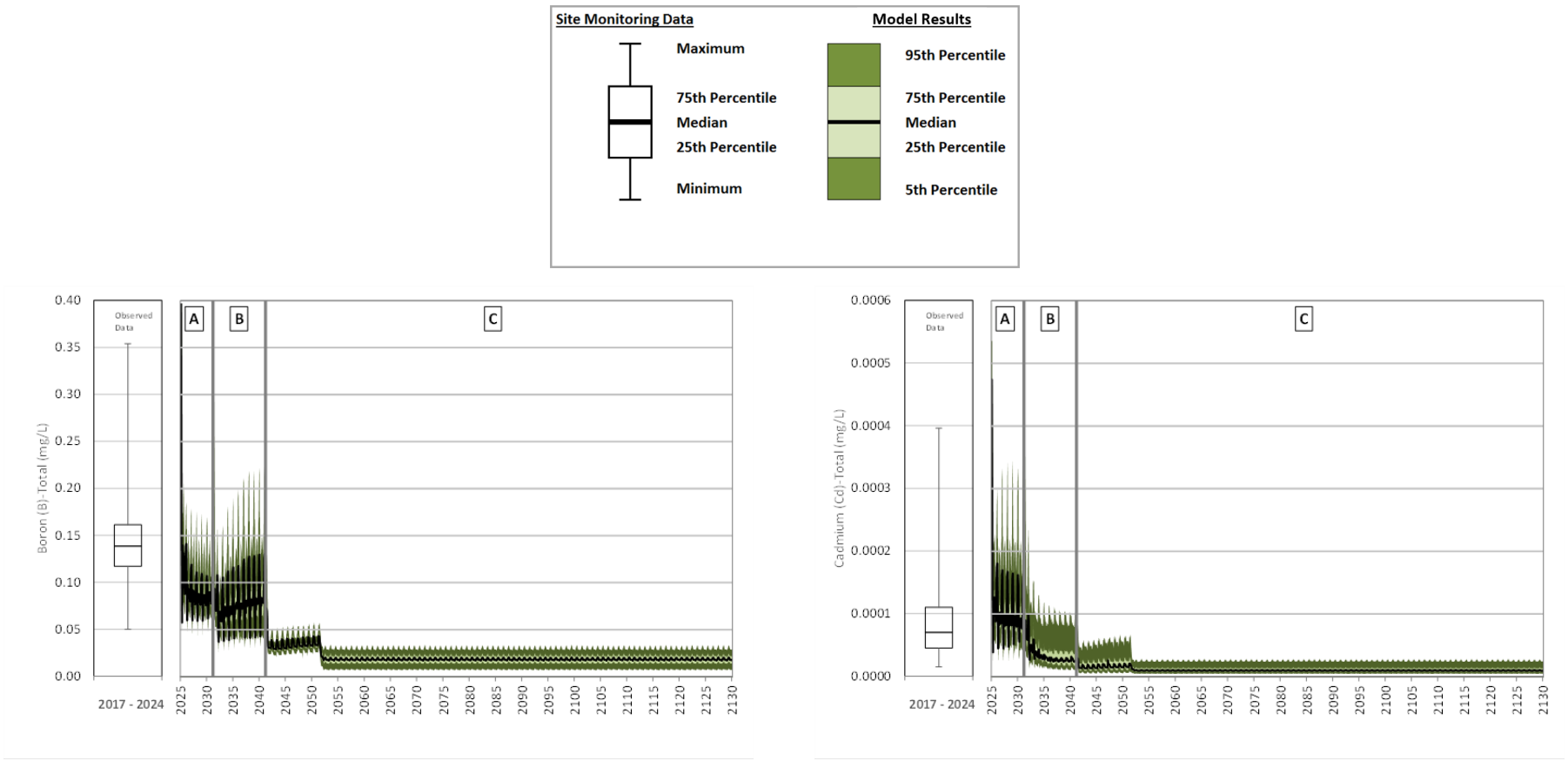
Figure B-153: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

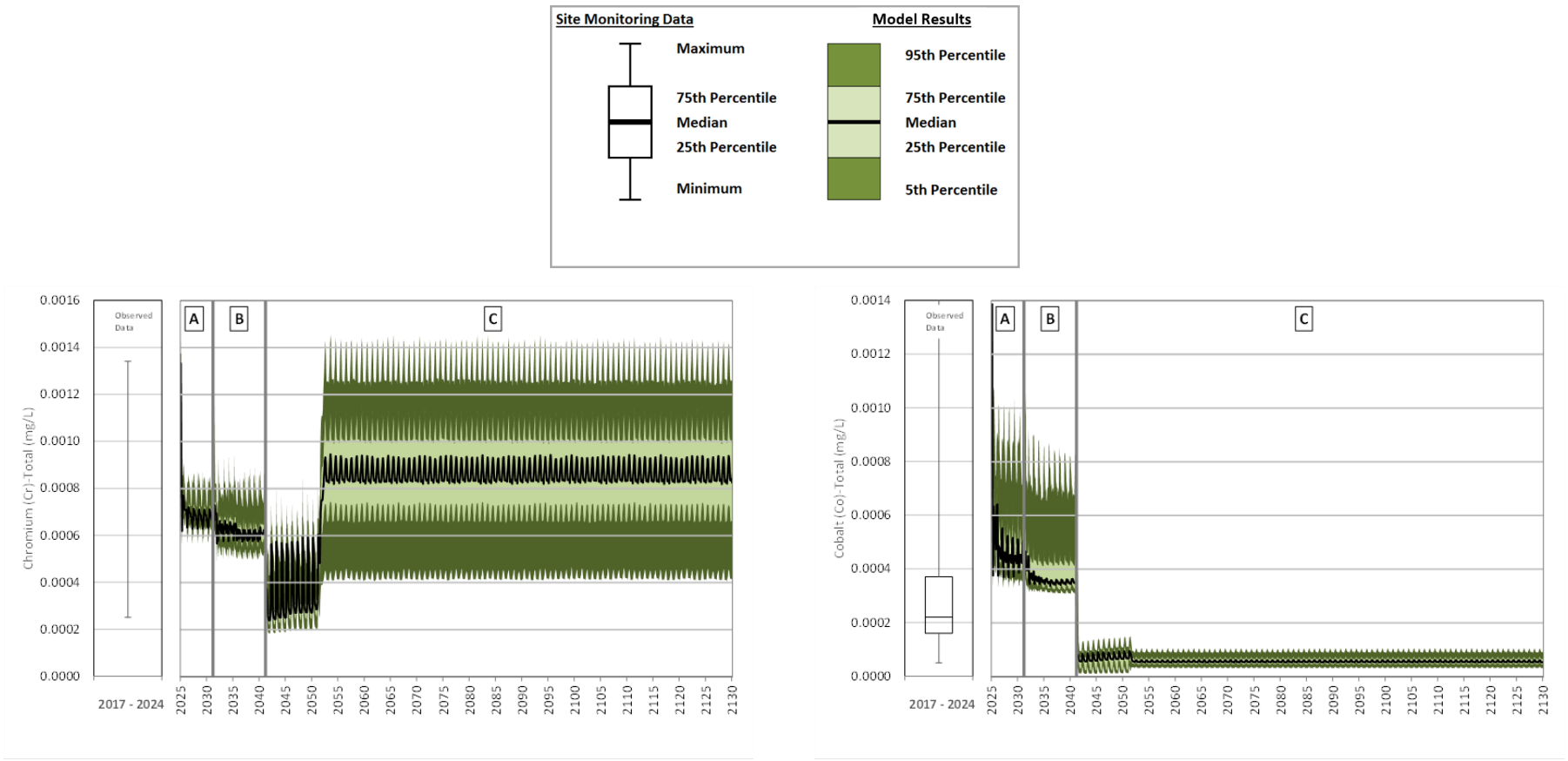
Figure B-154: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

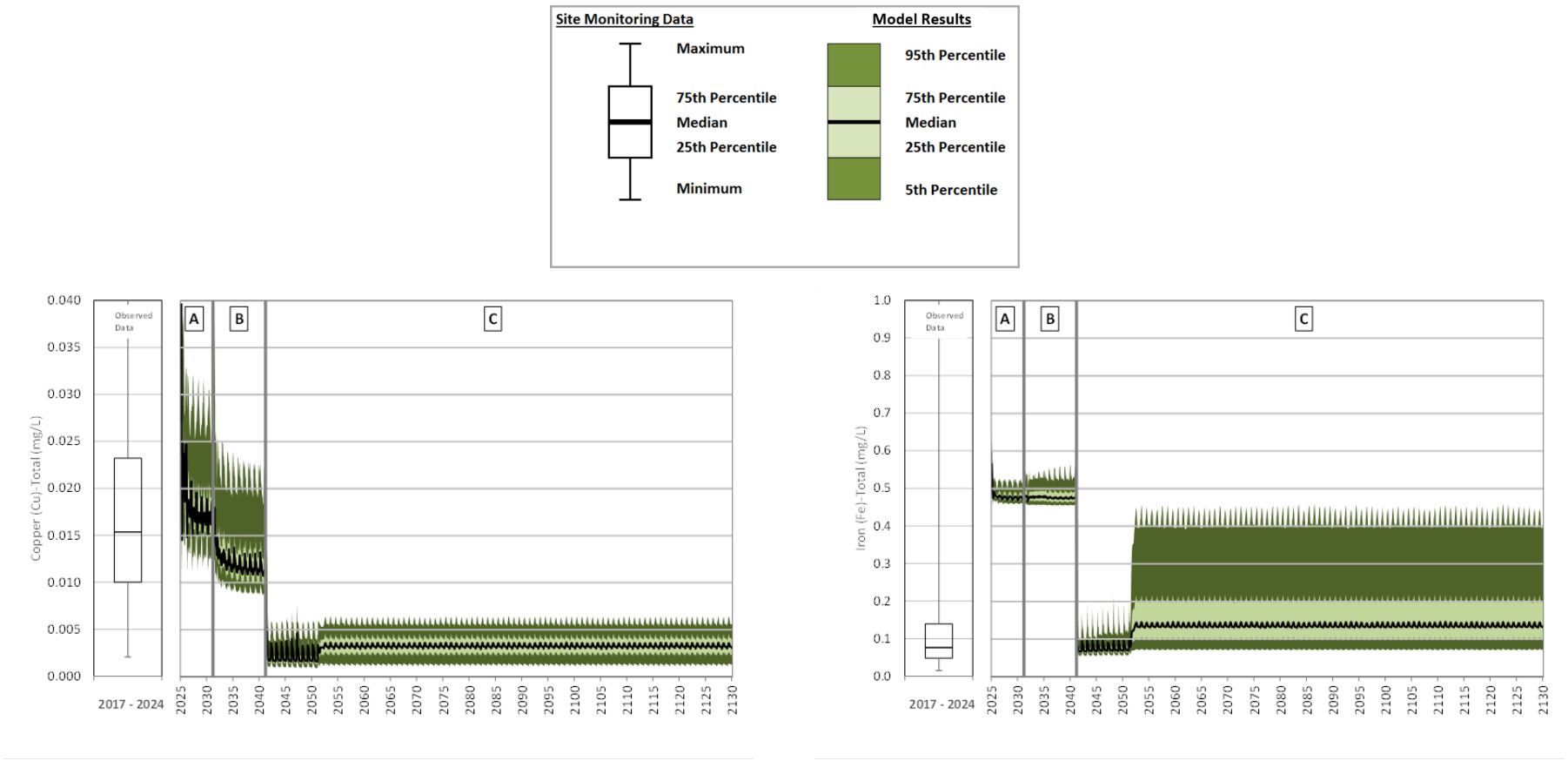
Figure B-155: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Total chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the NAG waste rock and disturbed runoff water quality inputs. Total cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in total cobalt concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

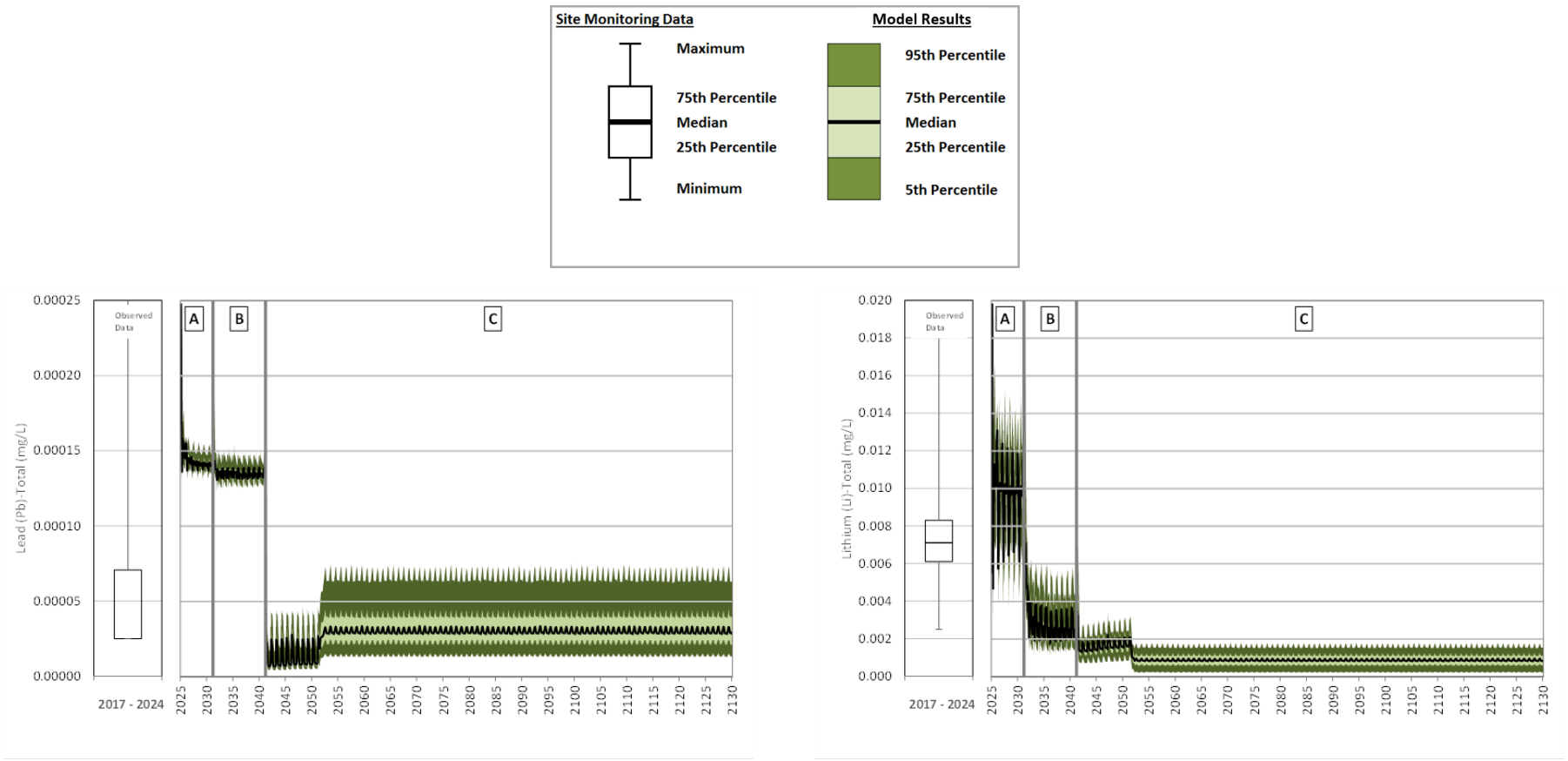
Figure B-156: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Total copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total iron concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for total iron than the NAG waste rock and disturbed runoff water quality inputs.

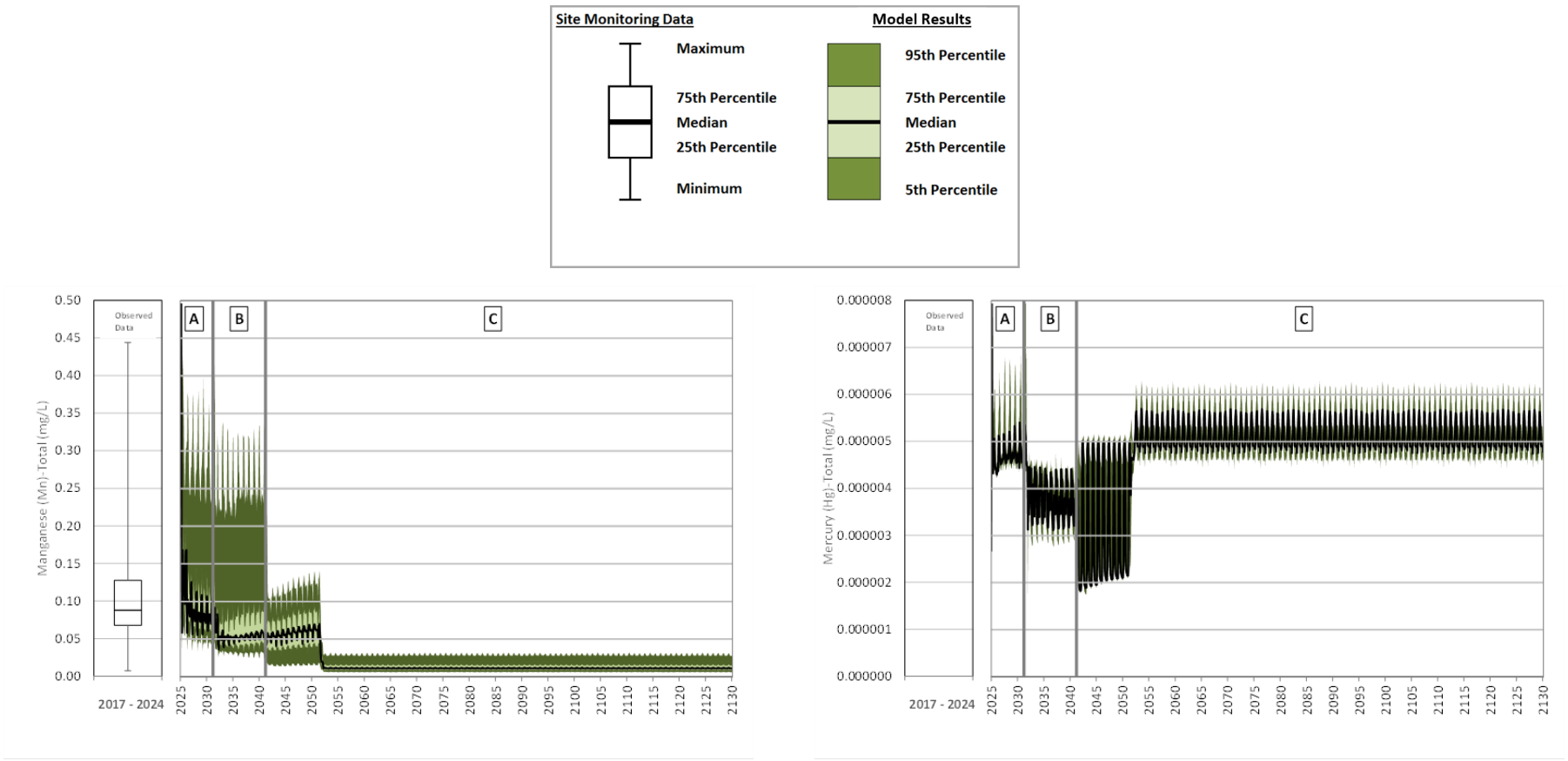
Figure B-157: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: Total lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total lead than the NAG waste rock and disturbed runoff water quality inputs. Total lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. The increase in total lithium concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

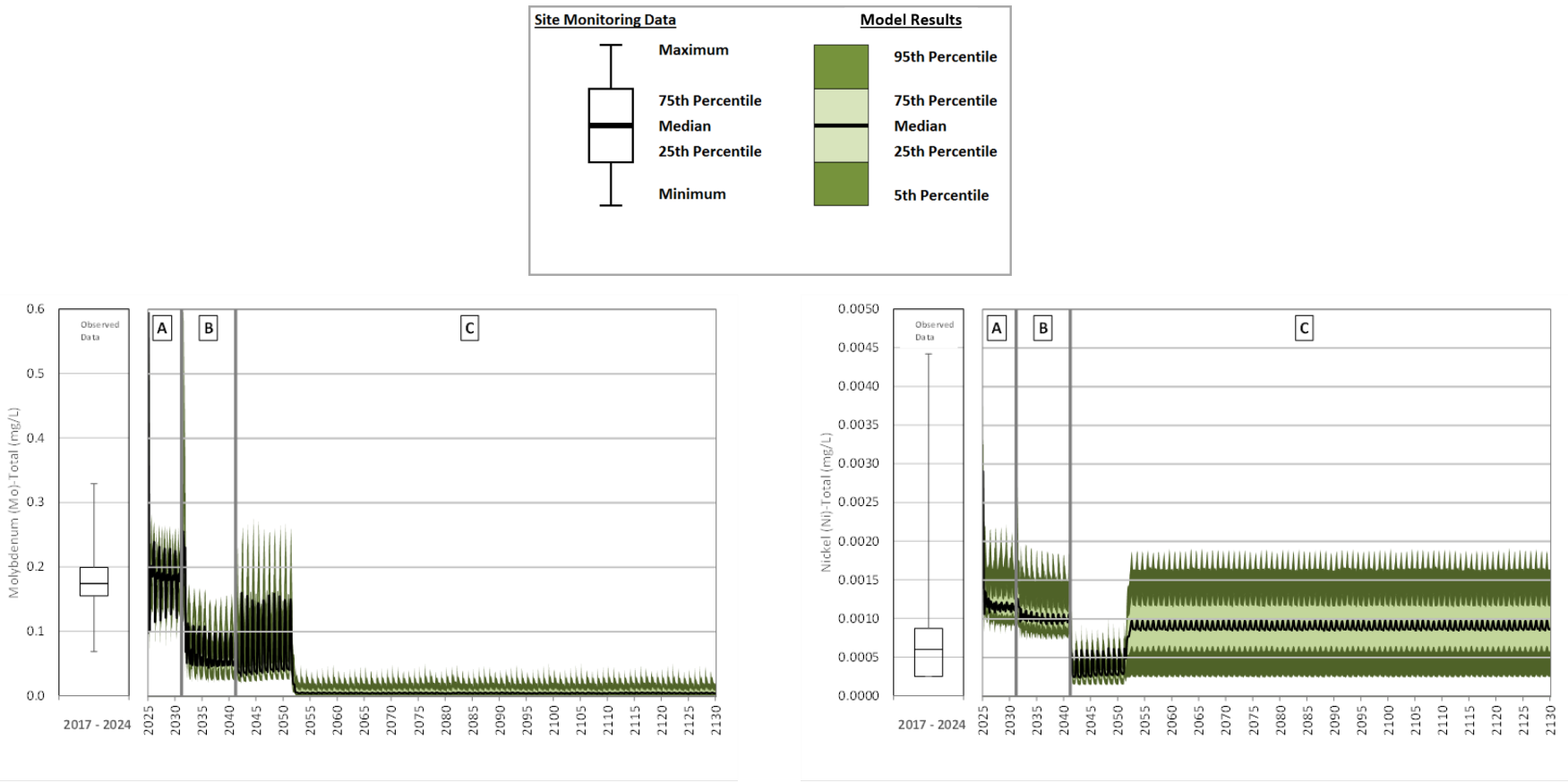
Figure B-158: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

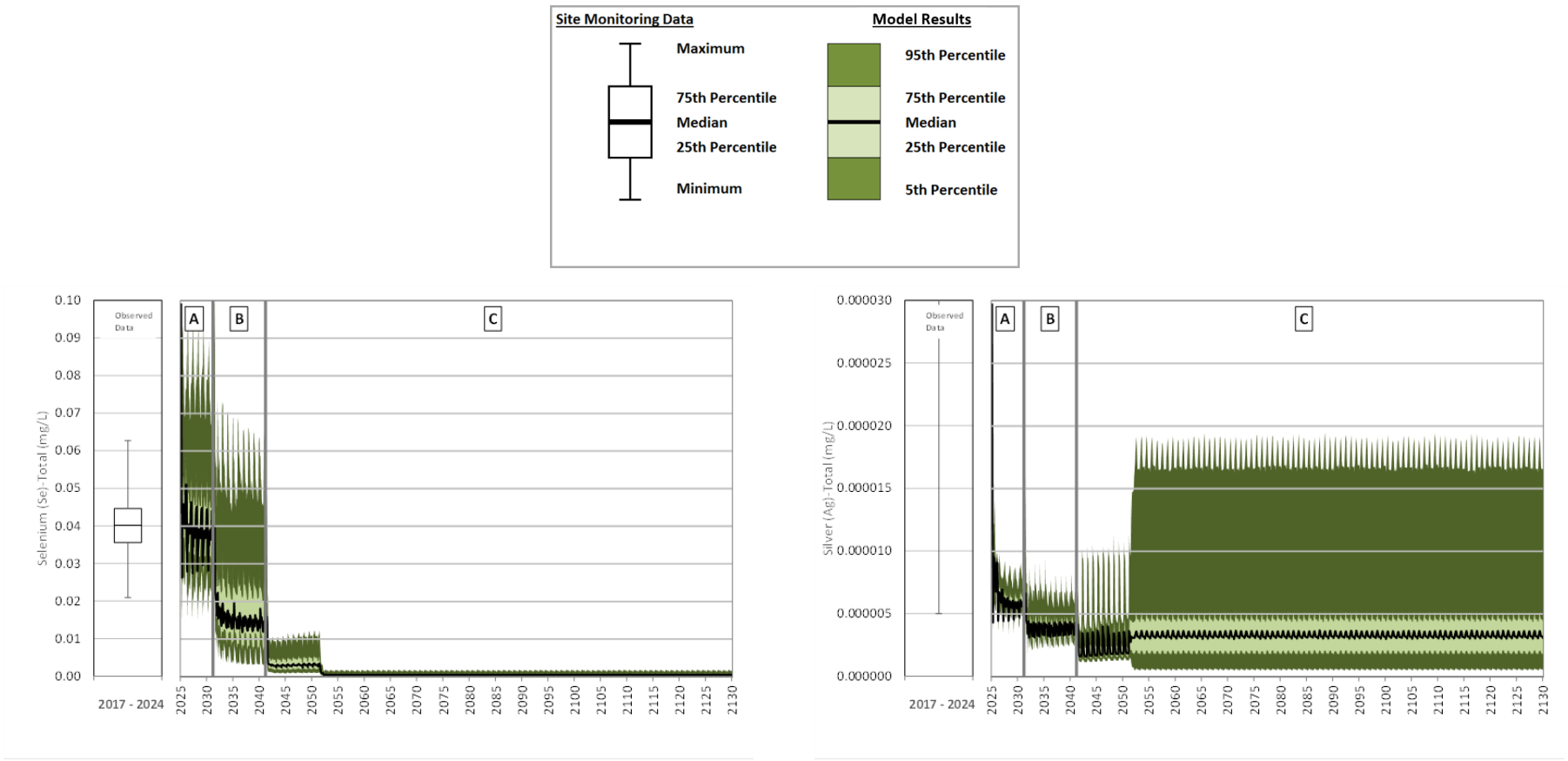
Figure B-159: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: Total molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Total nickel concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the NAG waste rock and disturbed runoff water quality inputs. The increase in total molybdenum concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

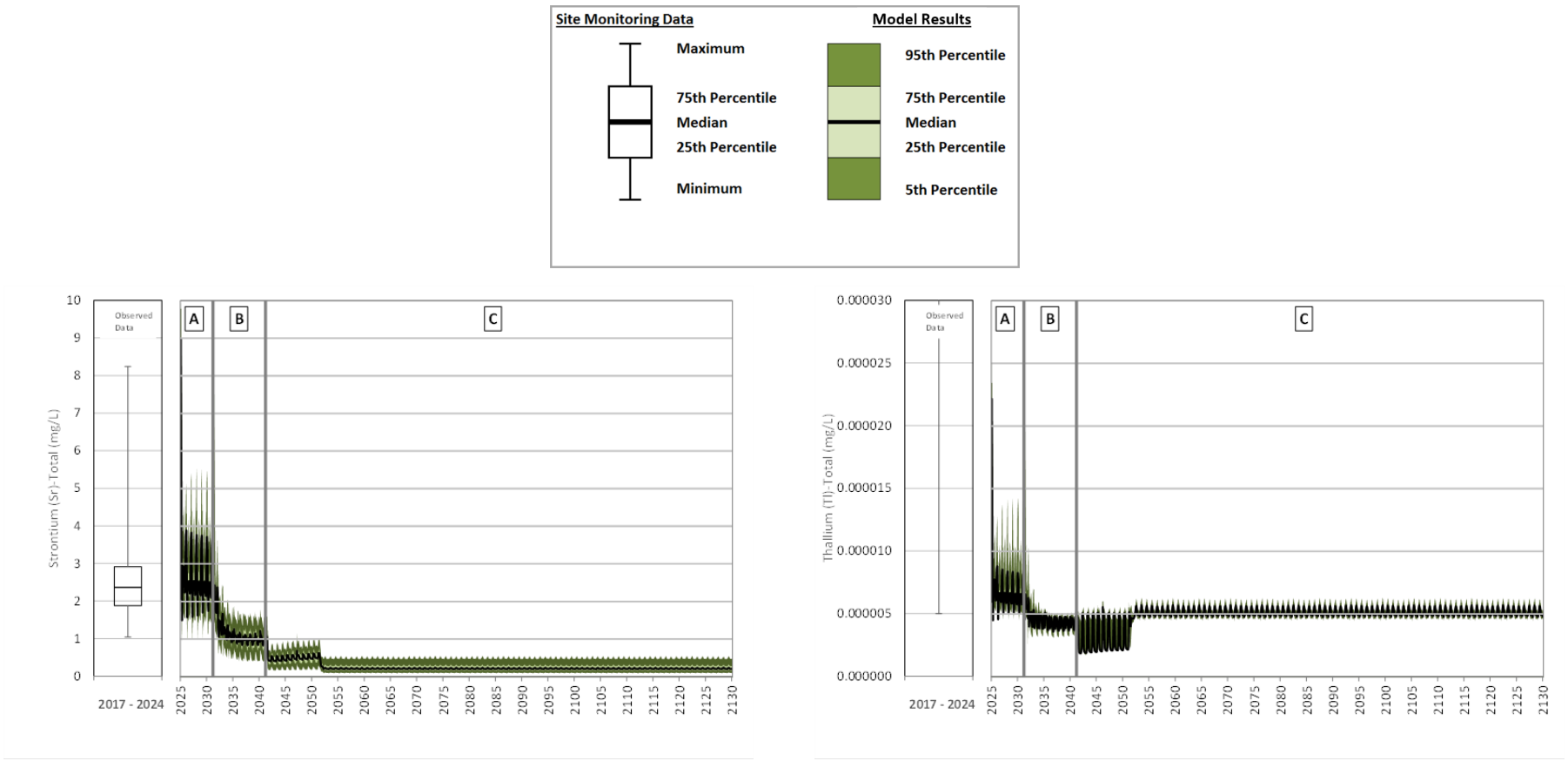
Figure B-160: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: Total selenium concentrations decrease from closure to post-closure as runoff areas are remediated. Total silver concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the NAG waste rock and disturbed runoff water quality inputs. The increase in total selenium concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

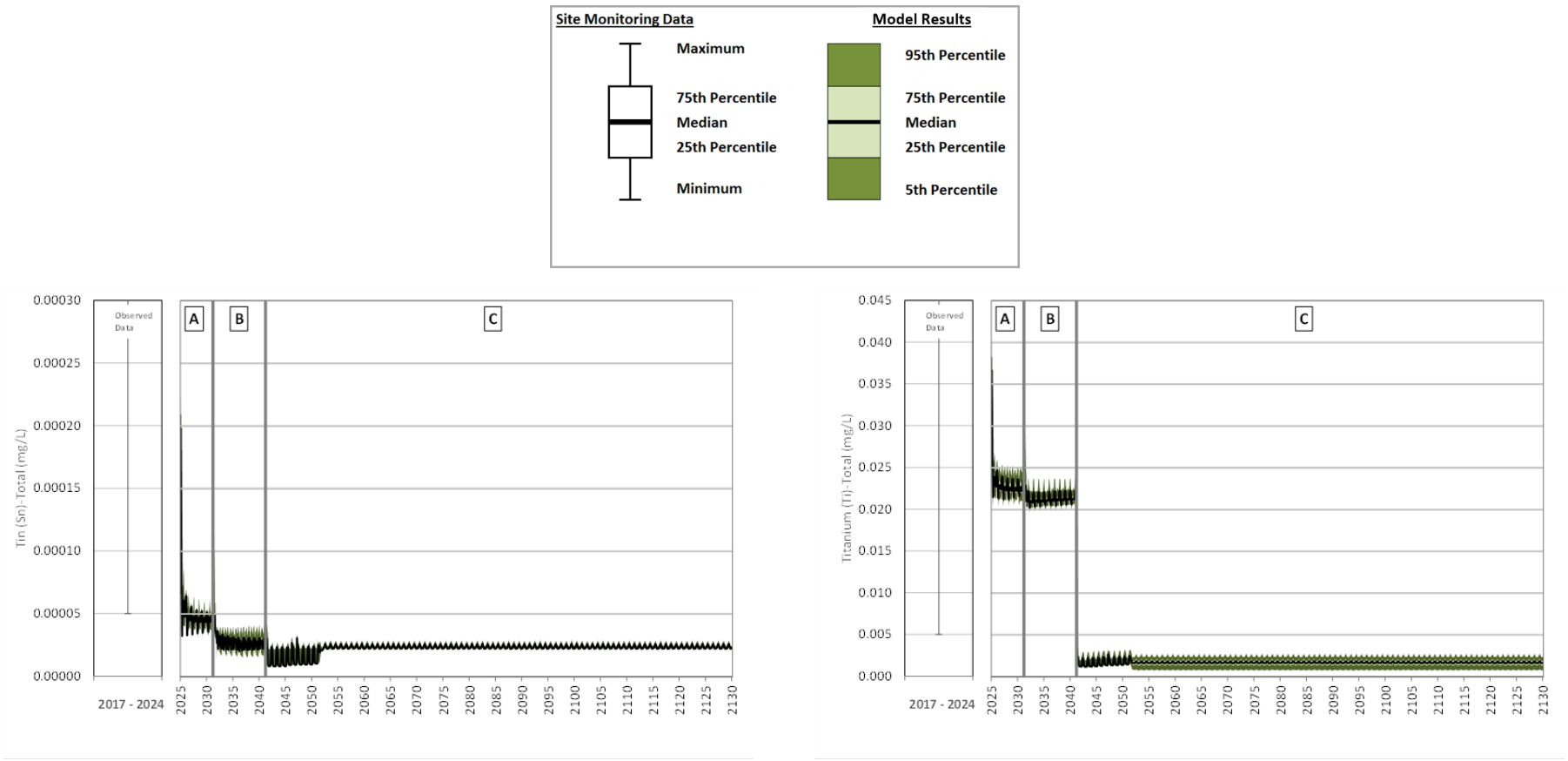
Figure B-161: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

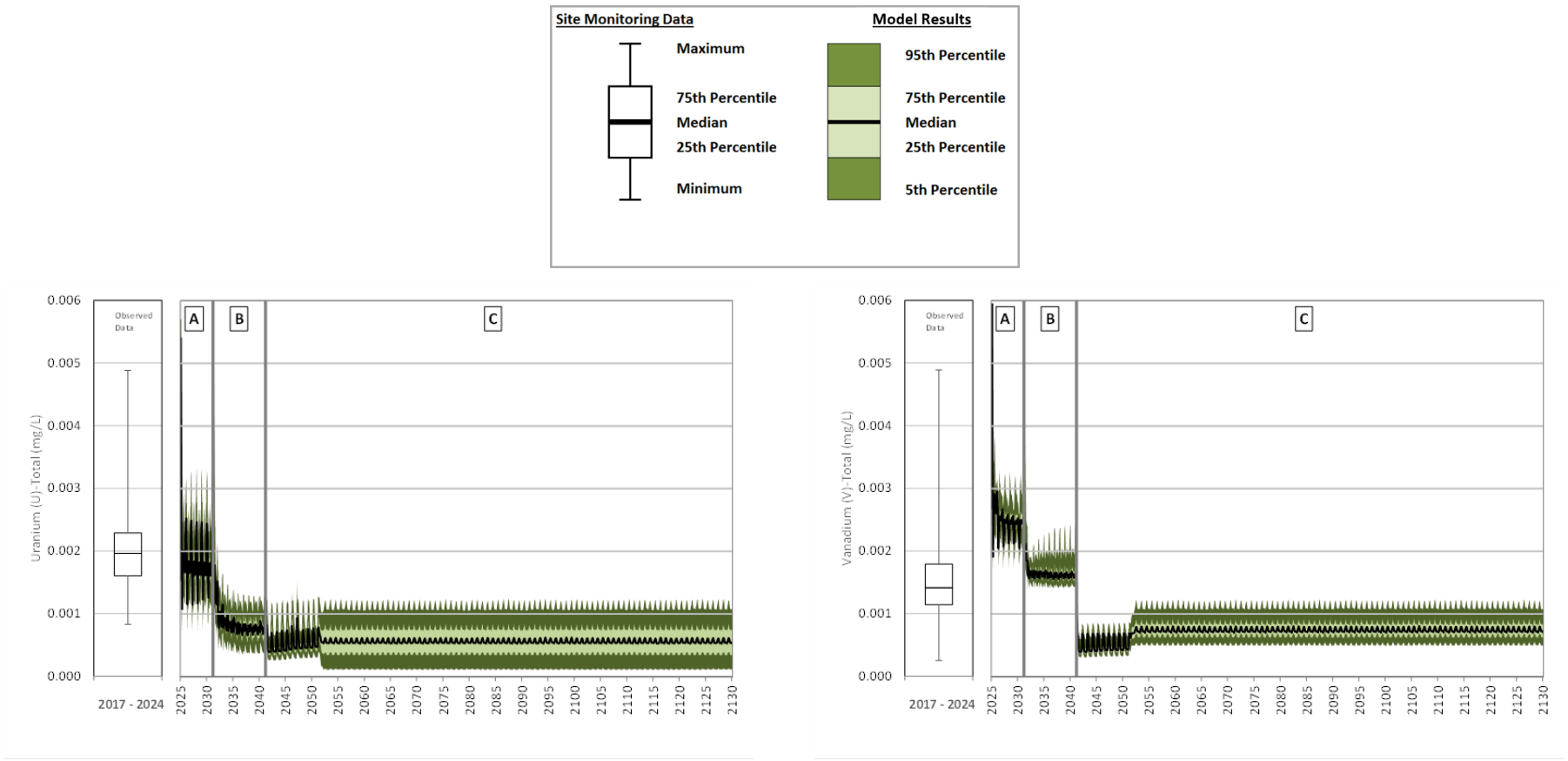
Figure B-162: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Total titanium concentrations increase in post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total titanium than the NAG waste rock and disturbed runoff water quality inputs. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

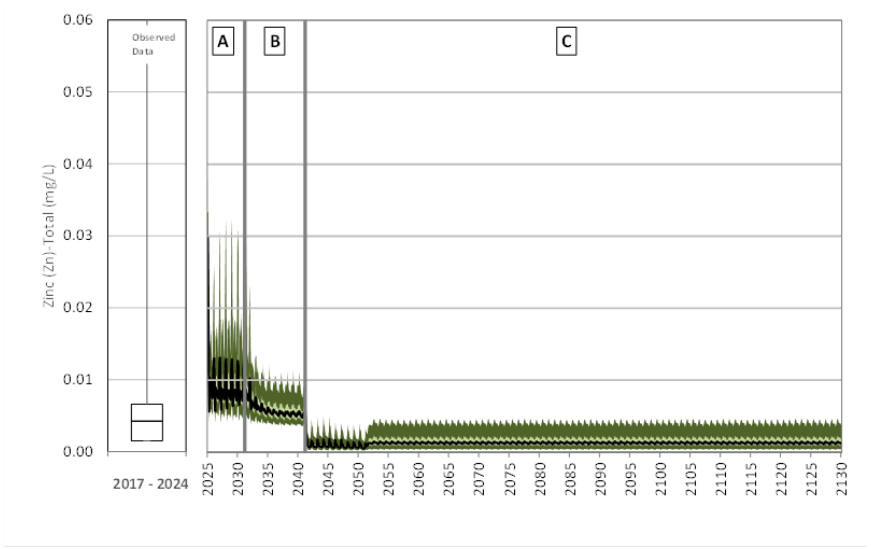
Figure B-163: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. The increase in concentrations from 2041 to 2051 is caused by pumping from the MESCP to the PETBP which ends in 2051.

Figure B-164: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Uranium and Total Vanadium

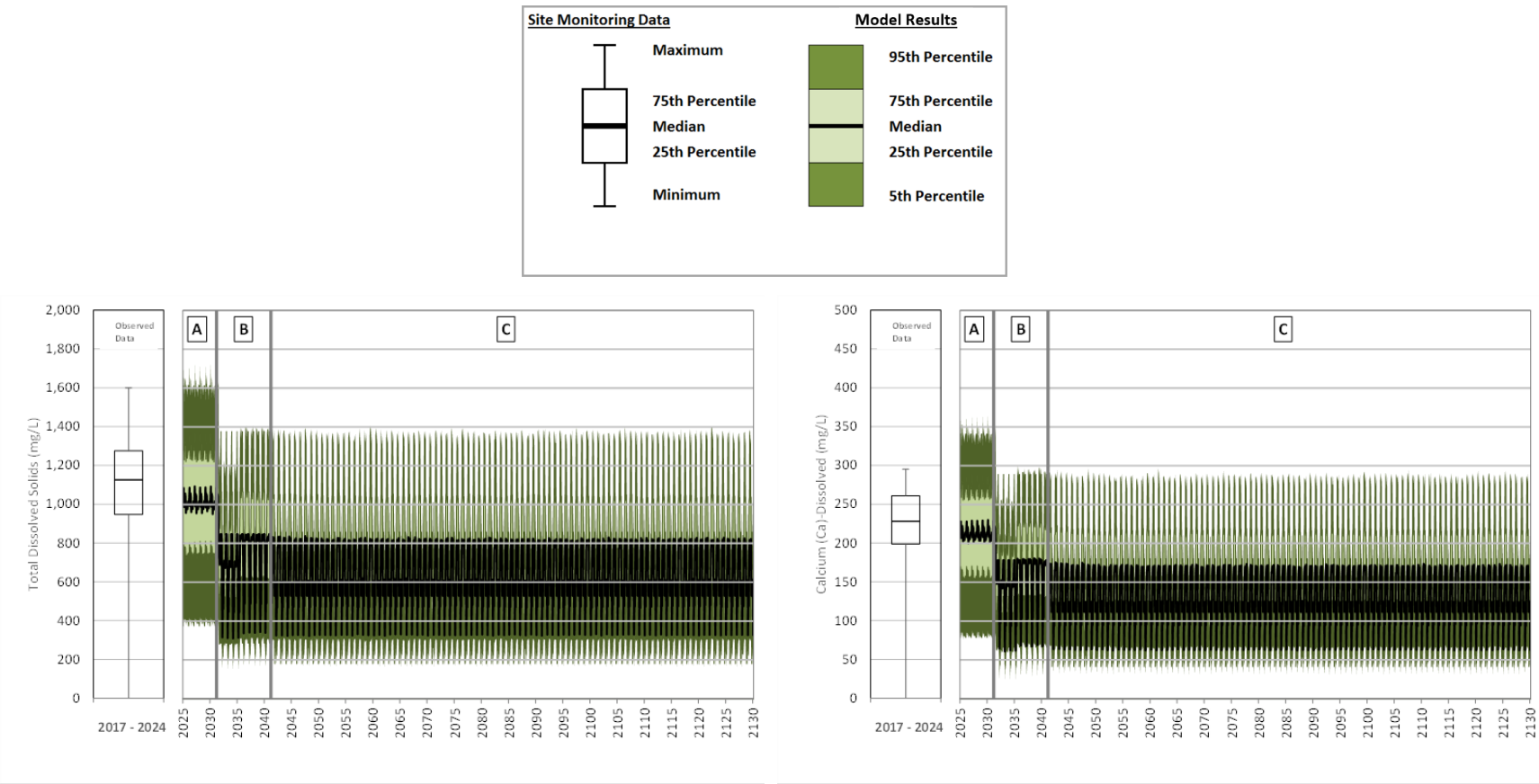


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-165: Perimeter Embankment Till Borrow Pond Operations, Closure and Post-closure – Total Zinc

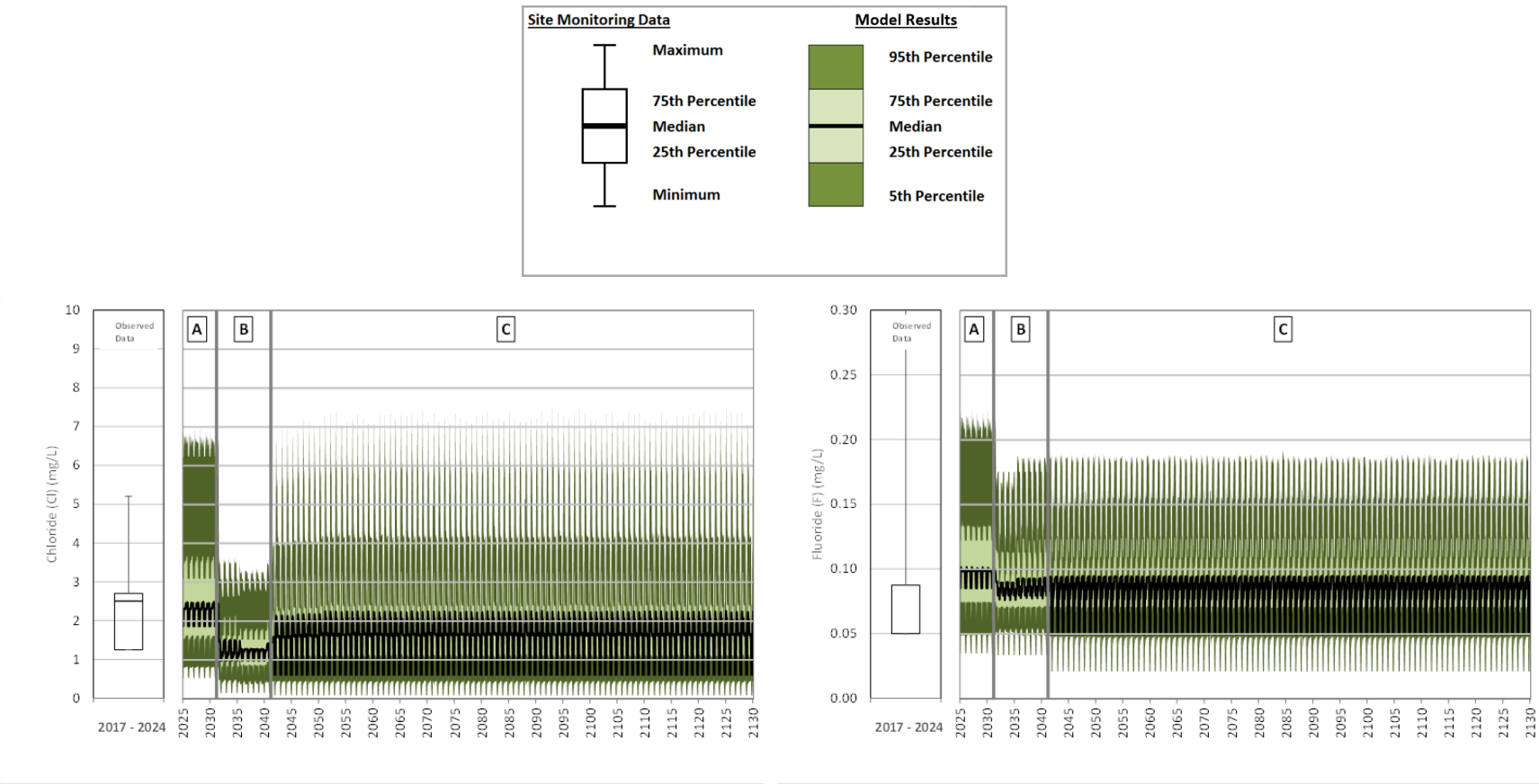
9K Sump Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

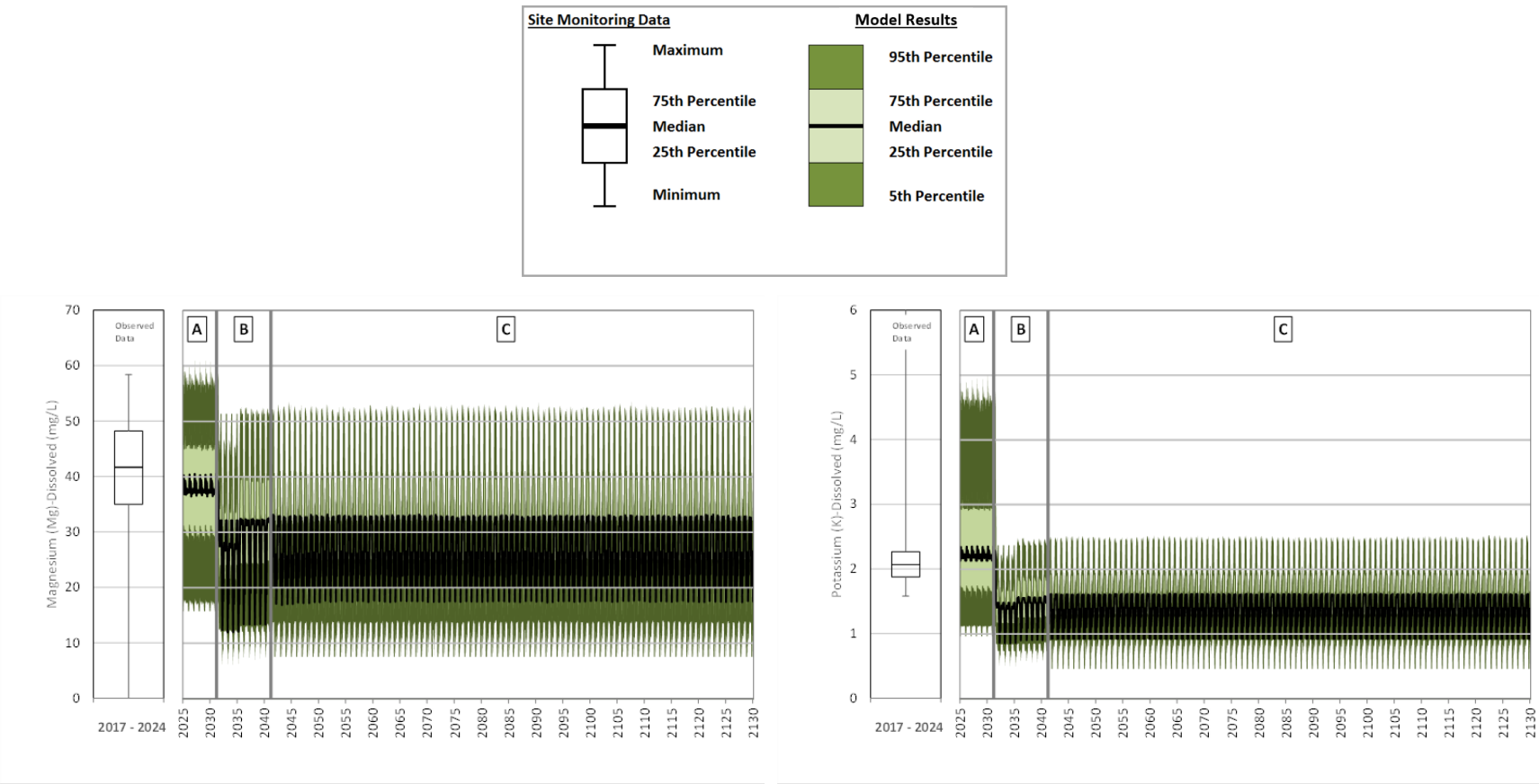
Figure B-166: 9K Sump Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: Chloride concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for chloride than the disturbed runoff water quality input. Fluoride concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

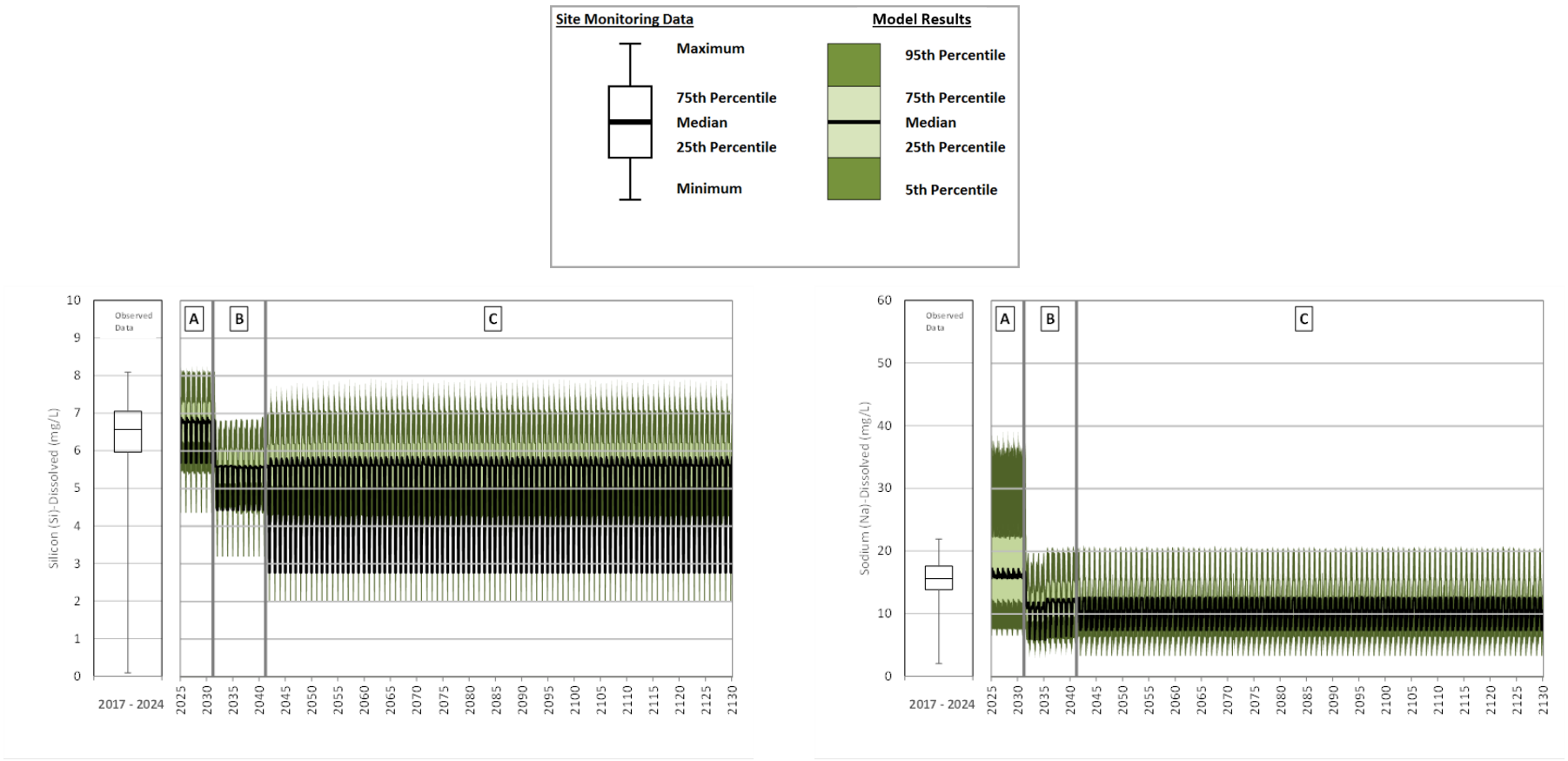
Figure B-167: 9K Sump Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

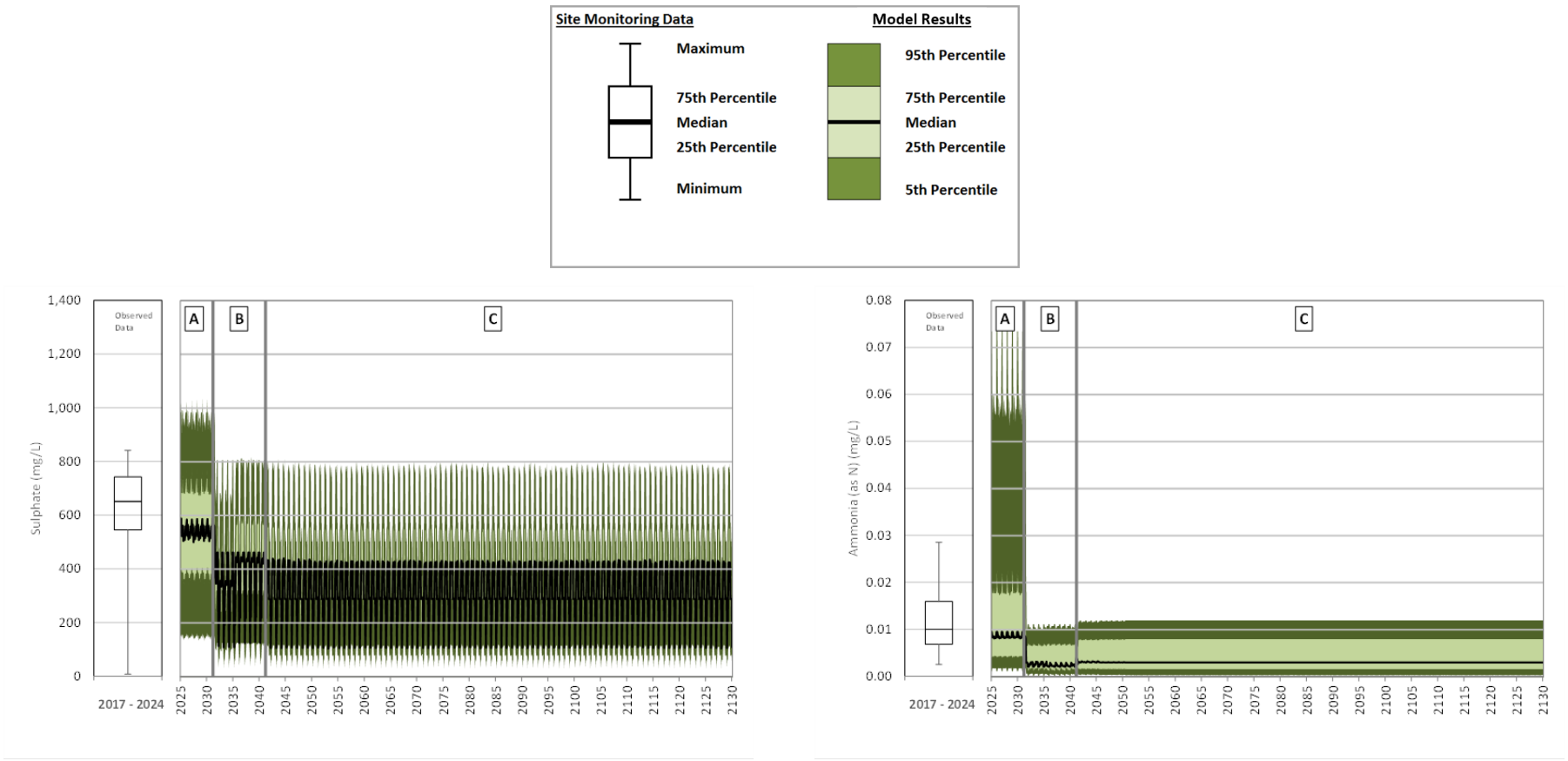
Figure B-168: 9K Sump Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: Silicon concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for silicon than the disturbed runoff water quality input. Sodium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

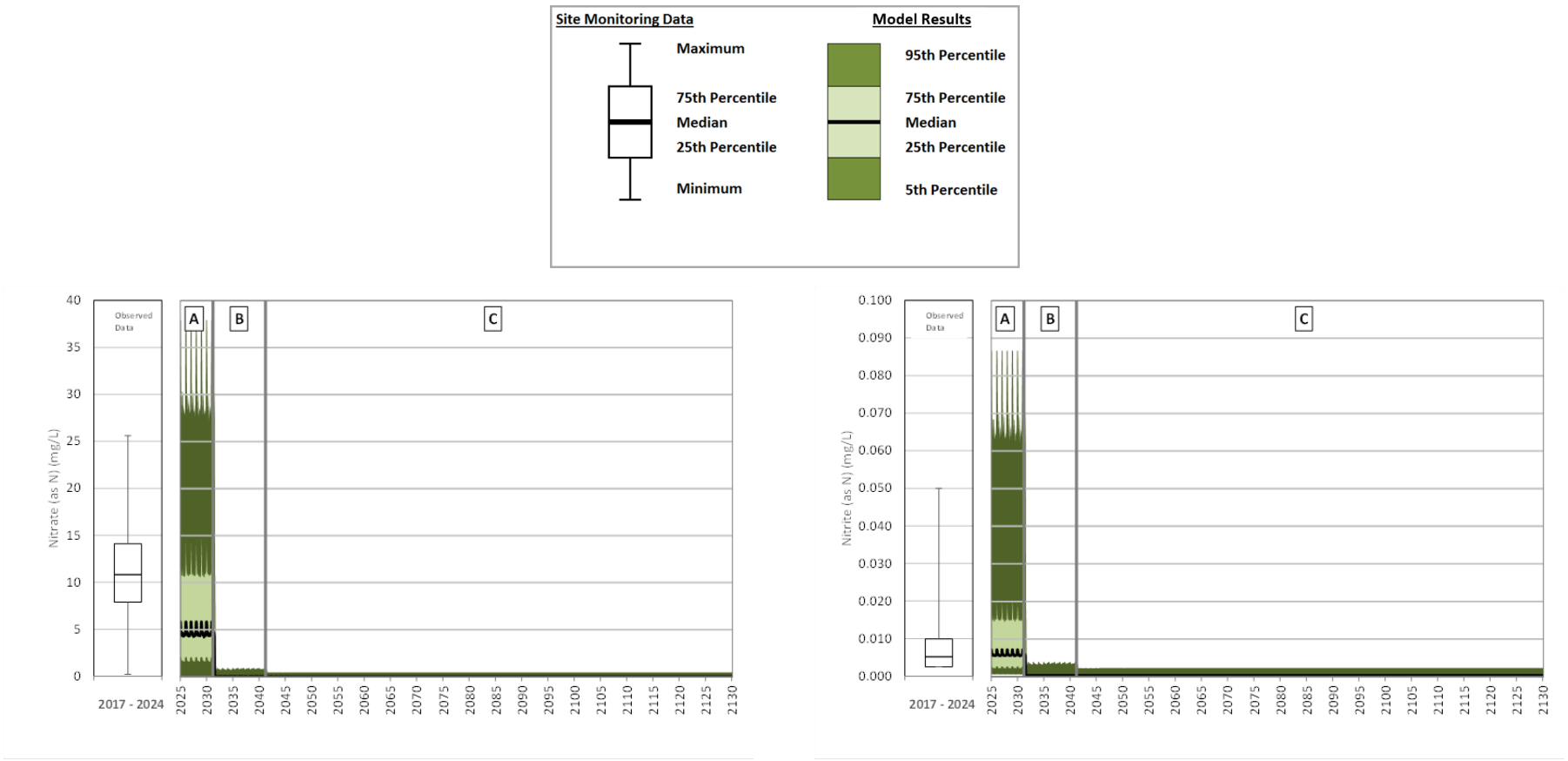
Figure B-169: 9K Sump Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: Sulphate concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total ammonia concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total ammonia than the disturbed runoff water quality input.

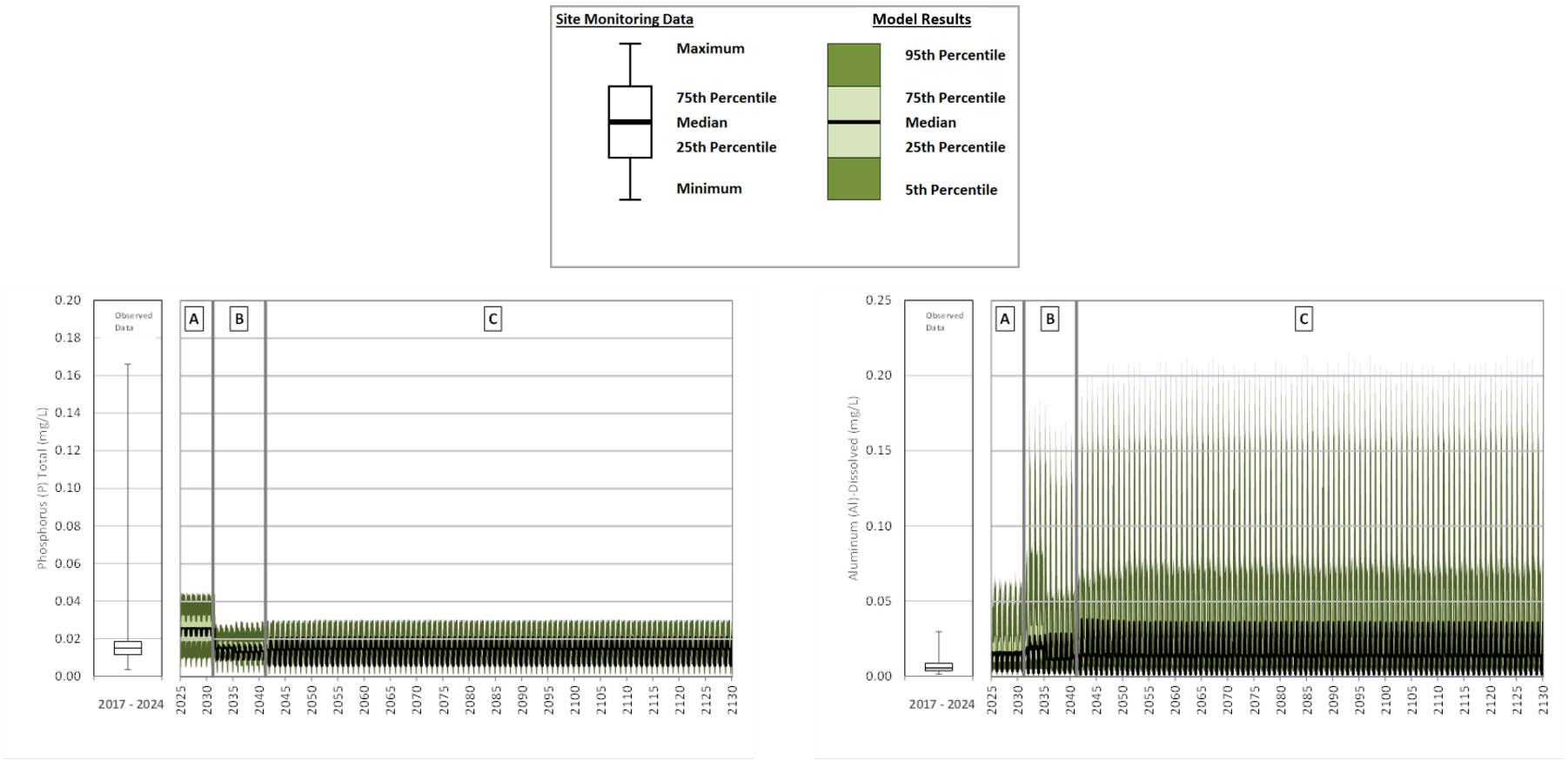
Figure B-170: 9K Sump Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

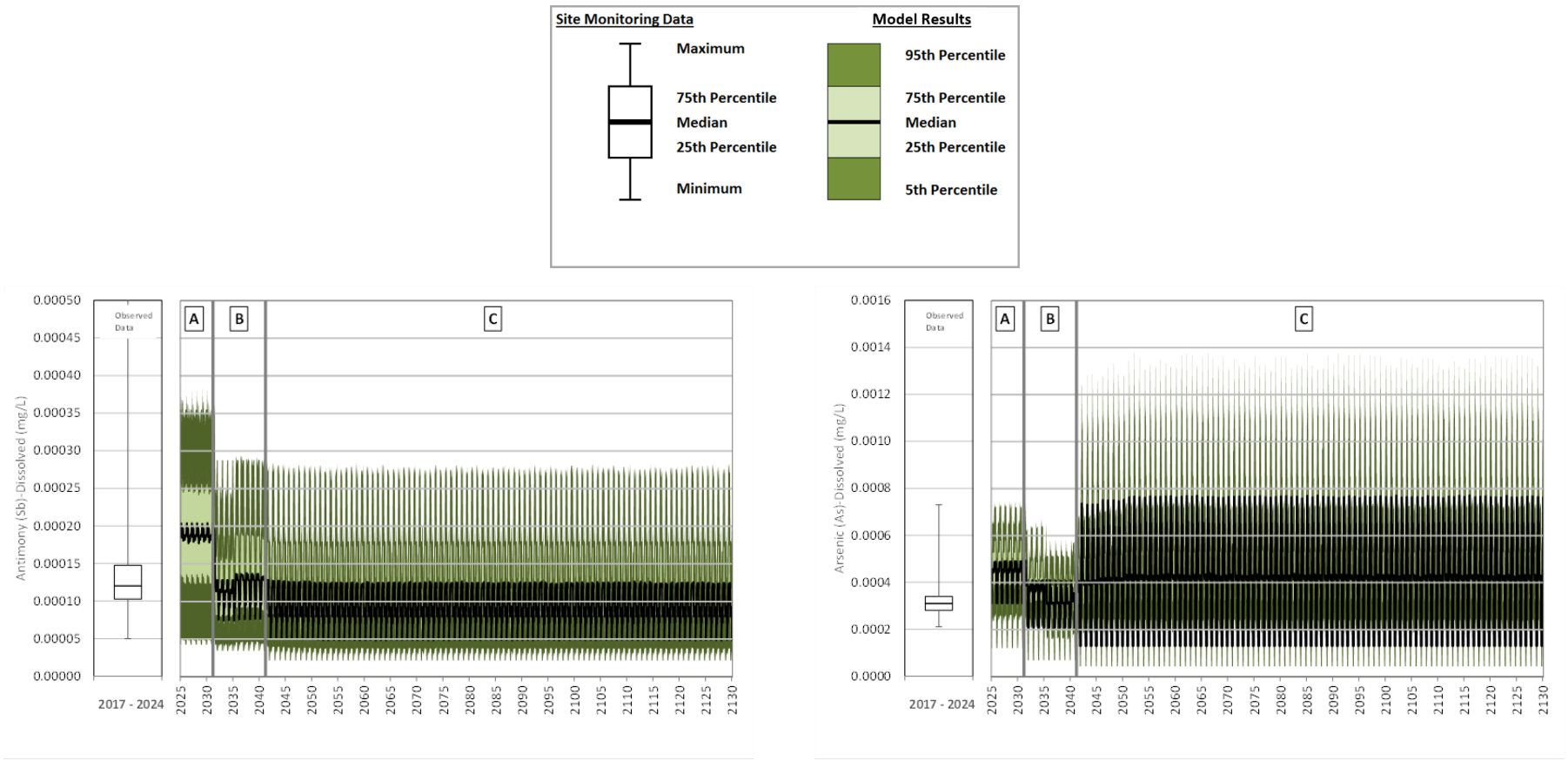
Figure B-171: 9K Sump Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus and dissolved aluminum concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the NAG waste rock and disturbed runoff water quality inputs.

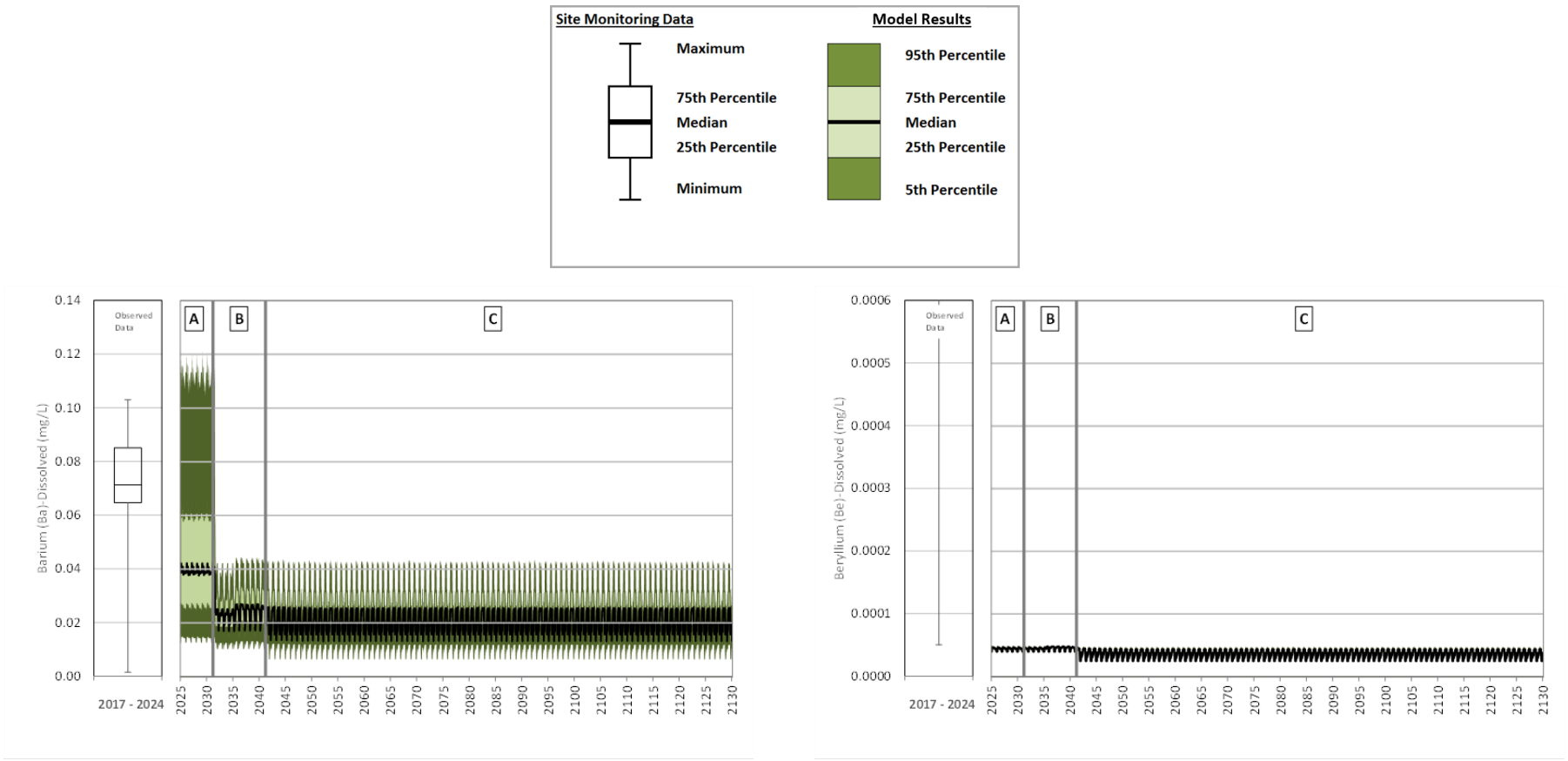
Figure B-172: 9K Sump Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: Dissolved antimony concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved arsenic concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for dissolved arsenic than the NAG waste rock and disturbed runoff water quality inputs.

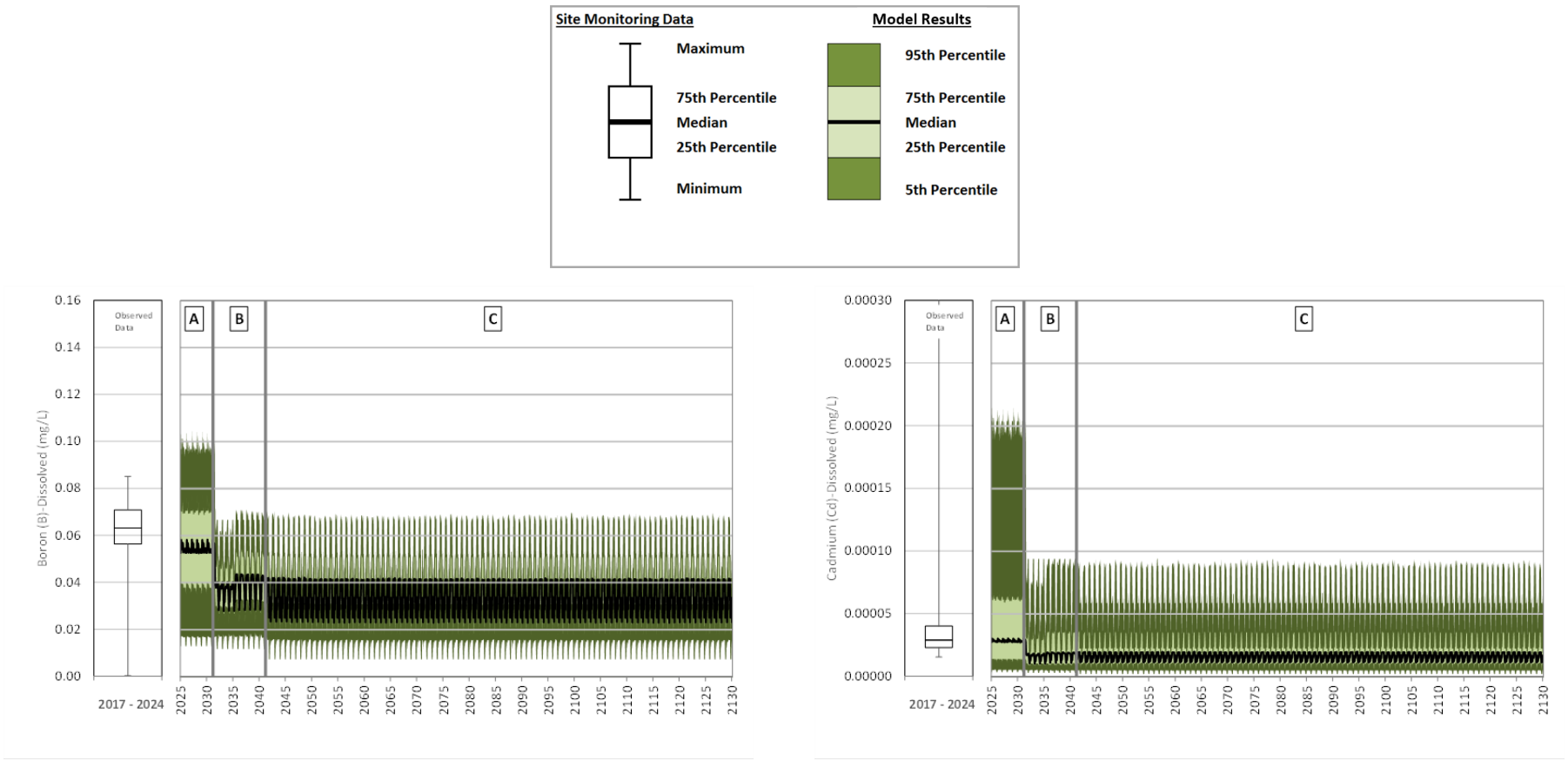
Figure B-173: 9K Sump Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

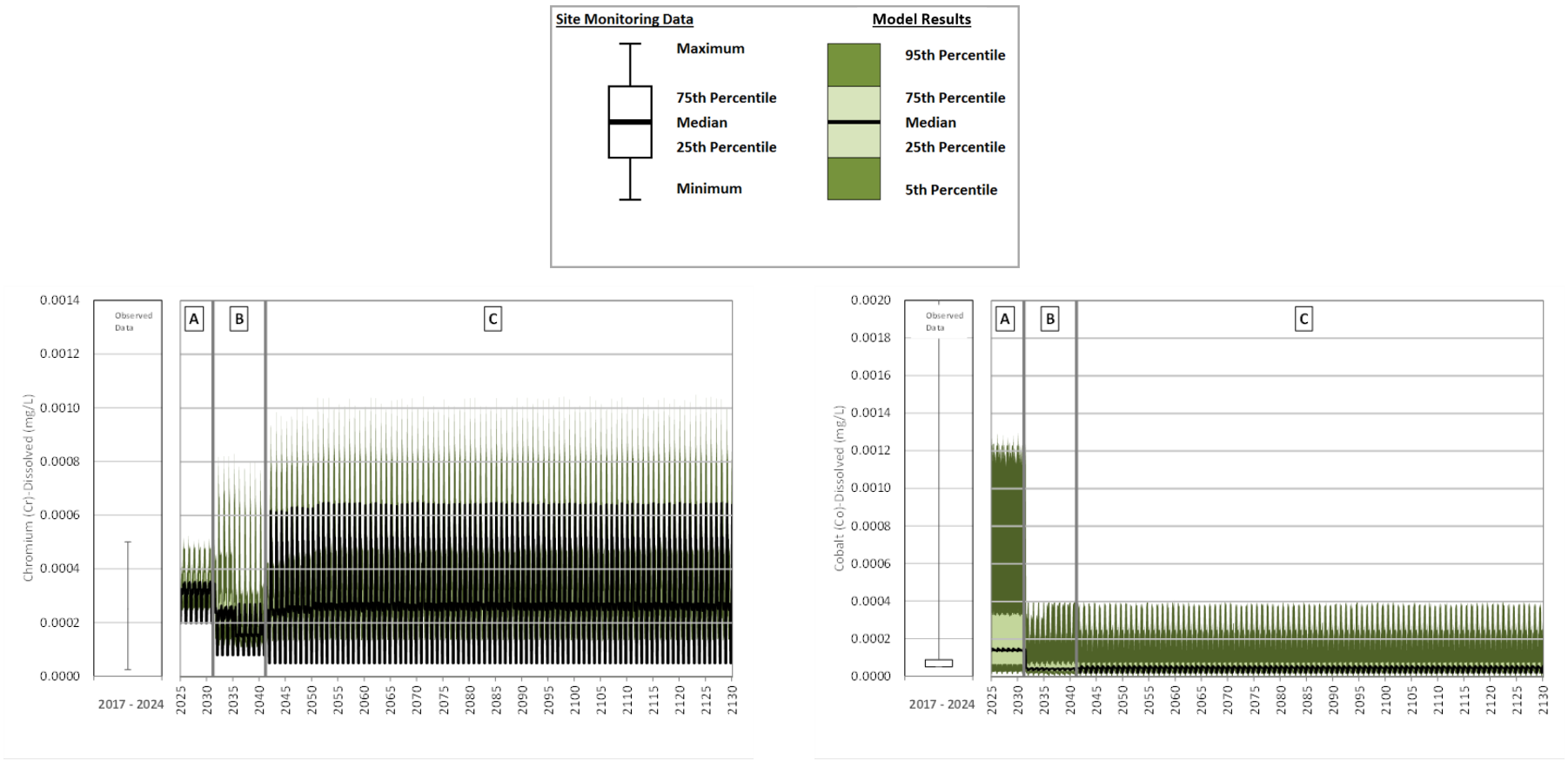
Figure B-174: 9K Sump Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

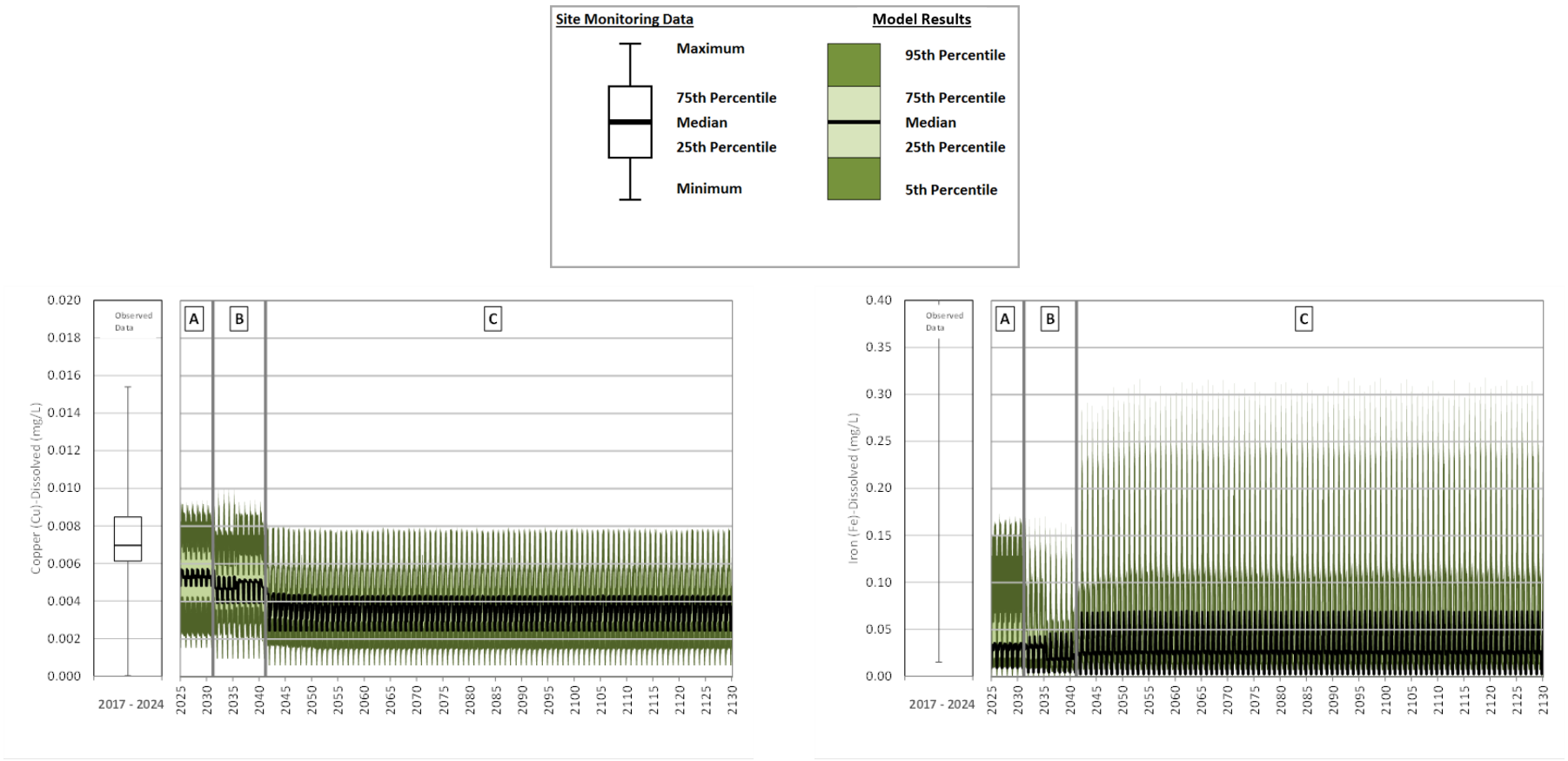
Figure B-175: 9K Sump Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

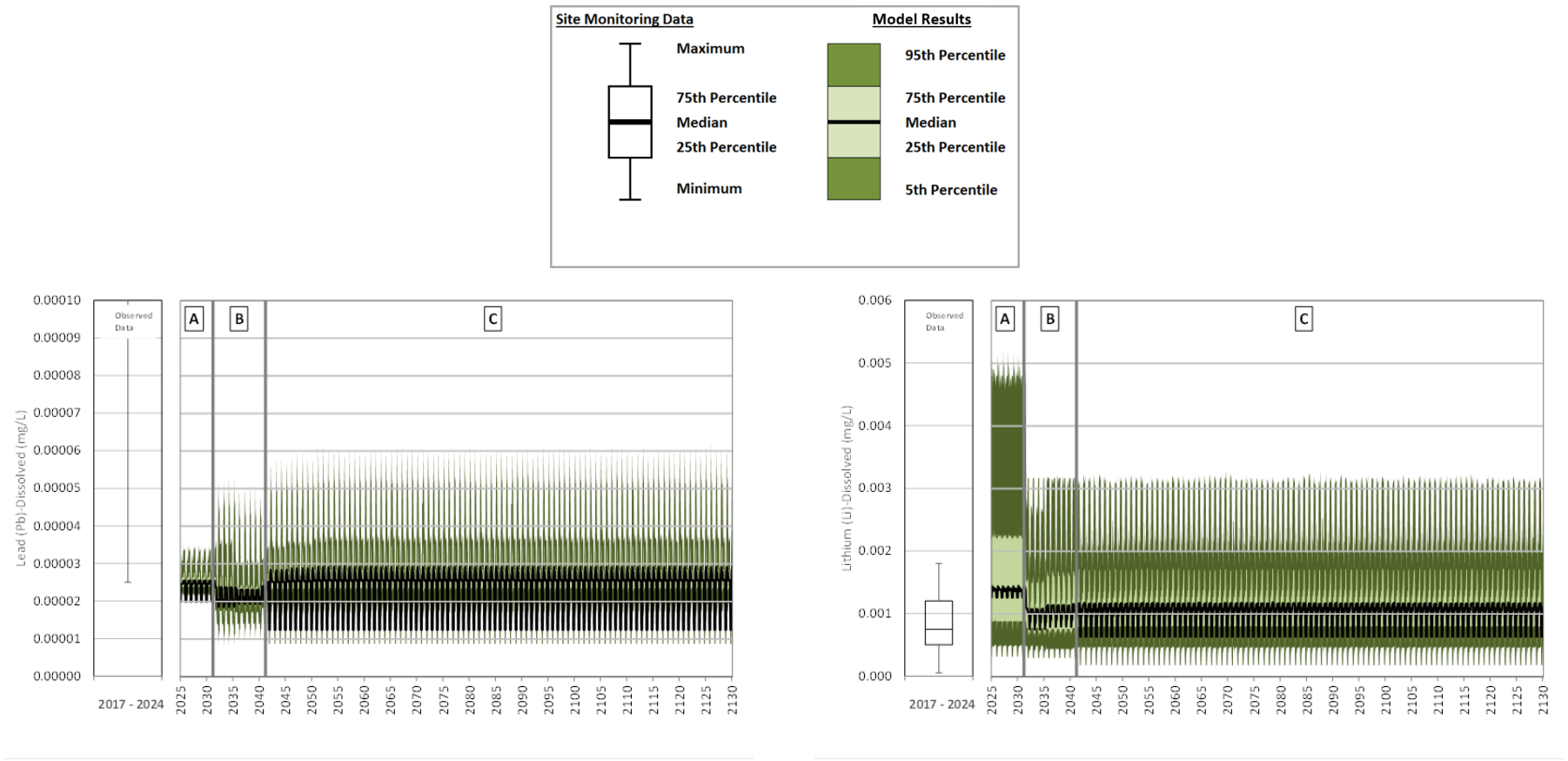
Figure B-176: 9K Sump Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Dissolved copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved iron concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for dissolved iron than the NAG waste rock and disturbed runoff water quality inputs.

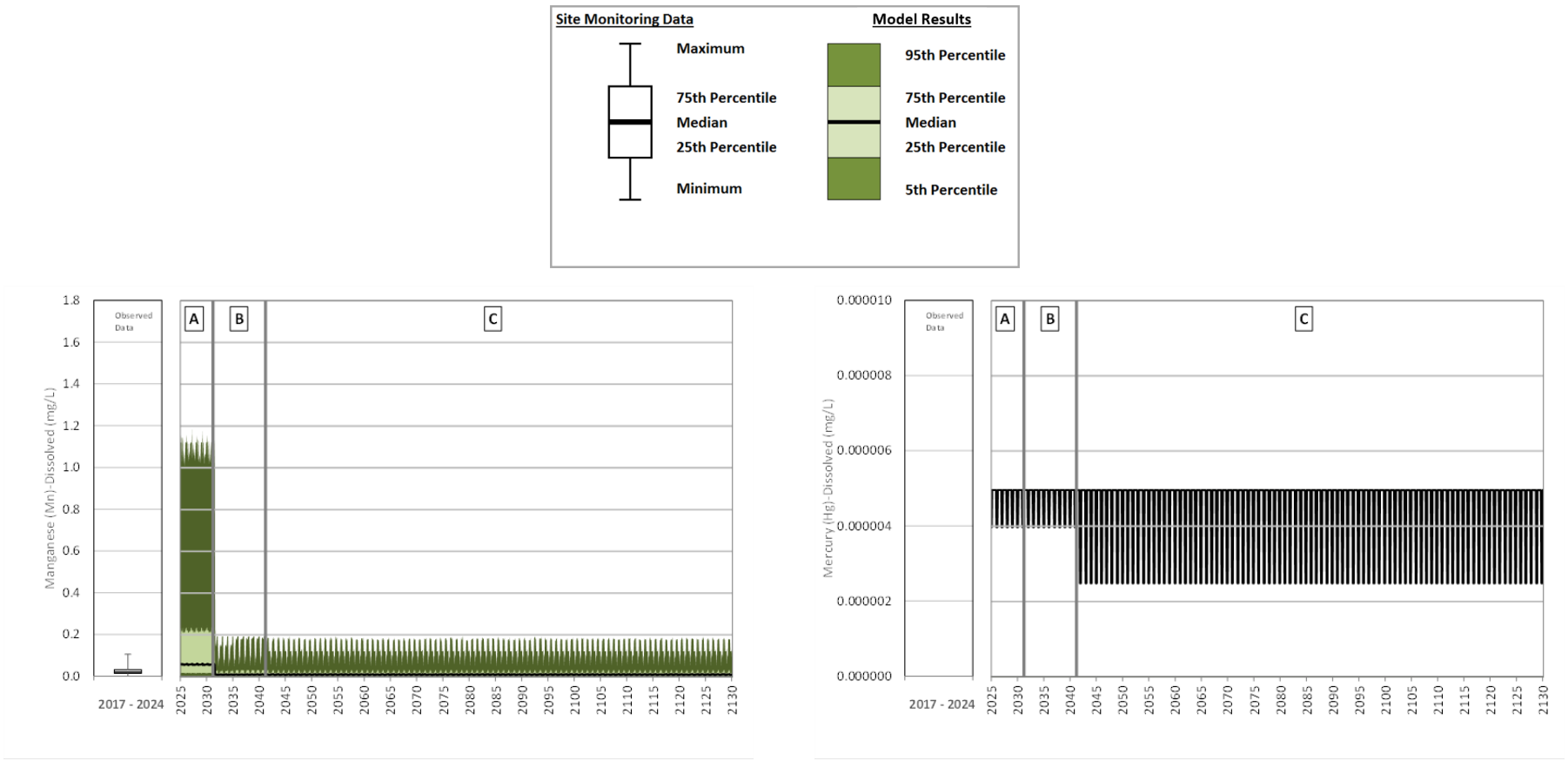
Figure B-177: 9K Sump Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Dissolved lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

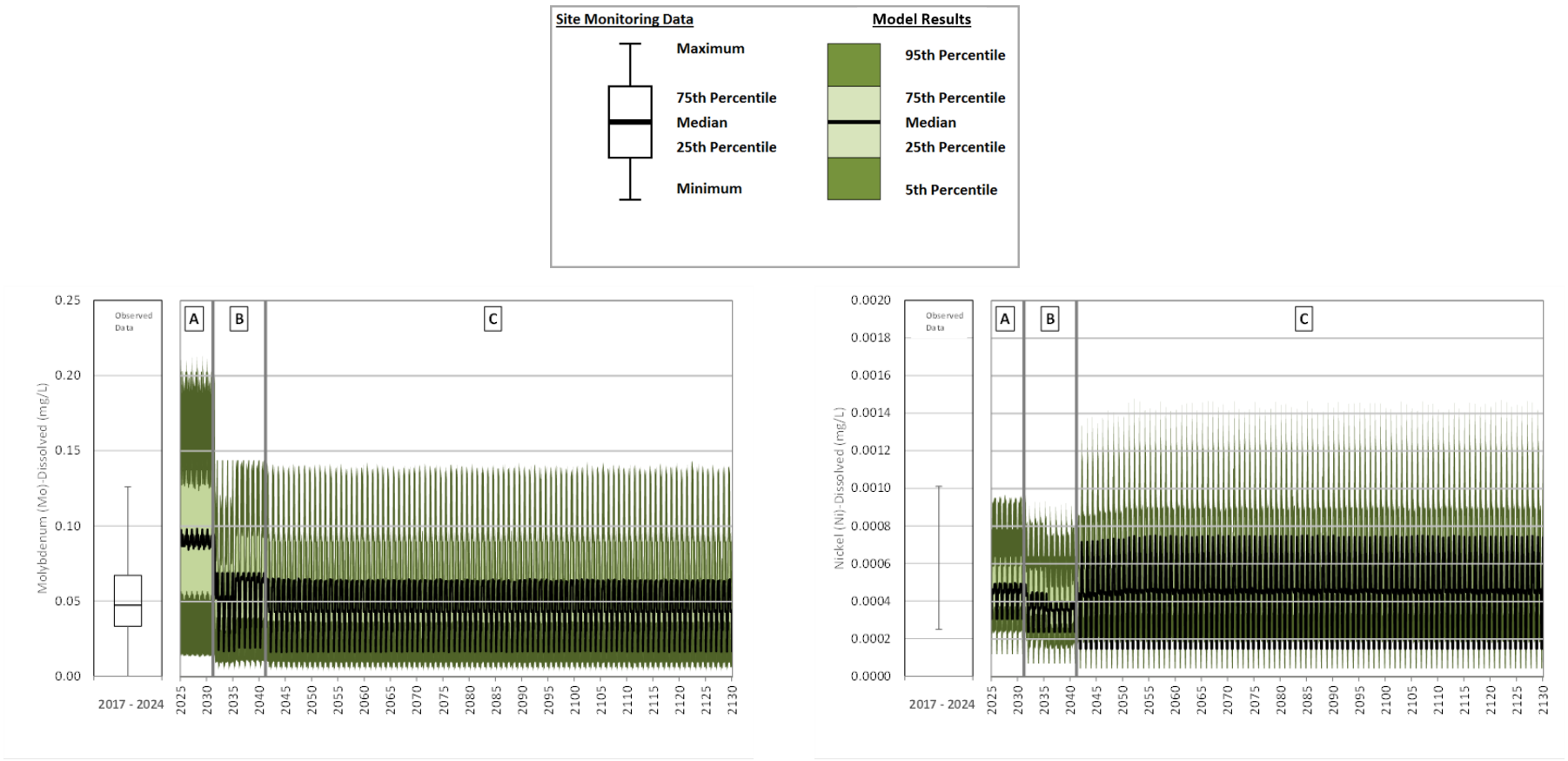
Figure B-178: 9K Sump Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

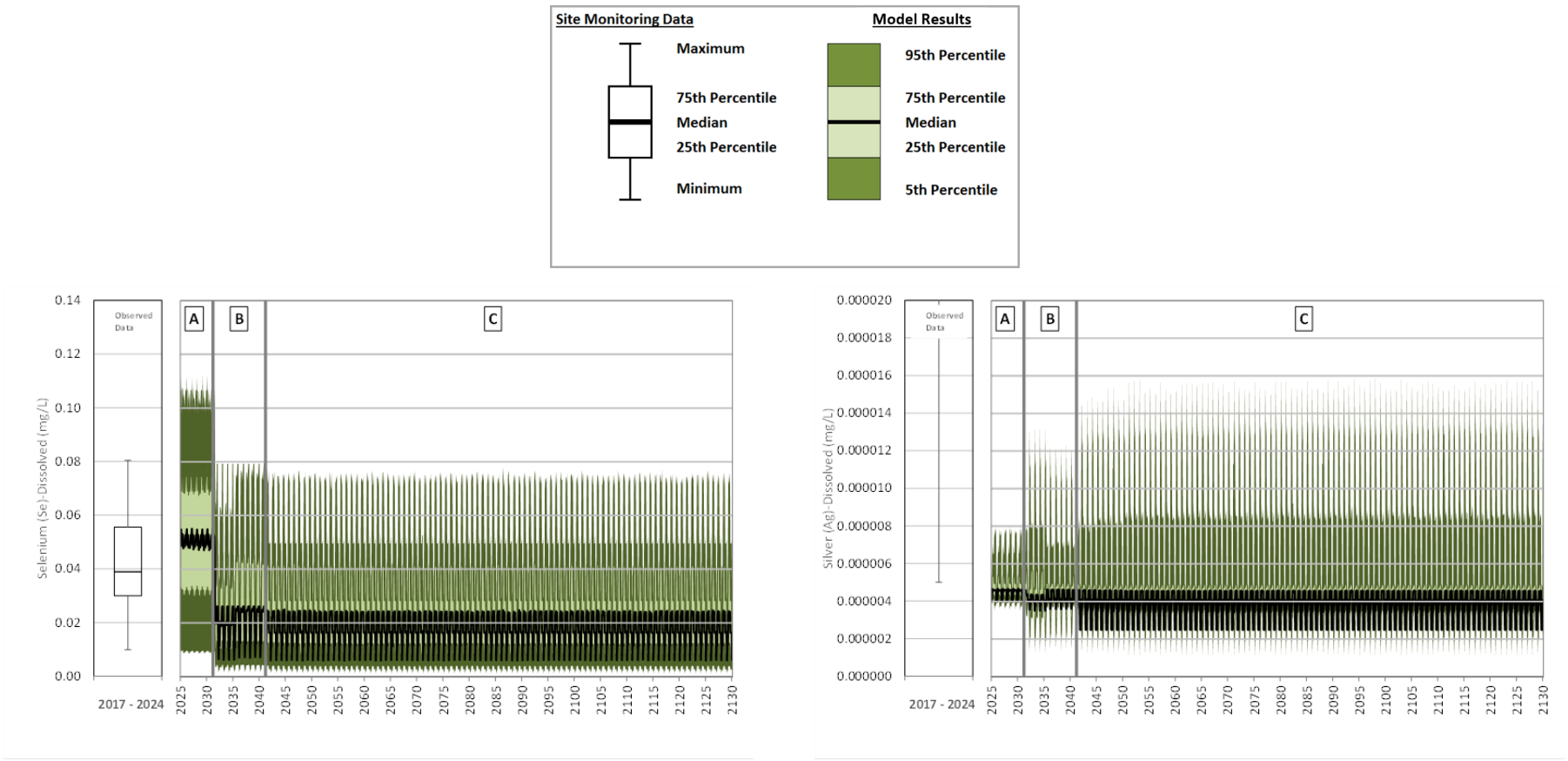
Figure B-179: 9K Sump Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved nickel concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs.

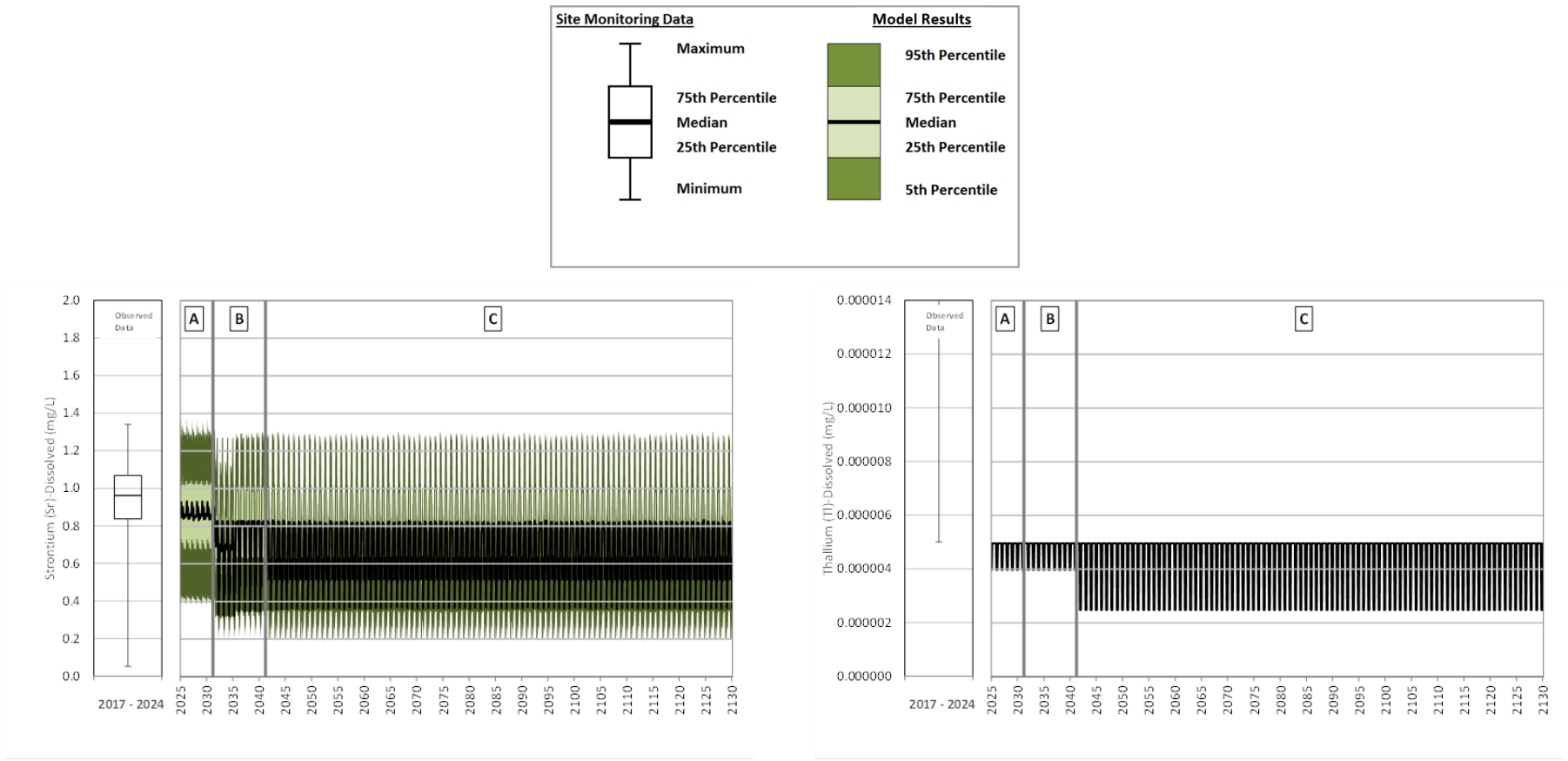
Figure B-180: 9K Sump Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs.

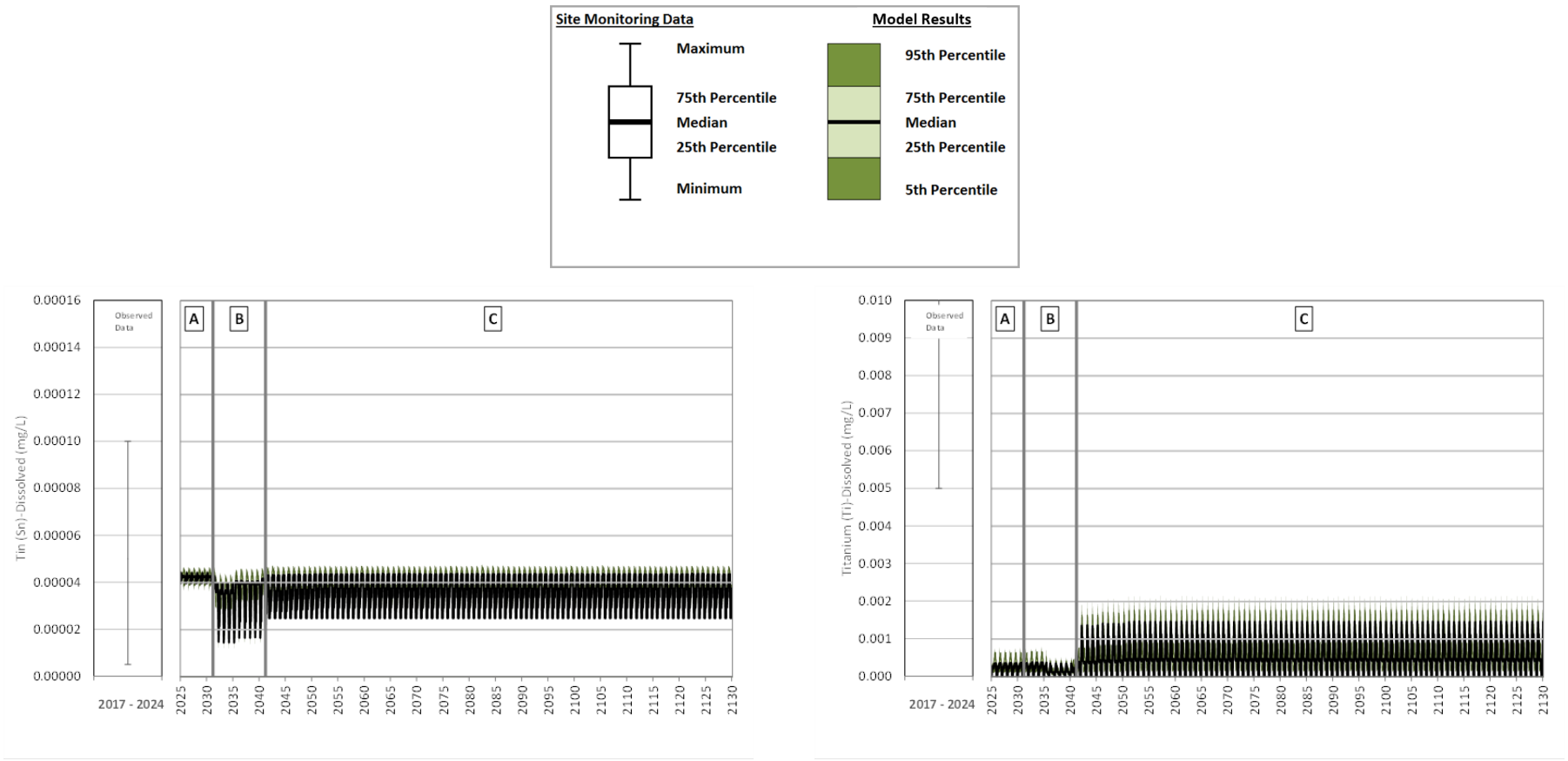
Figure B-181: 9K Sump Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

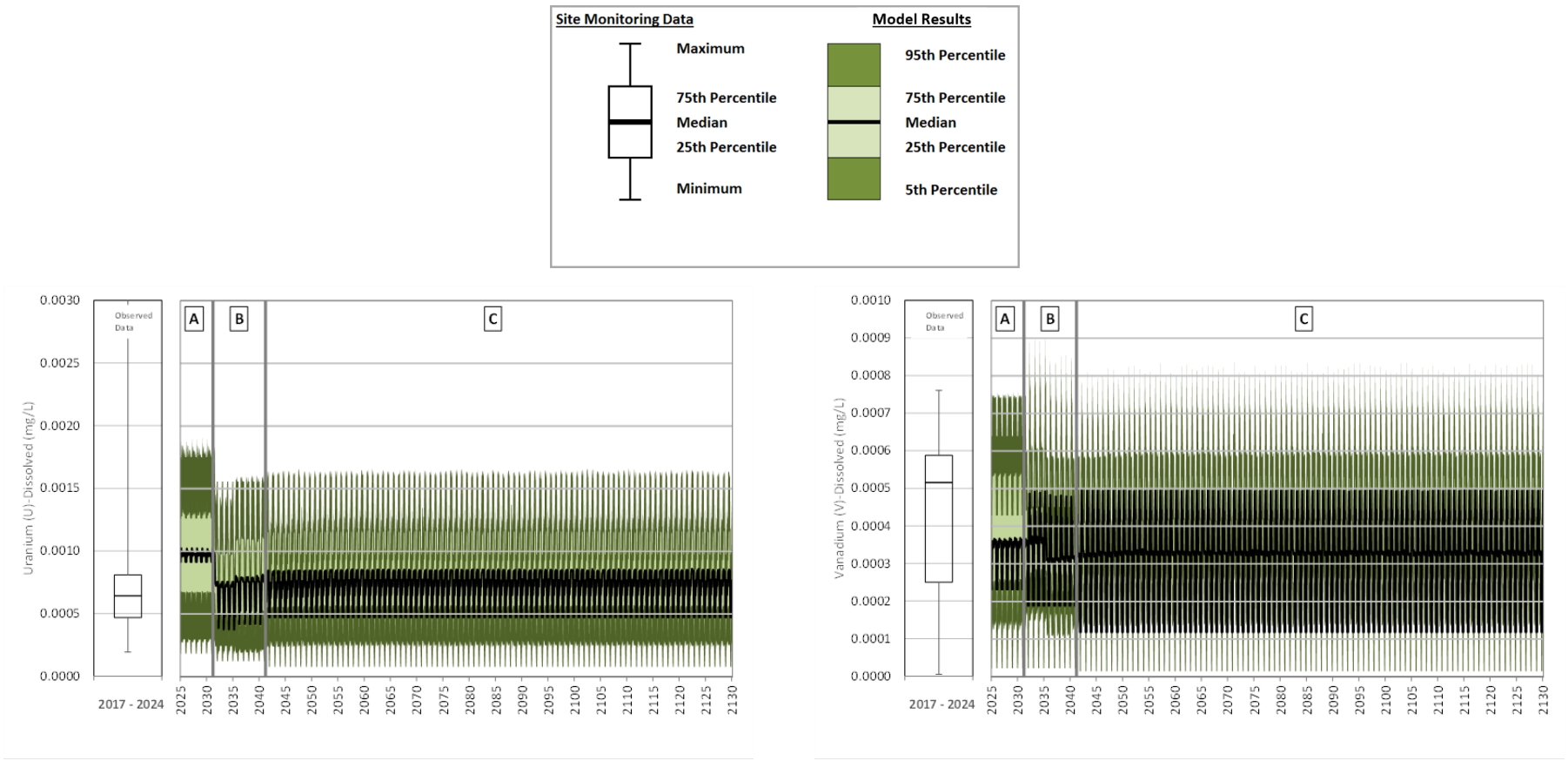
Figure B-182: 9K Sump Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved titanium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved titanium than the NAG waste rock and disturbed runoff water quality inputs.

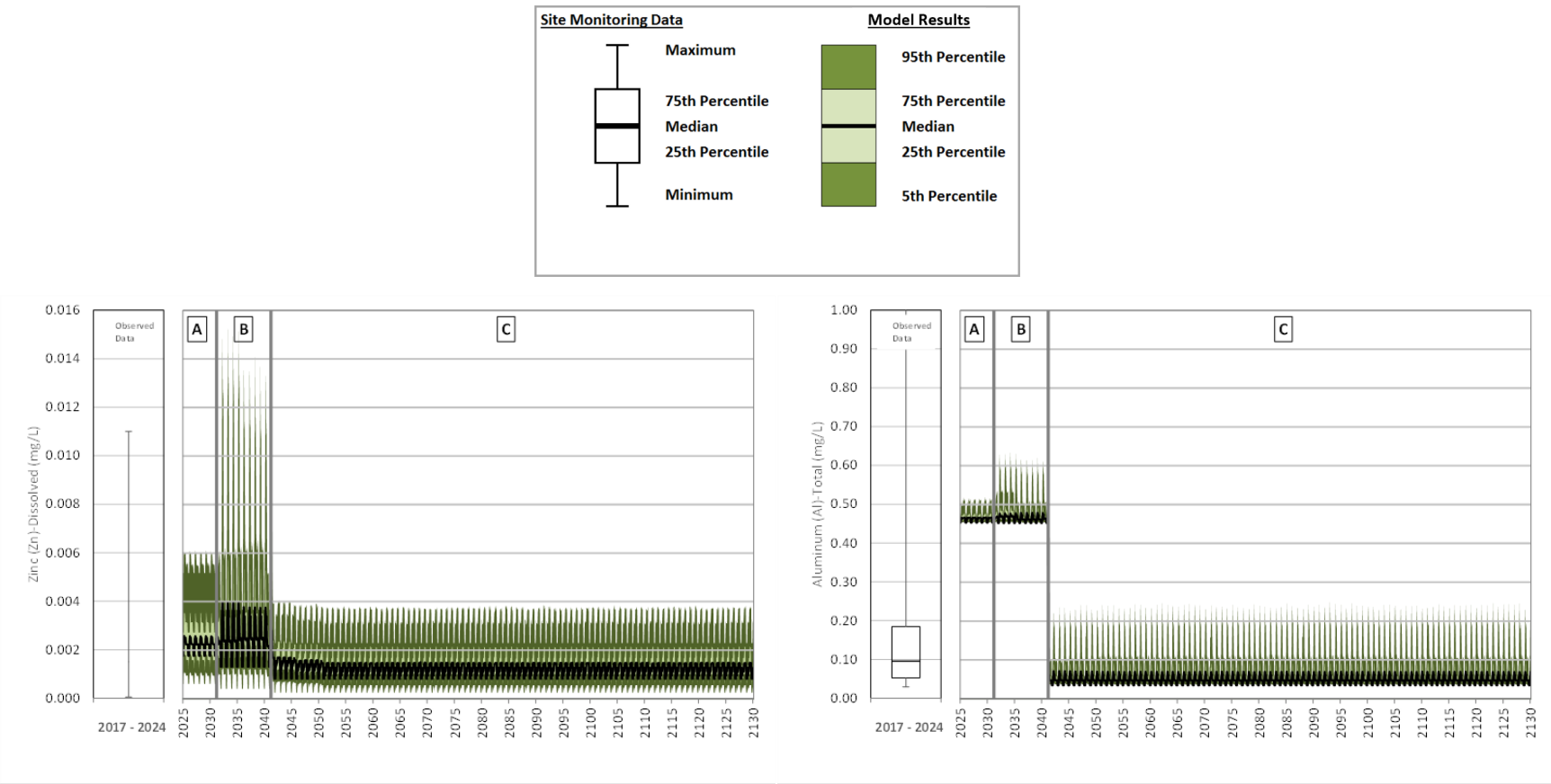
Figure B-183: 9K Sump Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

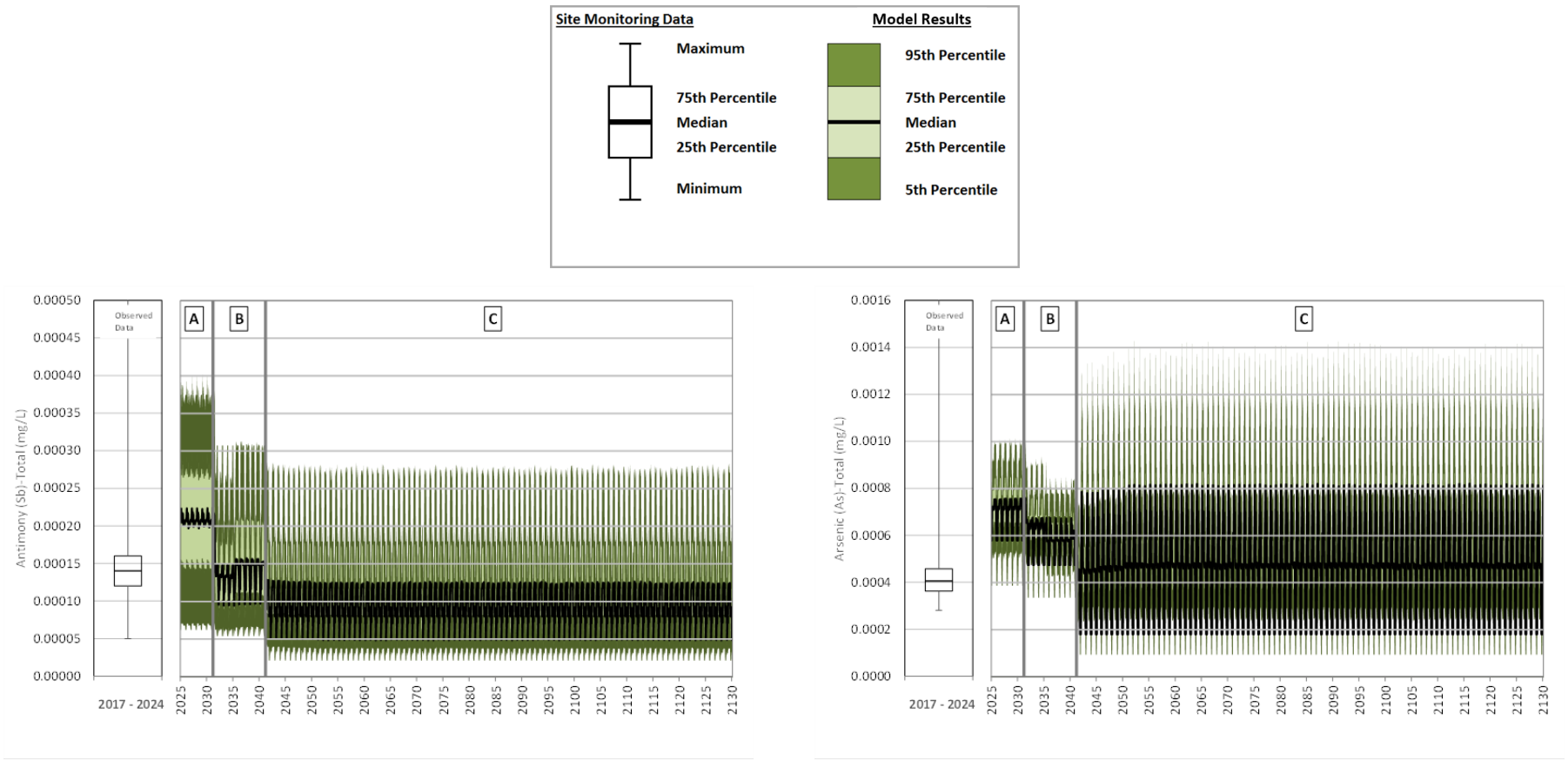
Figure B-184: 9K Sump Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: Maximum dissolved zinc concentrations increase during closure when seepage from the Temporary NW PAG Stockpile changes from the PAG water quality input to the NAG water quality input. The NAG water quality input has higher dissolved zinc concentrations than the Pag water quality input. Dissolved zinc concentrations decrease from closure and post-closure as runoff areas are remediated. Total aluminum concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total aluminum than the NAG waste rock and disturbed runoff water quality inputs

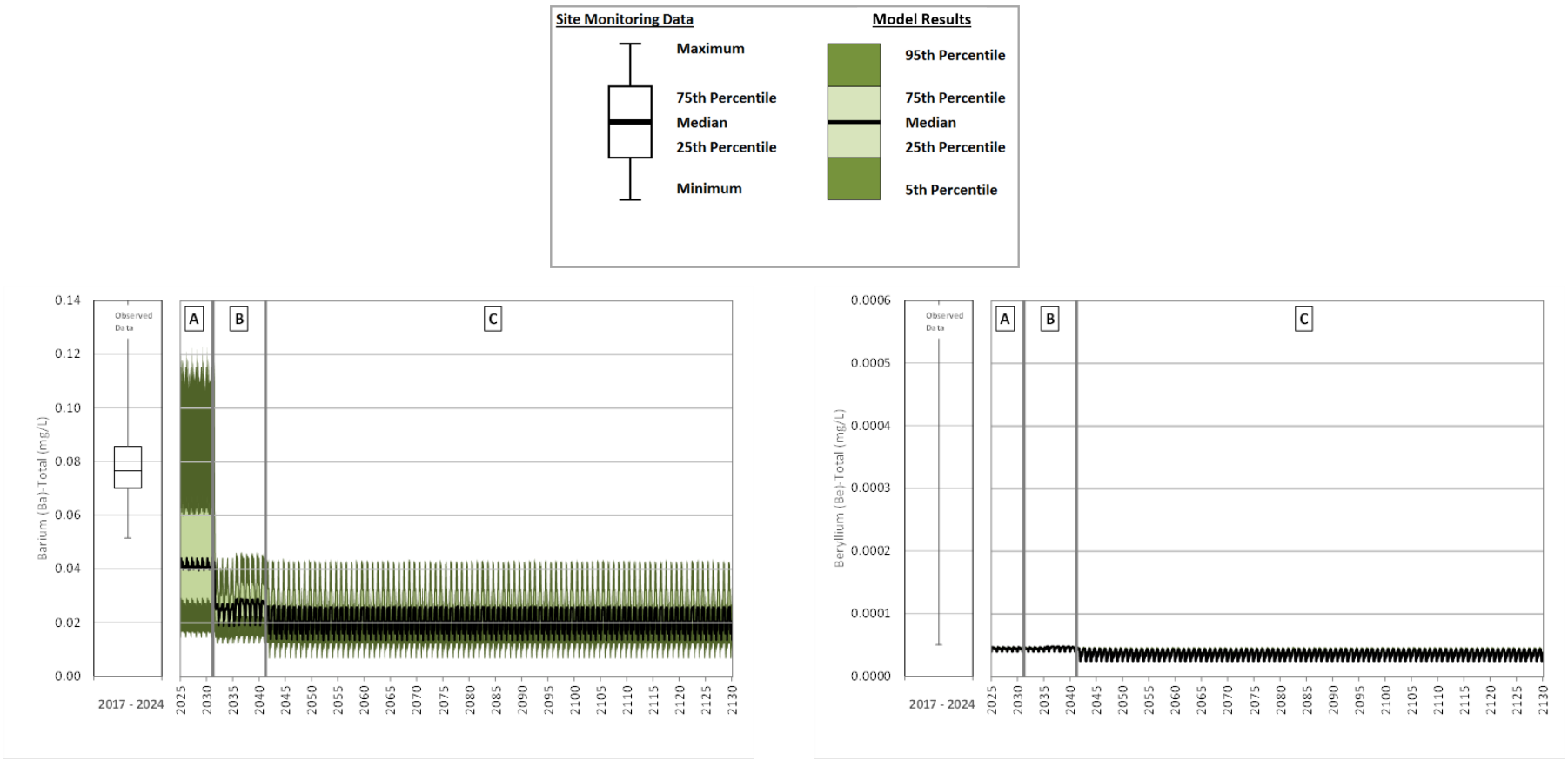
Figure B-185: 9K Sump Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: Total antimony concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total arsenic concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for total arsenic than the NAG waste rock and disturbed runoff water quality inputs.

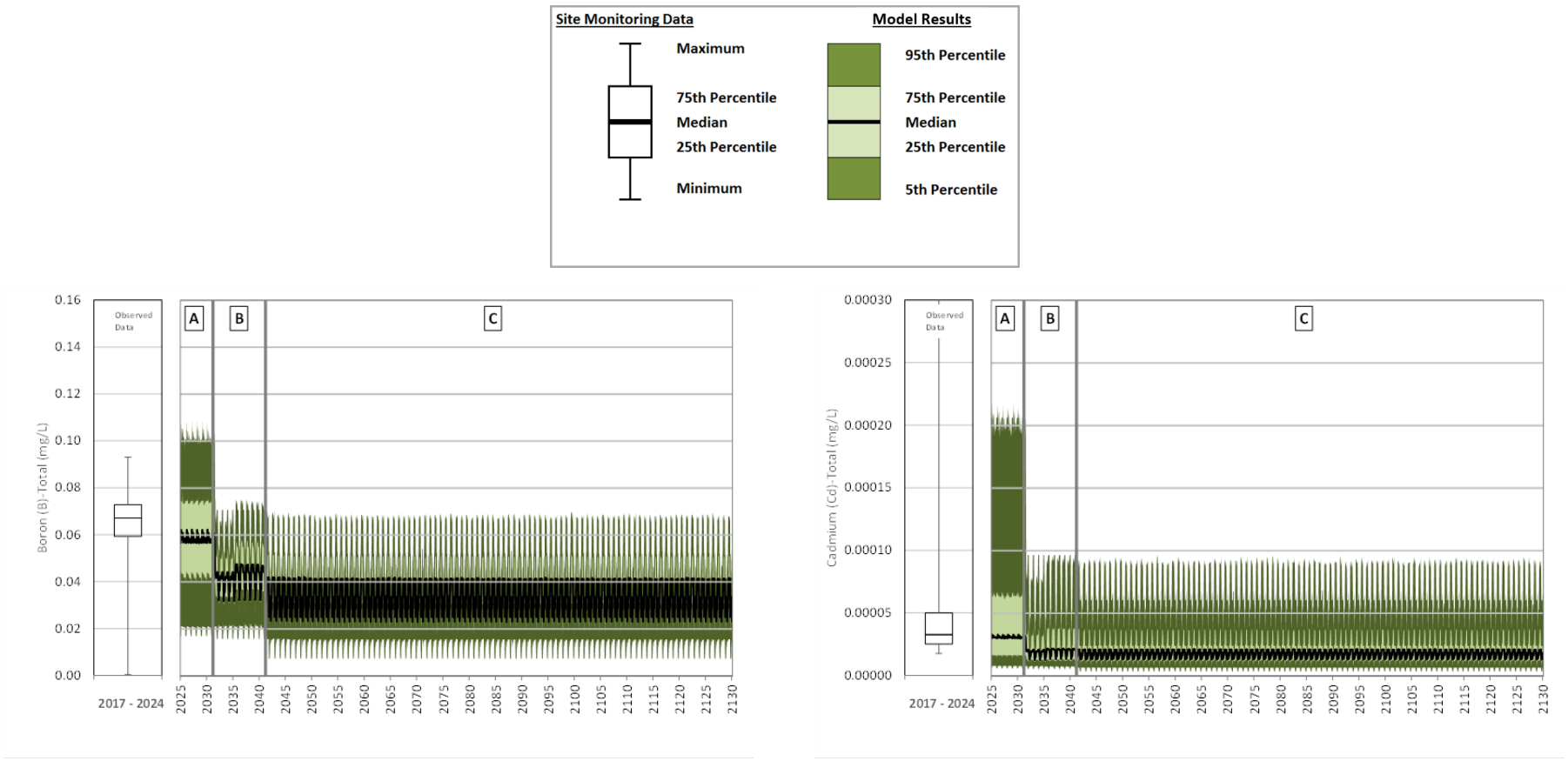
Figure B-186: 9K Sump Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

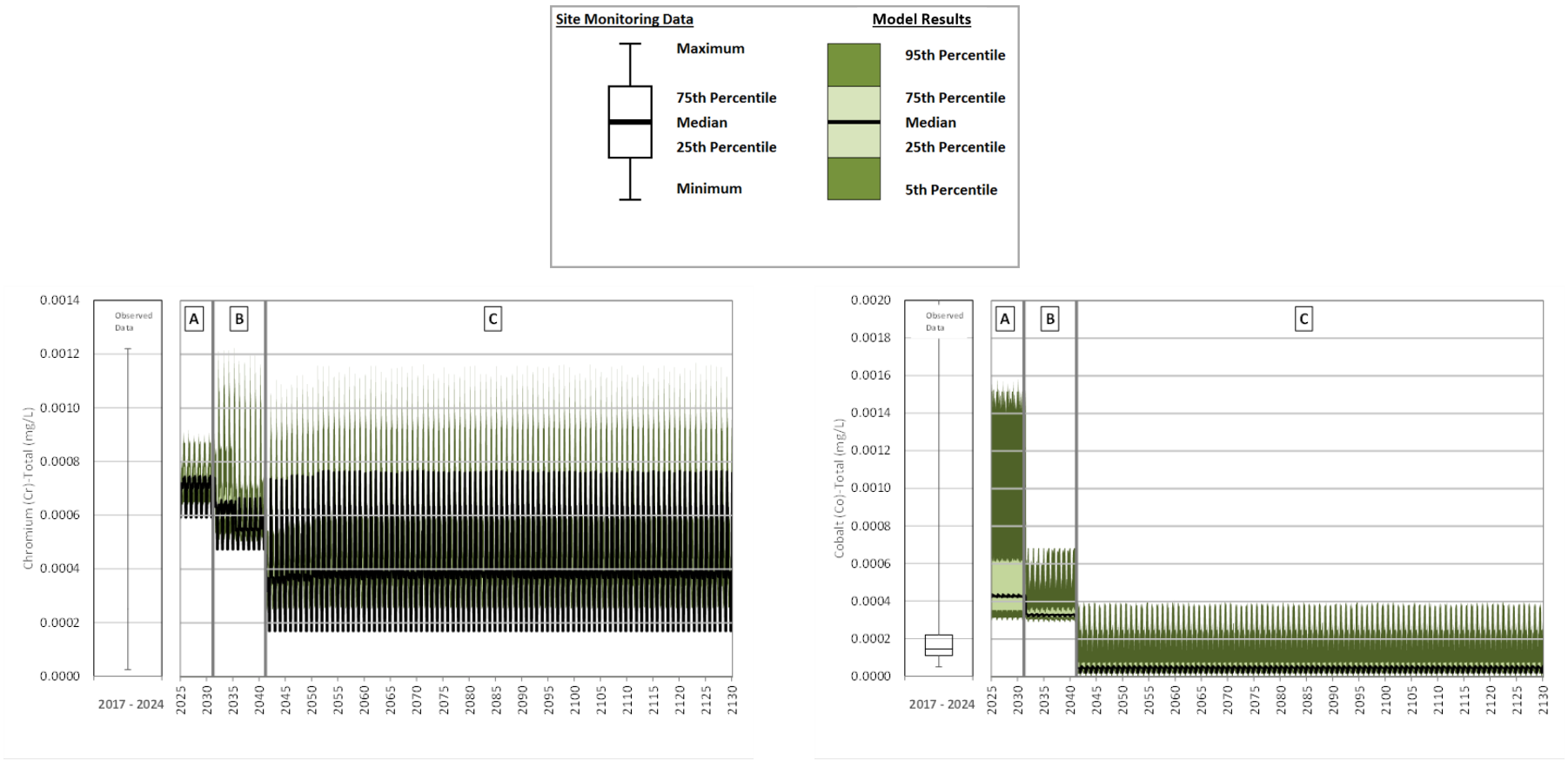
Figure B-187: 9K Sump Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

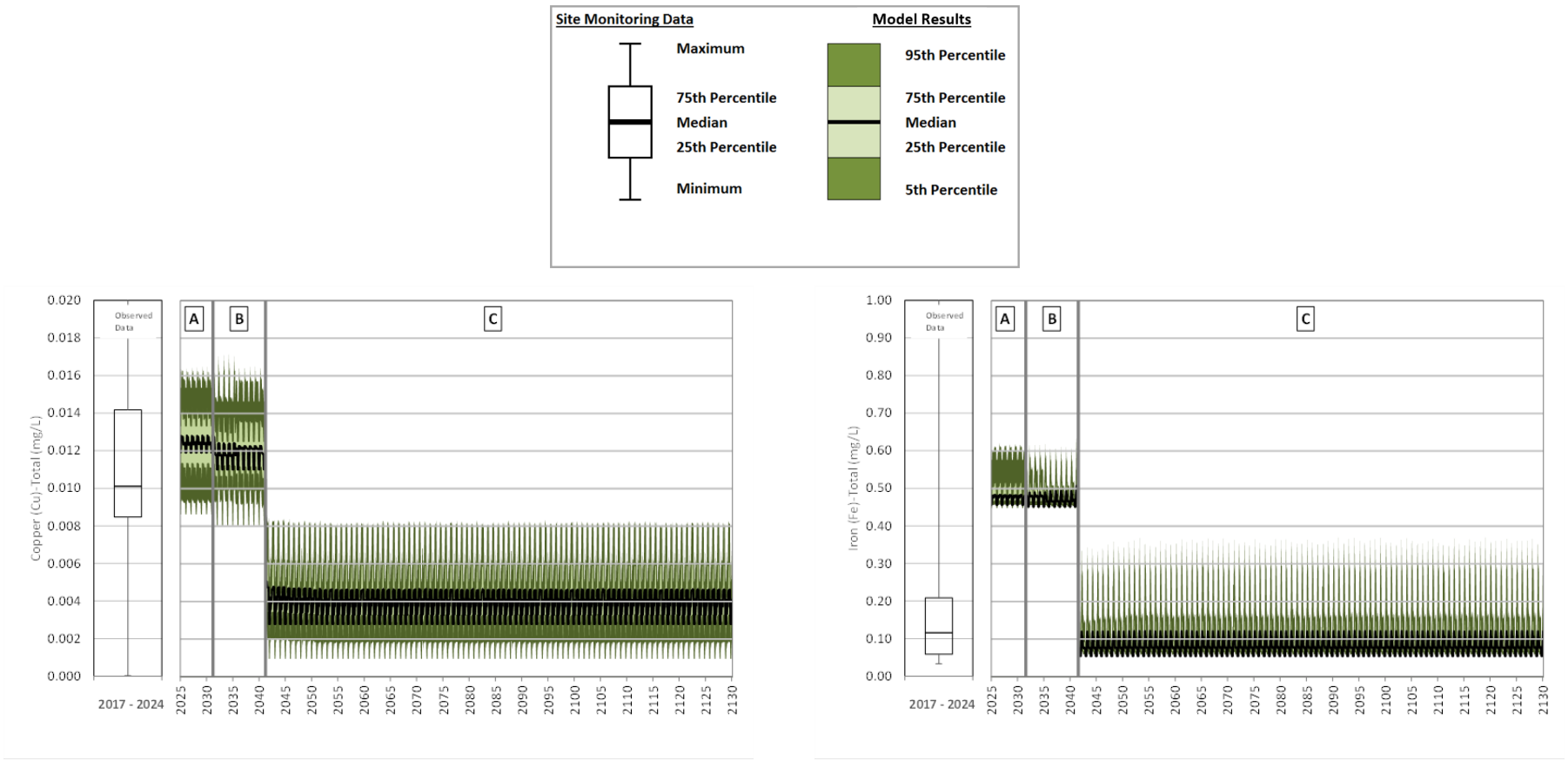
Figure B-188: 9K Sump Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Total chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the NAG waste rock and disturbed runoff water quality inputs. Total cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

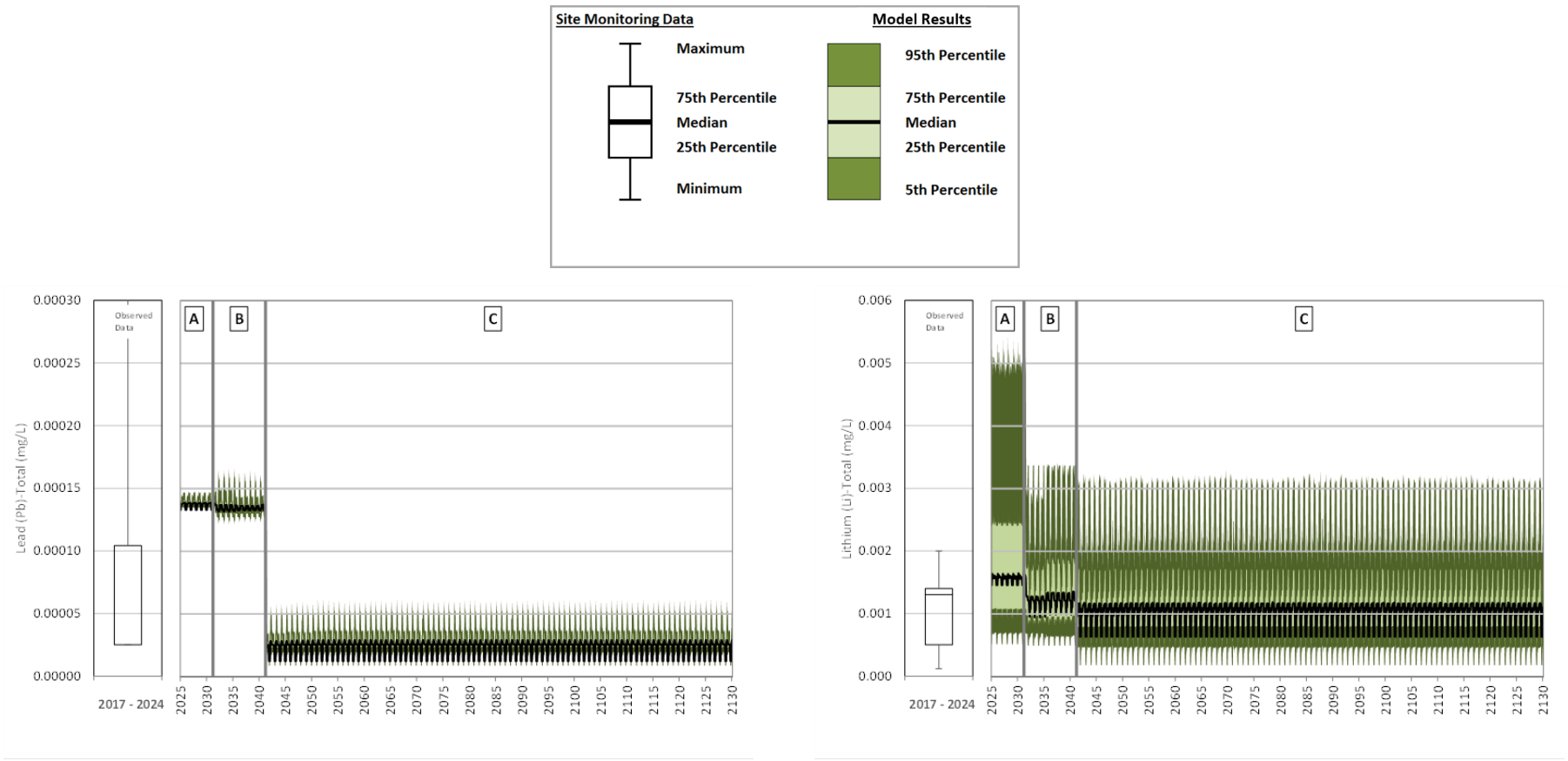
Figure B-189: 9K Sump Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Total copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total iron concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for total iron than the NAG waste rock and disturbed runoff water quality inputs.

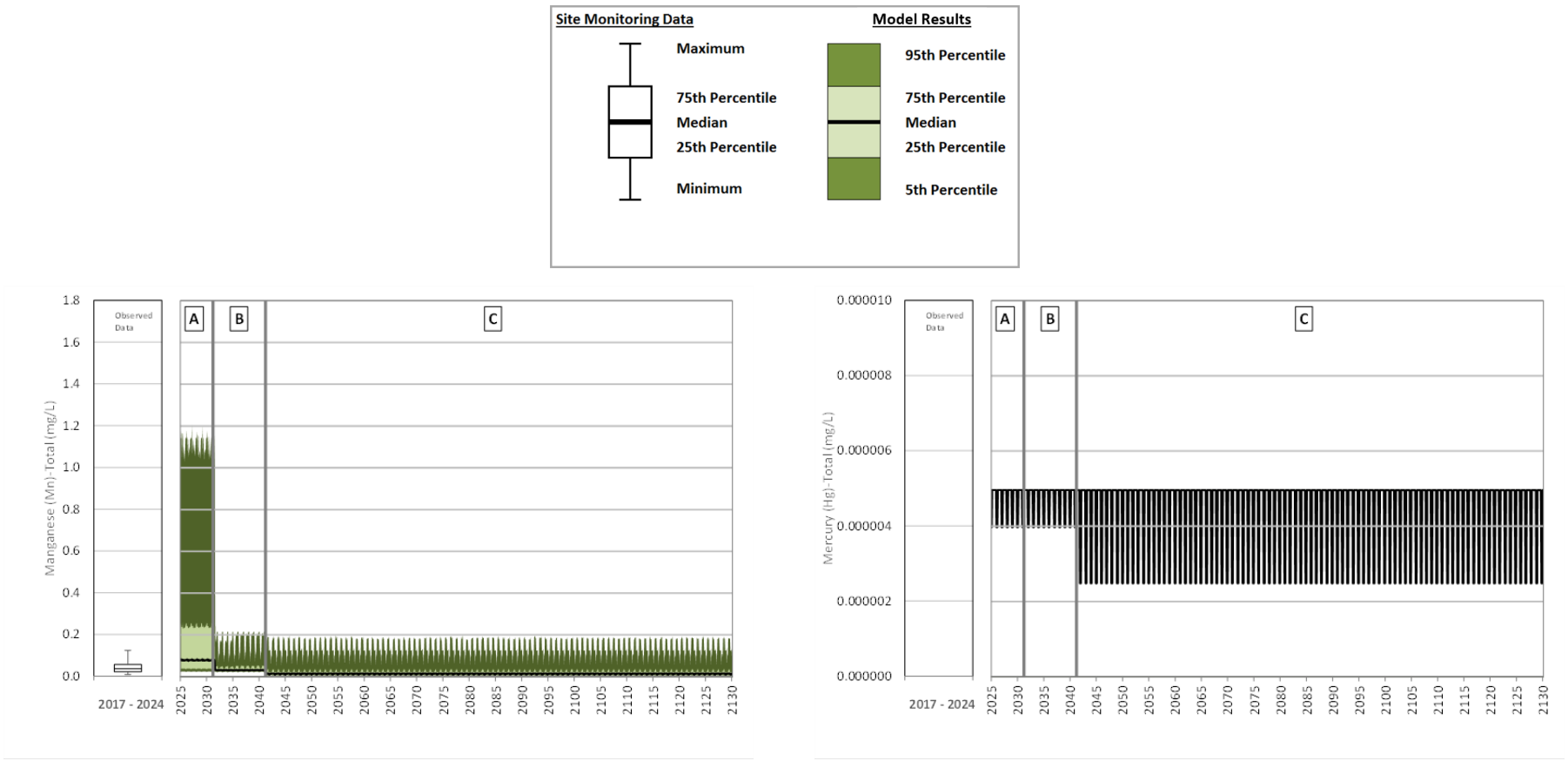
Figure B-190: 9K Sump Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: Total lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Total lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

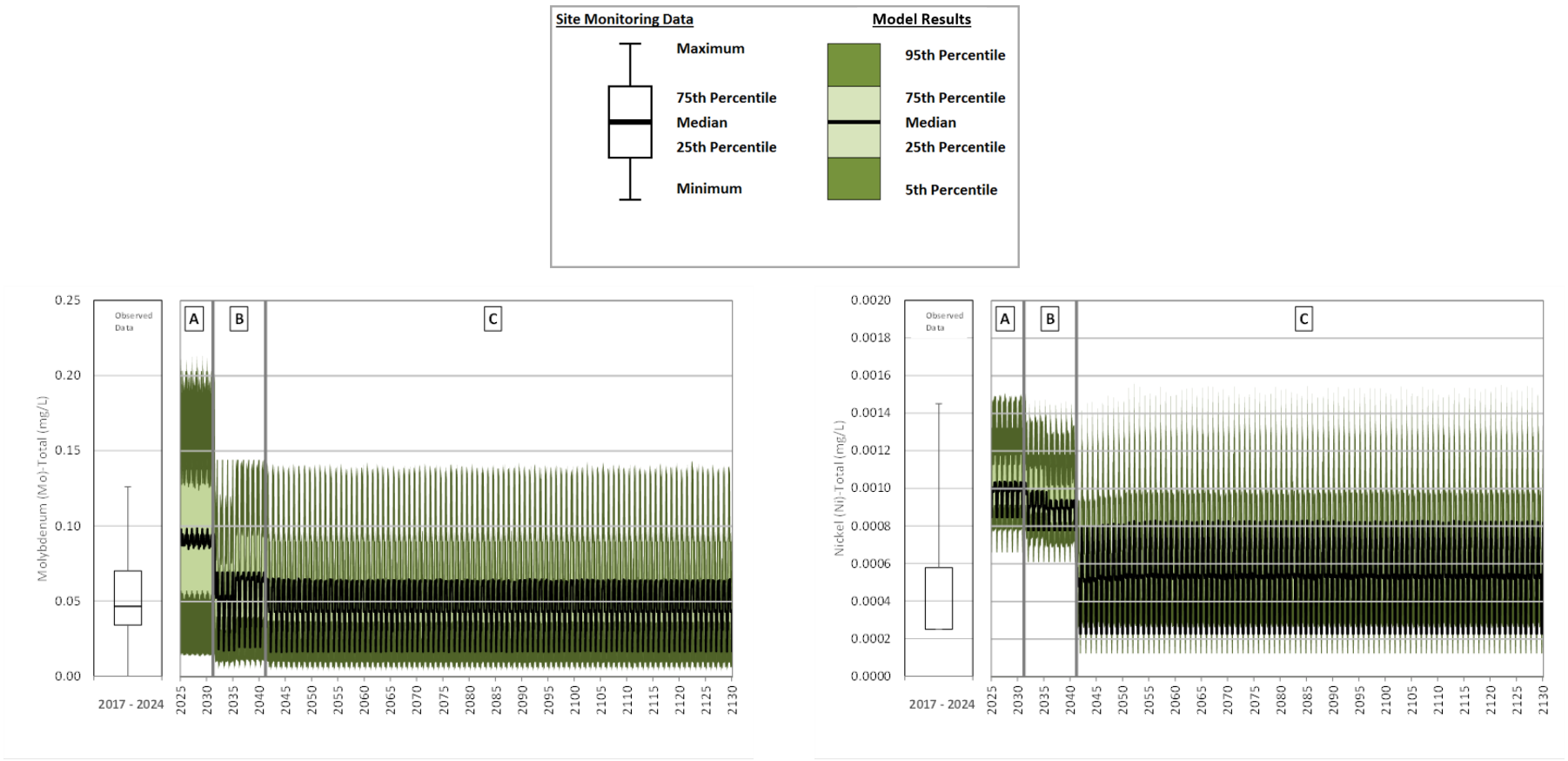
Figure B-191: 9K Sump Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

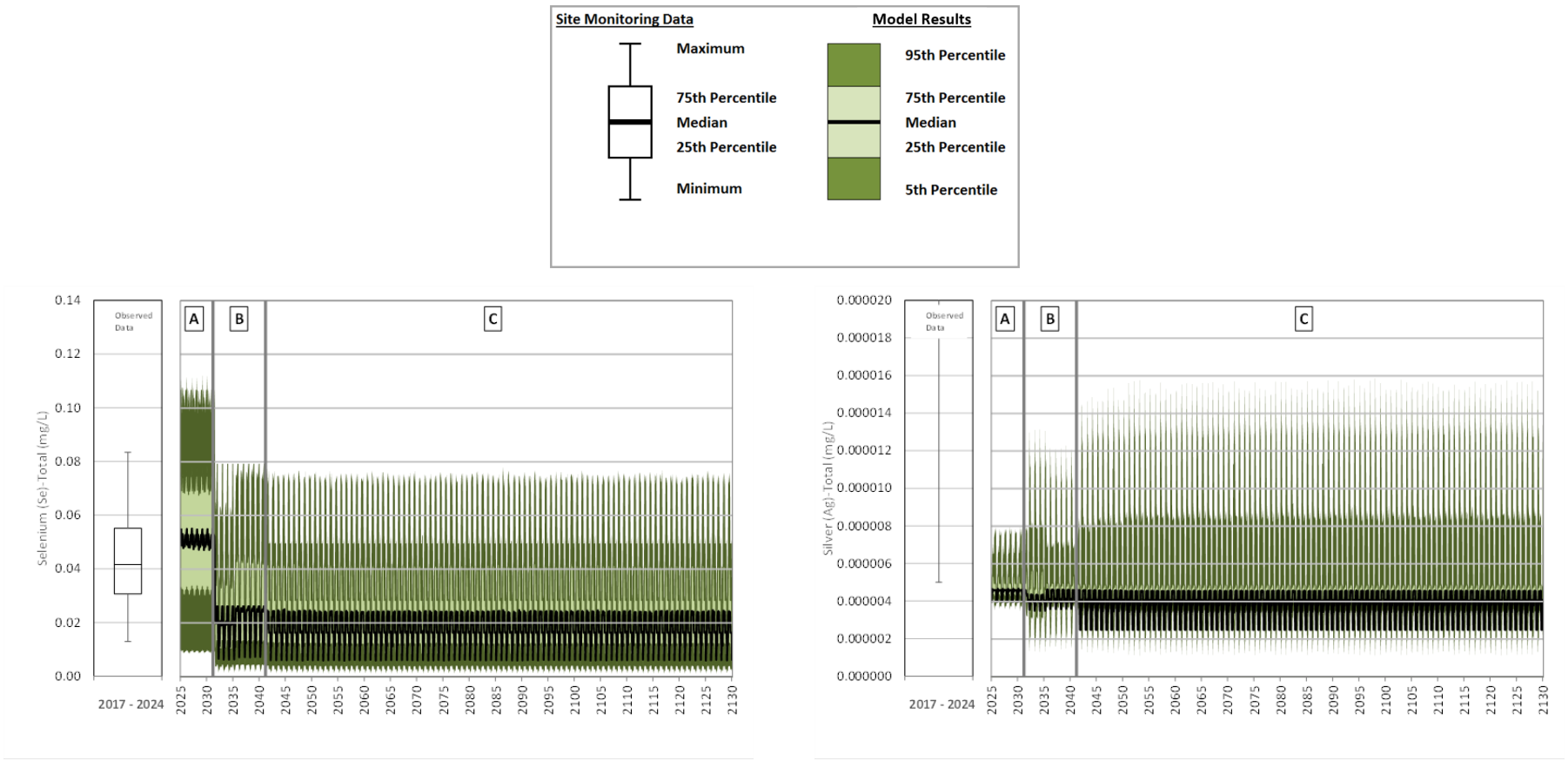
Figure B-192: 9K Sump Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: Total molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Total nickel concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the NAG waste rock and disturbed runoff water quality inputs.

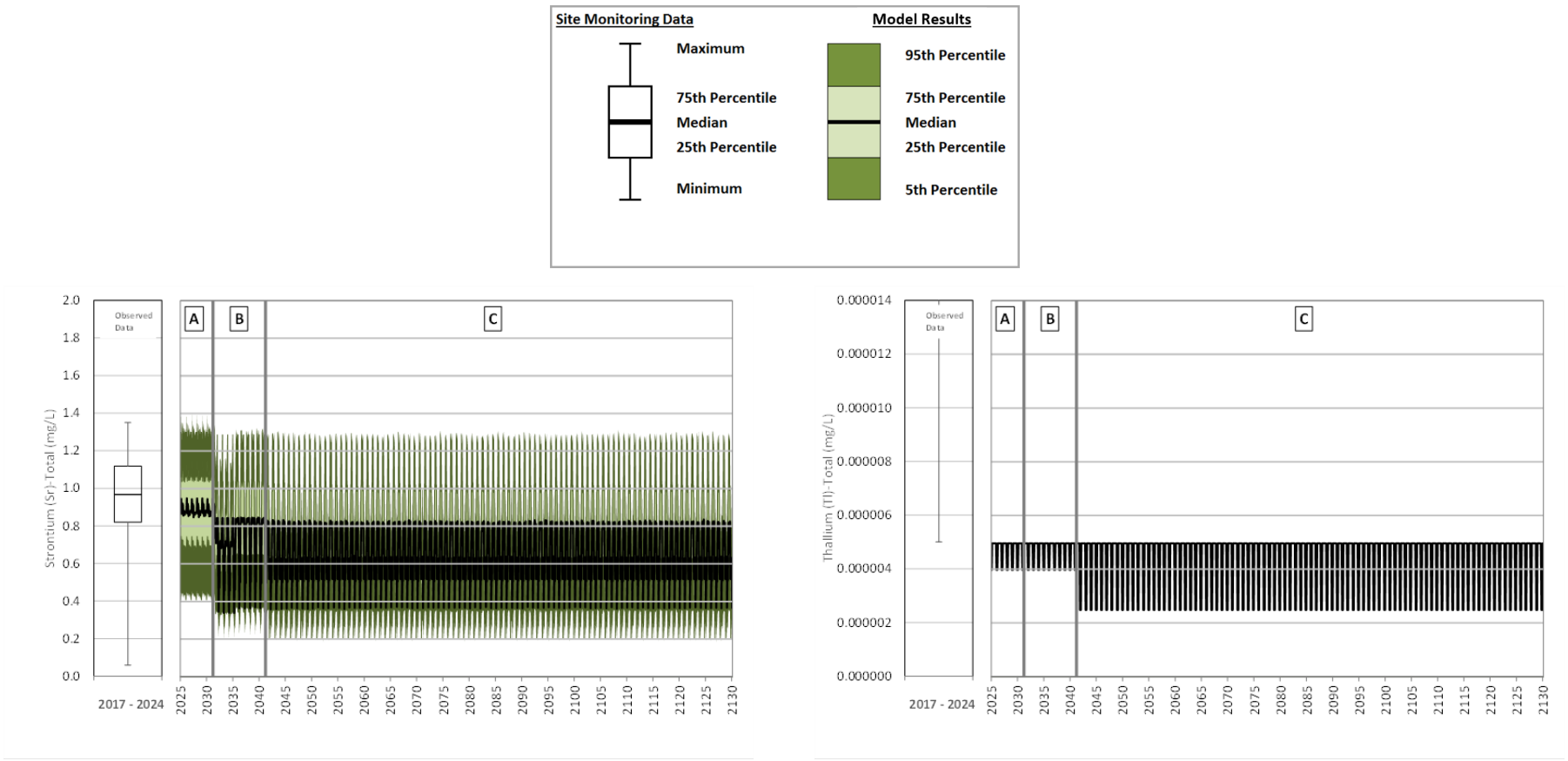
Figure B-193: 9K Sump Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: Total selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the NAG waste rock and disturbed runoff water quality inputs.

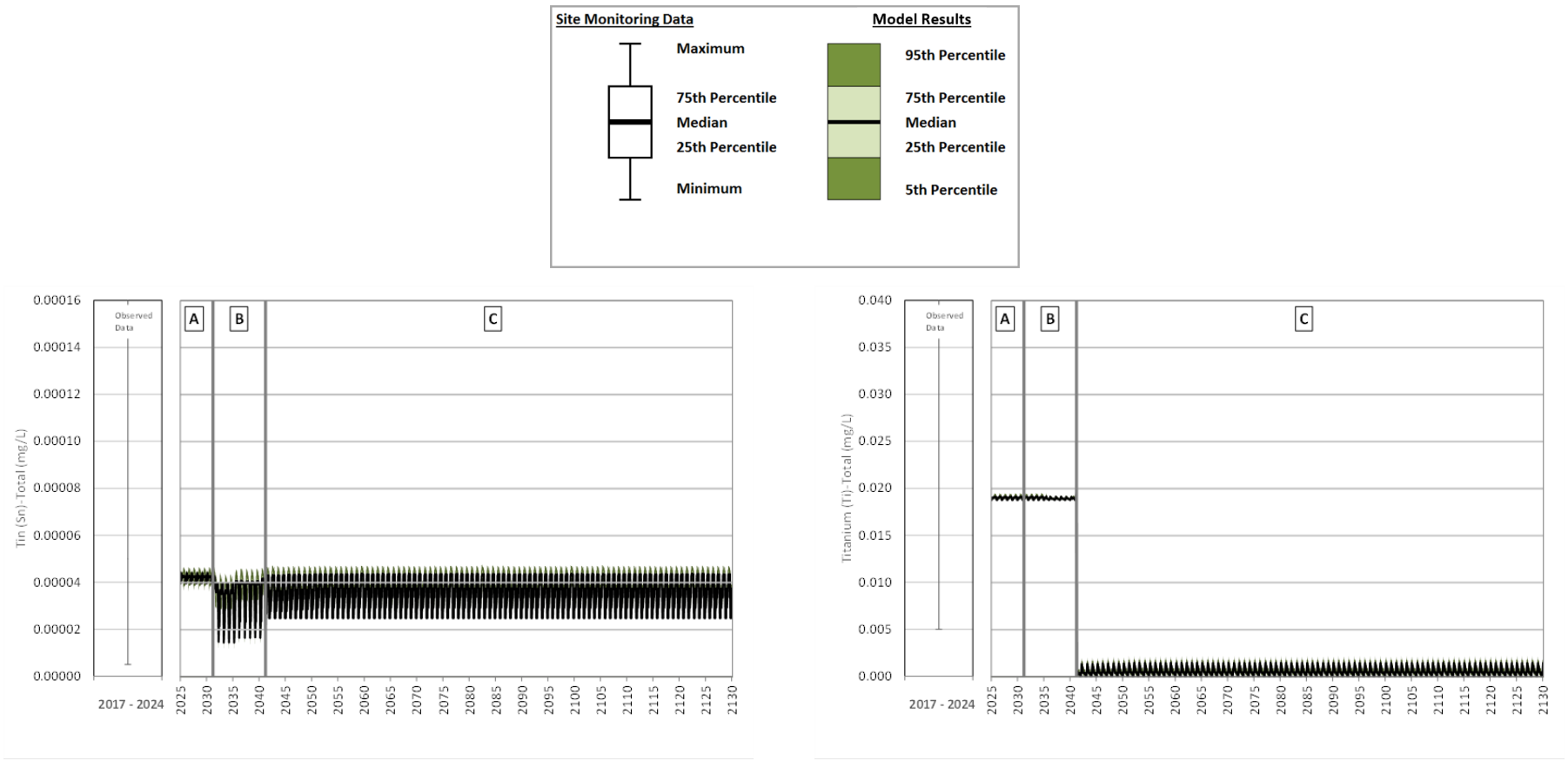
Figure B-194: 9K Sump Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

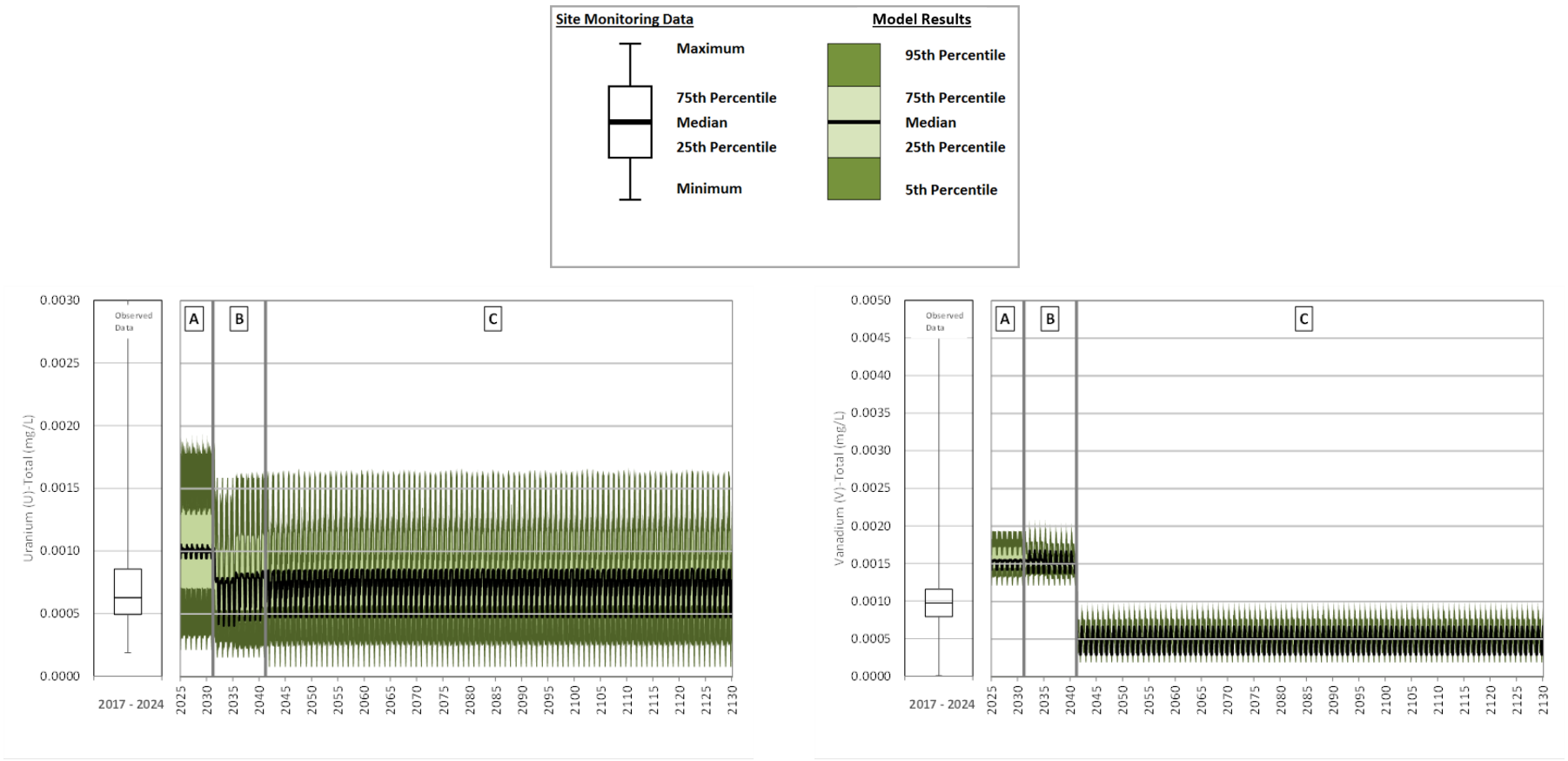
Figure B-195: 9K Sump Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: Total titanium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total titanium than the NAG waste rock and disturbed runoff water quality inputs.

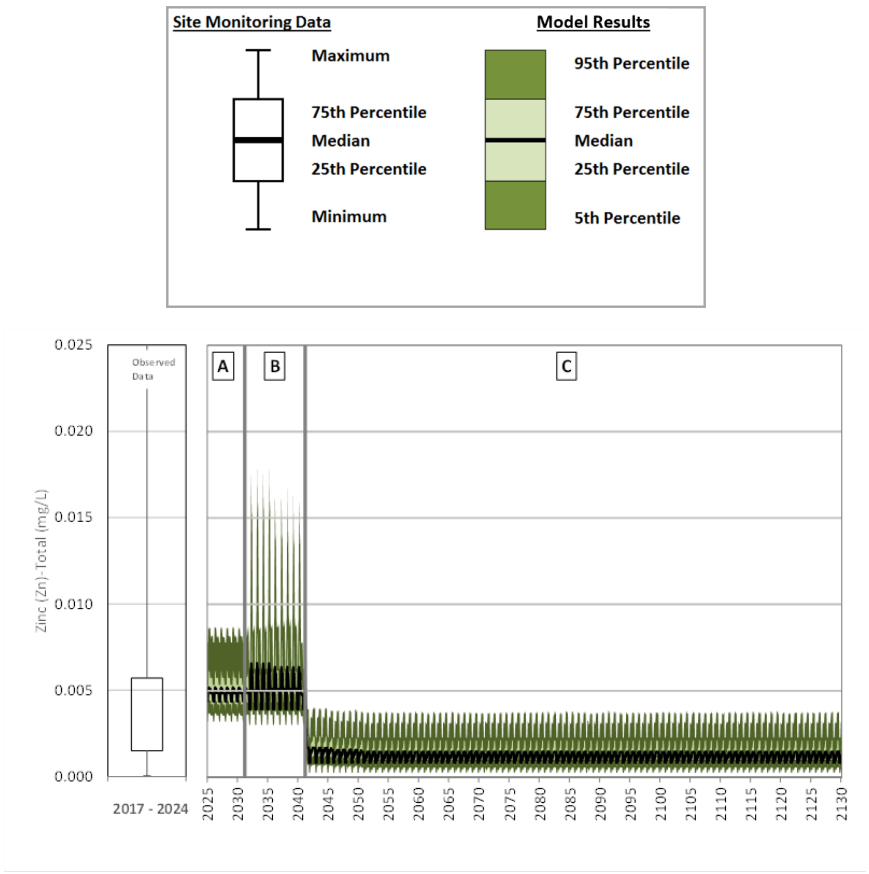
Figure B-196: 9K Sump Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-197: 9K Sump Operations, Closure and Post-closure – Total Uranium and Total Vanadium

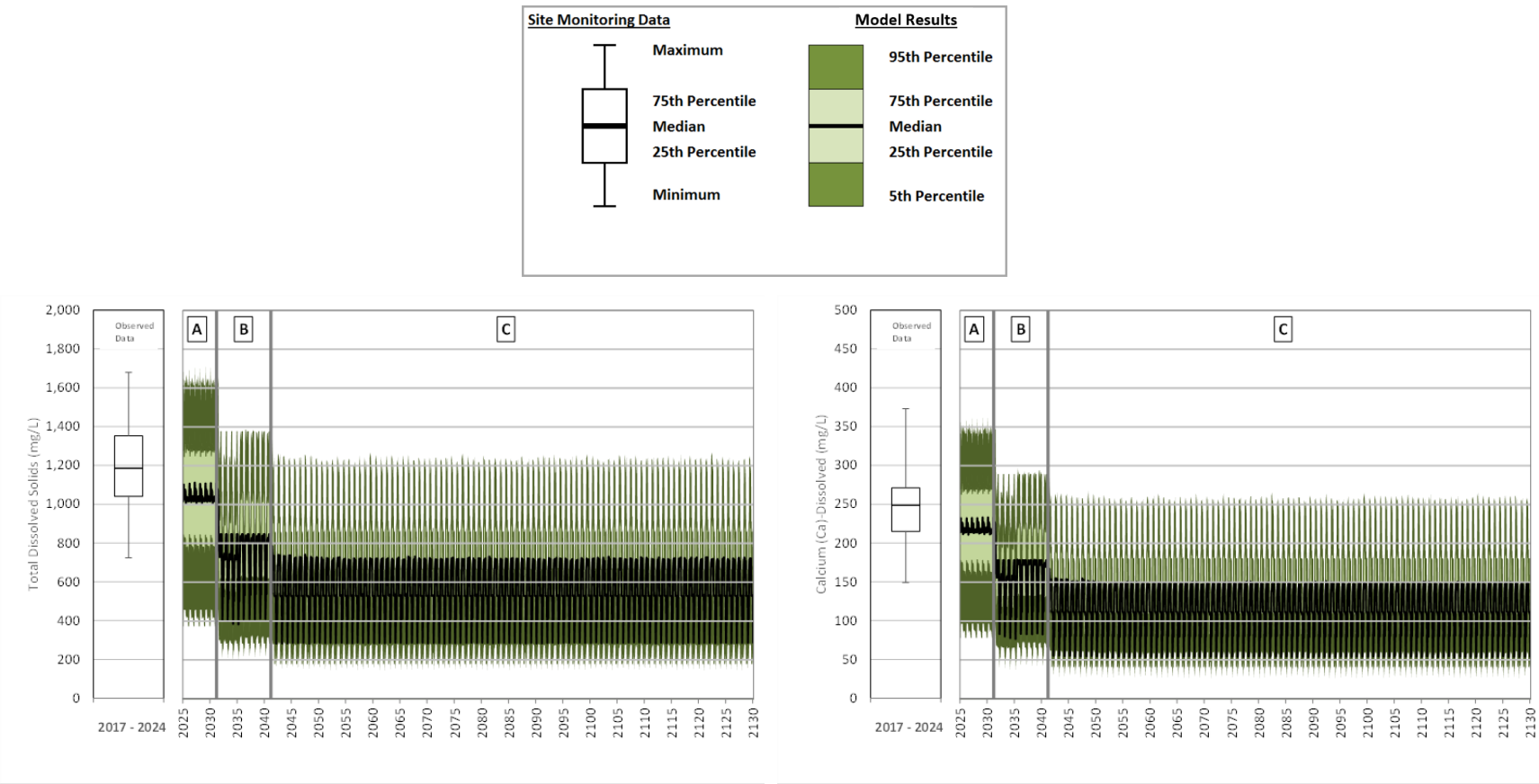


A = Operations; B = Closure; C = Post-closure

Note: Maximum total zinc concentrations increase during closure when seepage from the Temporary NW PAG Stockpile changes from the PAG water quality input to the NAG water quality input. The NAG water quality input has higher total zinc concentrations than the Pag water quality input. Total zinc concentrations decrease from closure and post-closure as runoff areas are remediated.

Figure B-198: 9K Sump Operations, Closure and Post-closure – Total Zinc

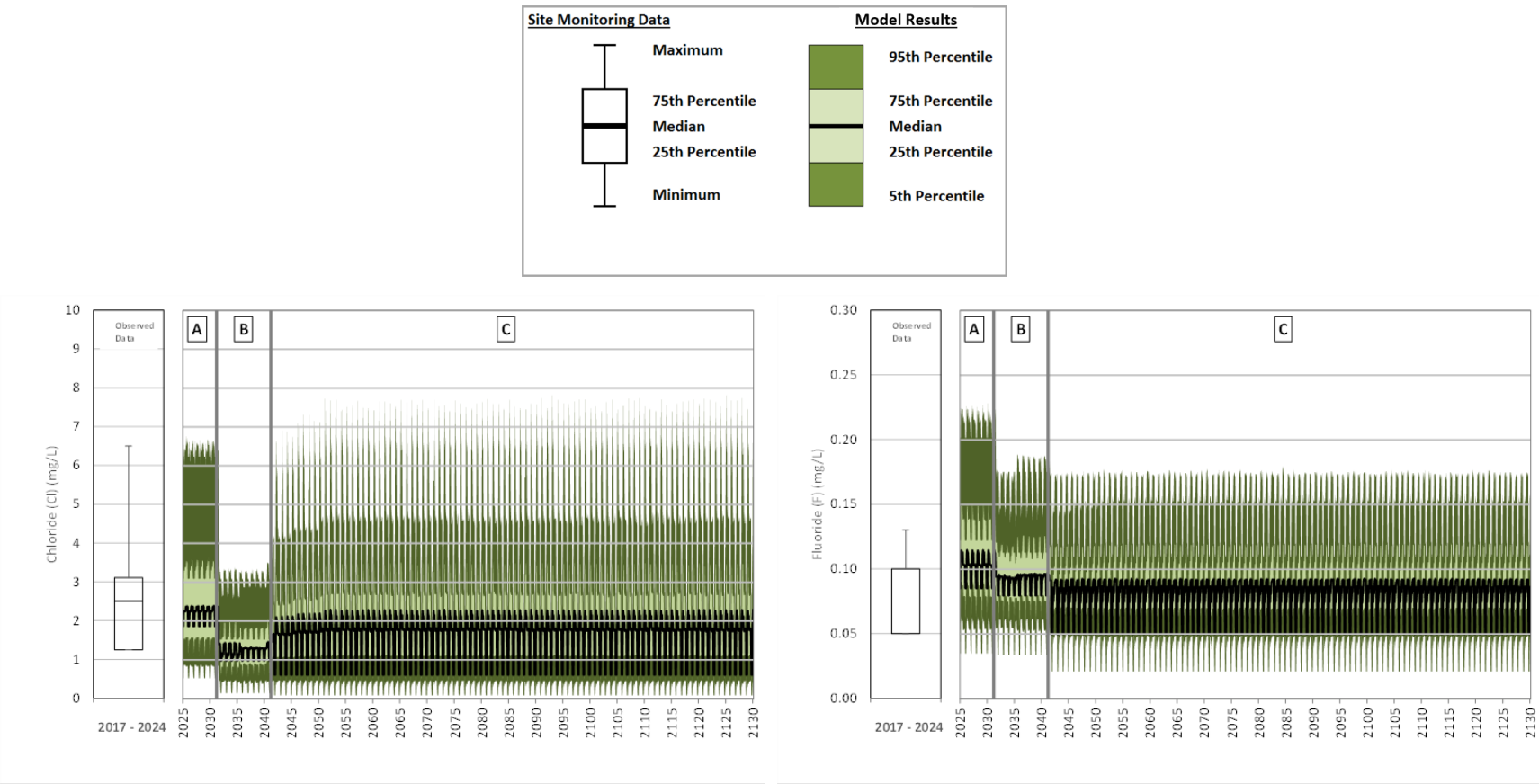
Northwest Sump Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

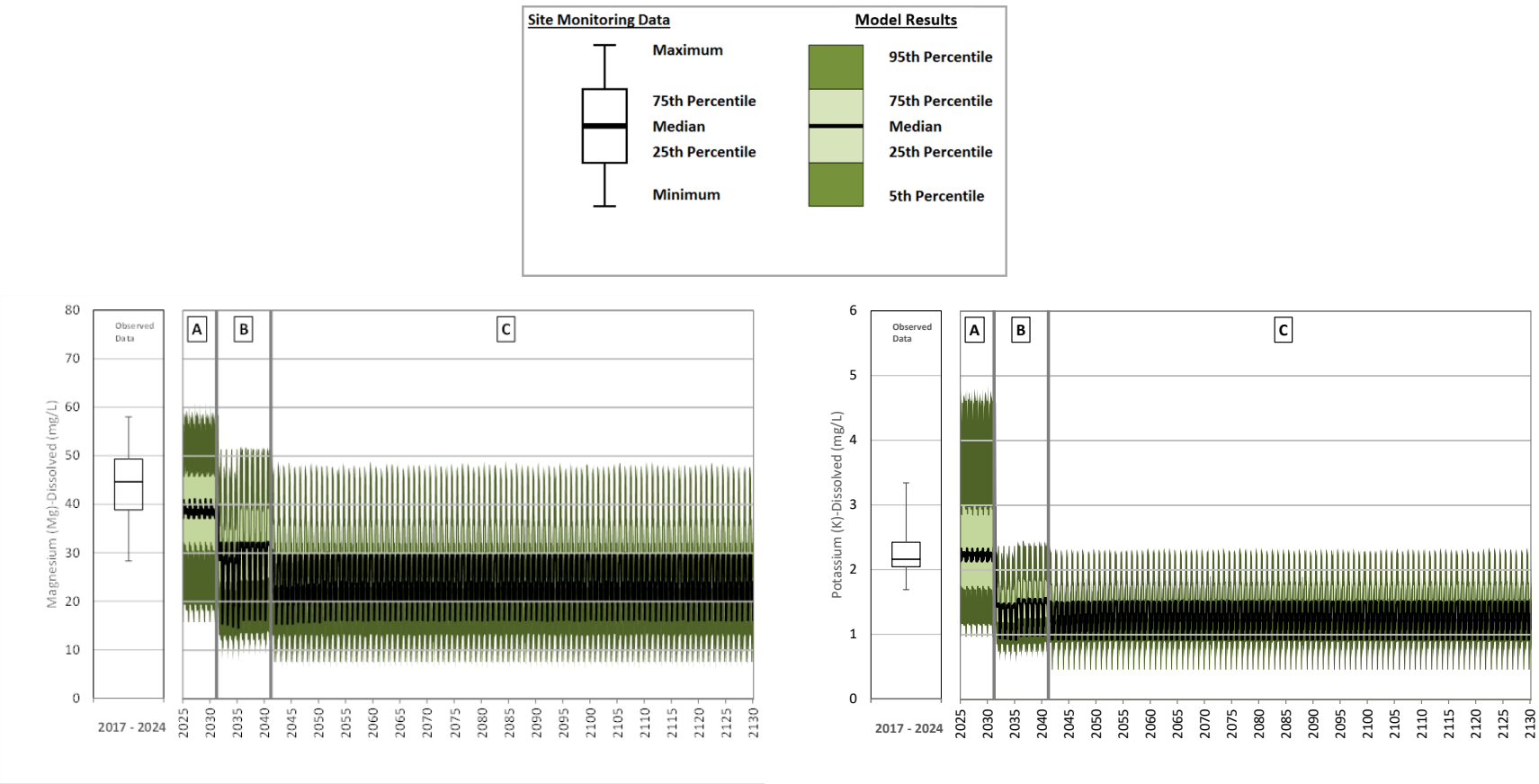
Figure B-199: Northwest Sump Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: Chloride concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for chloride than the disturbed runoff water quality input. Fluoride concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

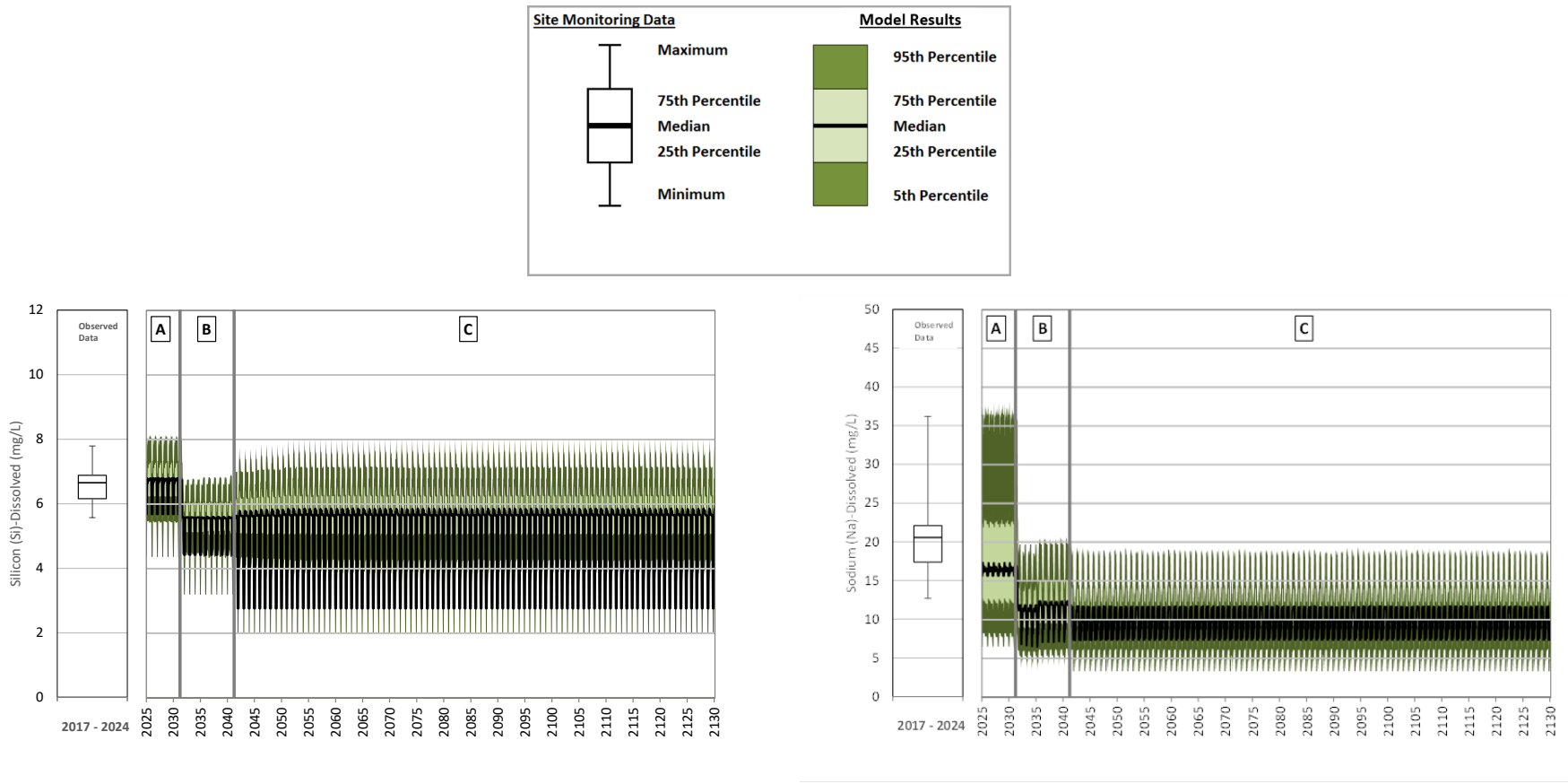
Figure B-200: Northwest Sump Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

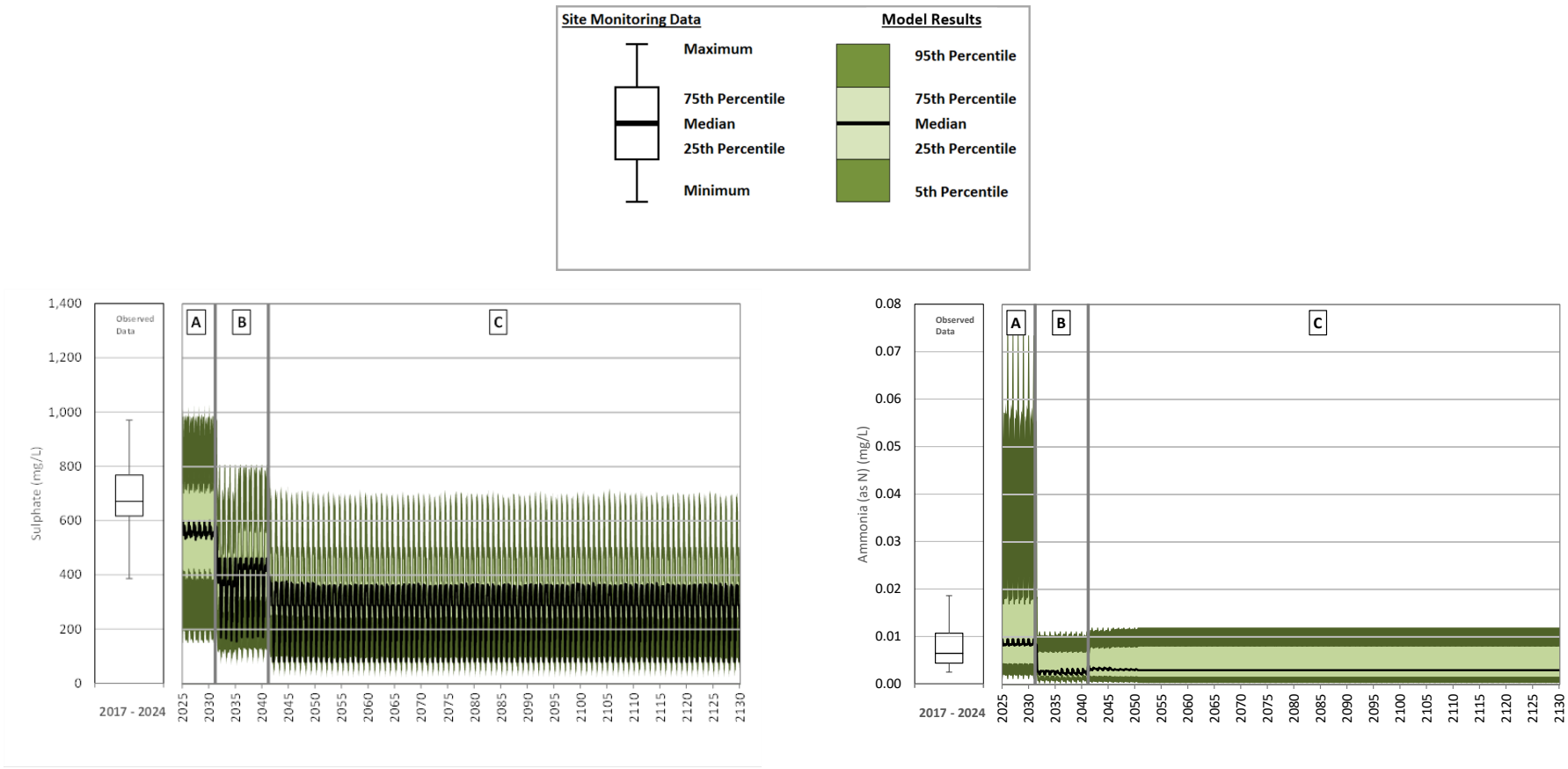
Figure B-201: Northwest Sump Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: Silicon concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for silicon than the disturbed runoff water quality input. Sodium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

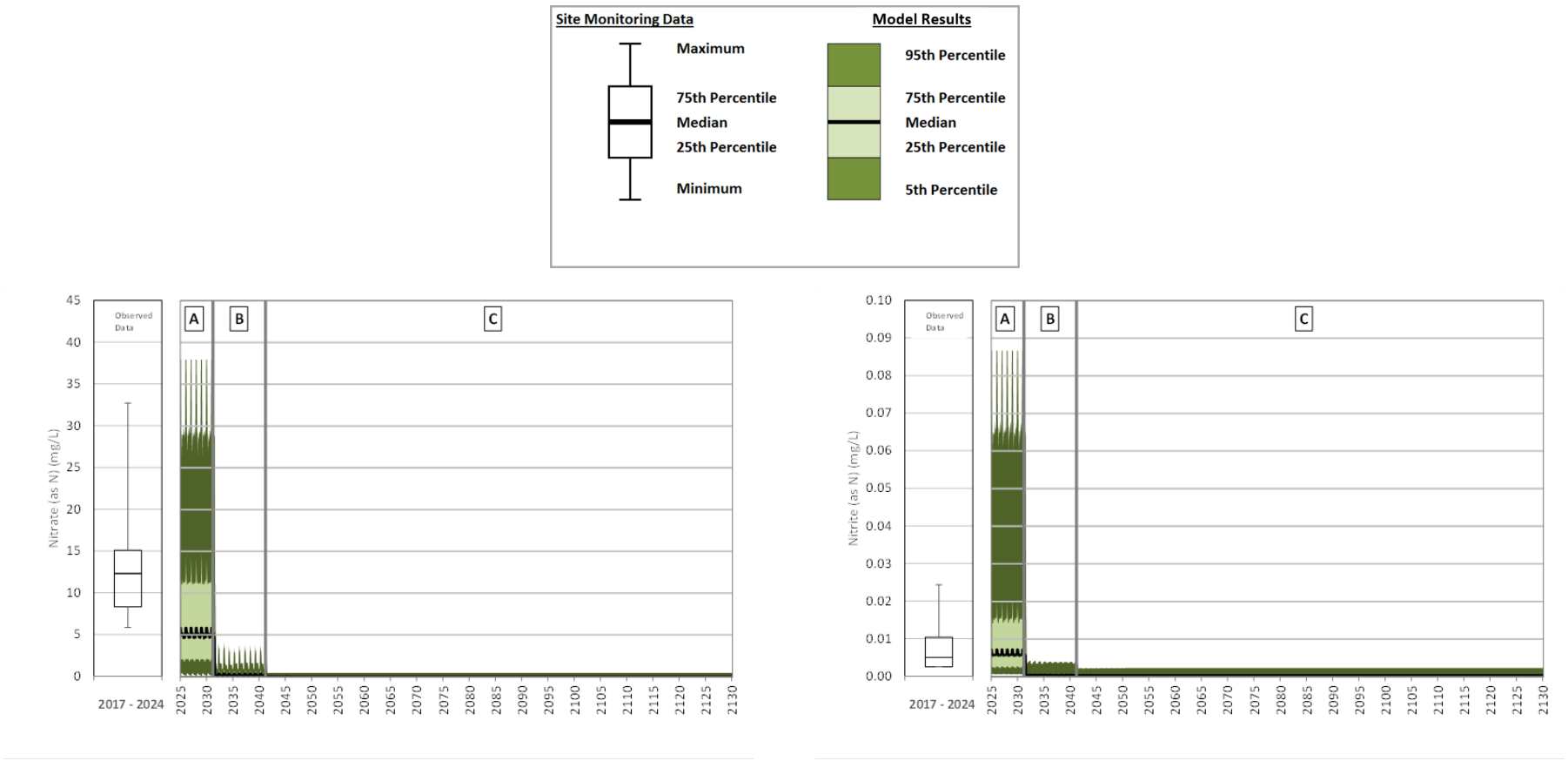
Figure B-202: Northwest Sump Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: Sulphate concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total ammonia concentrations increase from closure to post-closure as disturbed runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total ammonia than the disturbed runoff water quality input.

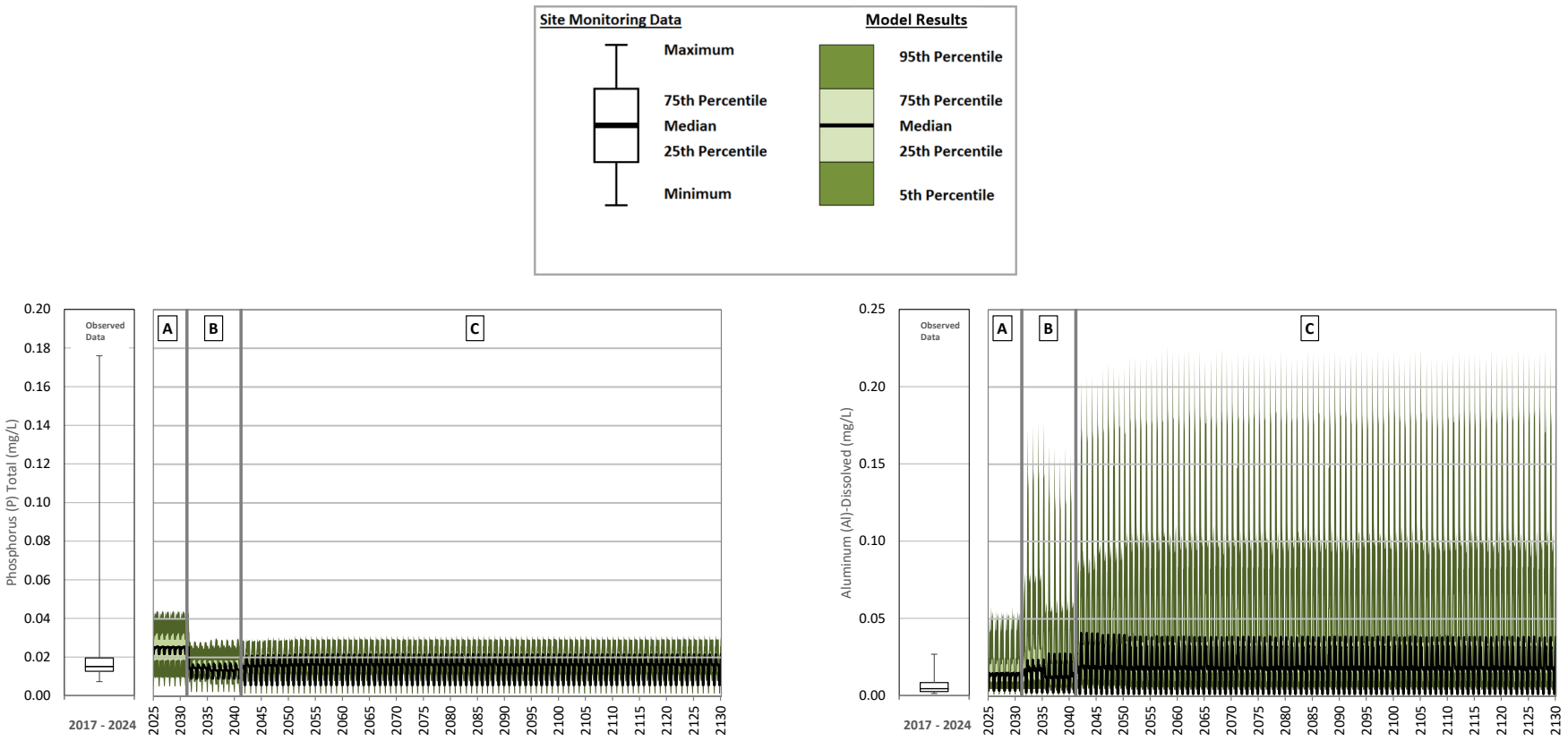
Figure B-203: Northwest Sump Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

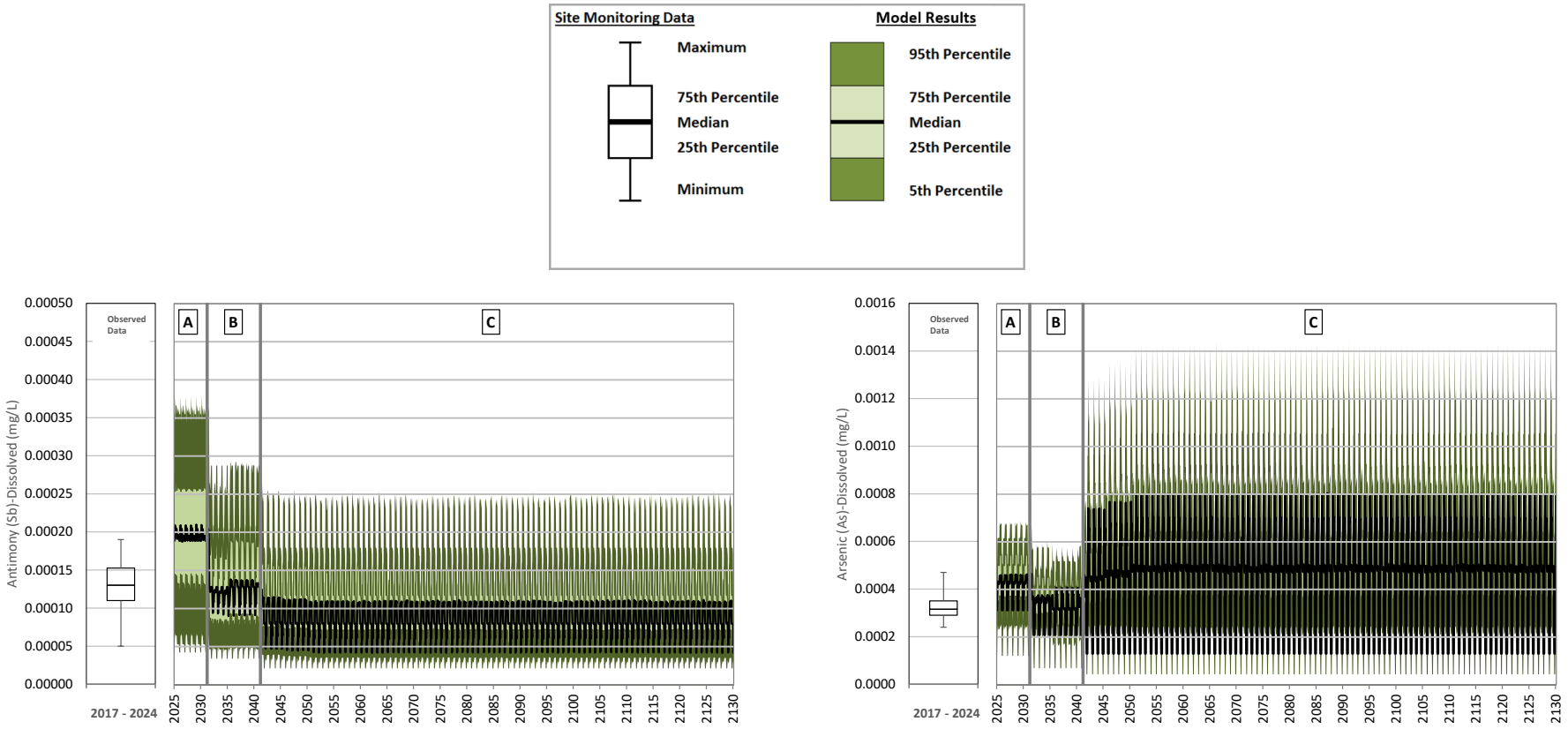
Figure B-204: Northwest Sump Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: Total phosphorus and dissolved aluminum concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the NAG waste rock and disturbed runoff water quality inputs.

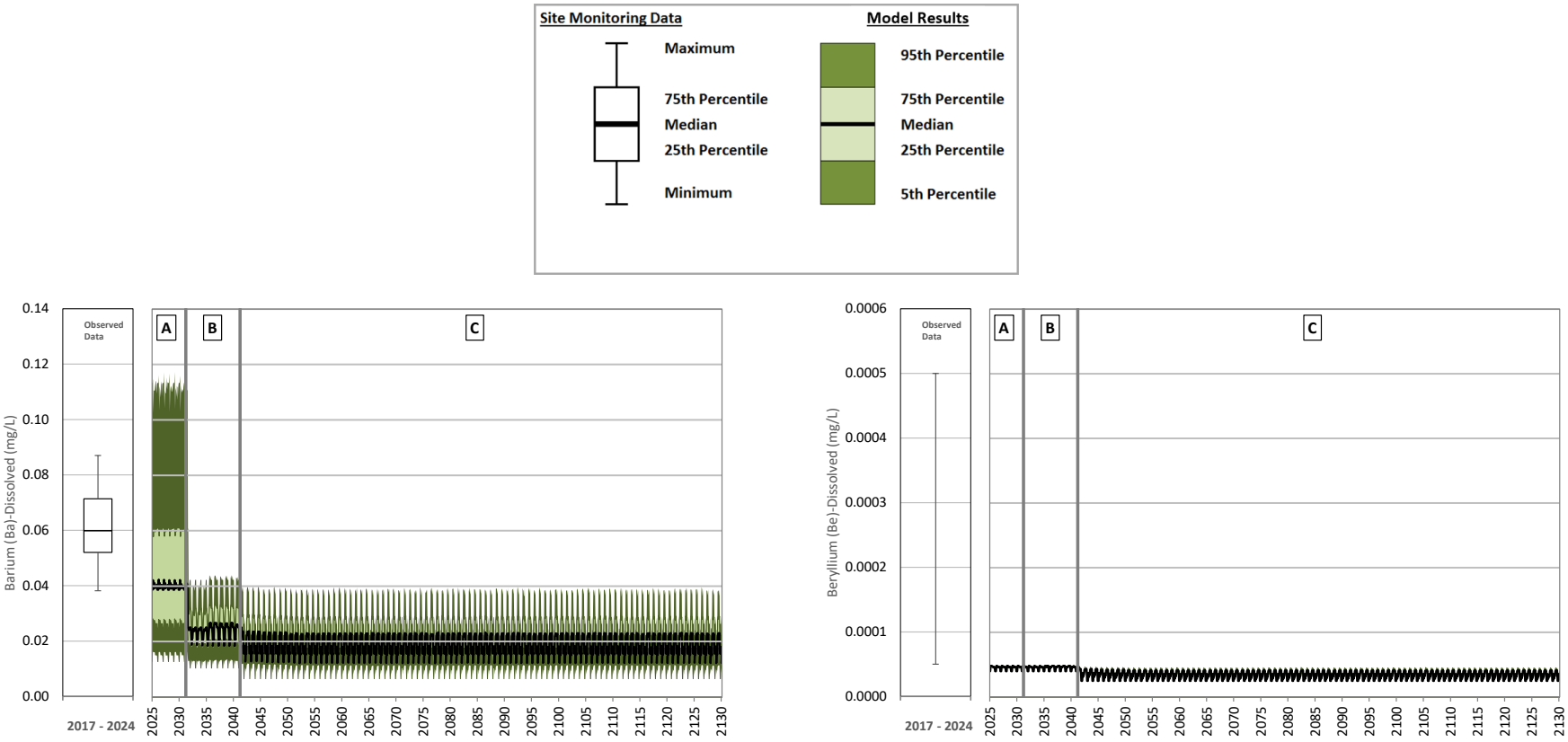
Figure B-205: Northwest Sump Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: Dissolved antimony concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved arsenic concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for dissolved arsenic than the NAG waste rock and disturbed runoff water quality inputs.

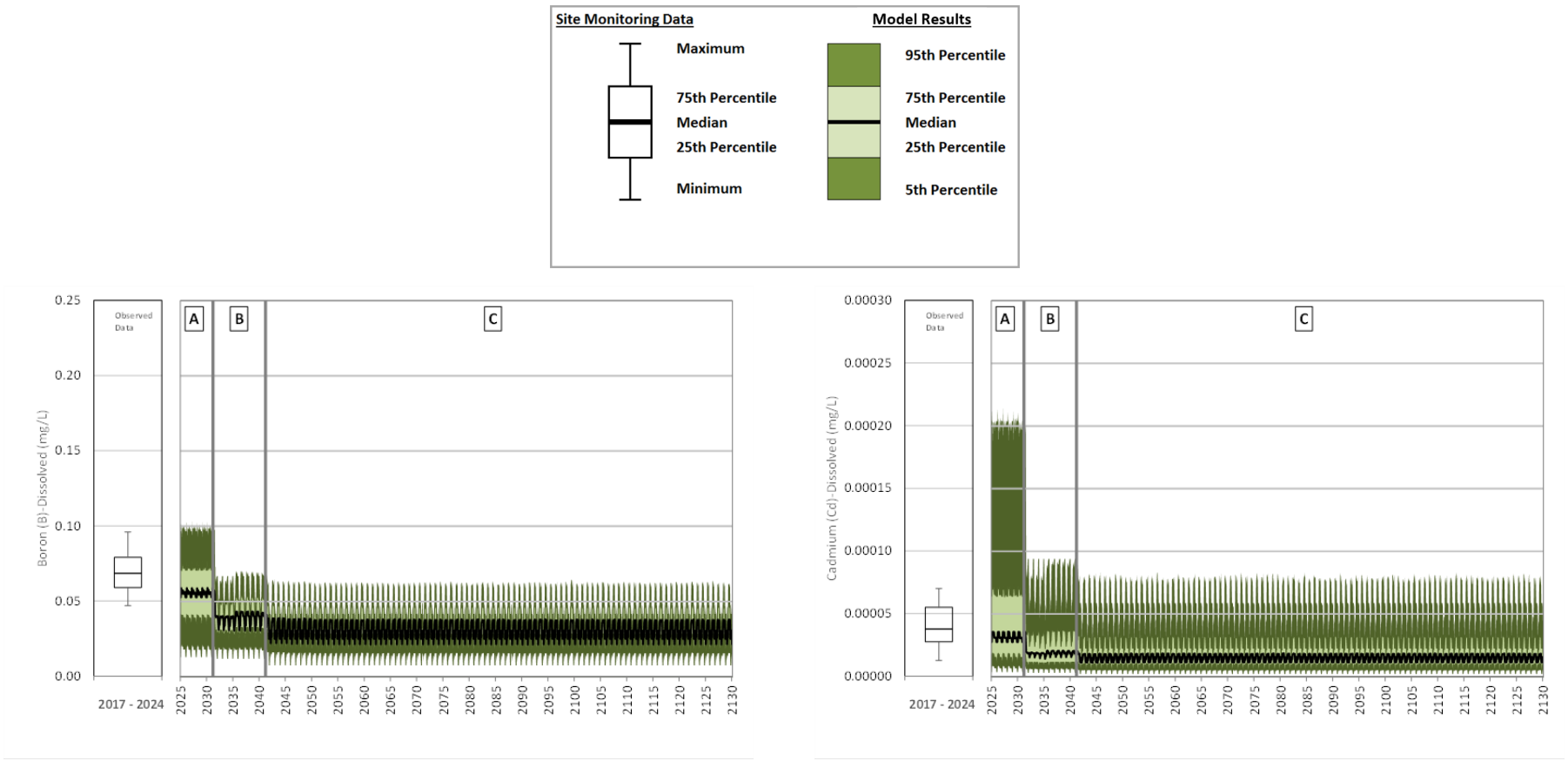
Figure B-206: Northwest Sump Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

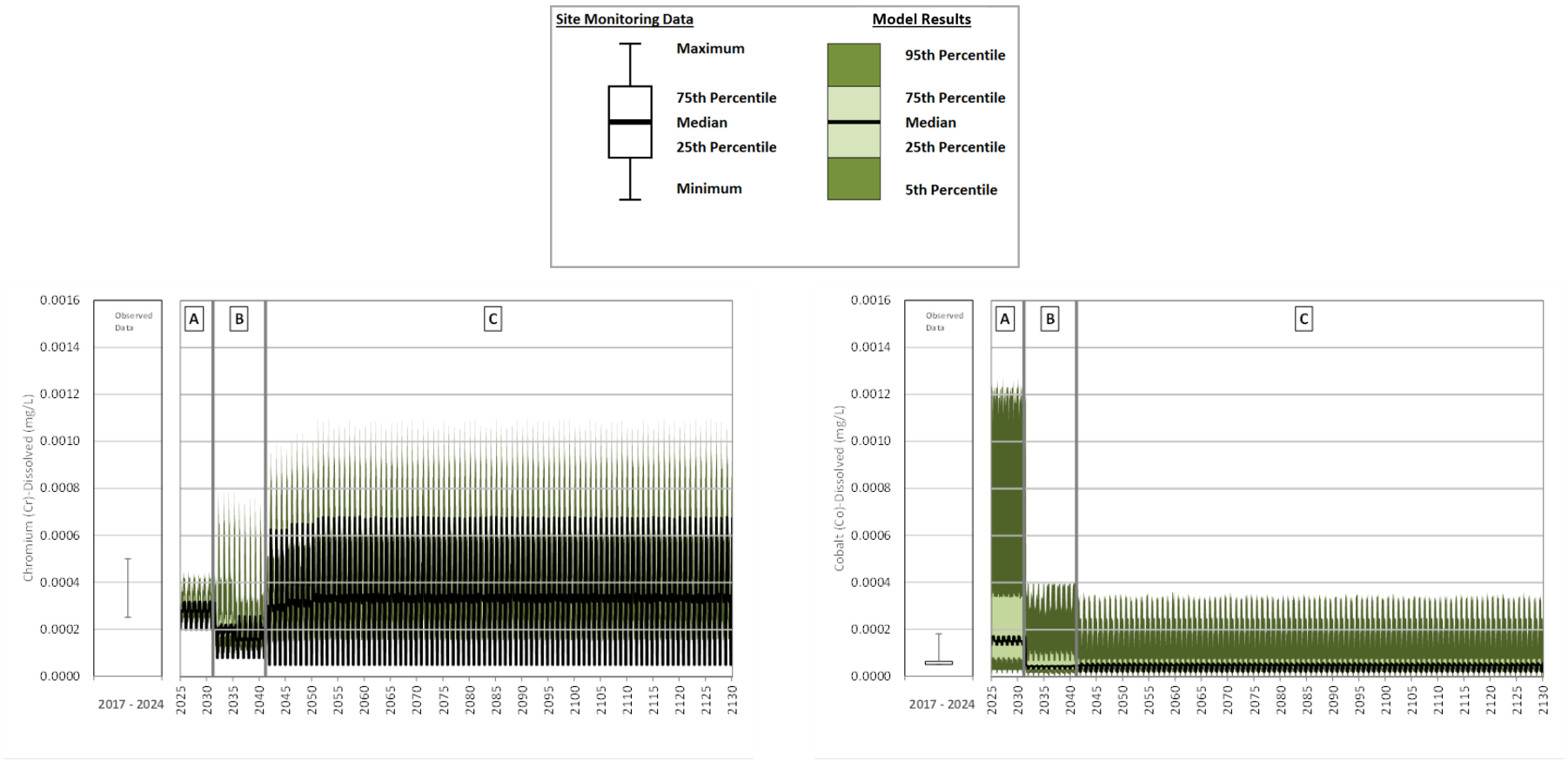
Figure B-207: Northwest Sump Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

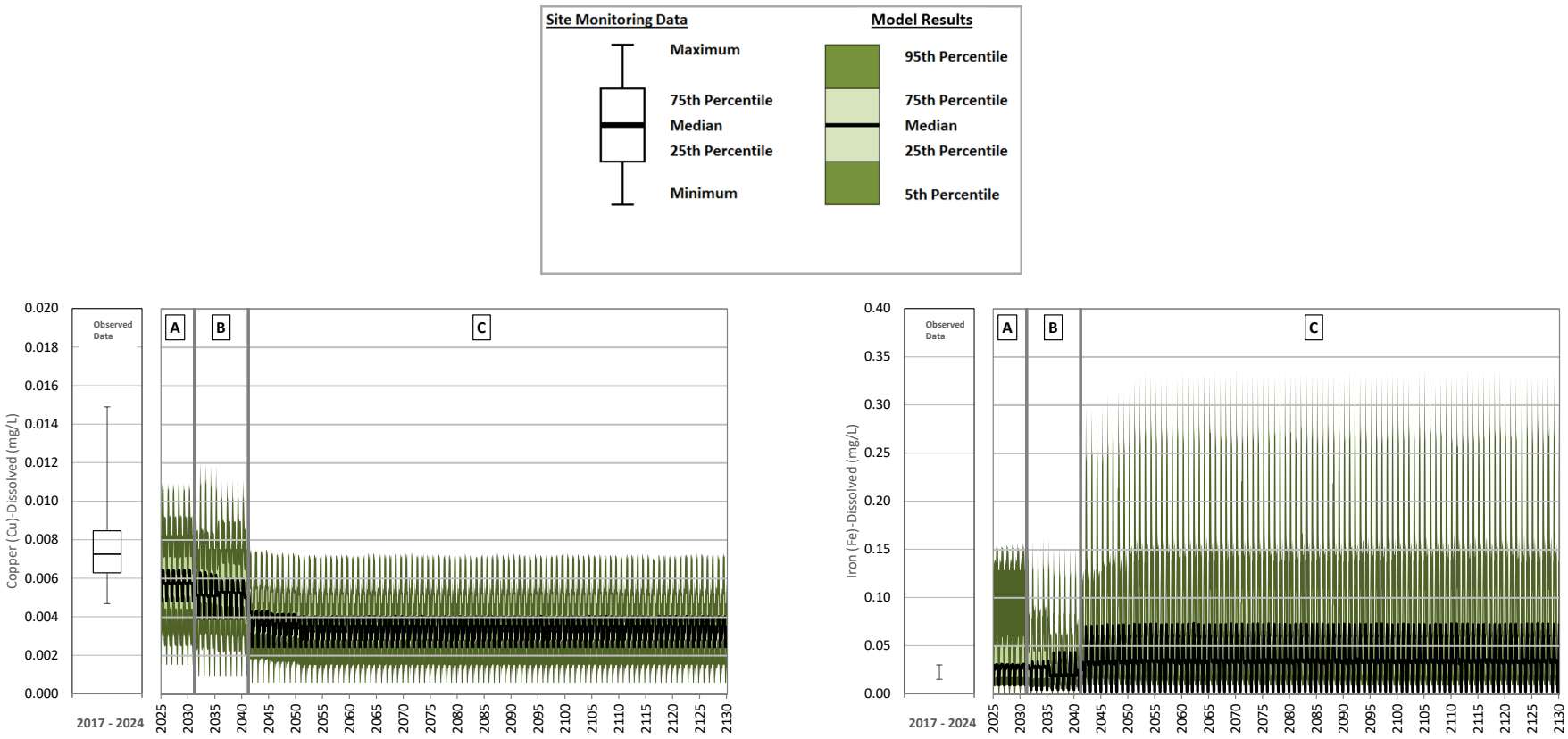
Figure B-208: Northwest Sump Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the NAG waste rock and disturbed runoff water quality inputs. Dissolved cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

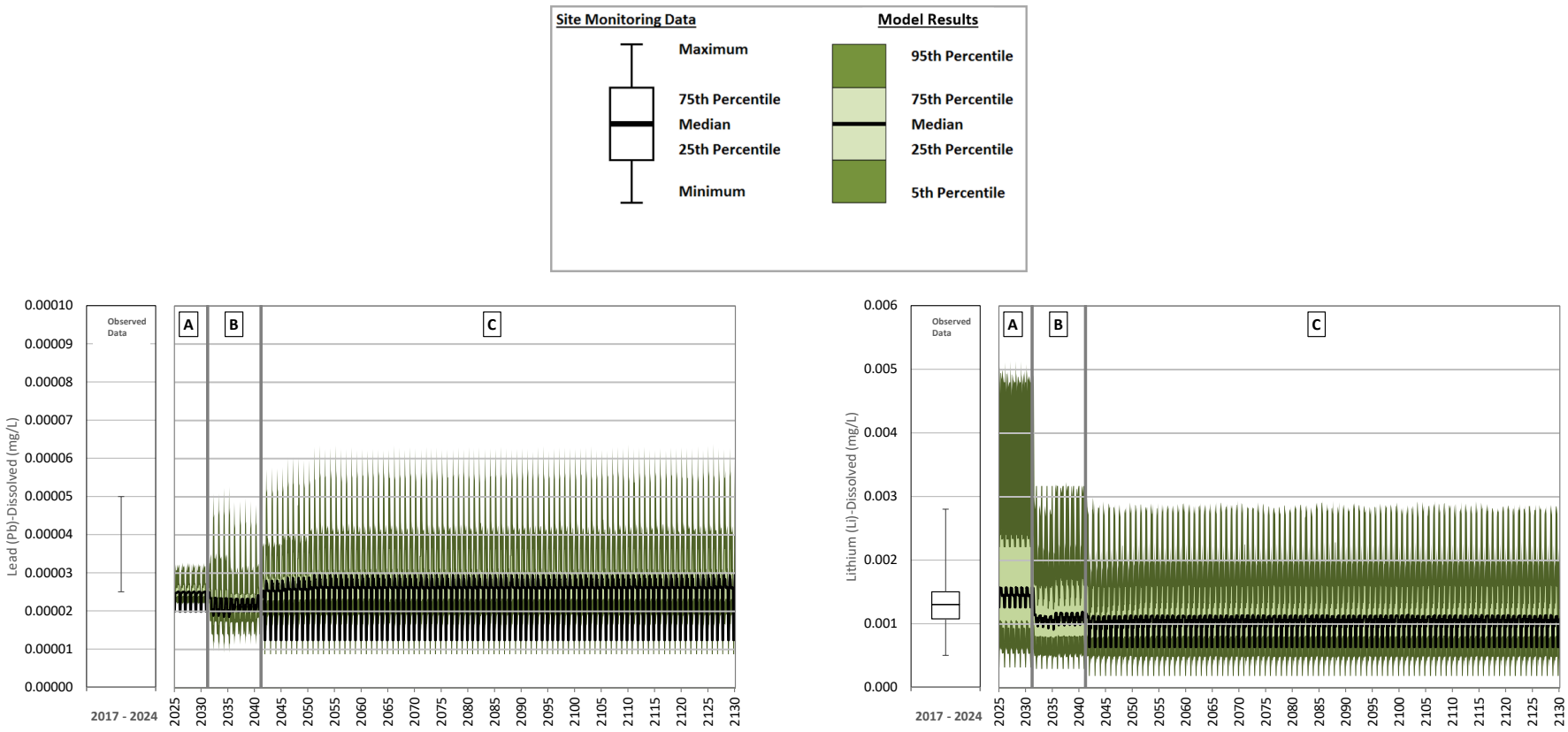
Figure B-209: Northwest Sump Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Dissolved copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved iron concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for dissolved iron than the NAG waste rock and disturbed runoff water quality inputs.

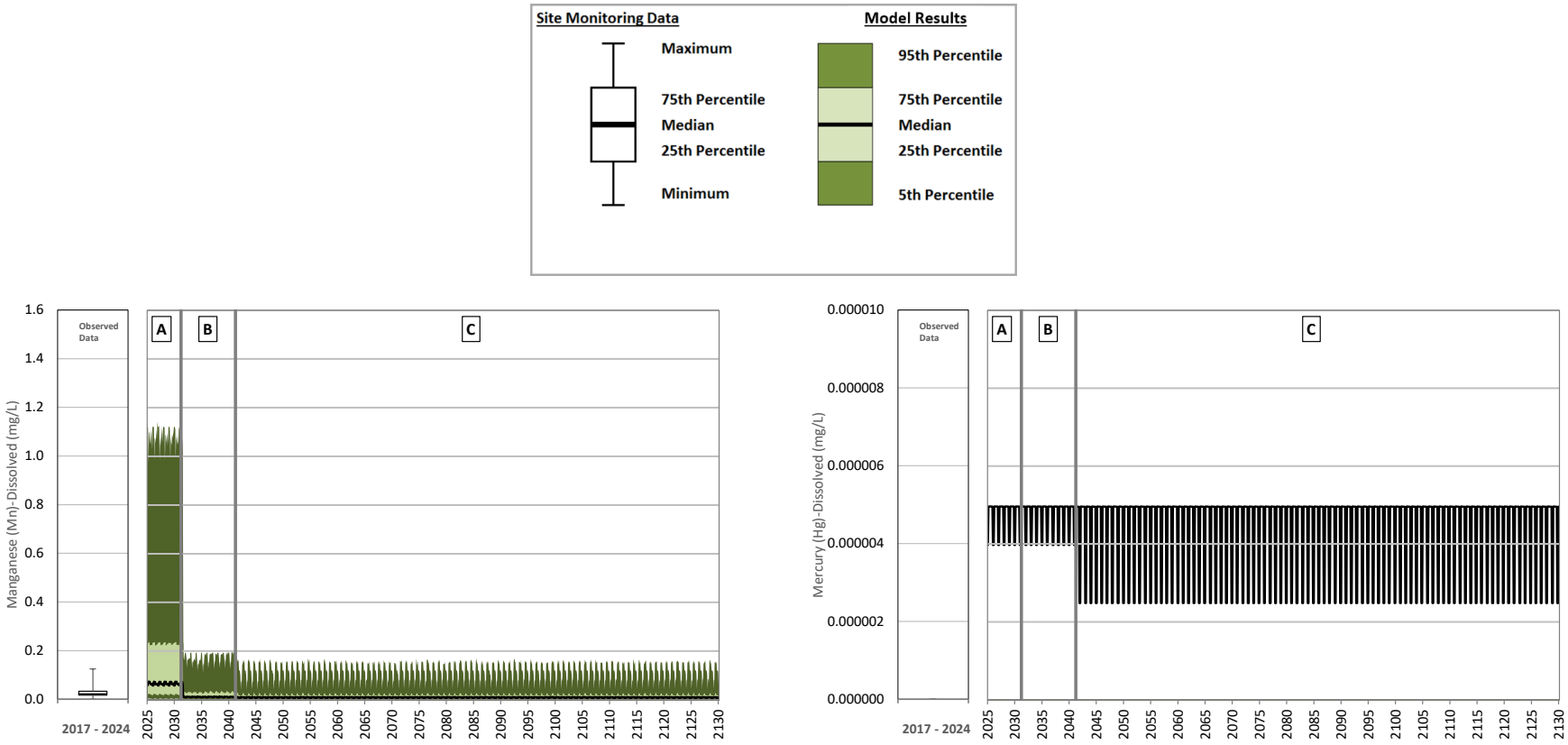
Figure B-210: Northwest Sump Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: Dissolved lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the NAG waste rock and disturbed runoff water quality inputs. Dissolved lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

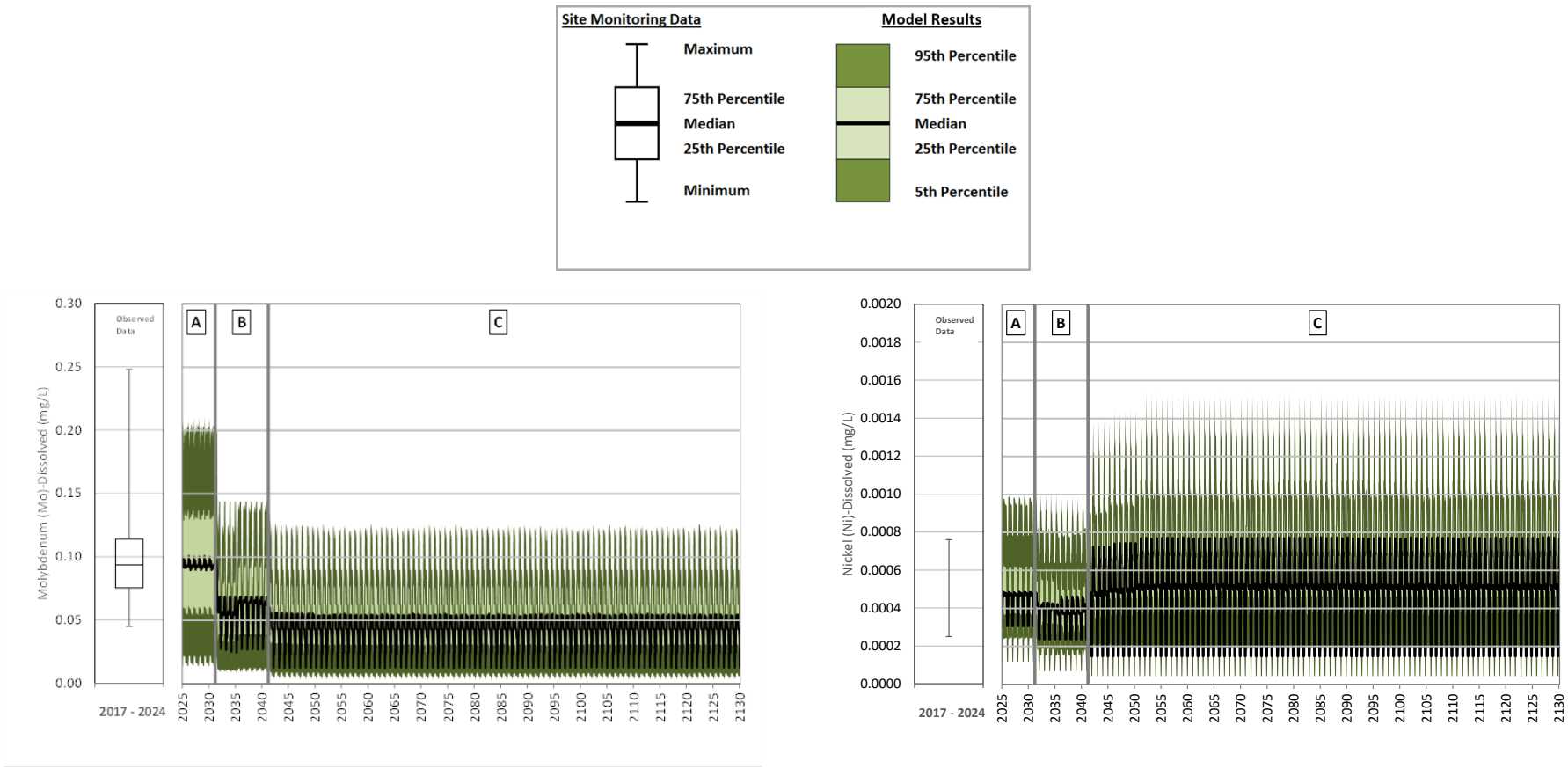
Figure B-211: Northwest Sump Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

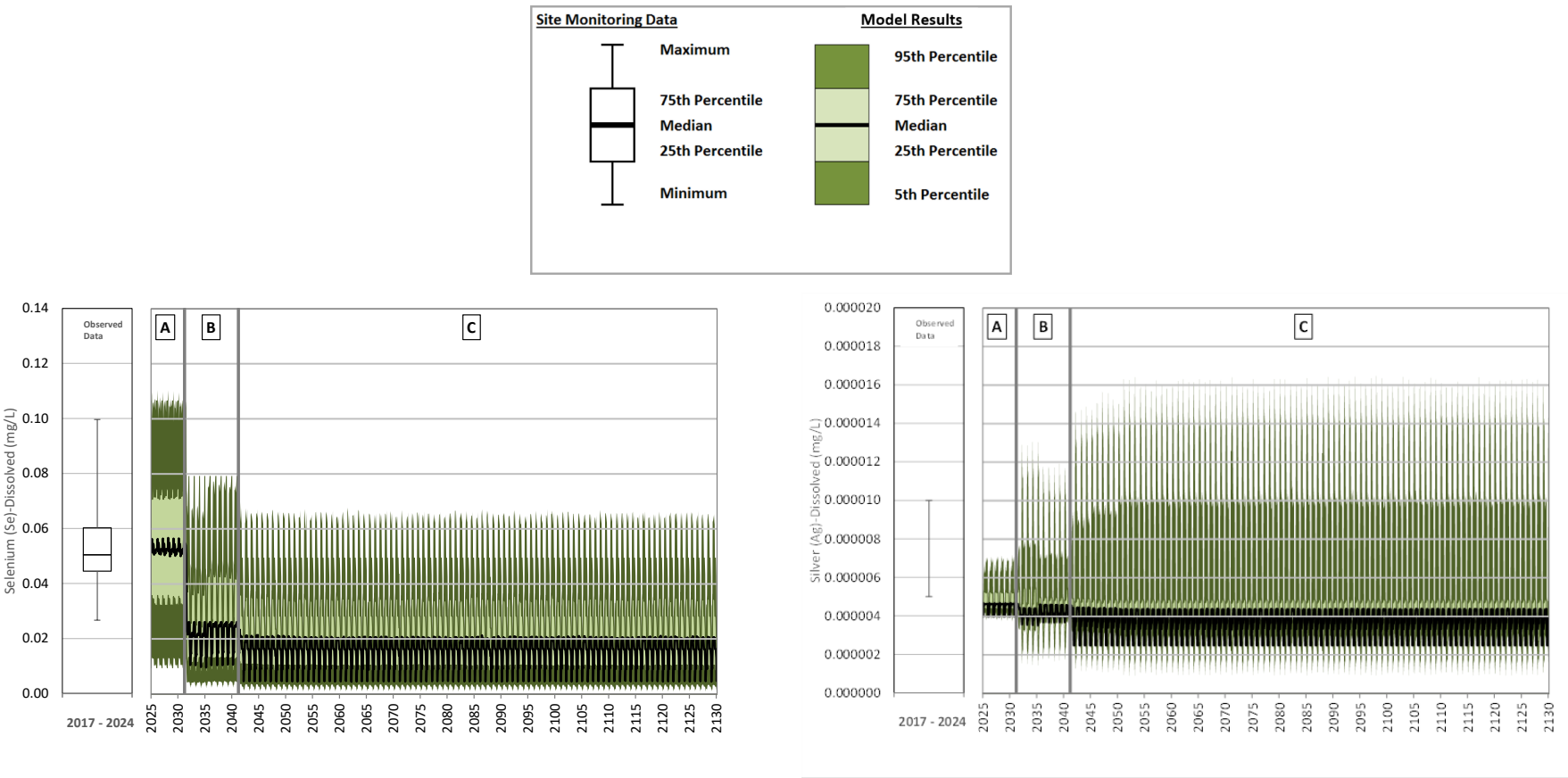
Figure B-212: Northwest Sump Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: Dissolved molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Dissolved nickel concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the NAG waste rock and disturbed runoff water quality inputs.

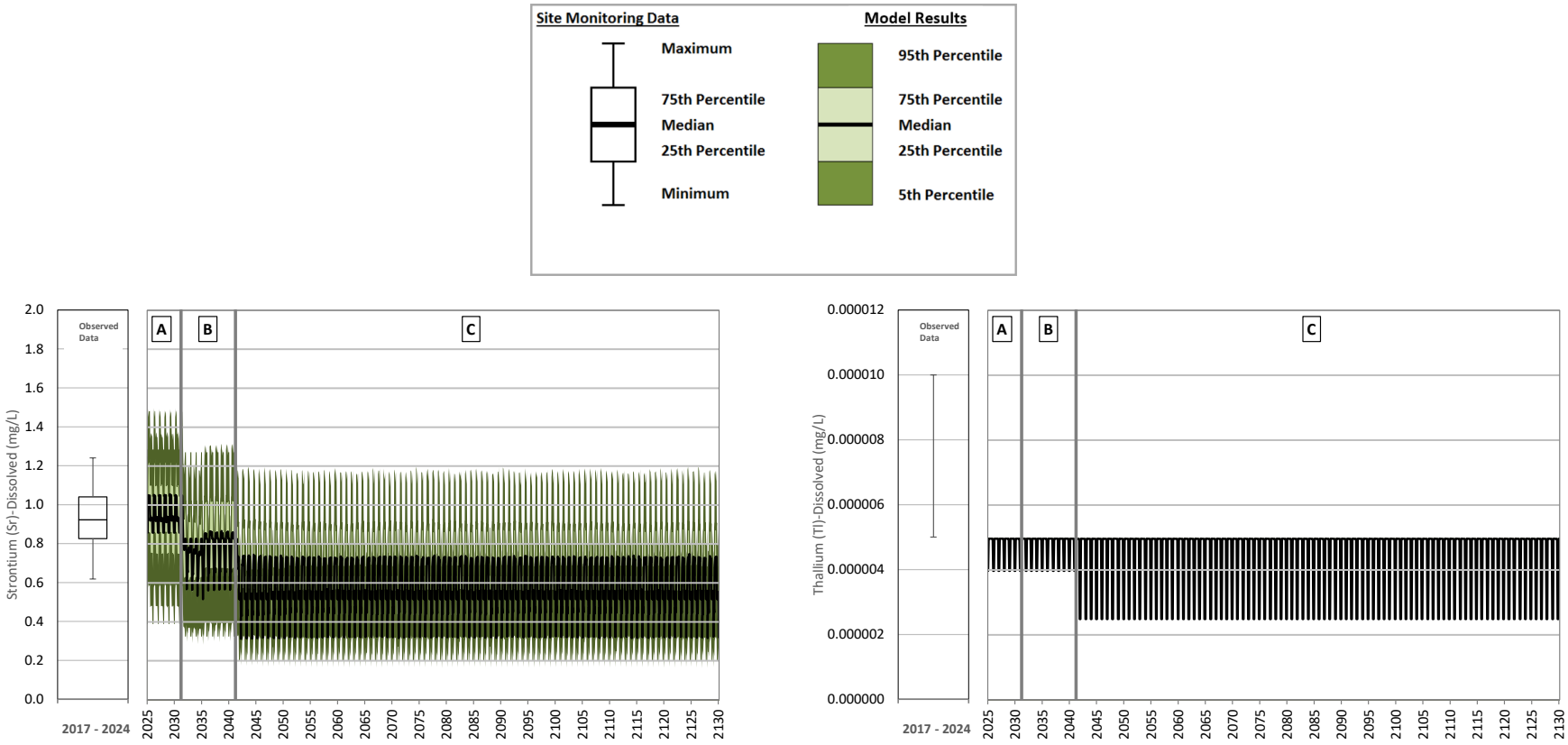
Figure B-213: Northwest Sump Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: Dissolved selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Dissolved silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the NAG waste rock and disturbed runoff water quality inputs.

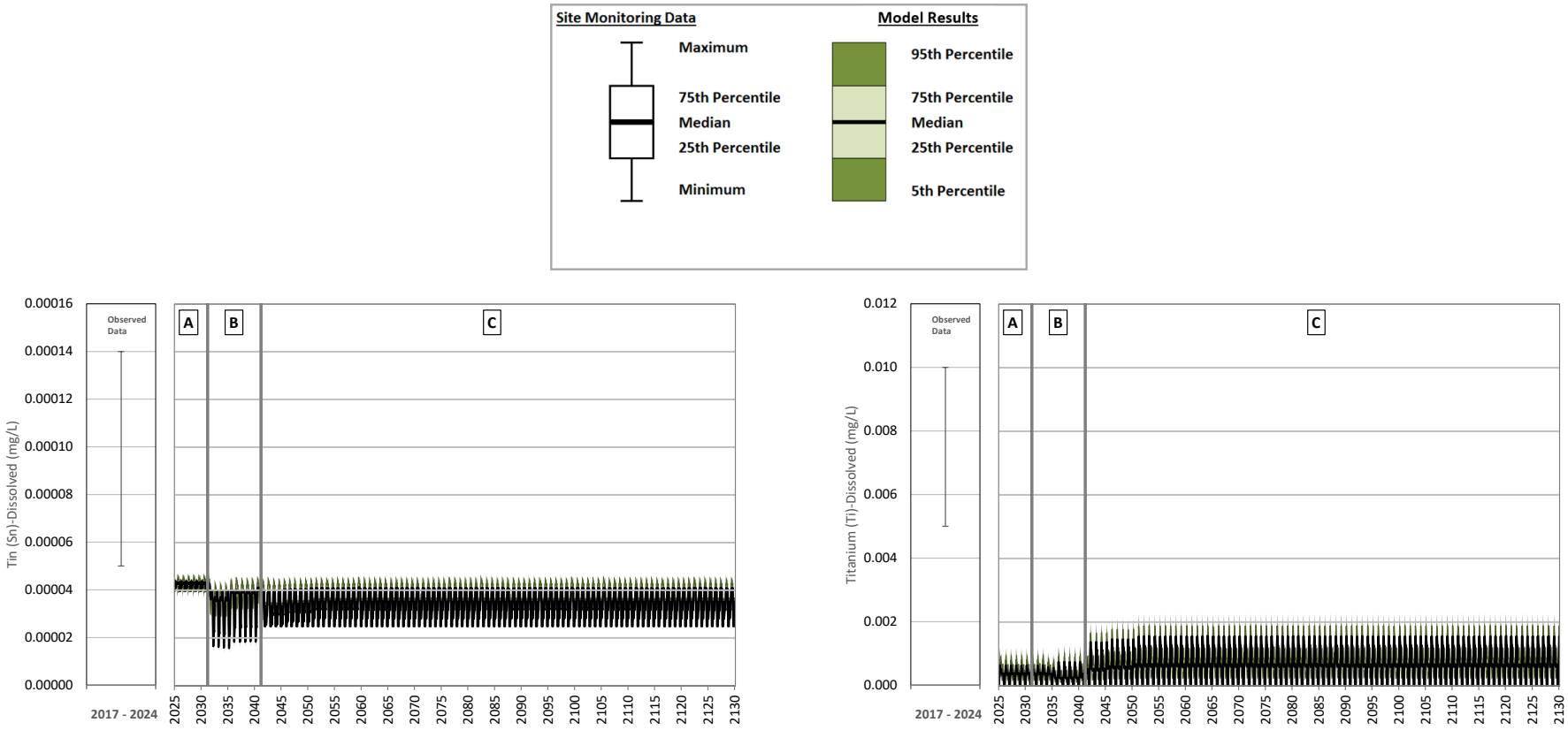
Figure B-214: Northwest Sump Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

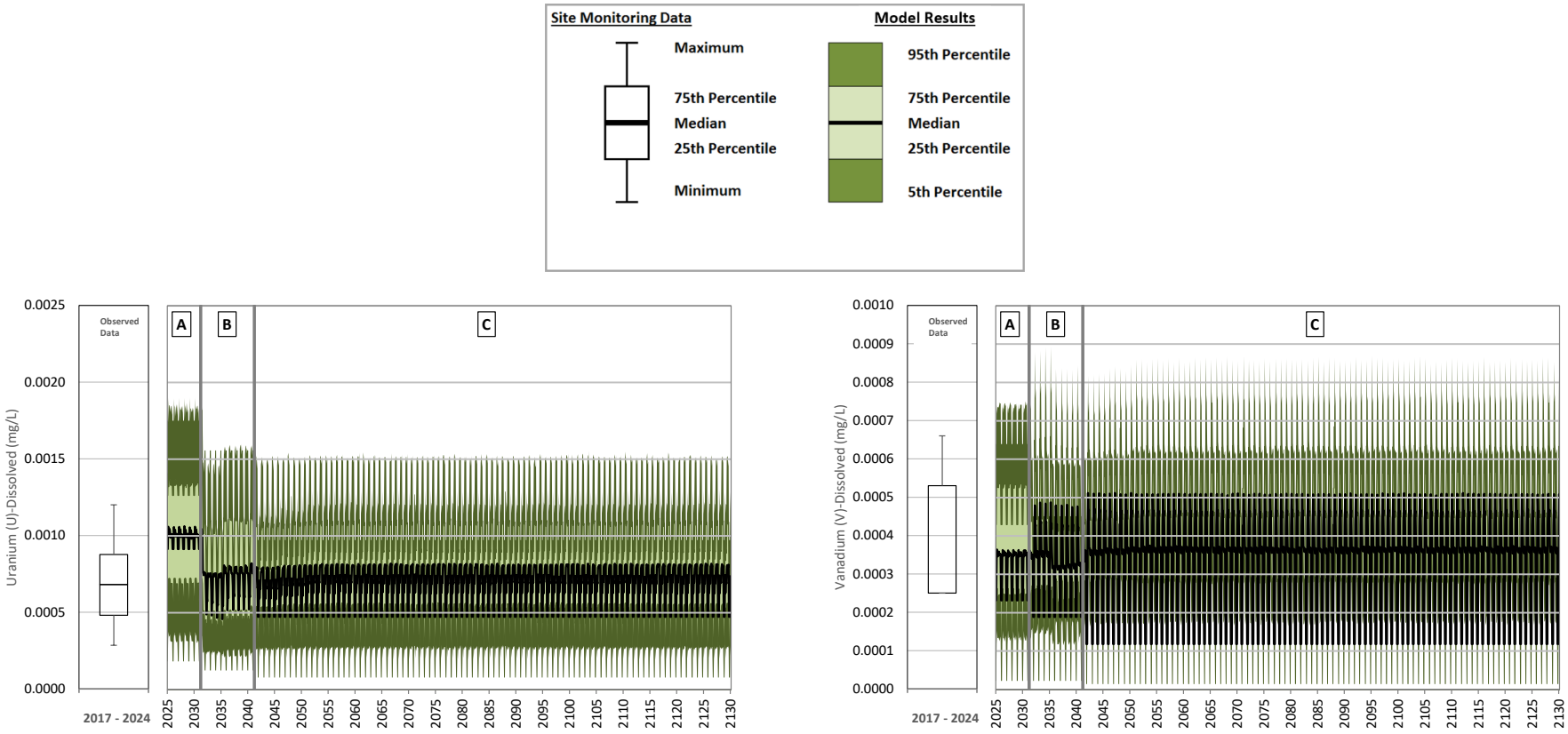
Figure B-215: Northwest Sump Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: Dissolved titanium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved titanium than the NAG waste rock and disturbed runoff water quality inputs.

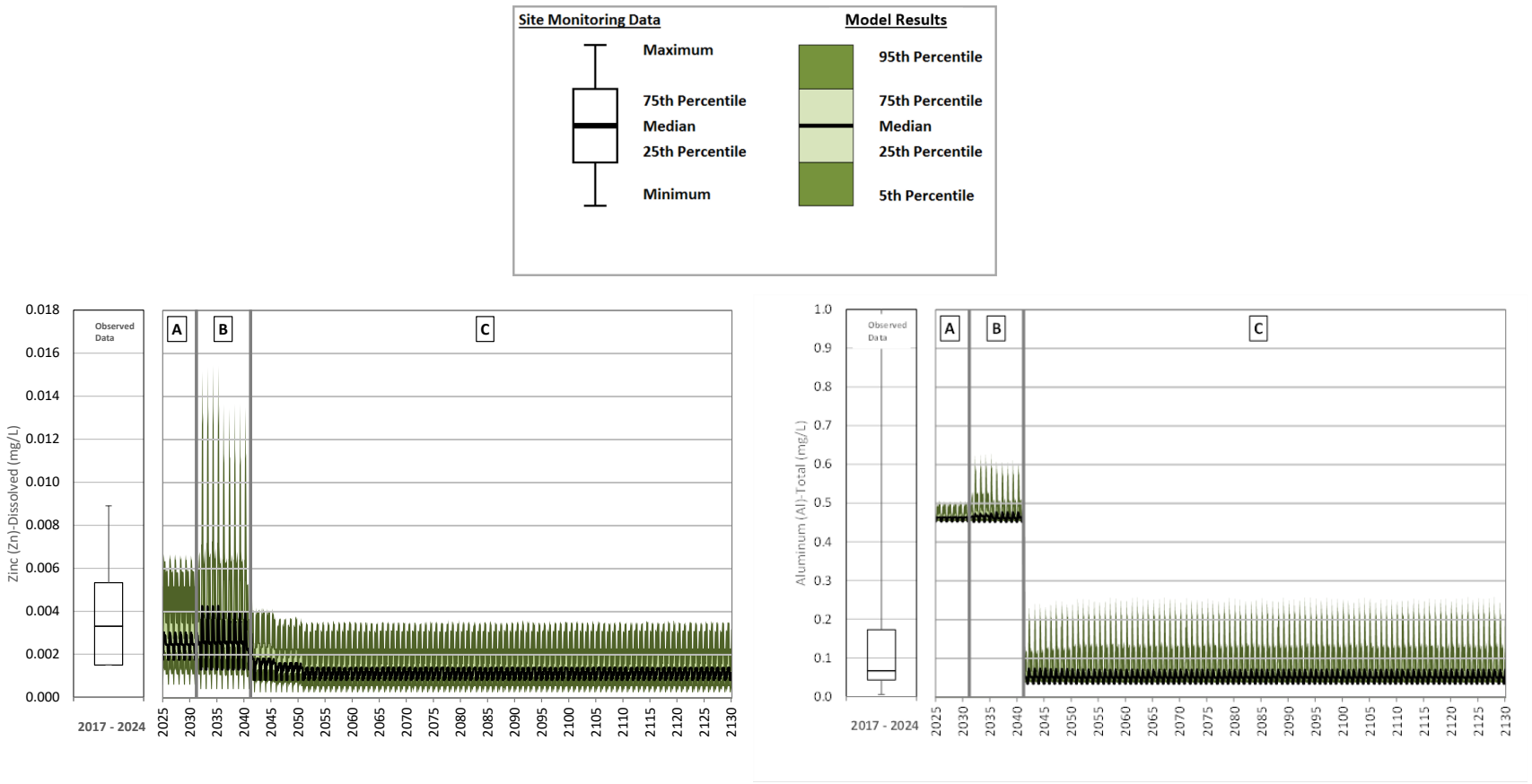
Figure B-216: Northwest Sump Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

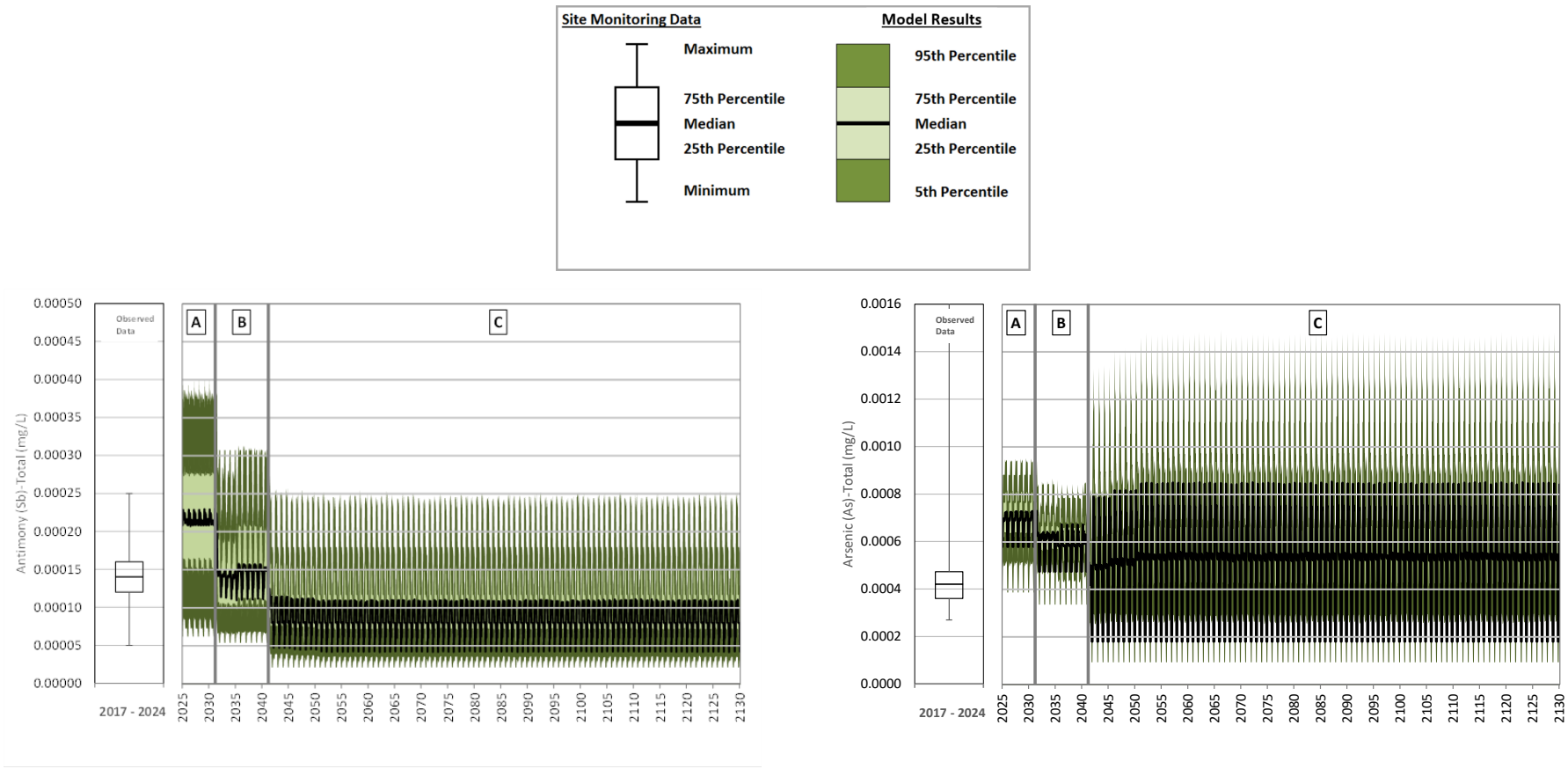
Figure B-217: Northwest Sump Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: Maximum dissolved zinc concentrations increase during closure when seepage from the Temporary NW PAG Stockpile changes from the PAG water quality input to the NAG water quality input. The NAG water quality input has higher dissolved zinc concentrations than the Pag water quality input. Dissolved zinc concentrations decrease from closure and post-closure as runoff areas are remediated. Total aluminum concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total aluminum than the NAG waste rock and disturbed runoff water quality inputs.

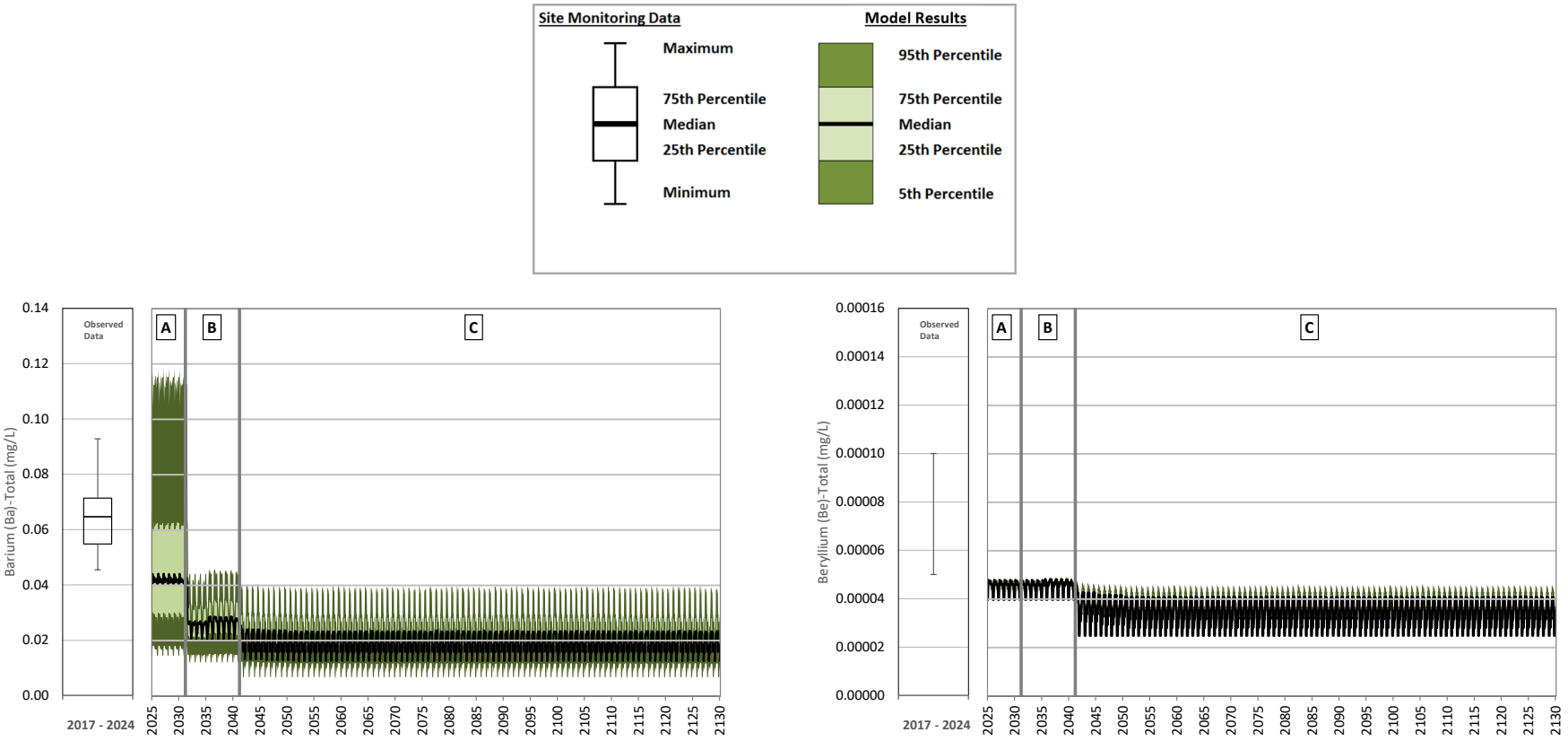
Figure B-218: Northwest Sump Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: Total antimony concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total arsenic concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for total arsenic than the NAG waste rock and disturbed runoff water quality inputs.

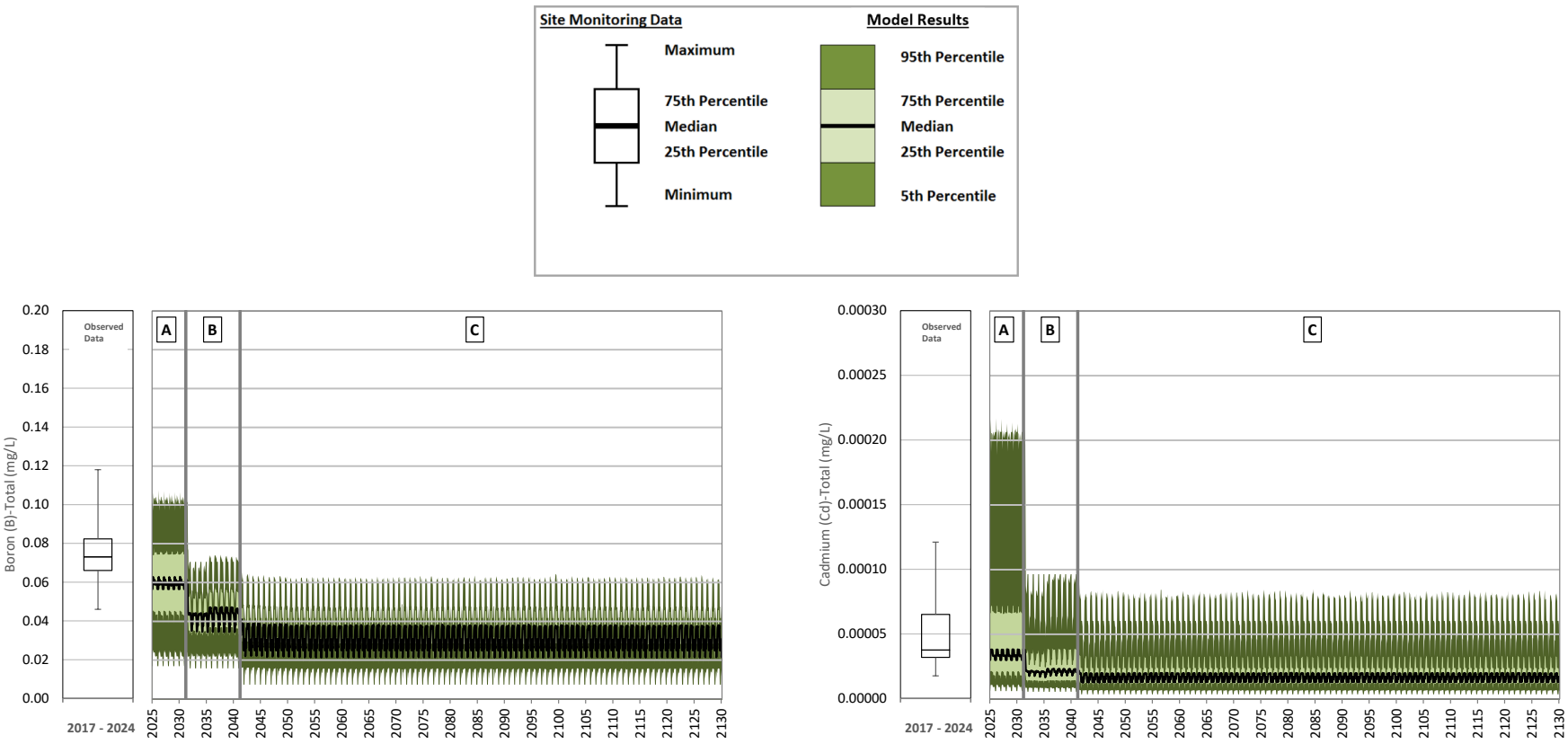
Figure B-219: Northwest Sump Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

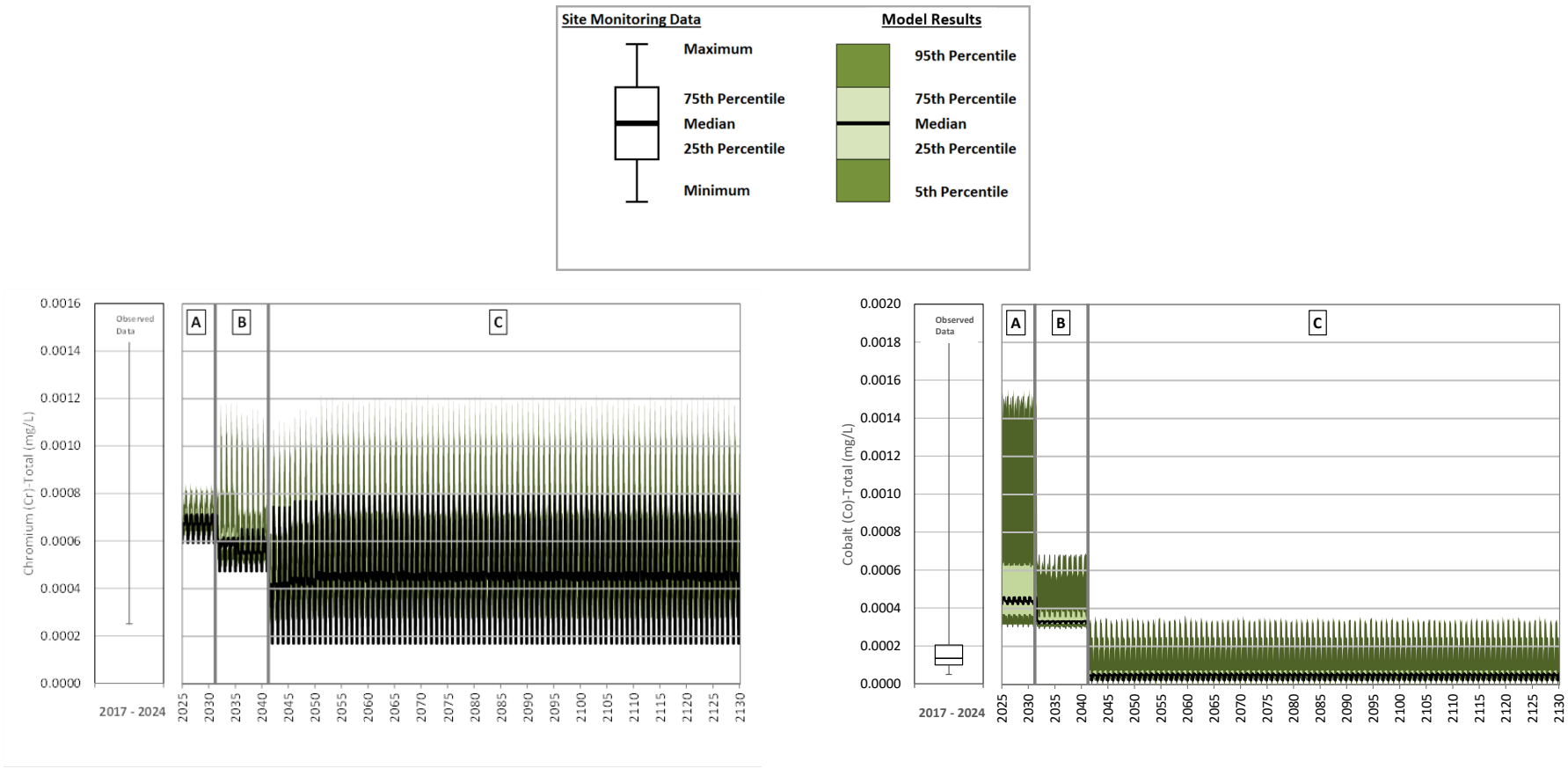
Figure B-220: Northwest Sump Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

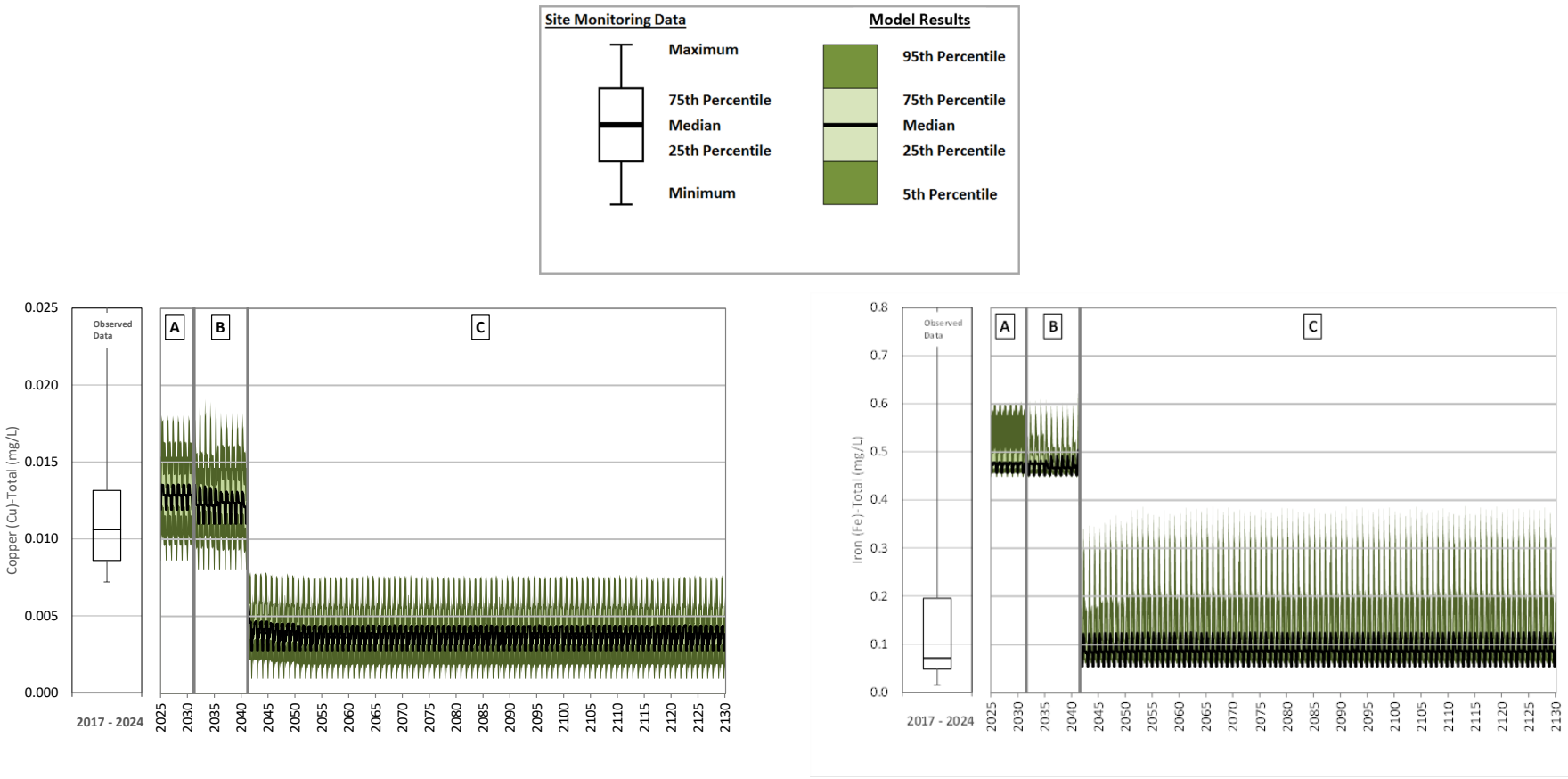
Figure B-221: Northwest Sump Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: Total chromium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the NAG waste rock and disturbed runoff water quality inputs. Total cobalt concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

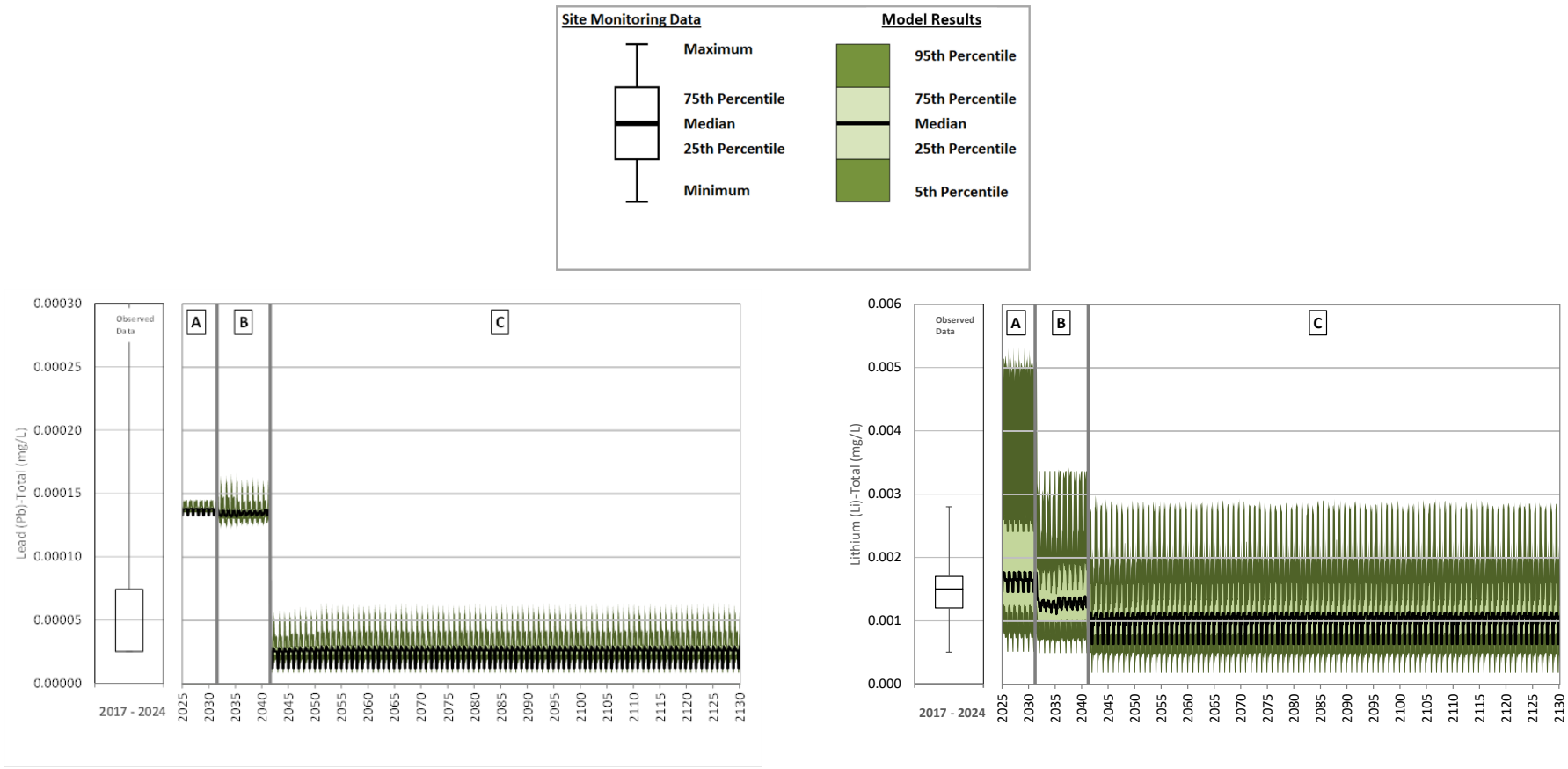
Figure B-222: Northwest Sump Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: Total copper concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total iron concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed water quality input has higher concentrations for total iron than the NAG waste rock and disturbed runoff water quality inputs.

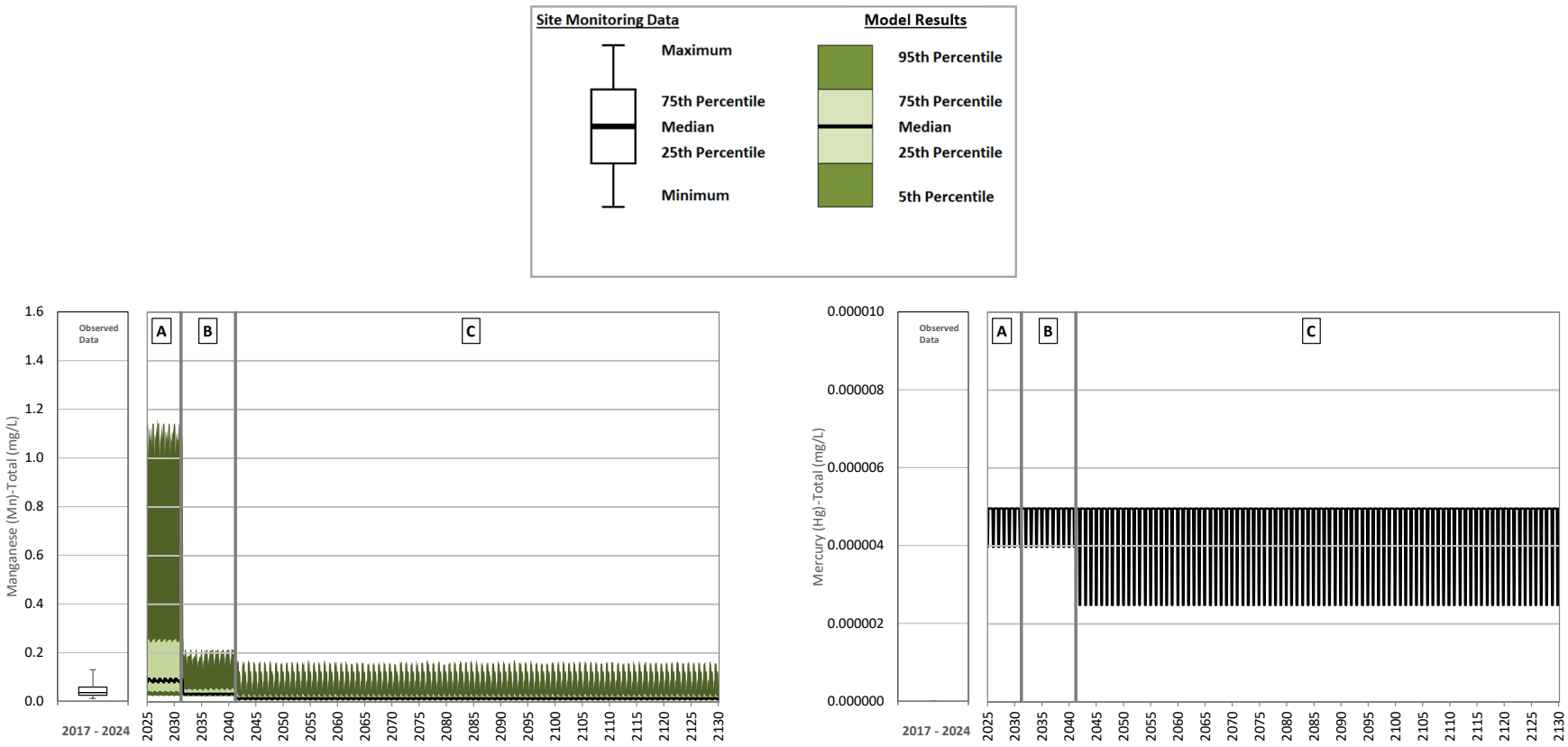
Figure B-223: Northwest Sump Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: Total lead concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total lead than the NAG waste rock and disturbed runoff water quality inputs. Total lithium concentrations decrease from operations to closure and post-closure as runoff areas are remediated.

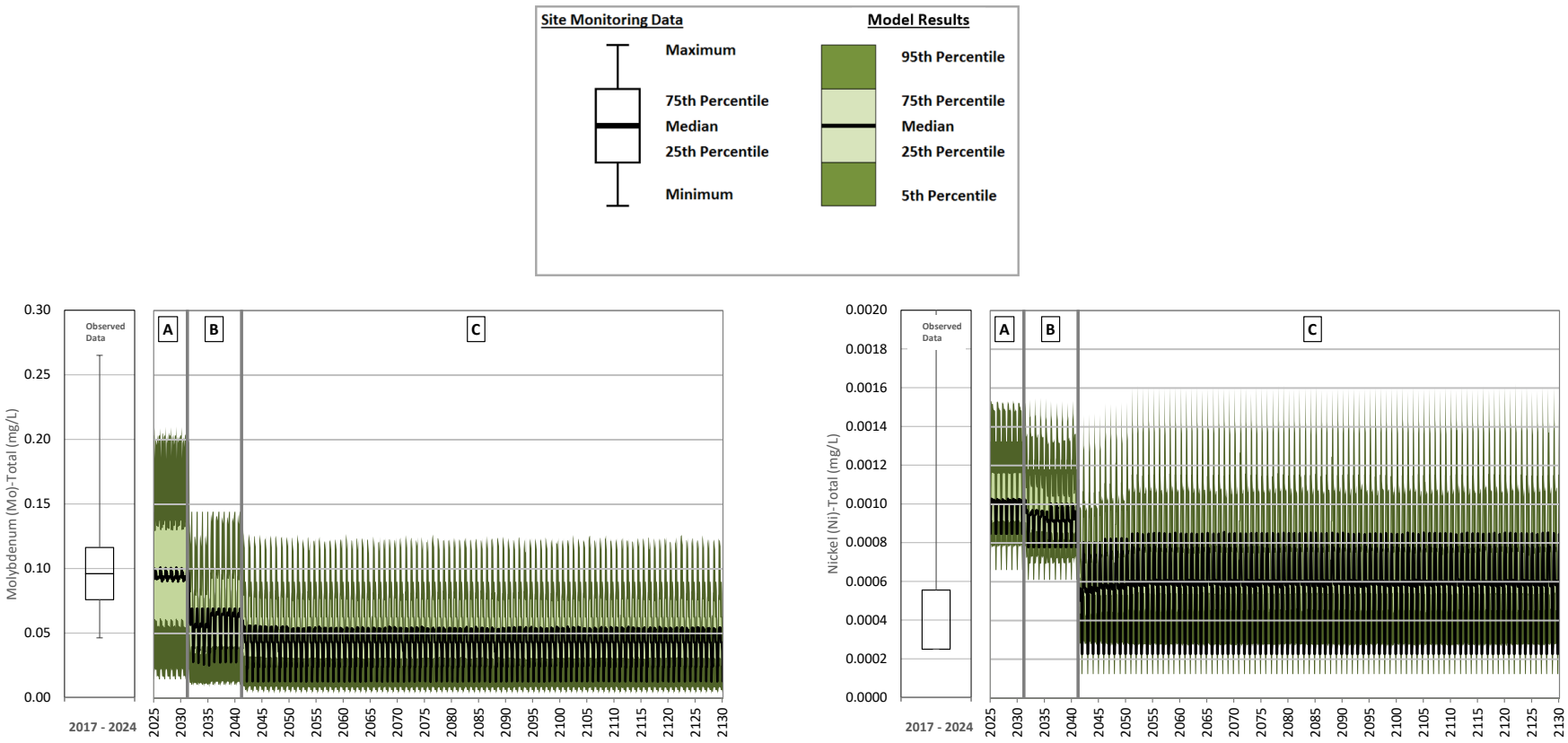
Figure B-224: Northwest Sump Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

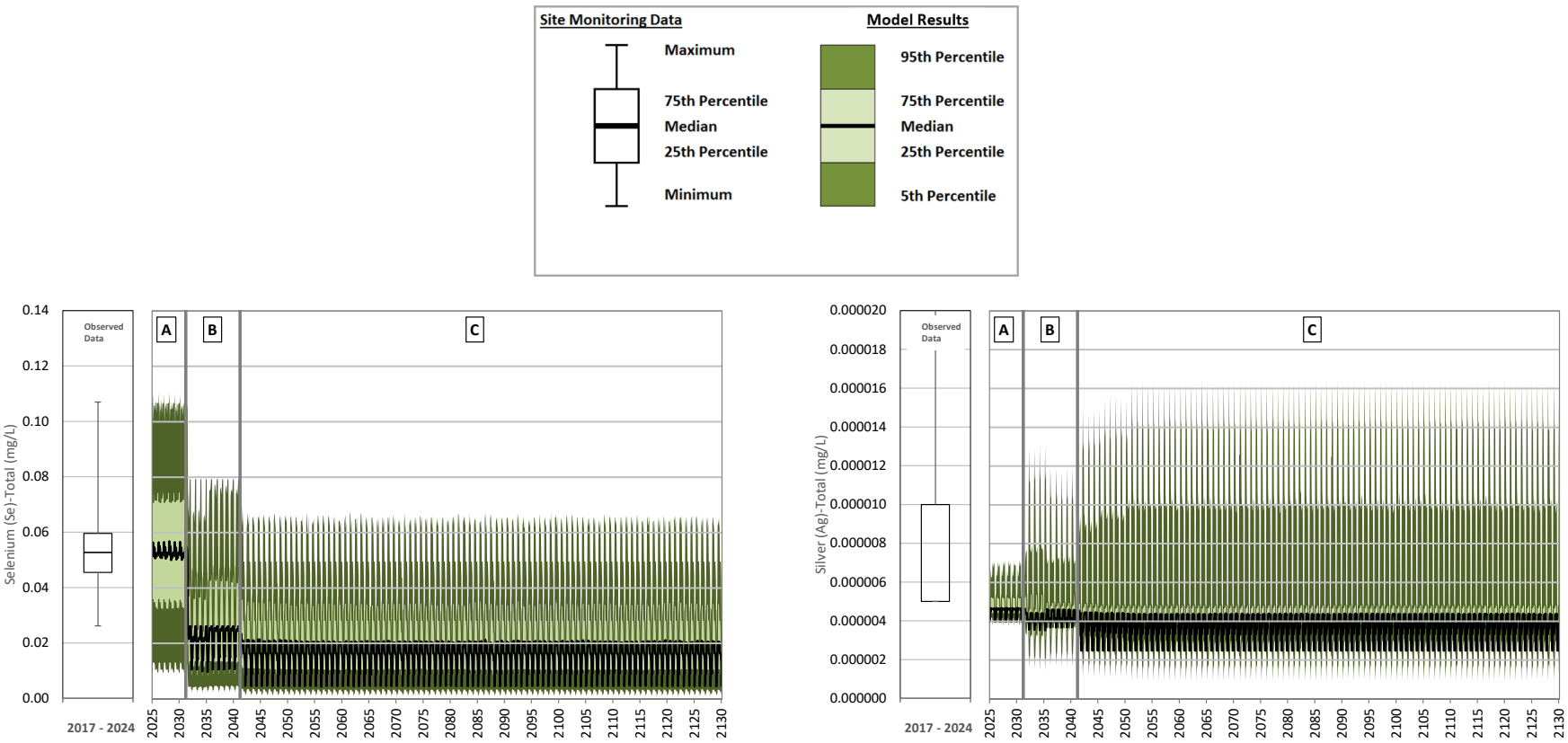
Figure B-225: Northwest Sump Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: Total molybdenum concentrations decrease from closure to post-closure as runoff areas are remediated. Total nickel concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the NAG waste rock and disturbed runoff water quality inputs.

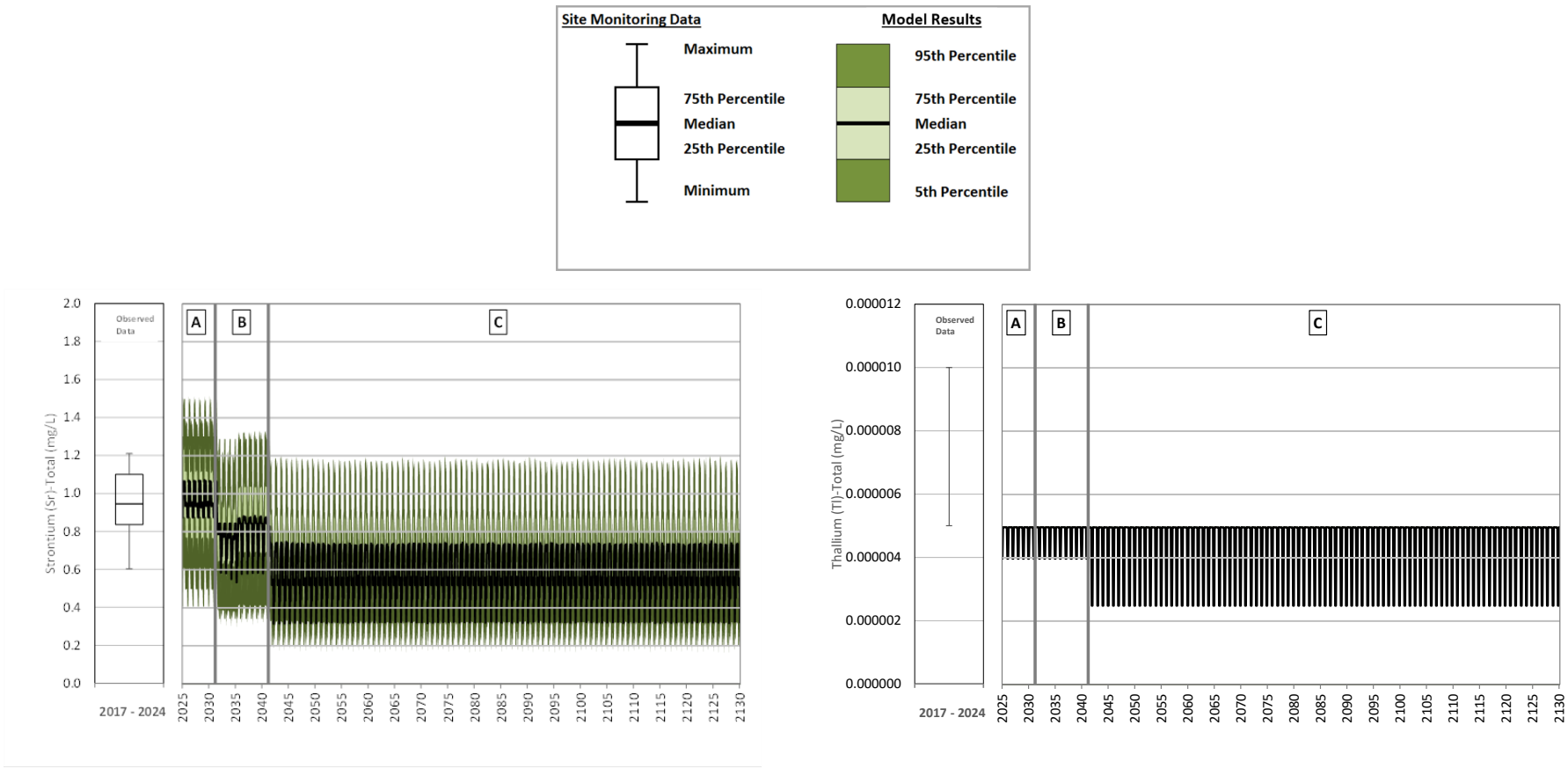
Figure B-226: Northwest Sump Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: Total selenium concentrations decrease from operations to closure and post-closure as runoff areas are remediated. Total silver concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the NAG waste rock and disturbed runoff water quality inputs.

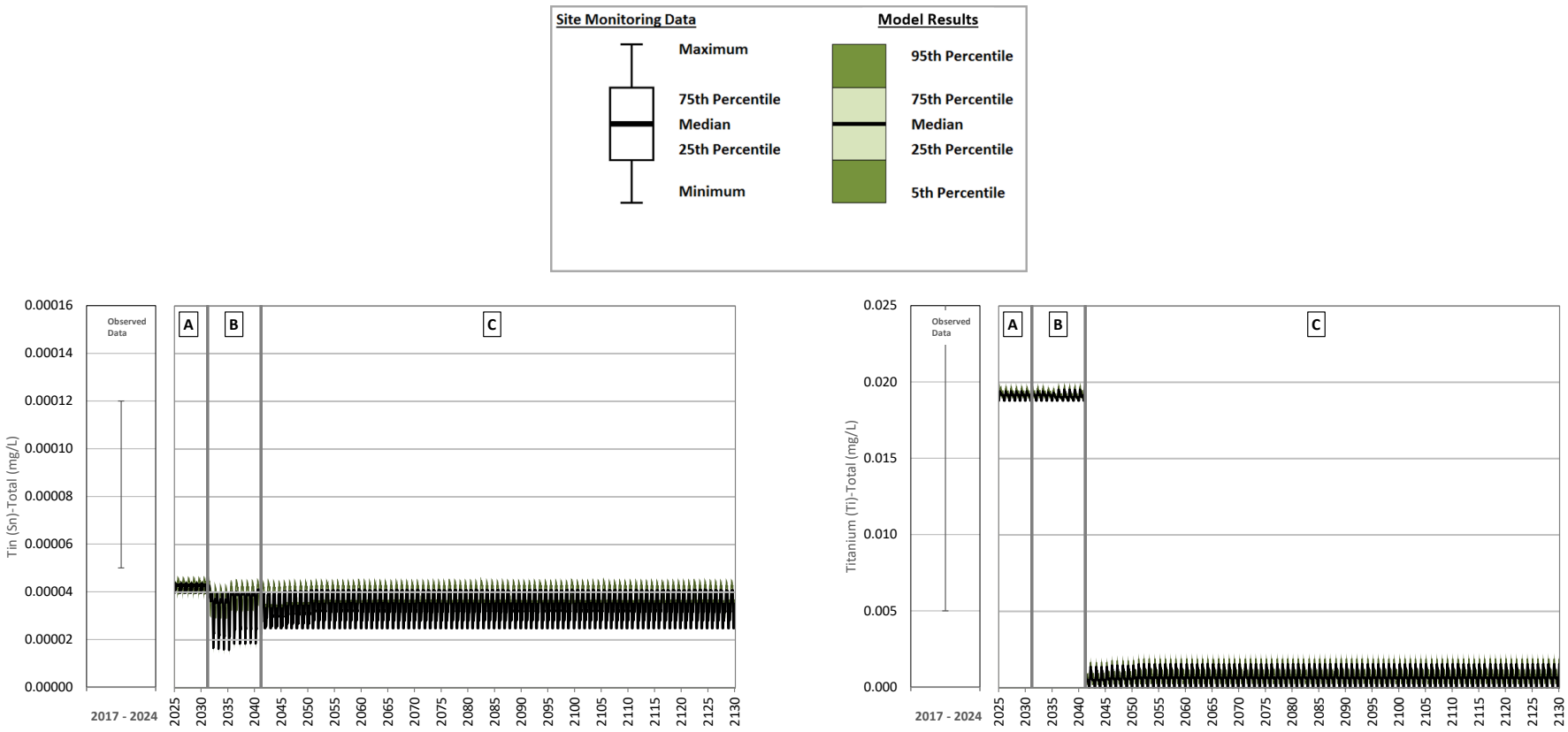
Figure B-227: Northwest Sump Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

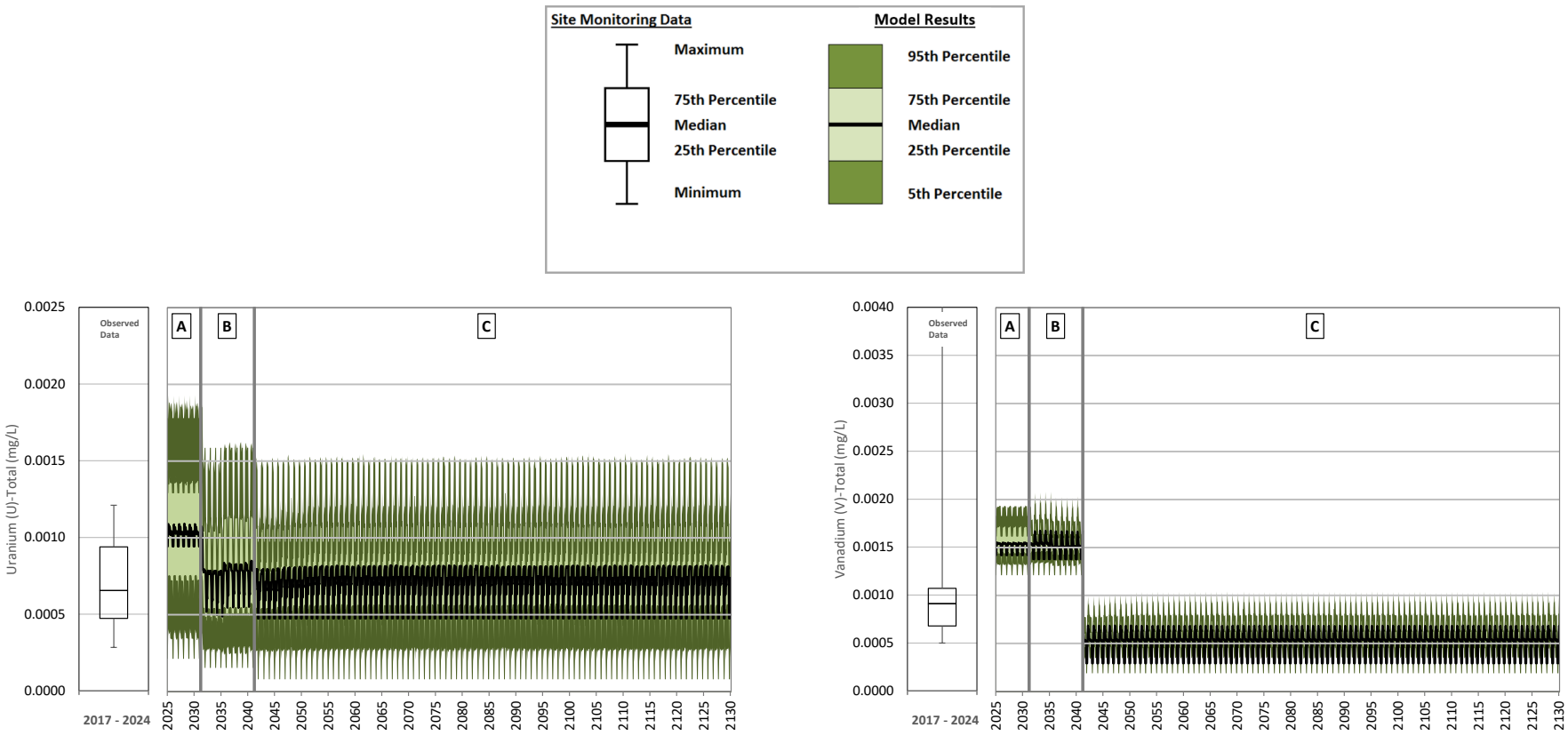
Figure B-228: Northwest Sump Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: Total titanium concentrations increase from operations to closure and post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total titanium than the NAG waste rock and disturbed runoff water quality inputs.

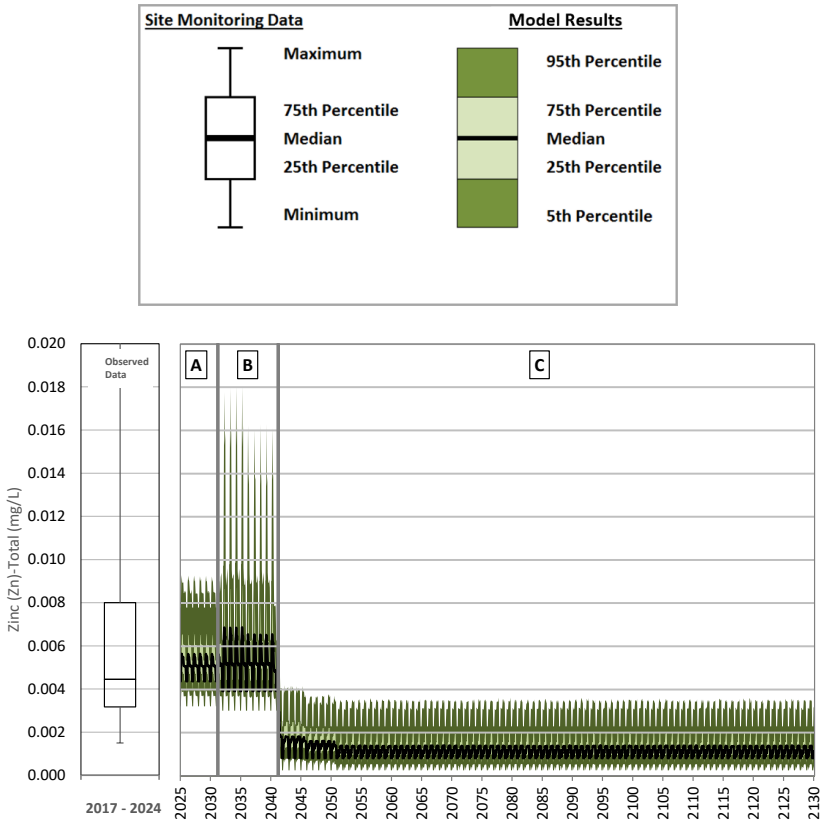
Figure B-229: Northwest Sump Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-230: Northwest Sump Operations, Closure and Post-closure – Total Uranium and Total Vanadium

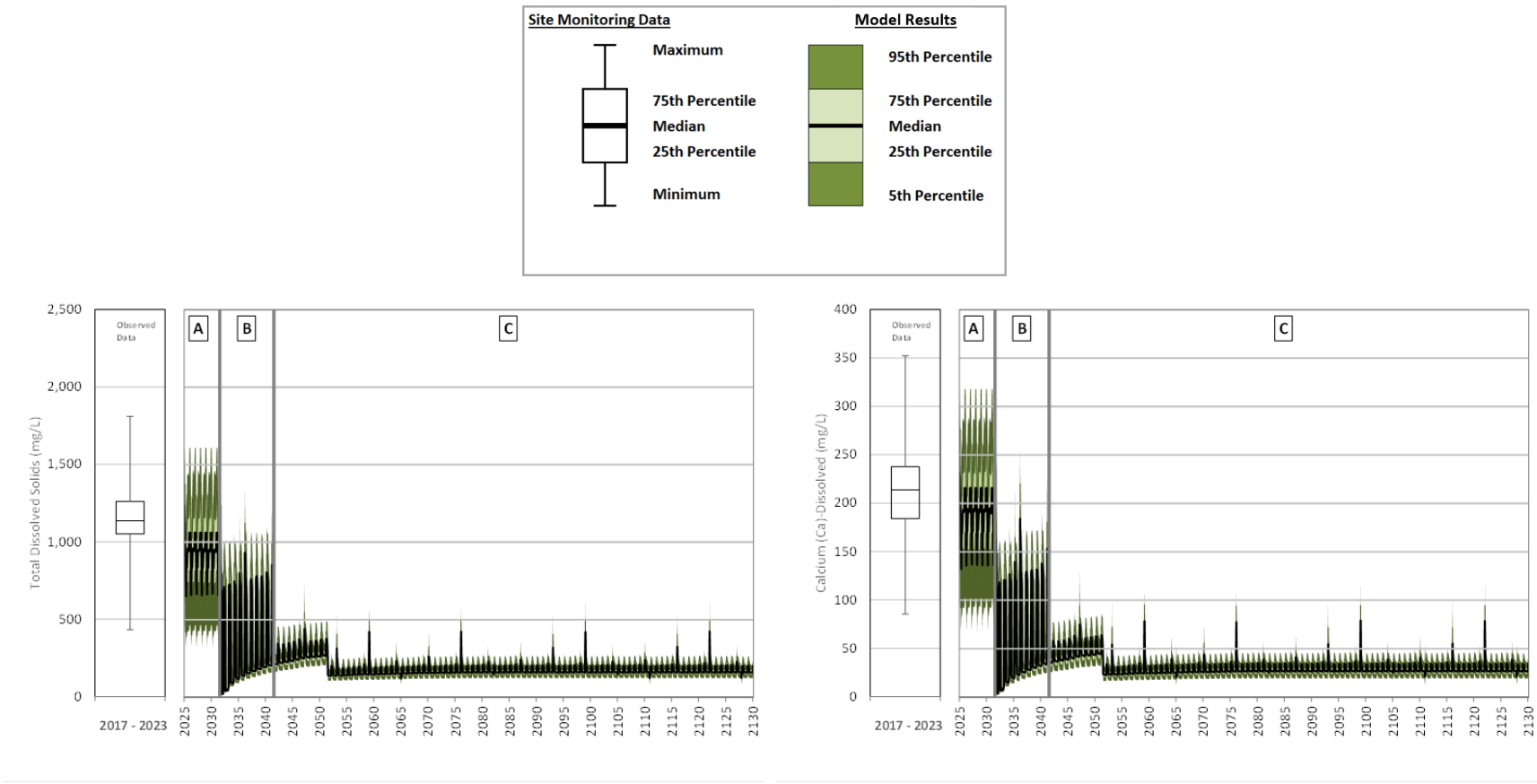


A = Operations; B = Closure; C = Post-closure

Note: Maximum total zinc concentrations increase during closure when seepage from the Temporary NW PAG Stockpile changes from the PAG water quality input to the NAG water quality input. The NAG water quality input has higher total zinc concentrations than the Pag water quality input. Total zinc concentrations decrease from closure and post-closure as runoff areas are remediated.

Figure B-231: Northwest Sump Operations, Closure and Post-closure – Total Zinc

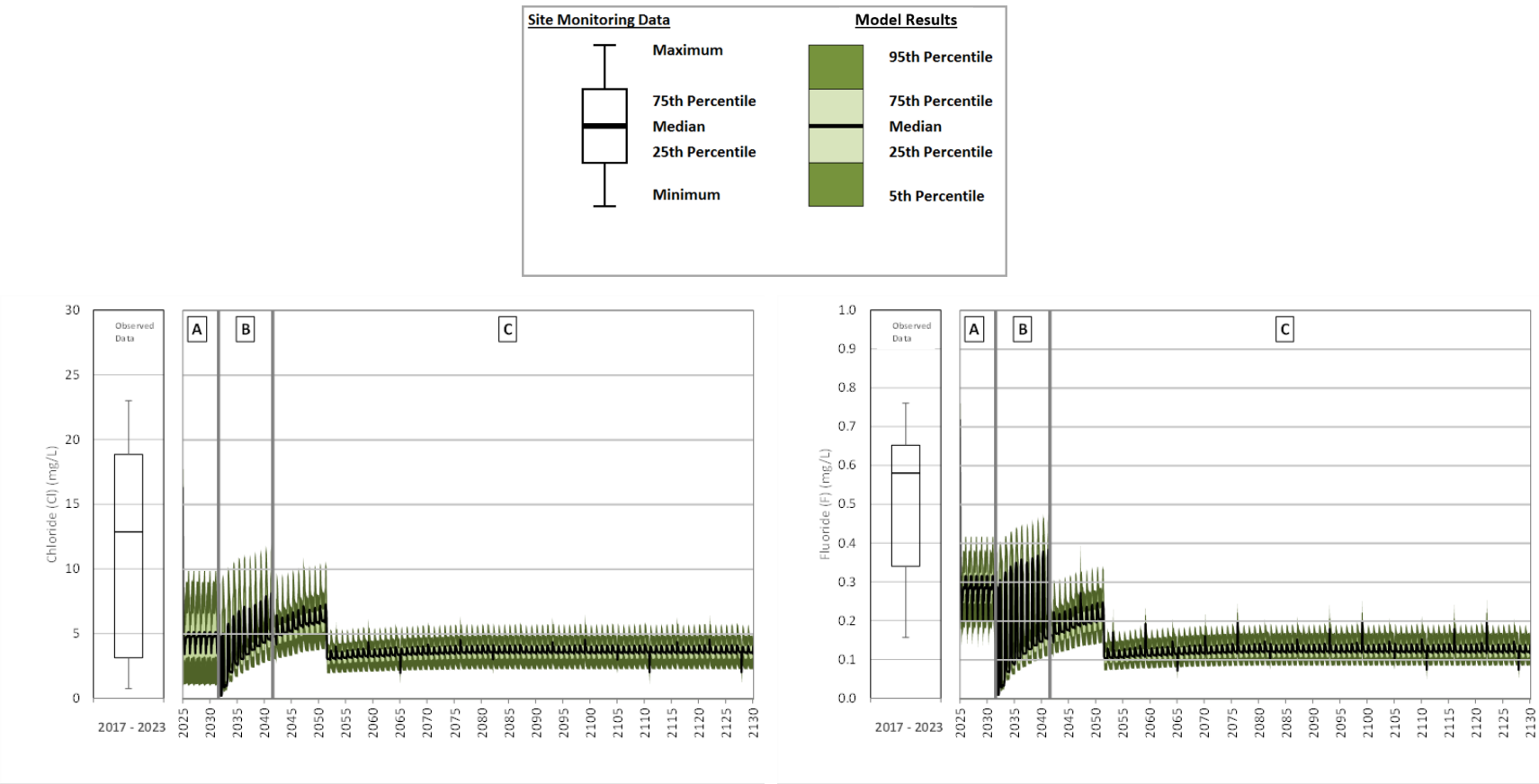
South Embankment Seepage Collection Pond Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

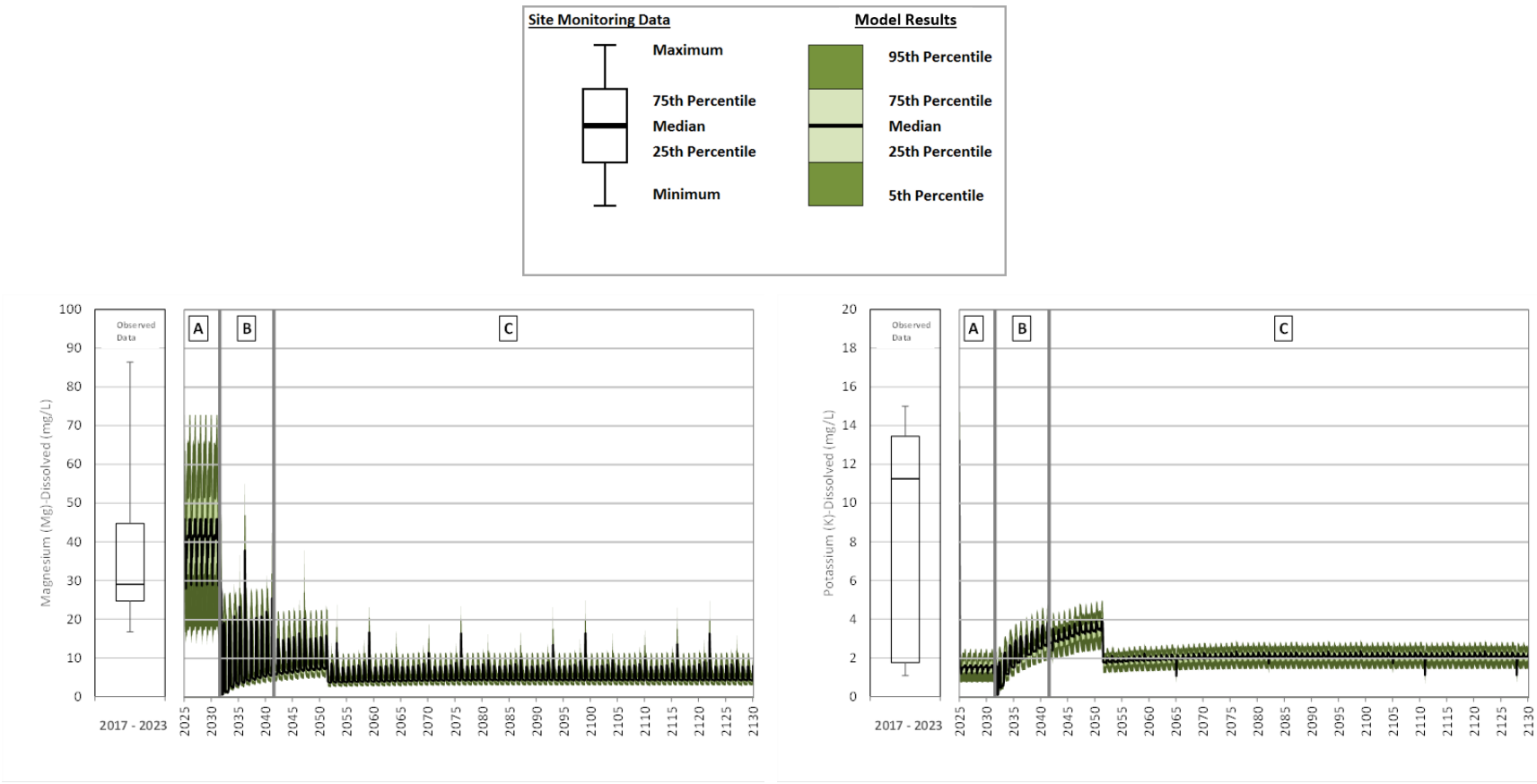
Figure B-232: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

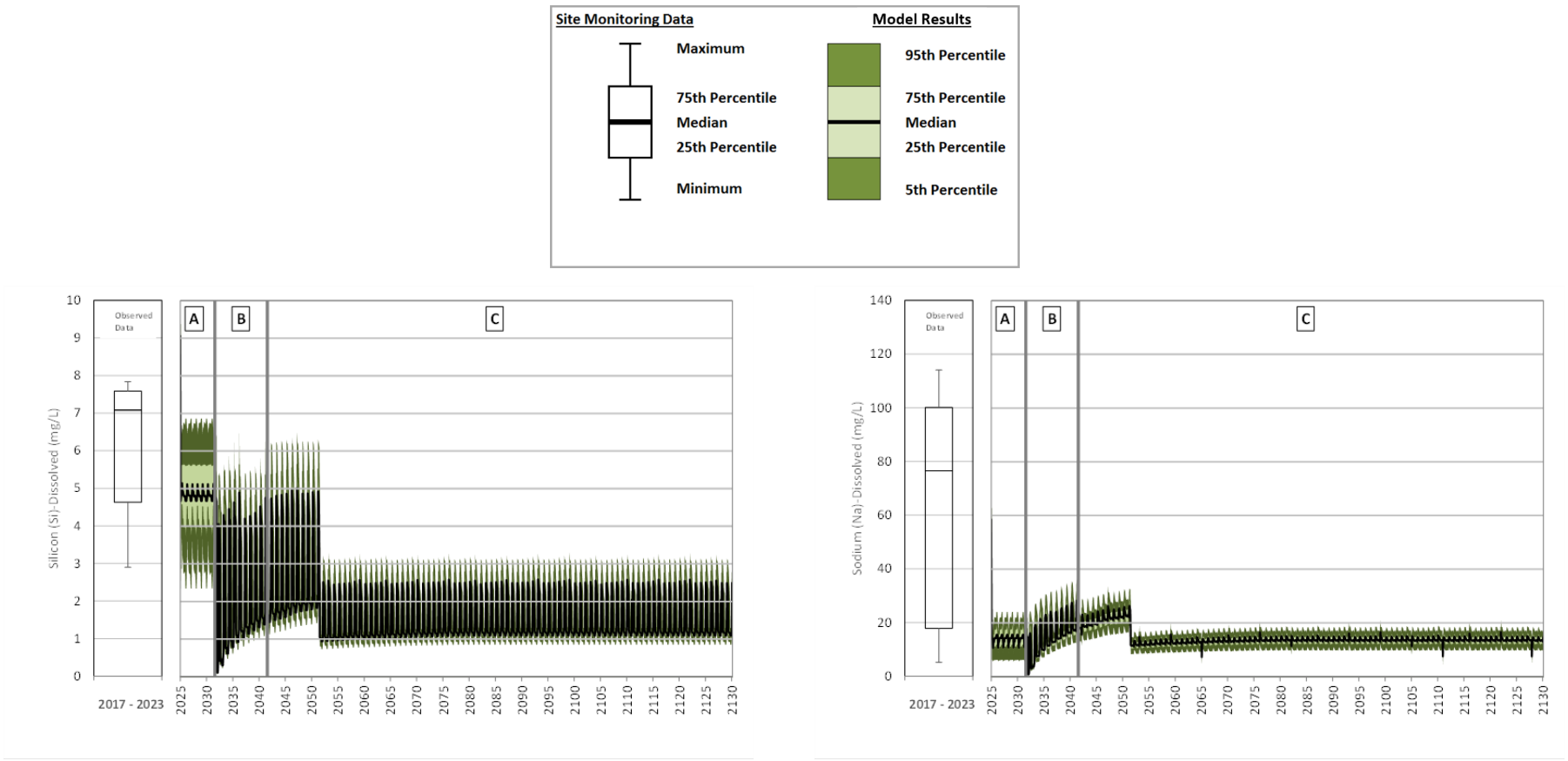
Figure B-233: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

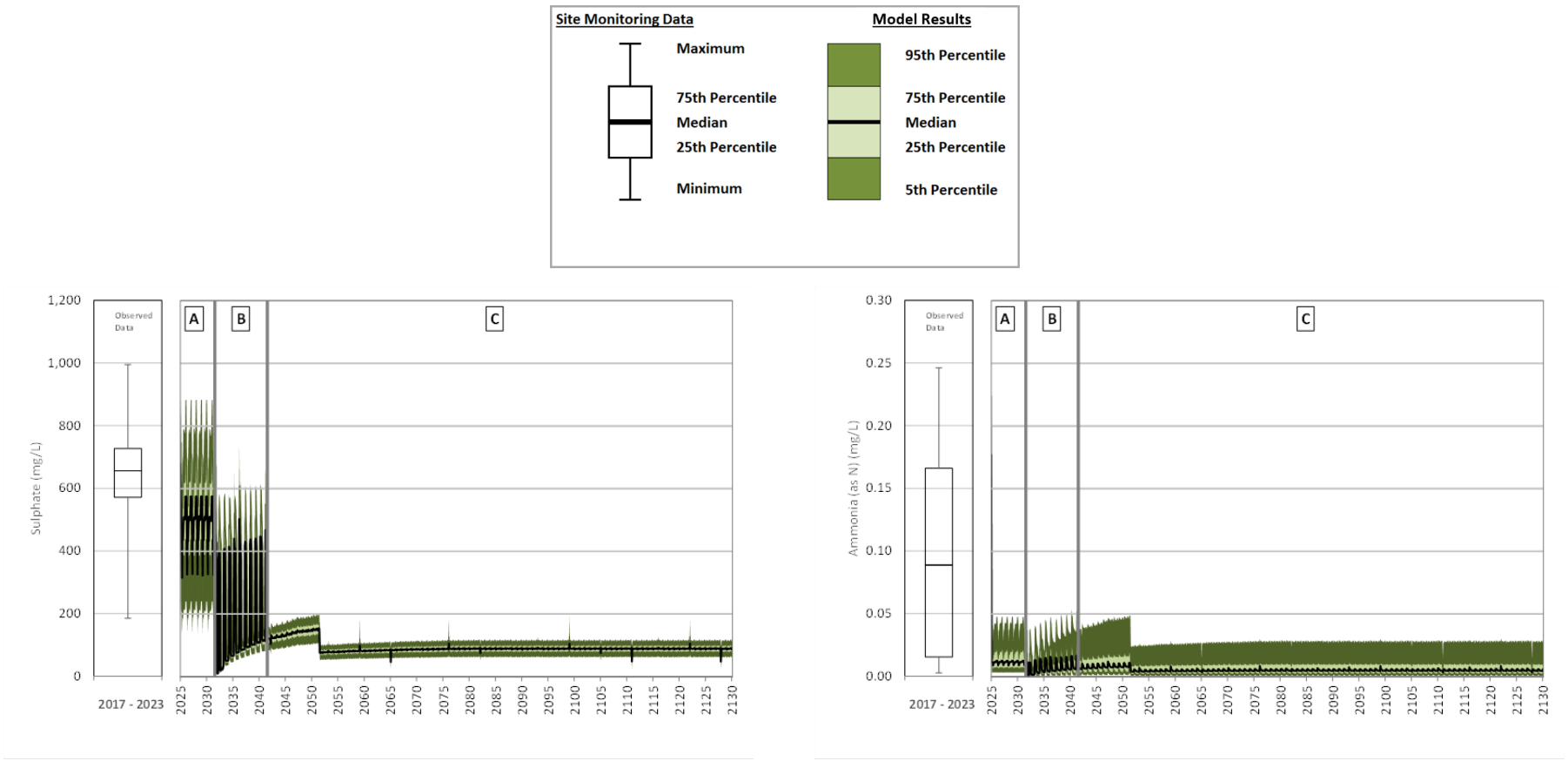
Figure B-234: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

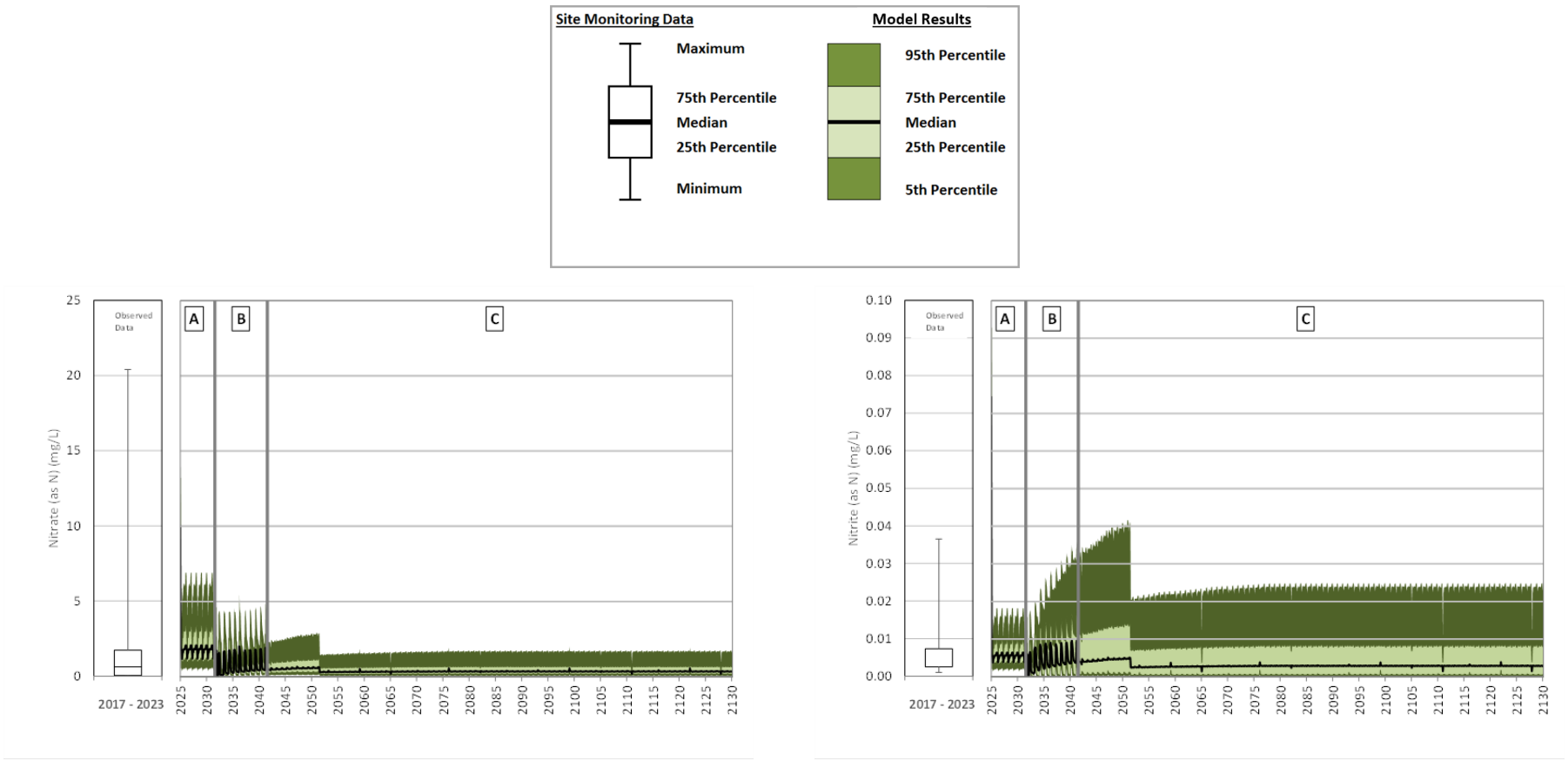
Figure B-235: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

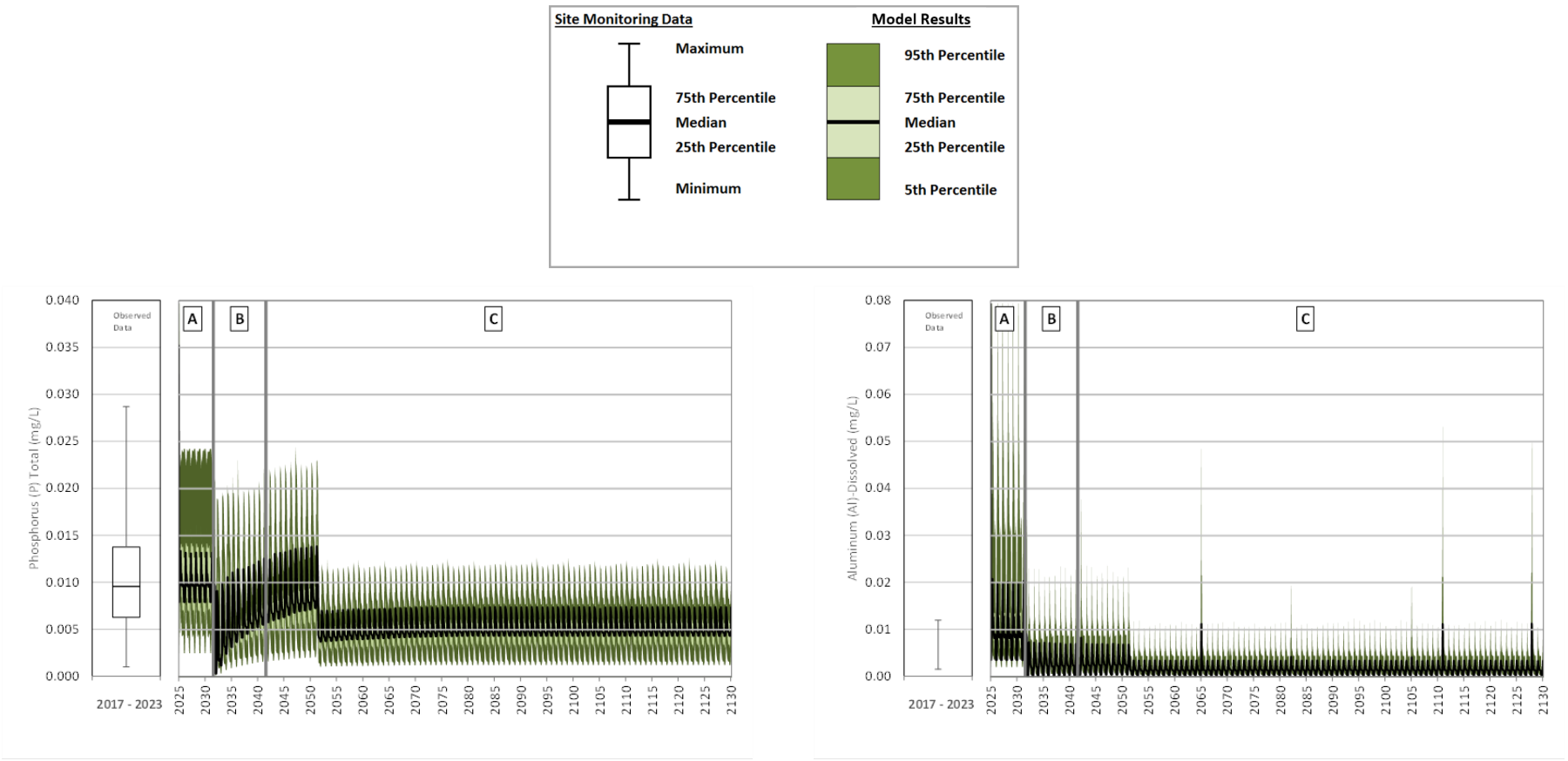
Figure B-236: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

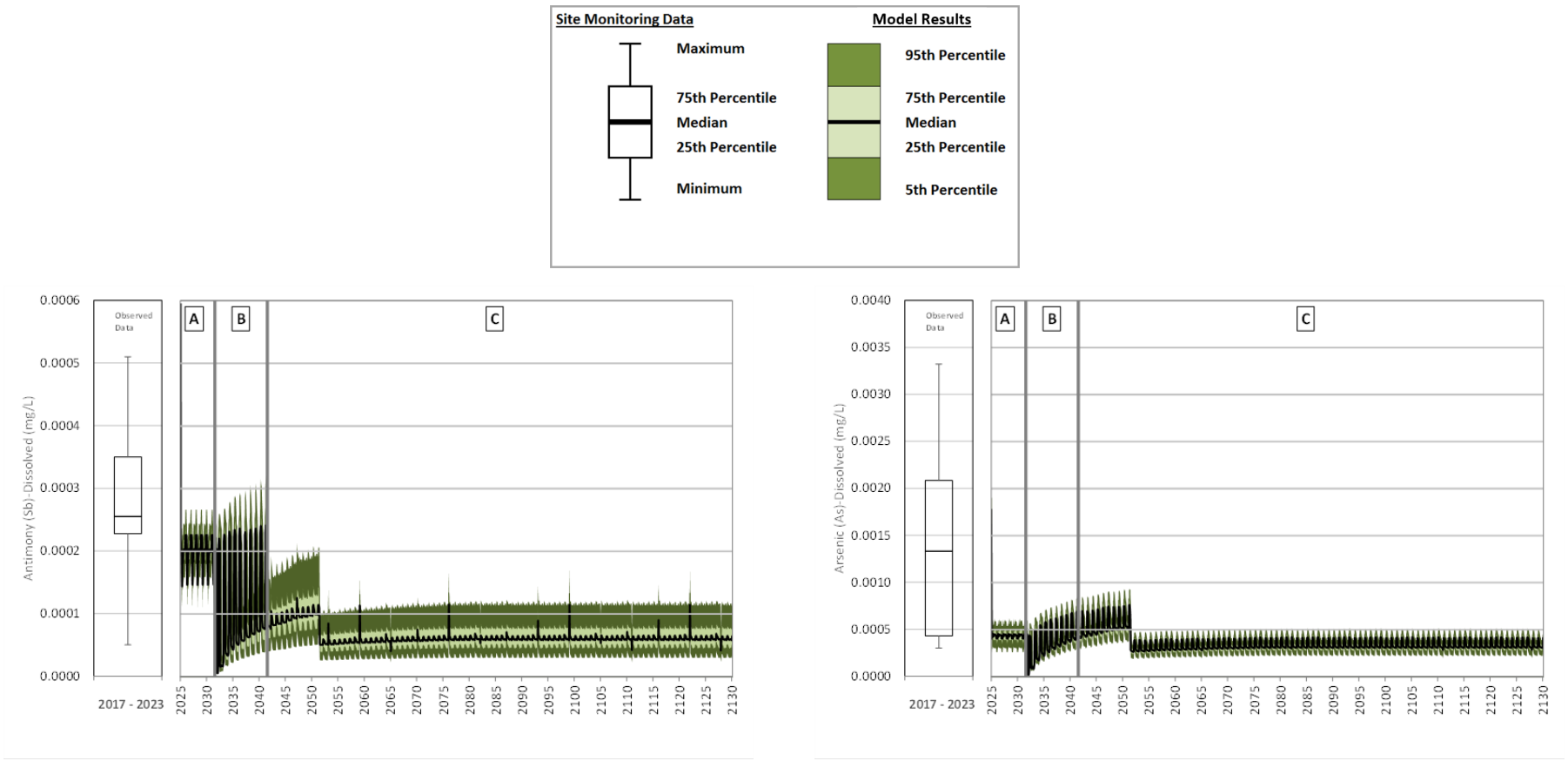
Figure B-237: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in total phosphorus concentrations from 2031 to 2074 and the decrease in dissolved aluminum concentrations are due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

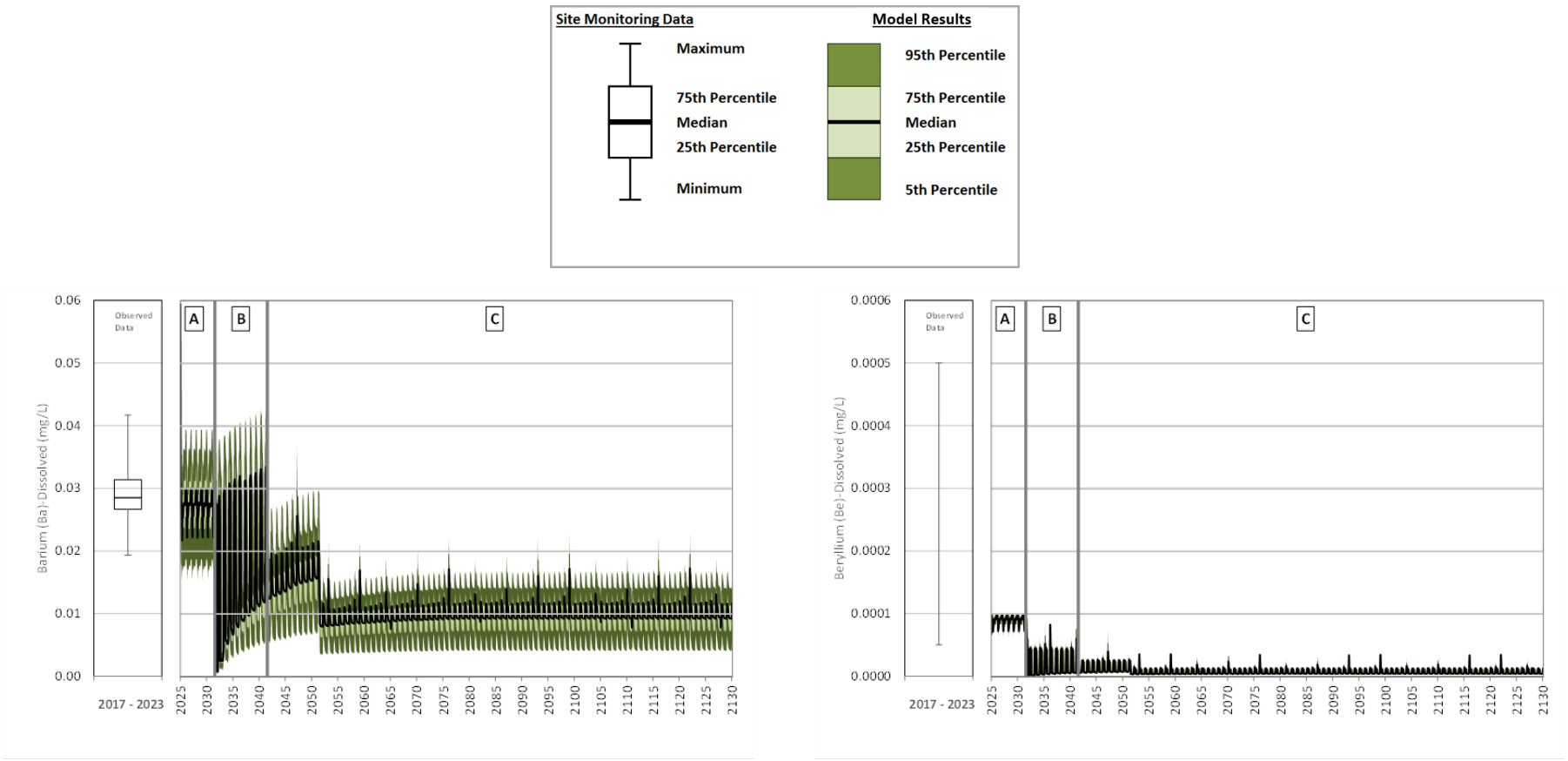
Figure B-238: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

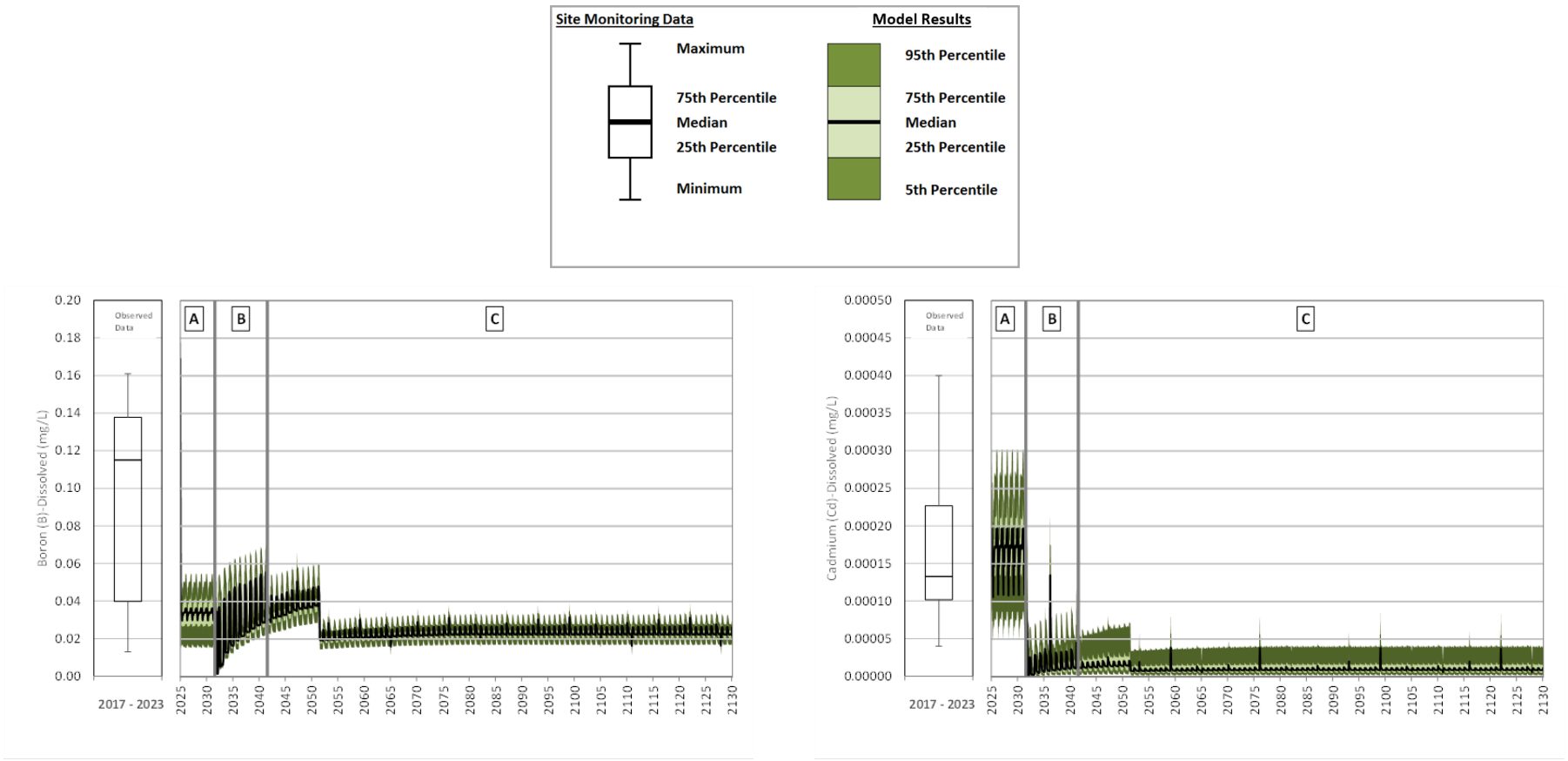
Figure B-239: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

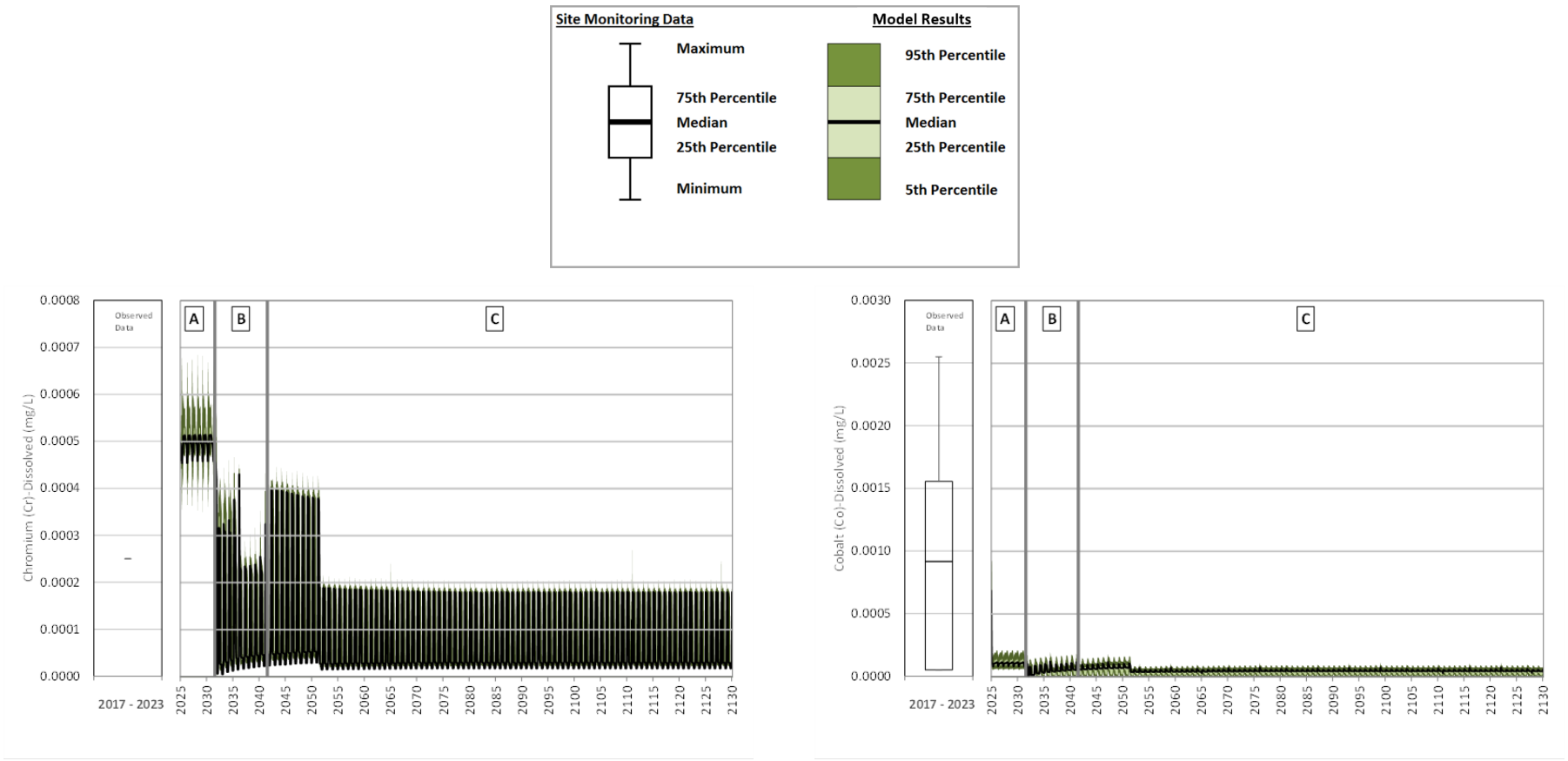
Figure B-240: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

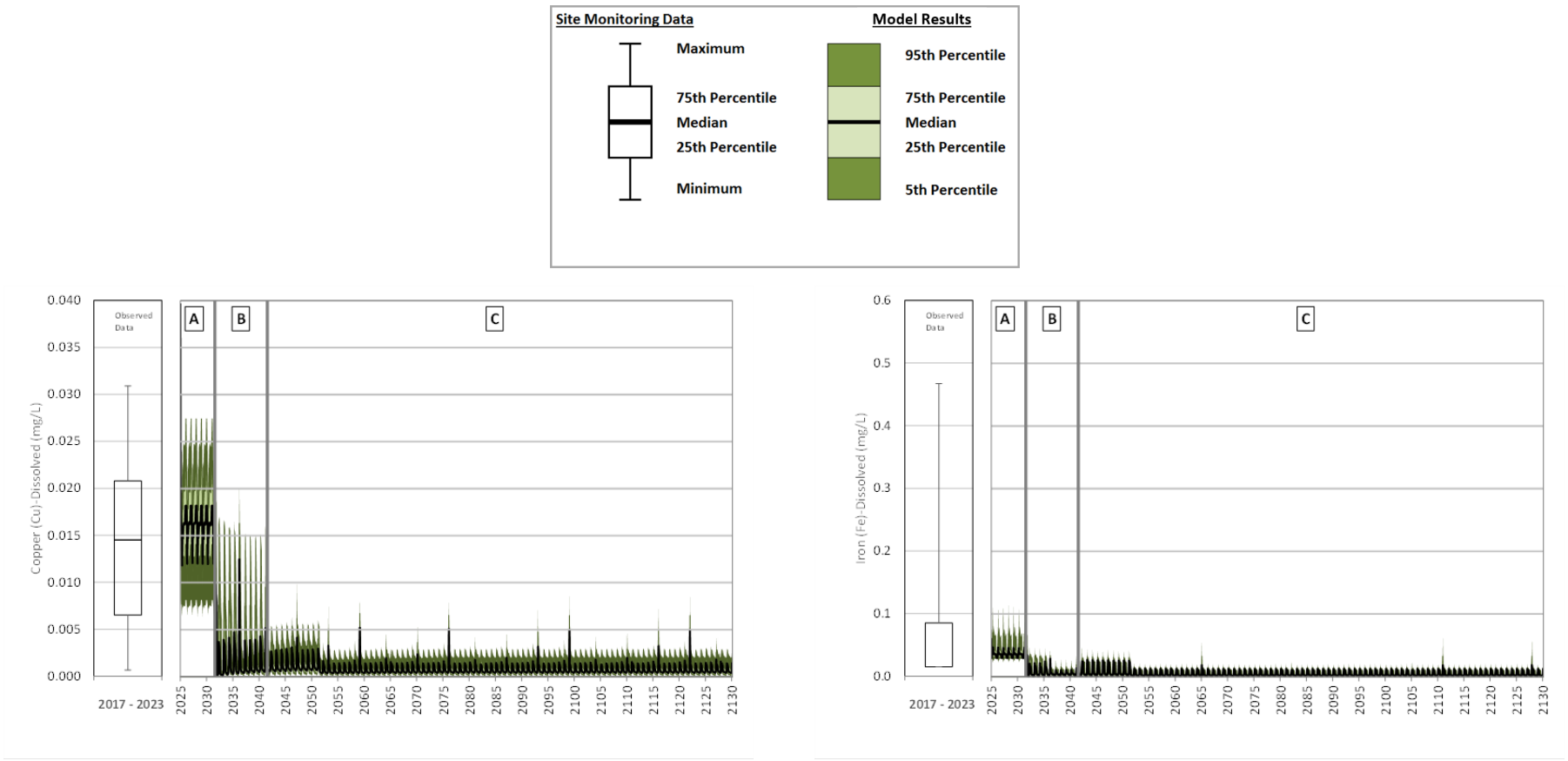
Figure B-241: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

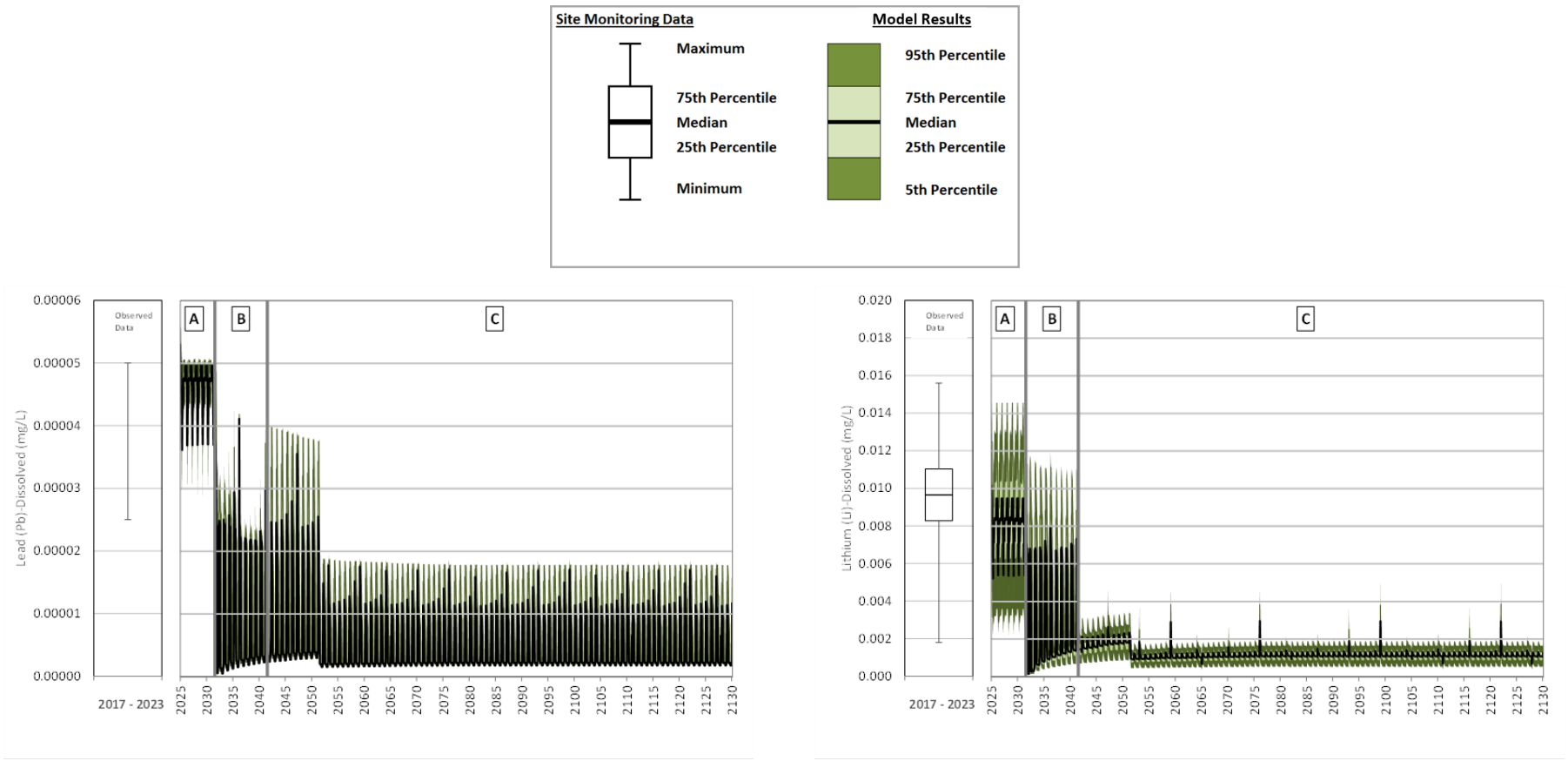
Figure B-242: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

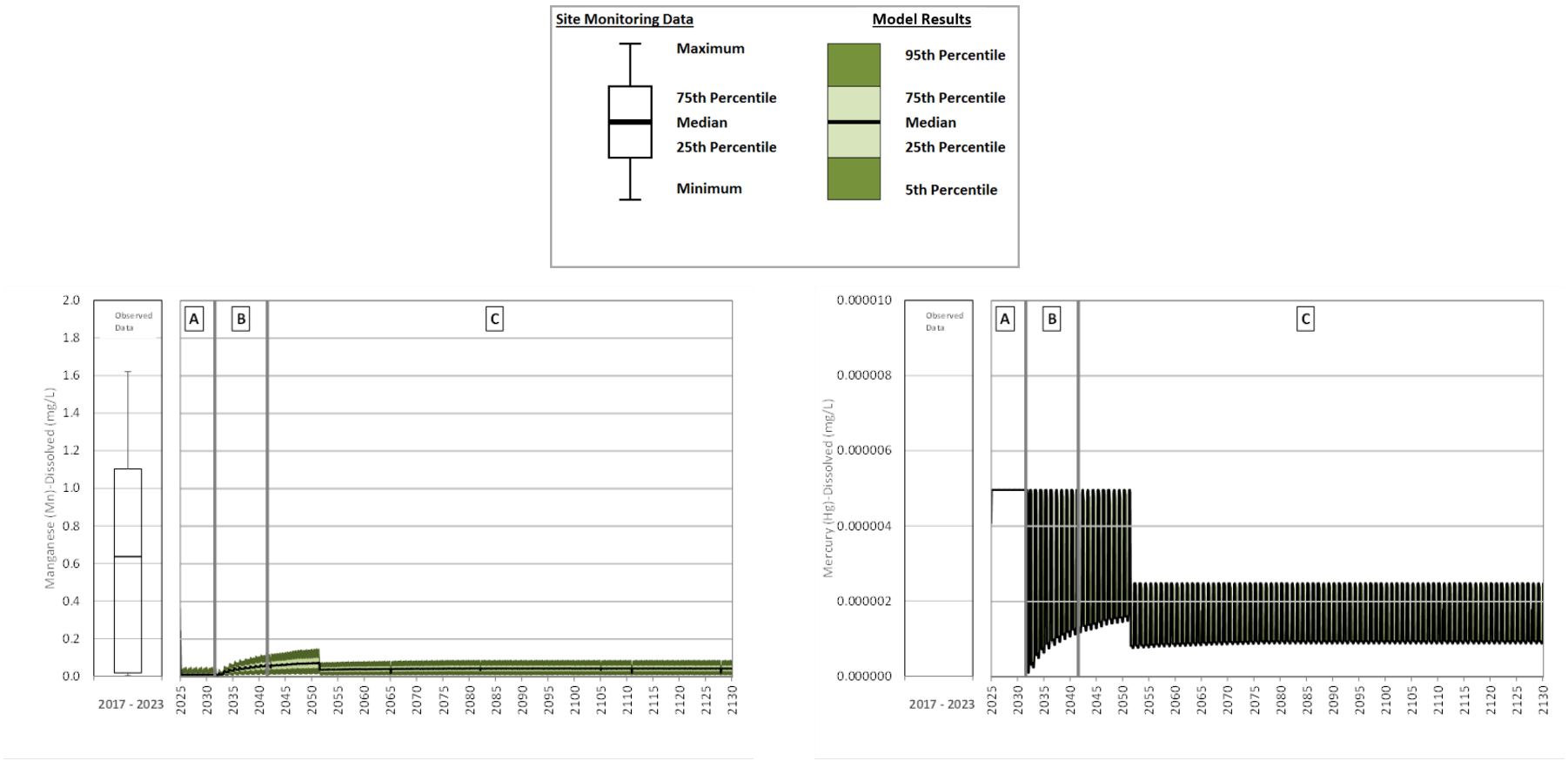
Figure B-243: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

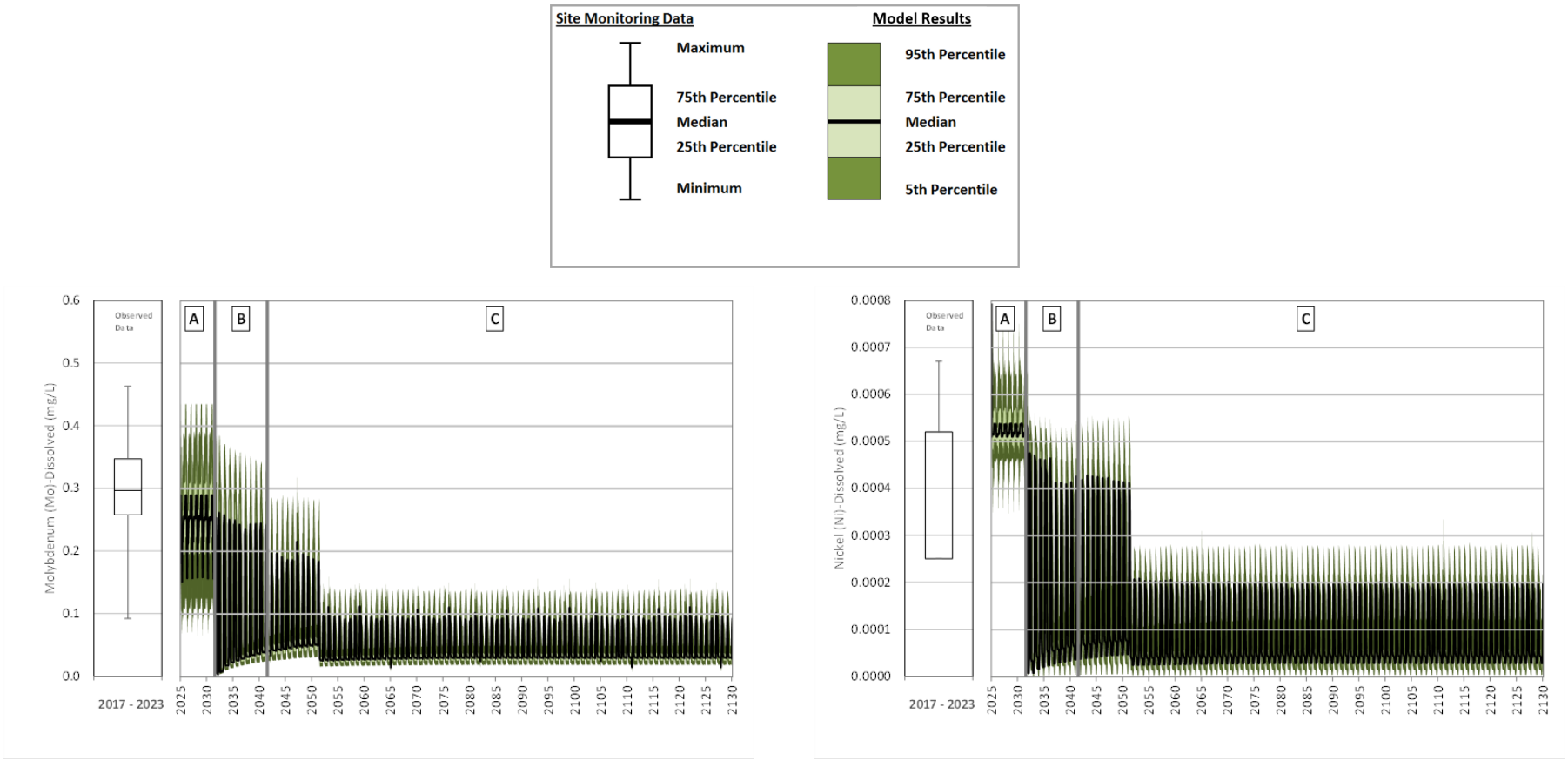
Figure B-244: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

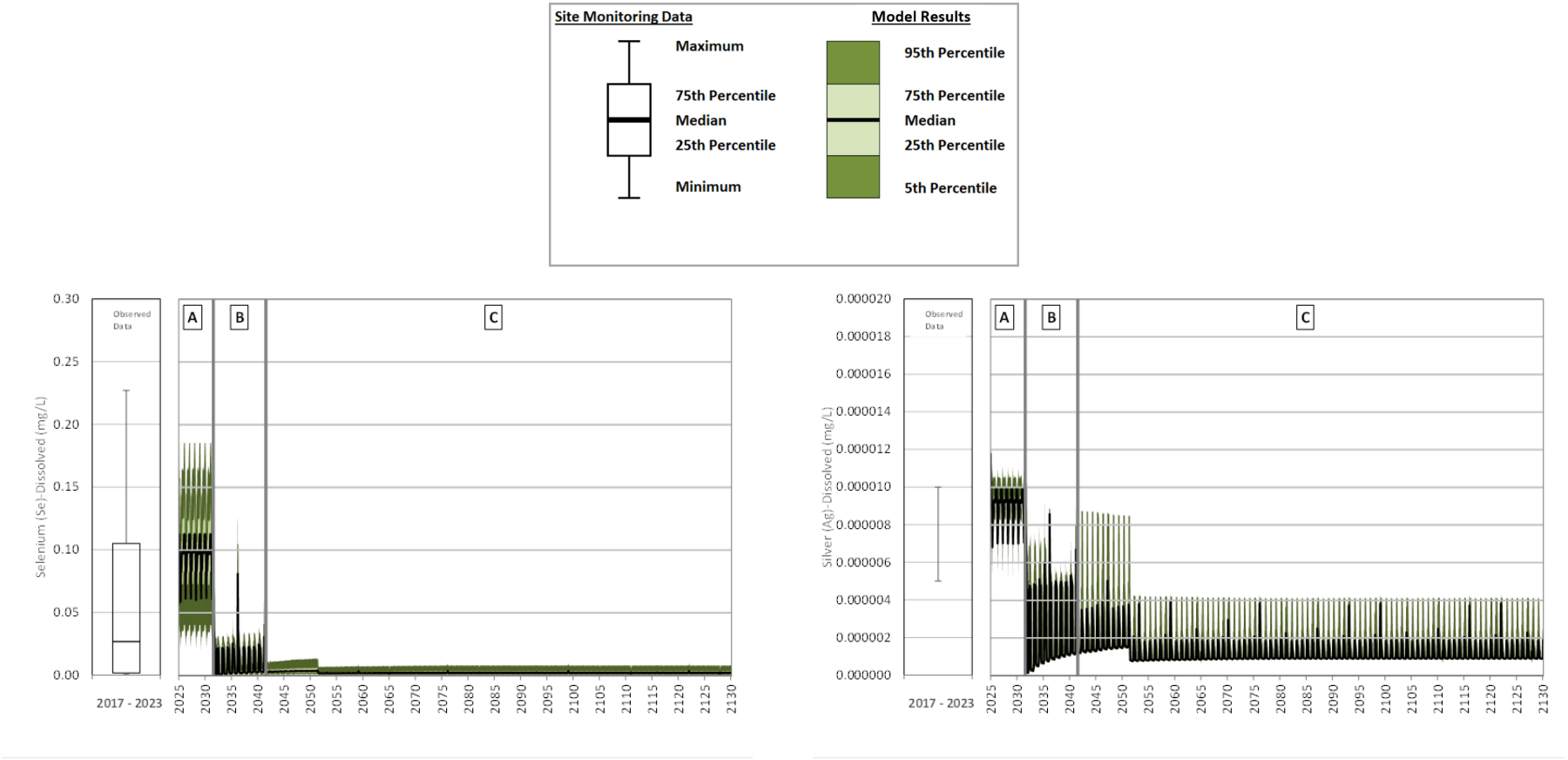
Figure B-245: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

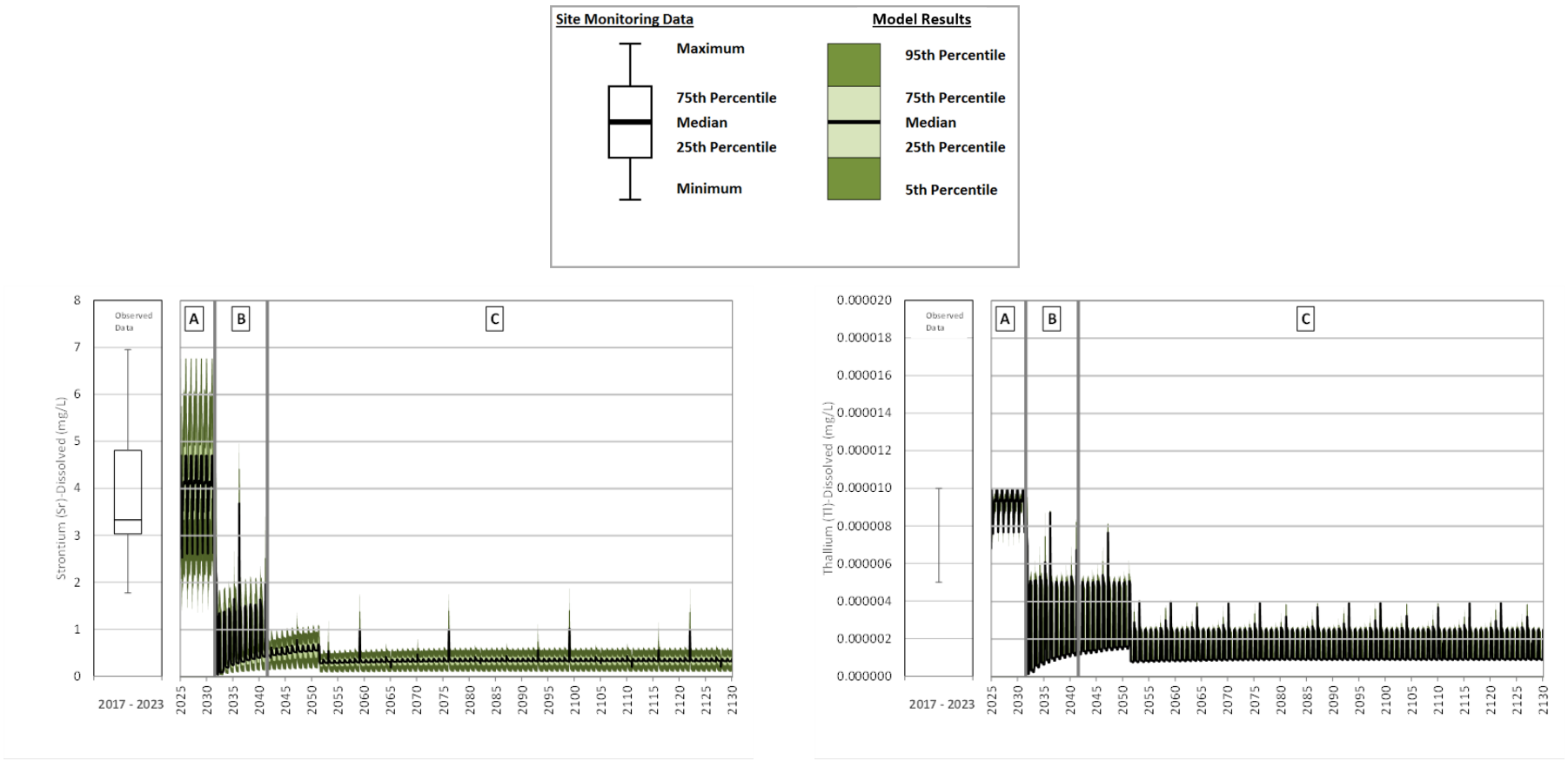
Figure B-246: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

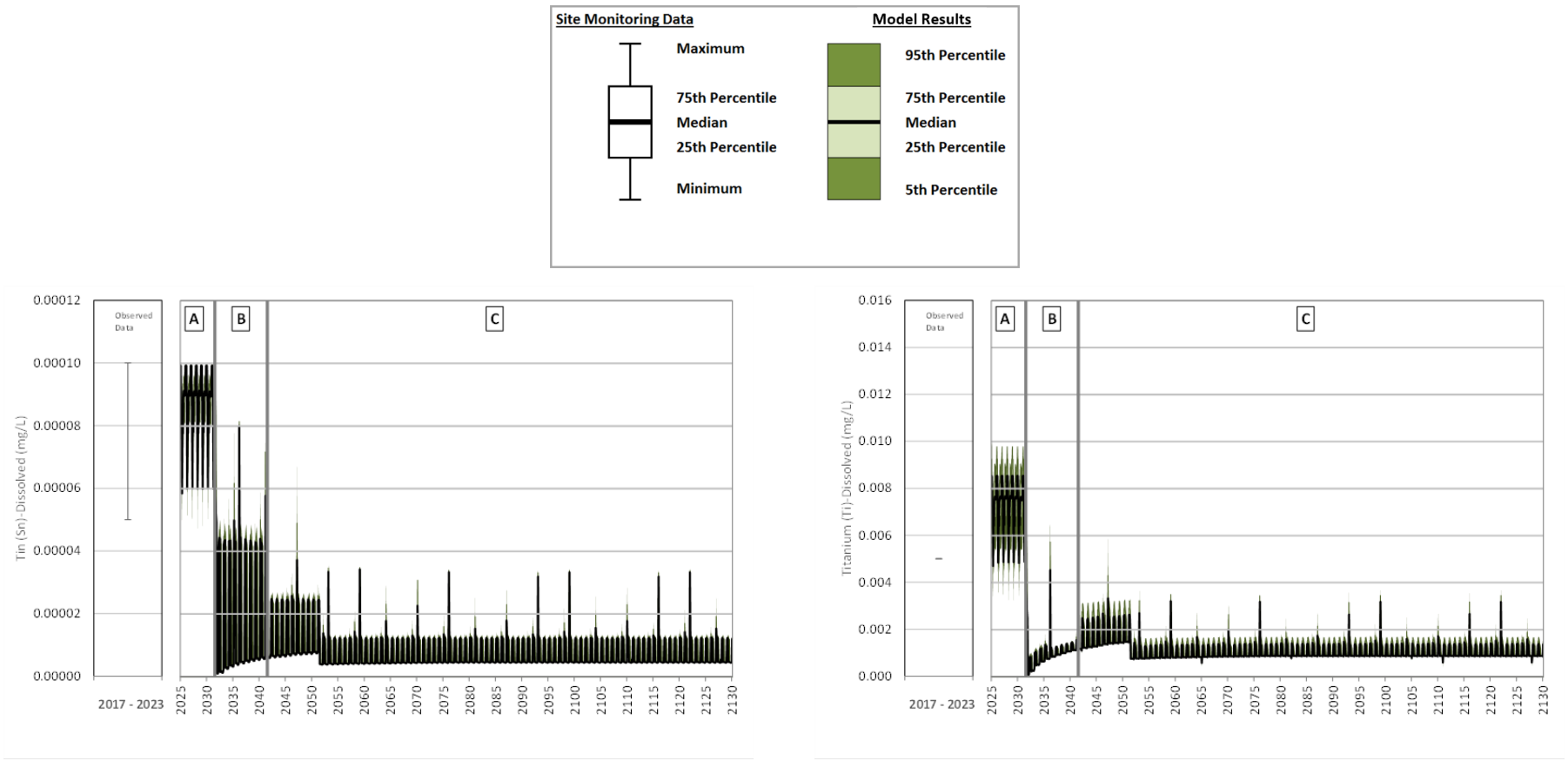
Figure B-247: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

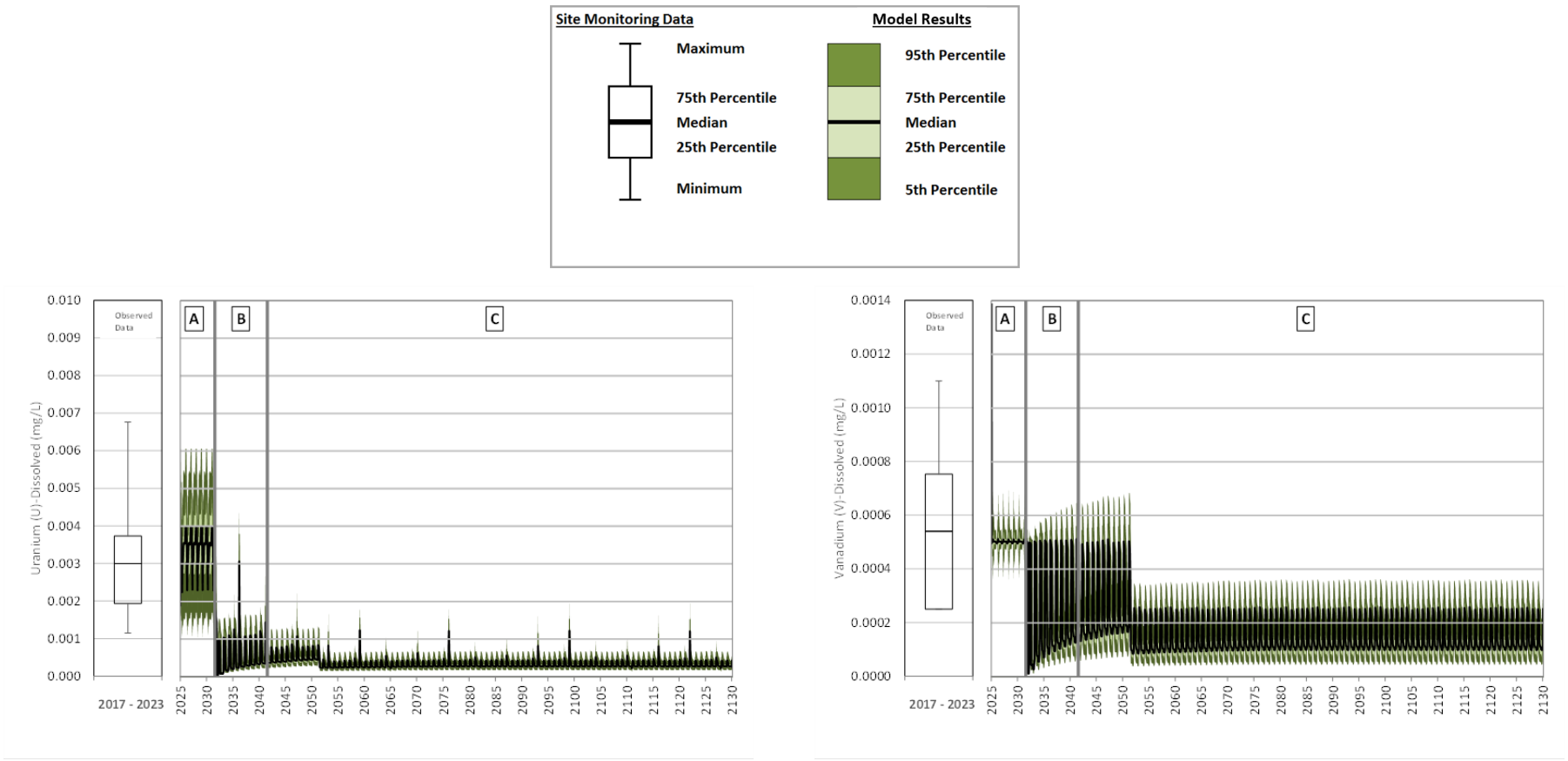
Figure B-248: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

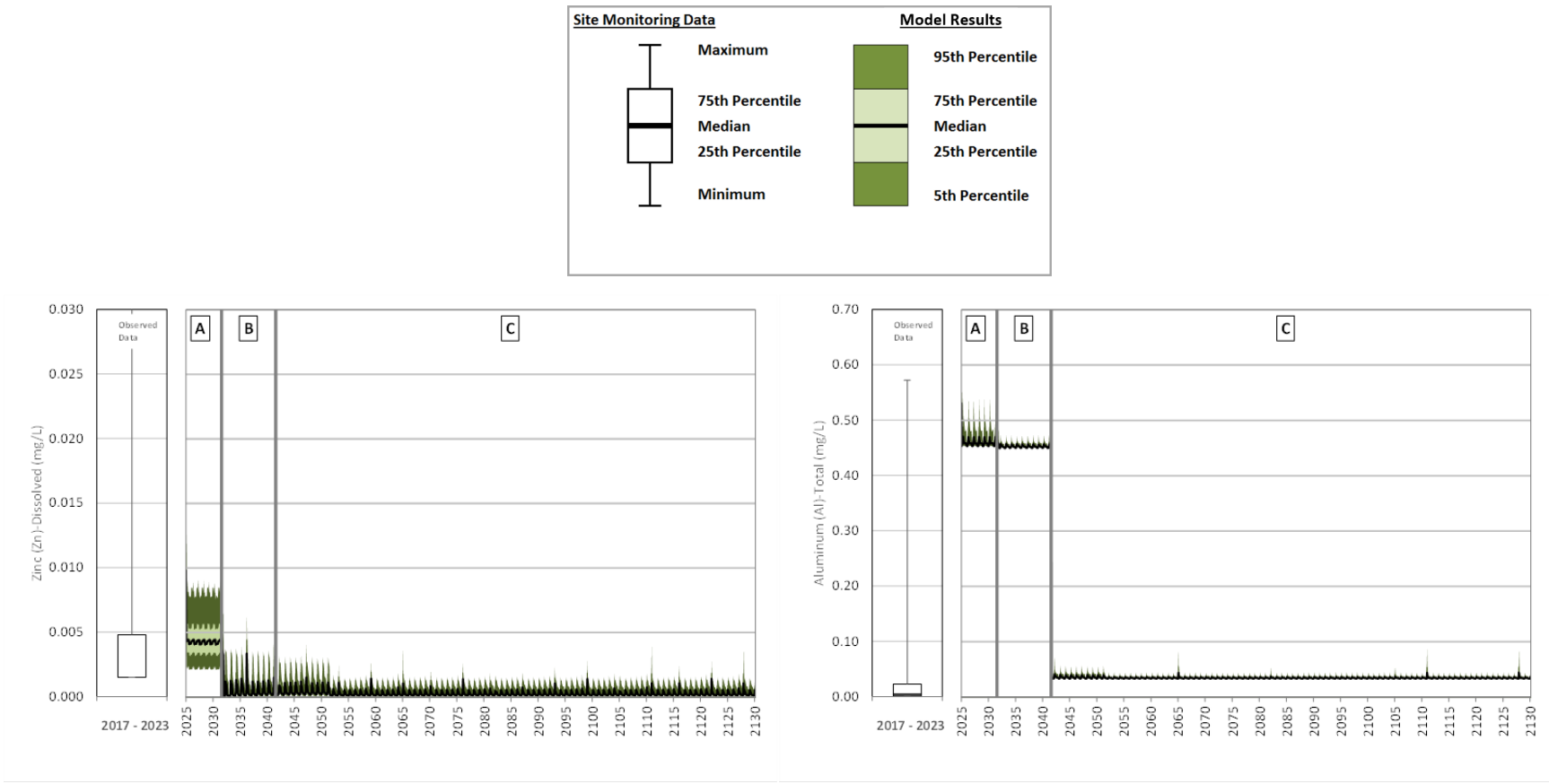
Figure B-249: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

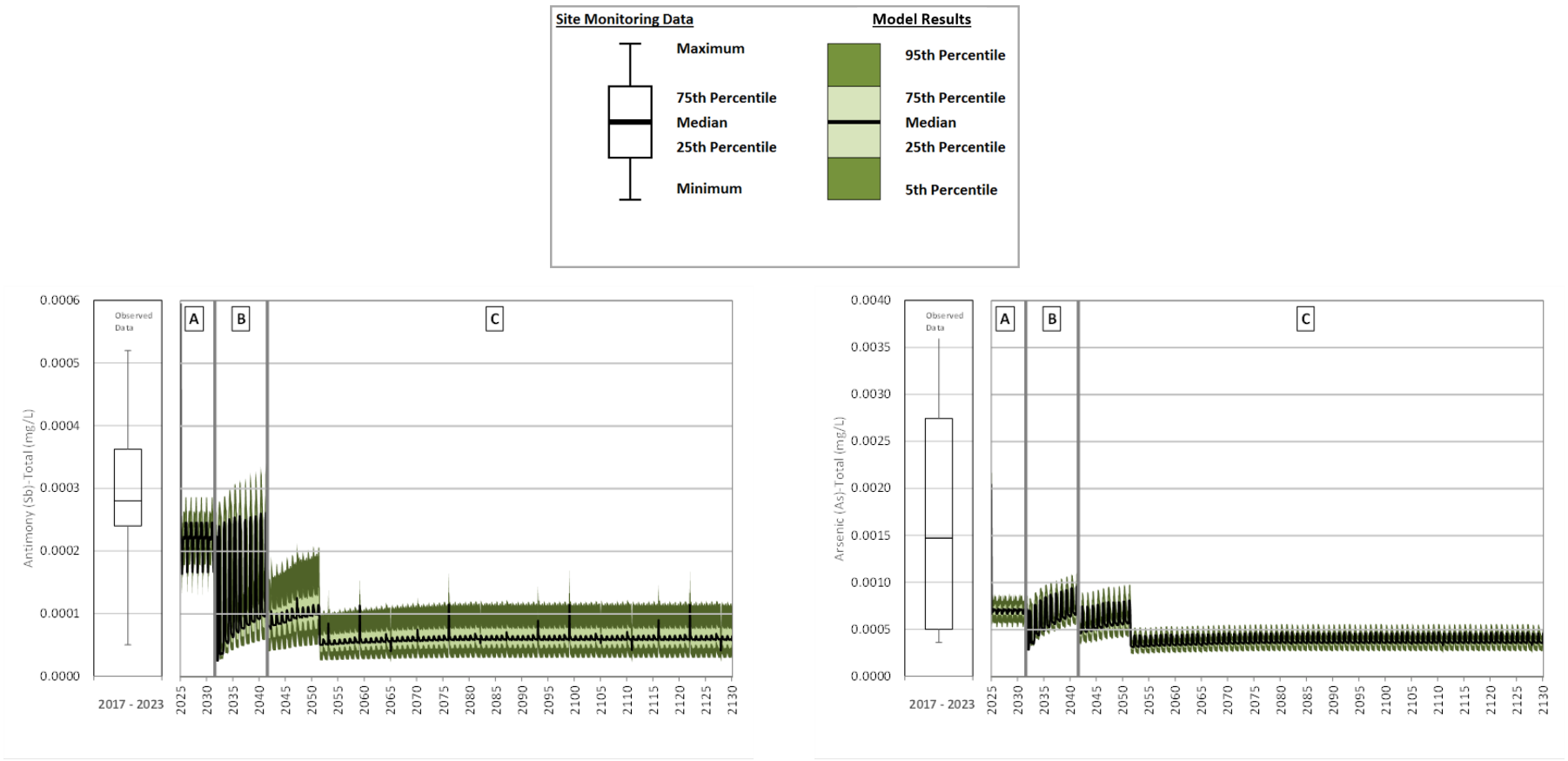
Figure B-250: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

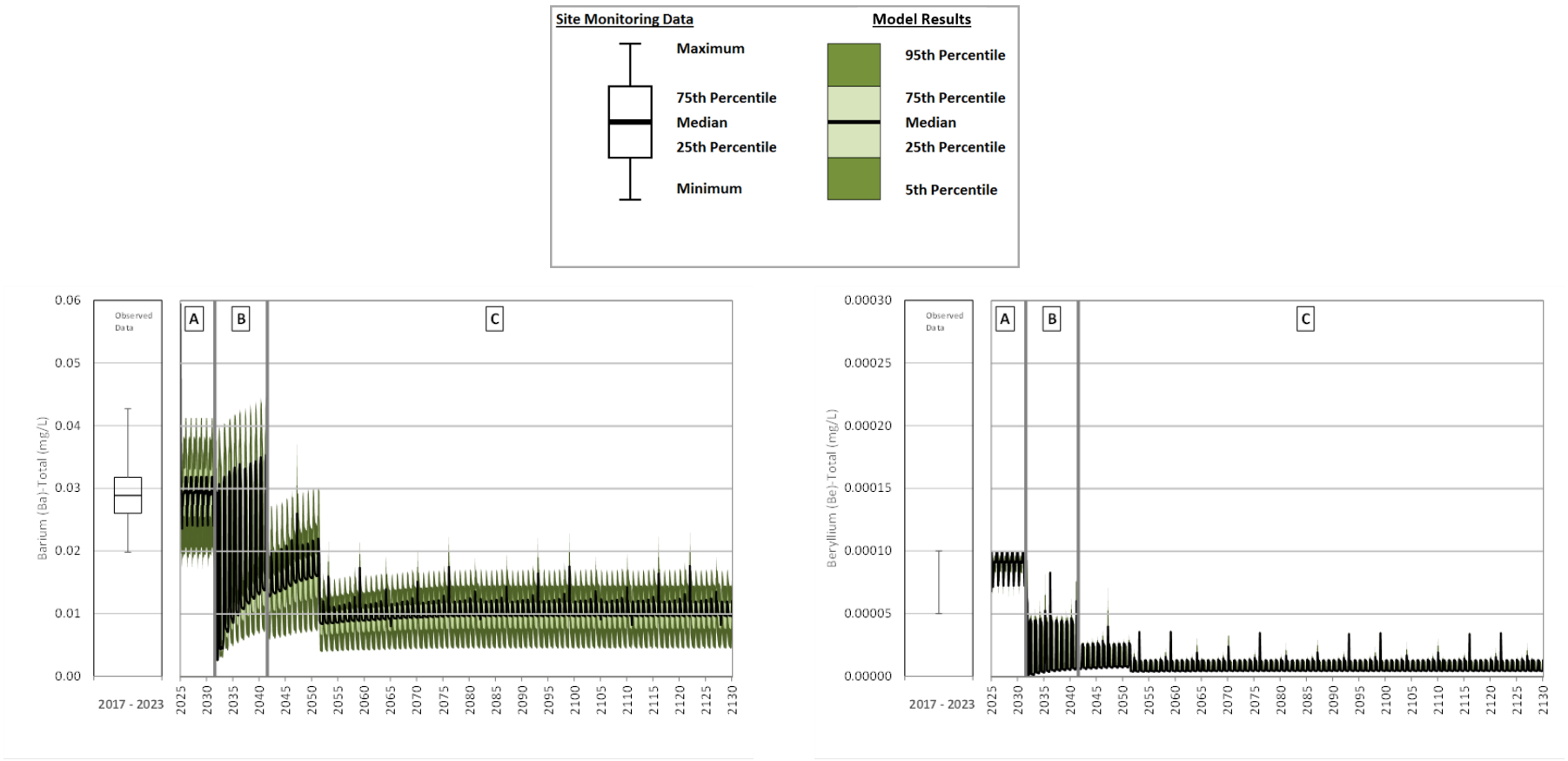
Figure B-251: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

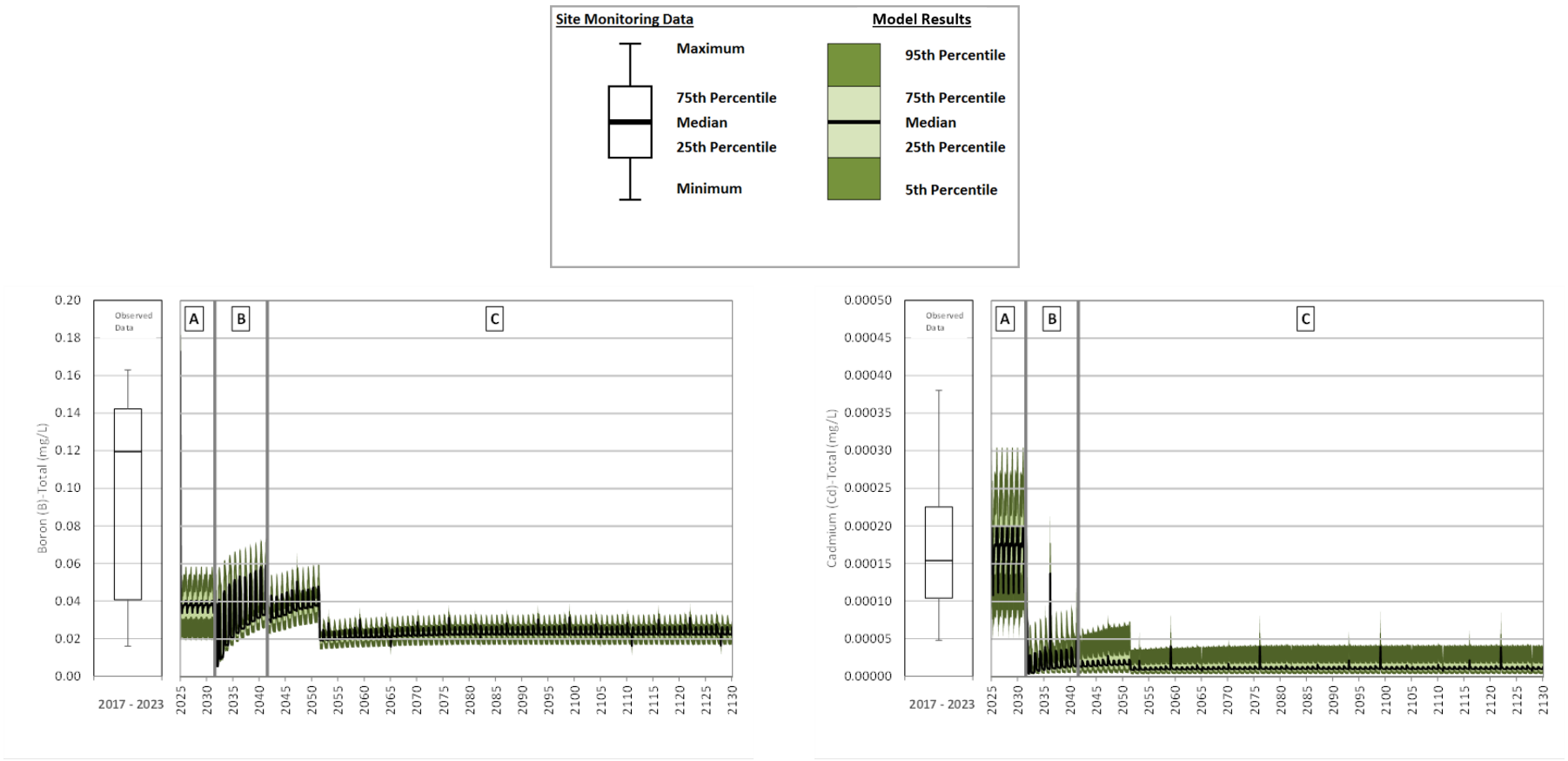
Figure B-252: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

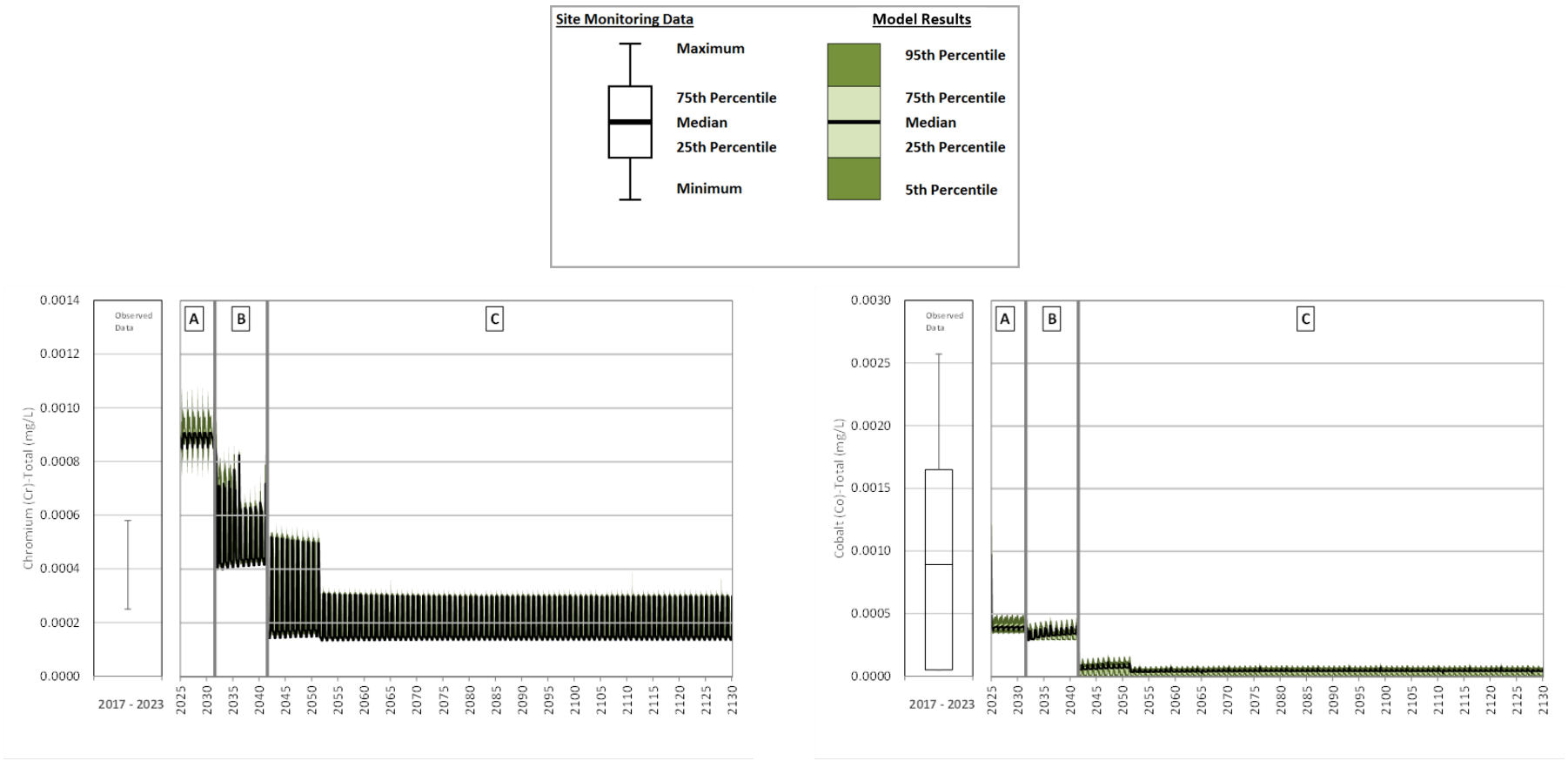
Figure B-253: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

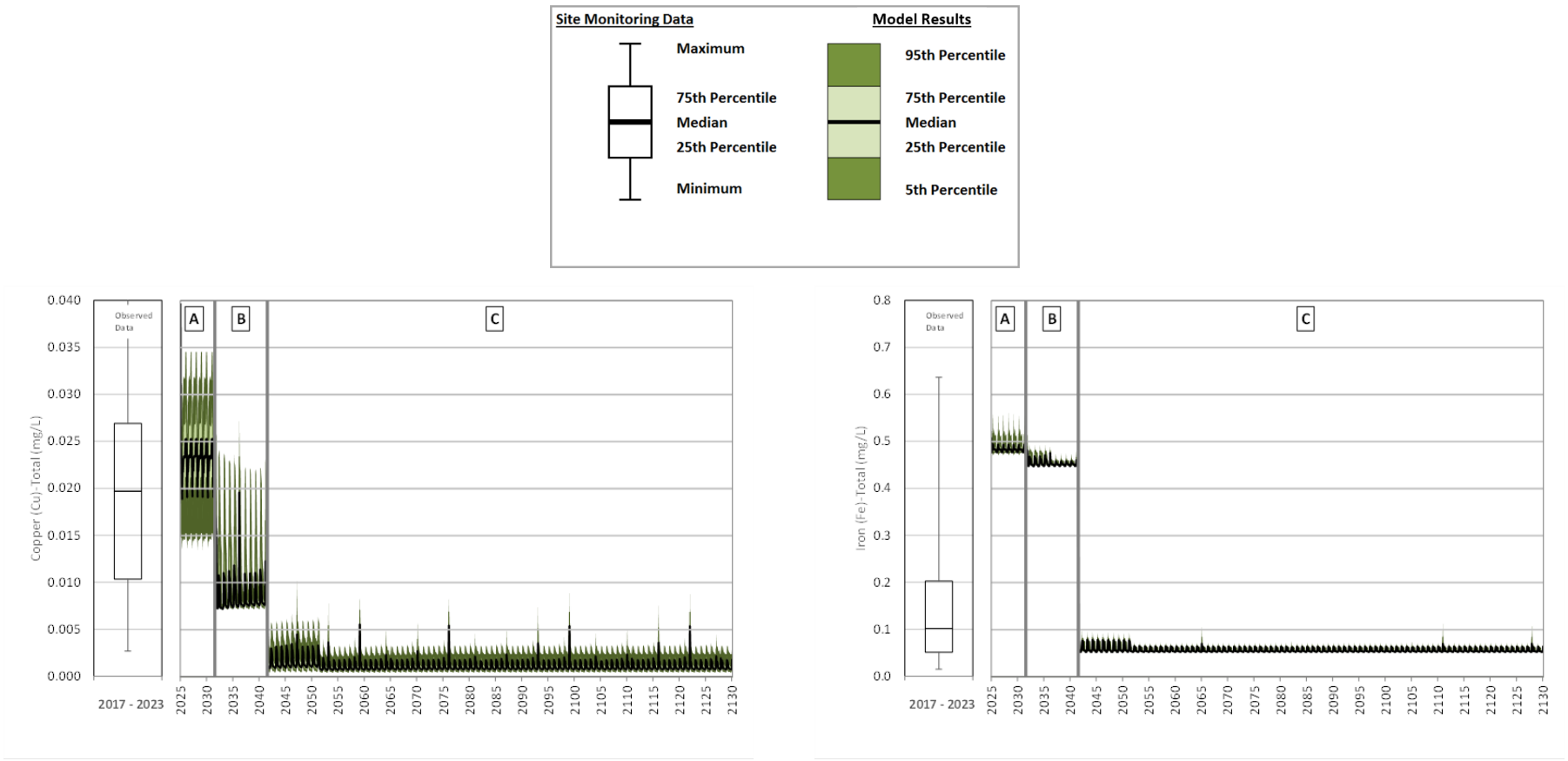
Figure B-254: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

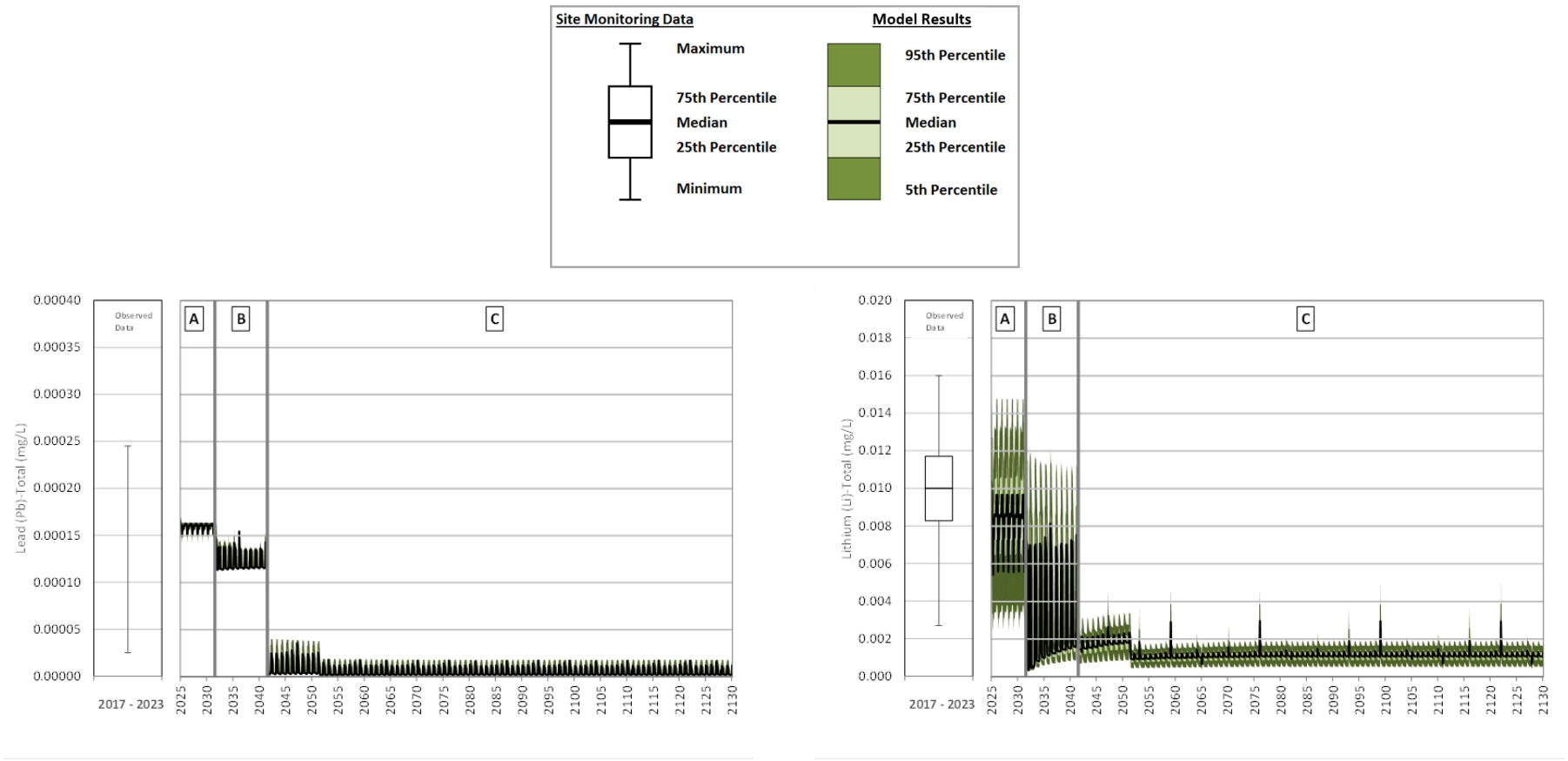
Figure B-255: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

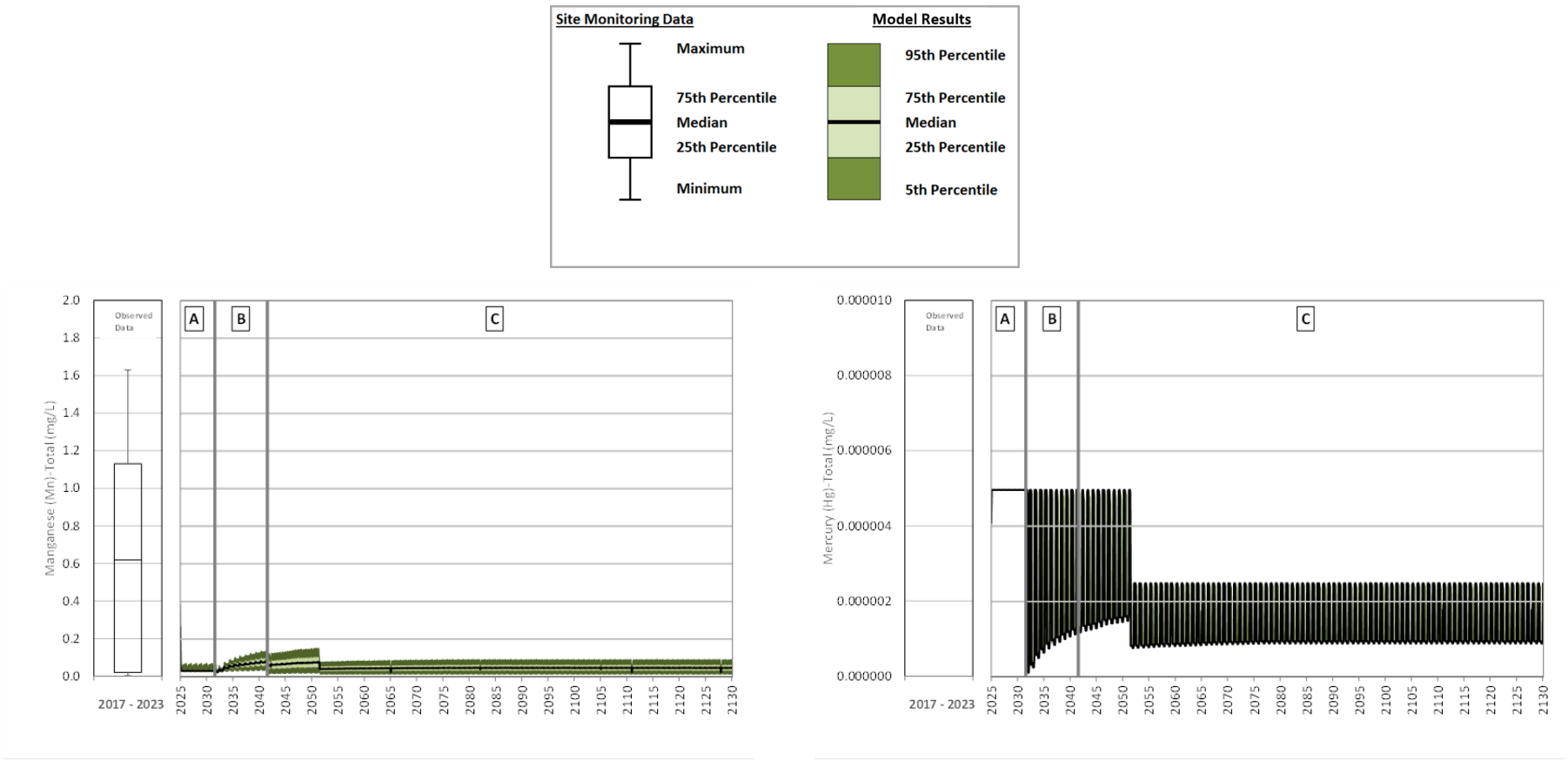
Figure B-256: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

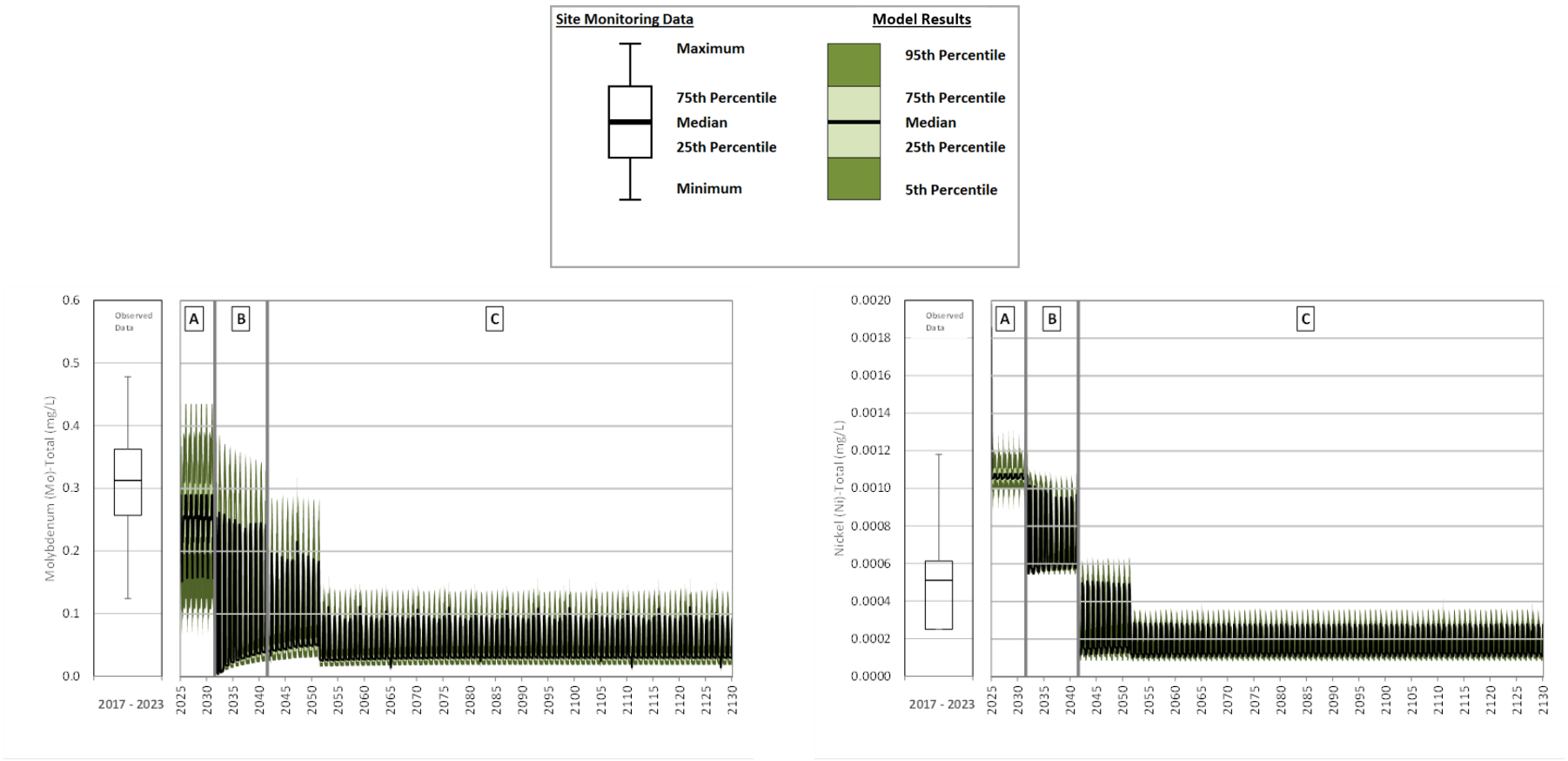
Figure B-257: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

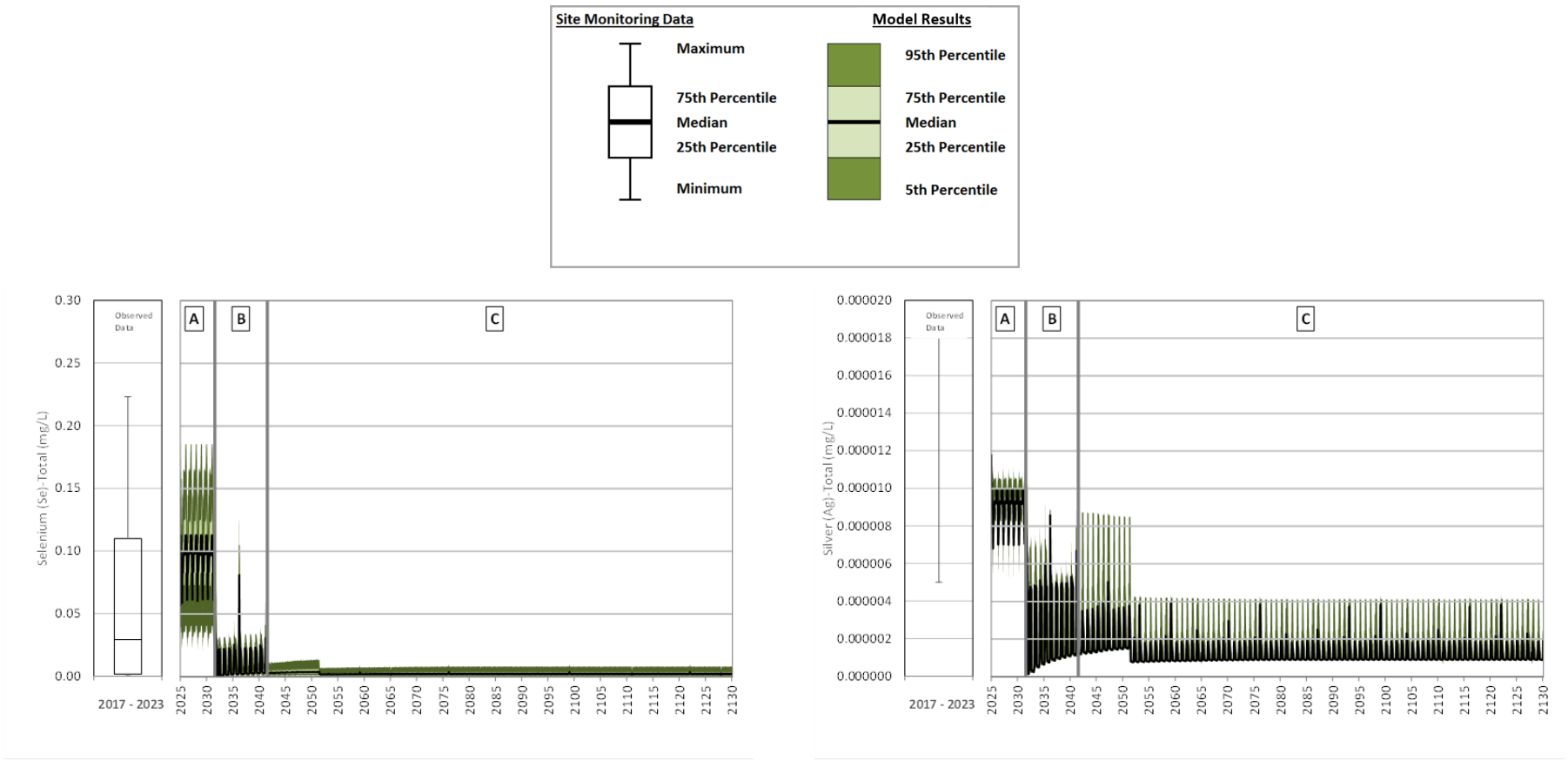
Figure B-258: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

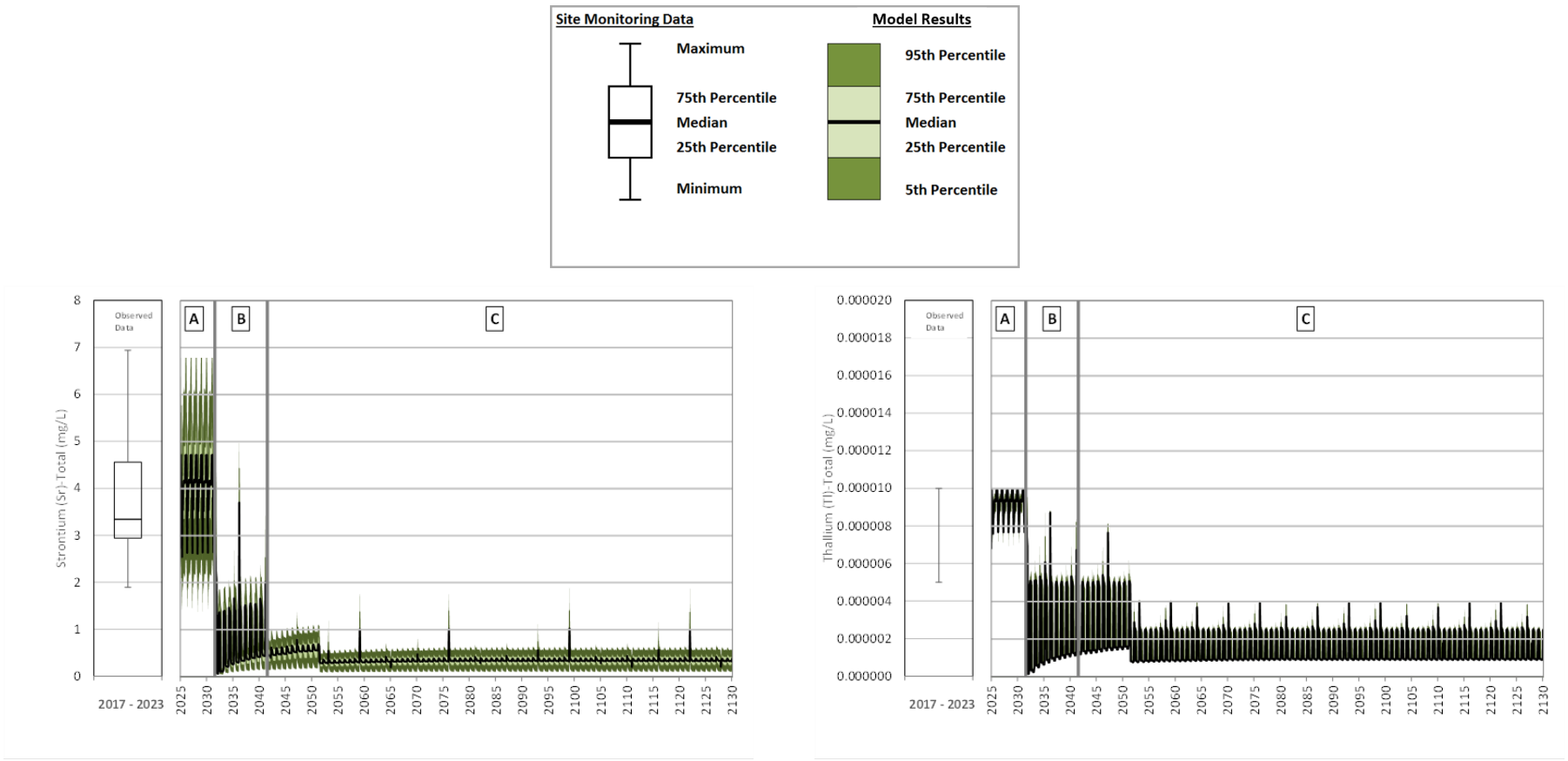
Figure B-259: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

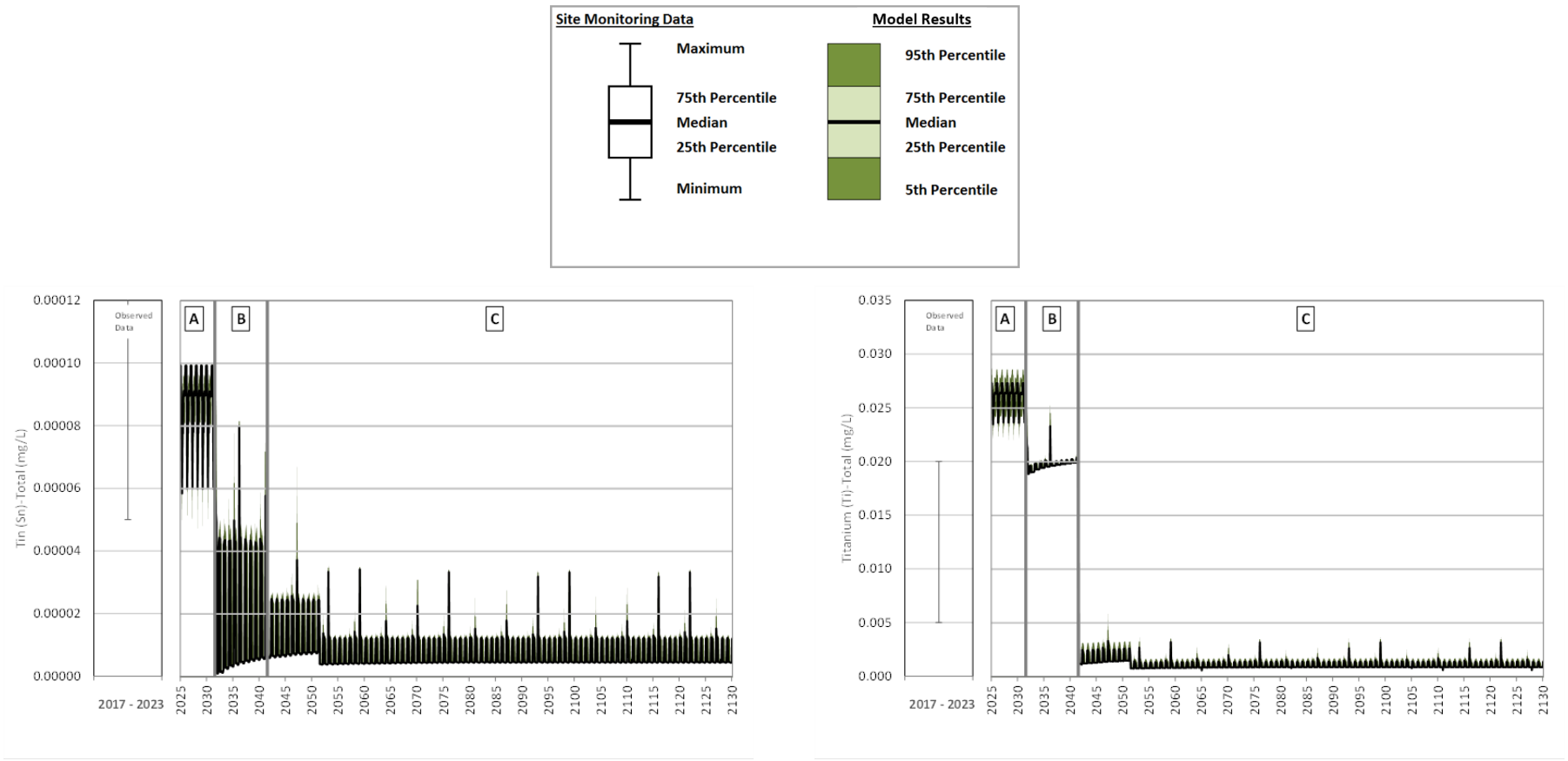
Figure B-260: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

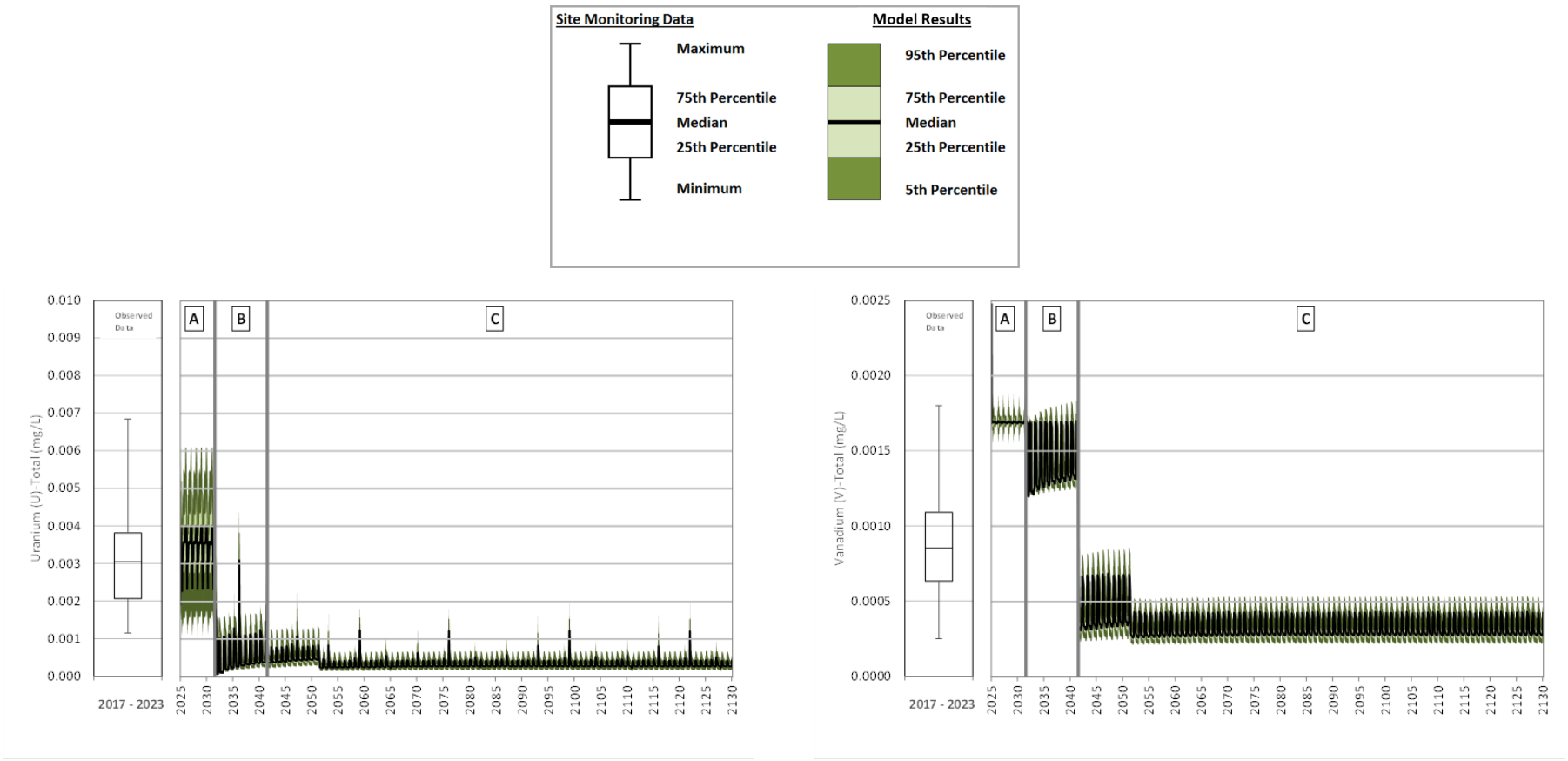
Figure B-261: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

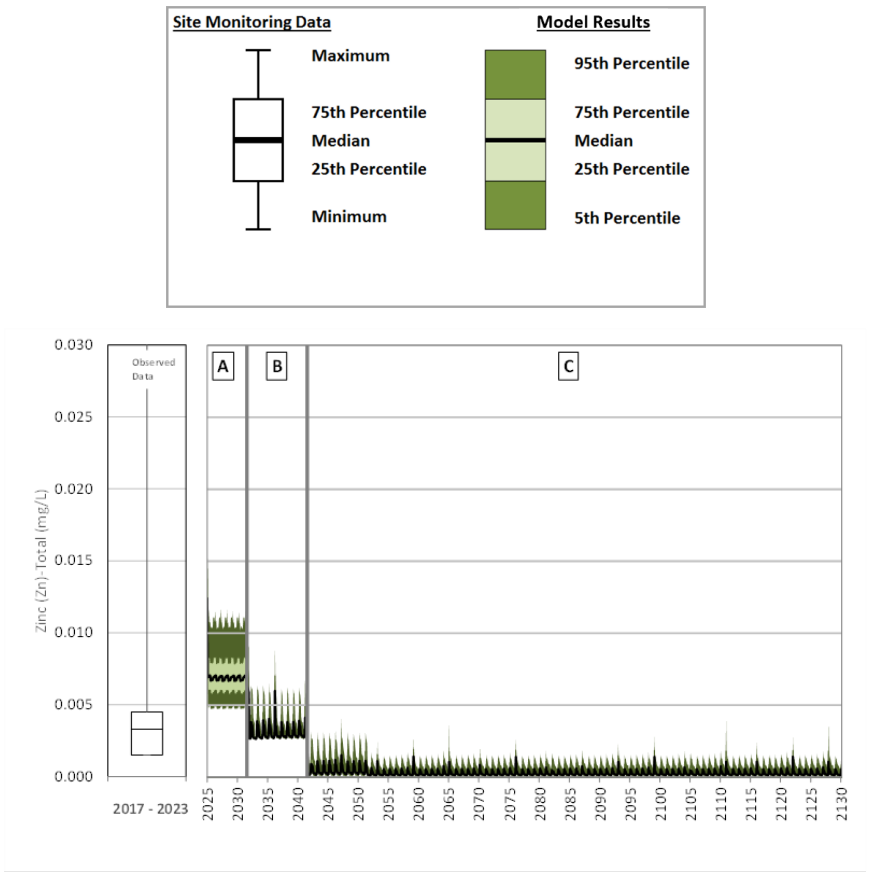
Figure B-262: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

Figure B-263: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Uranium and Total Vanadium

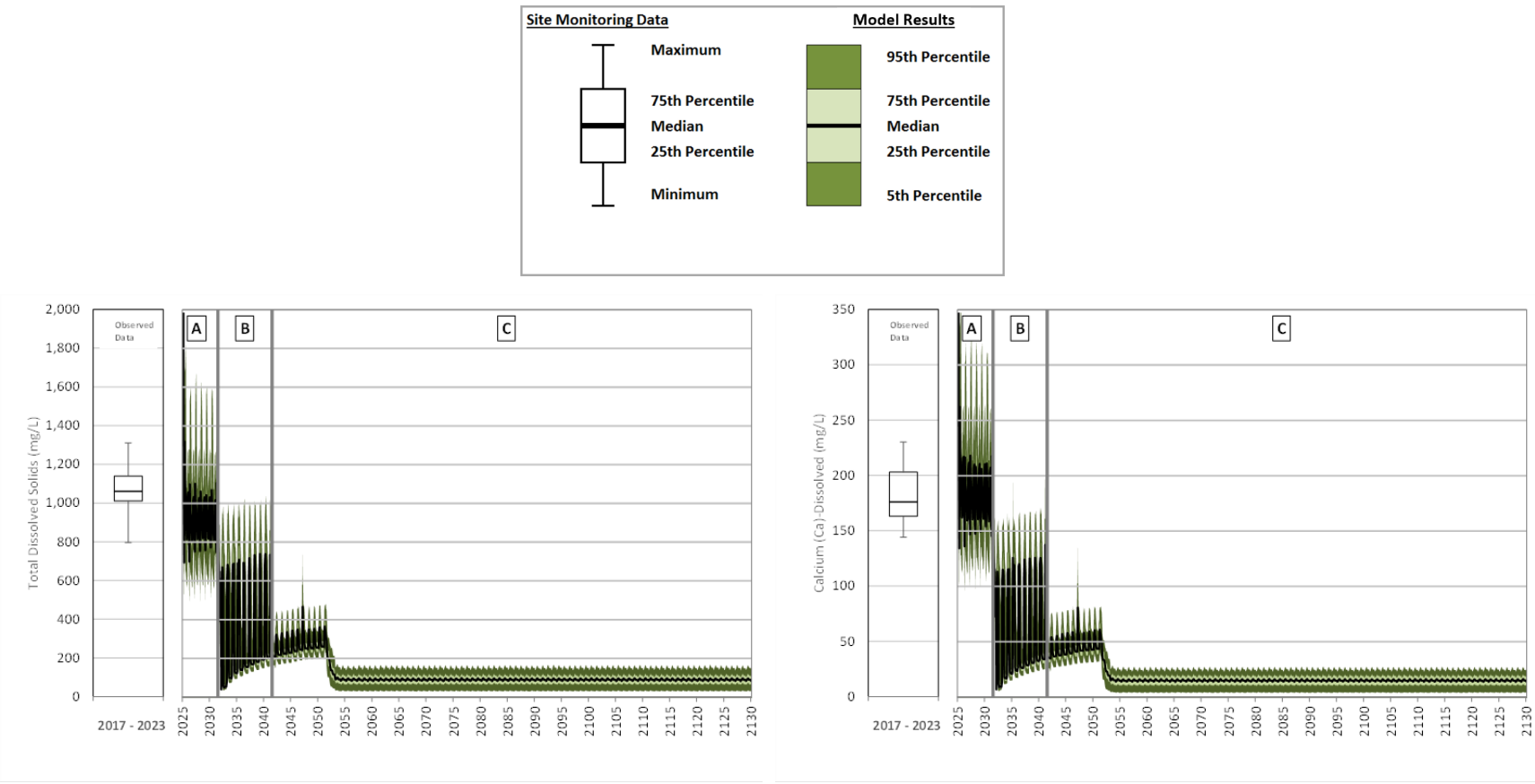


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2074 is due to decreases in the proportion of the seepage from the TSF to the SESCP that maintains an unsaturated water quality based on hydrogeologic modelling of seepage from the facility.

Figure B-264: South Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Zinc

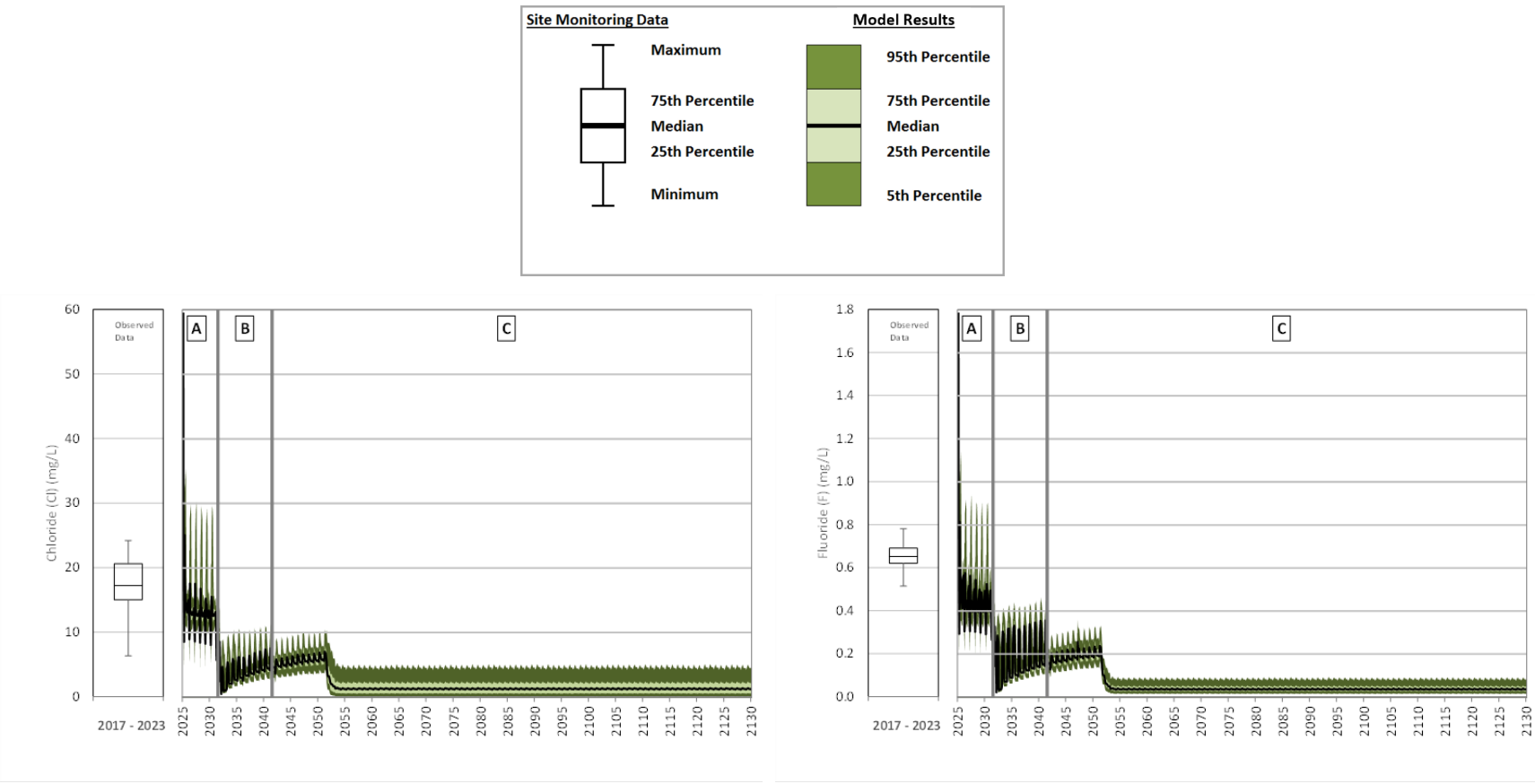
Main Embankment Seepage Collection Pond Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

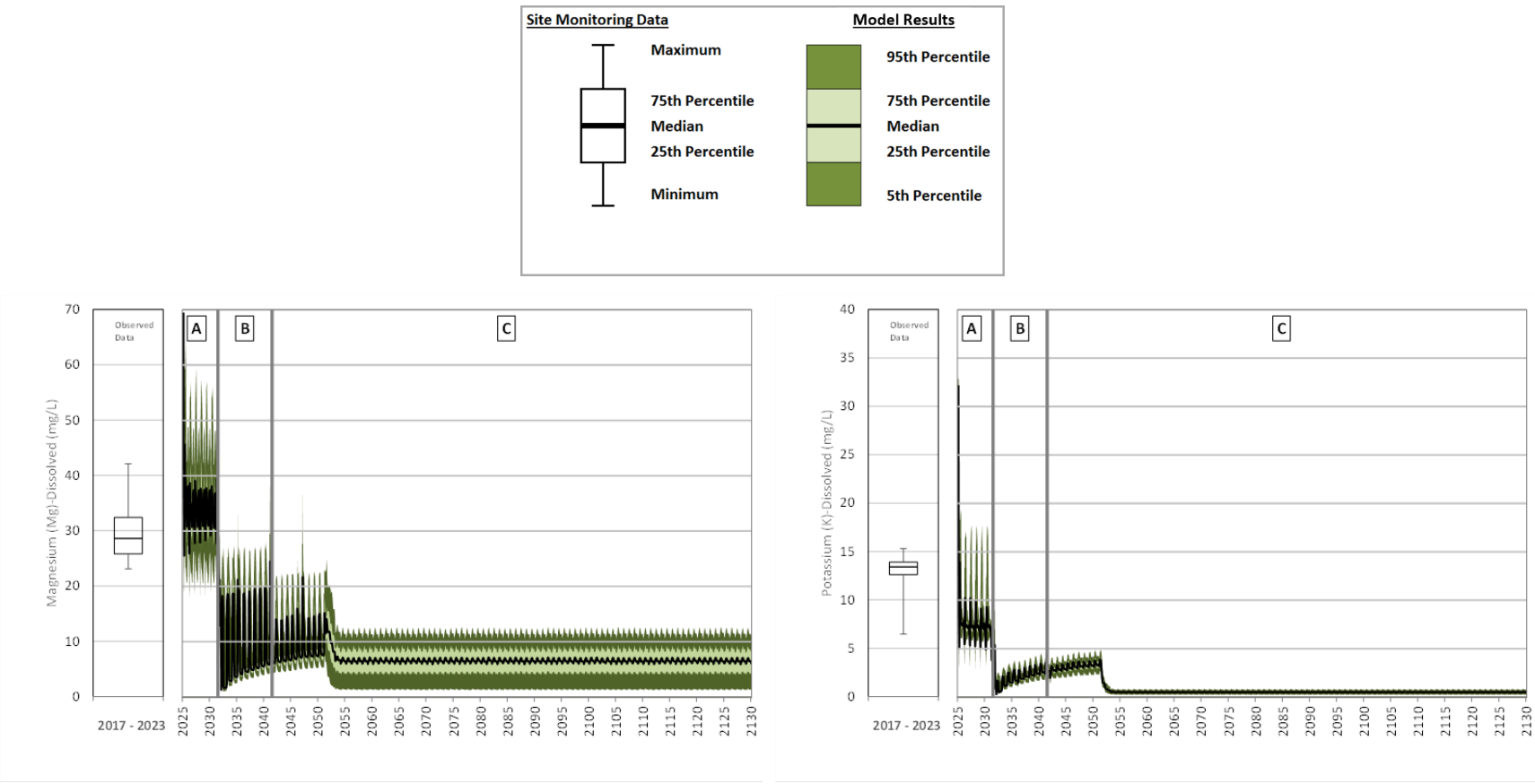
Figure B-265: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

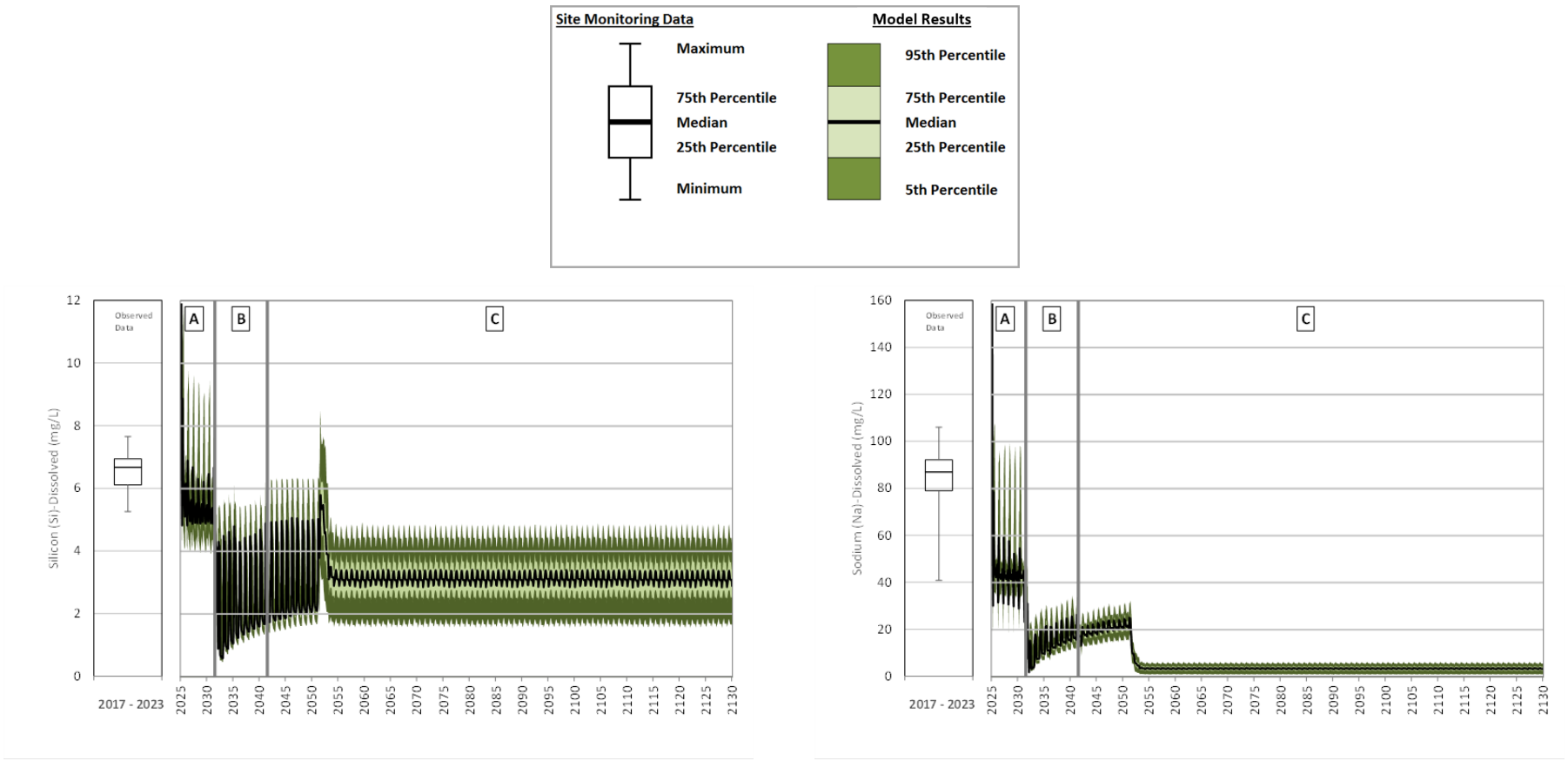
Figure B-266: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

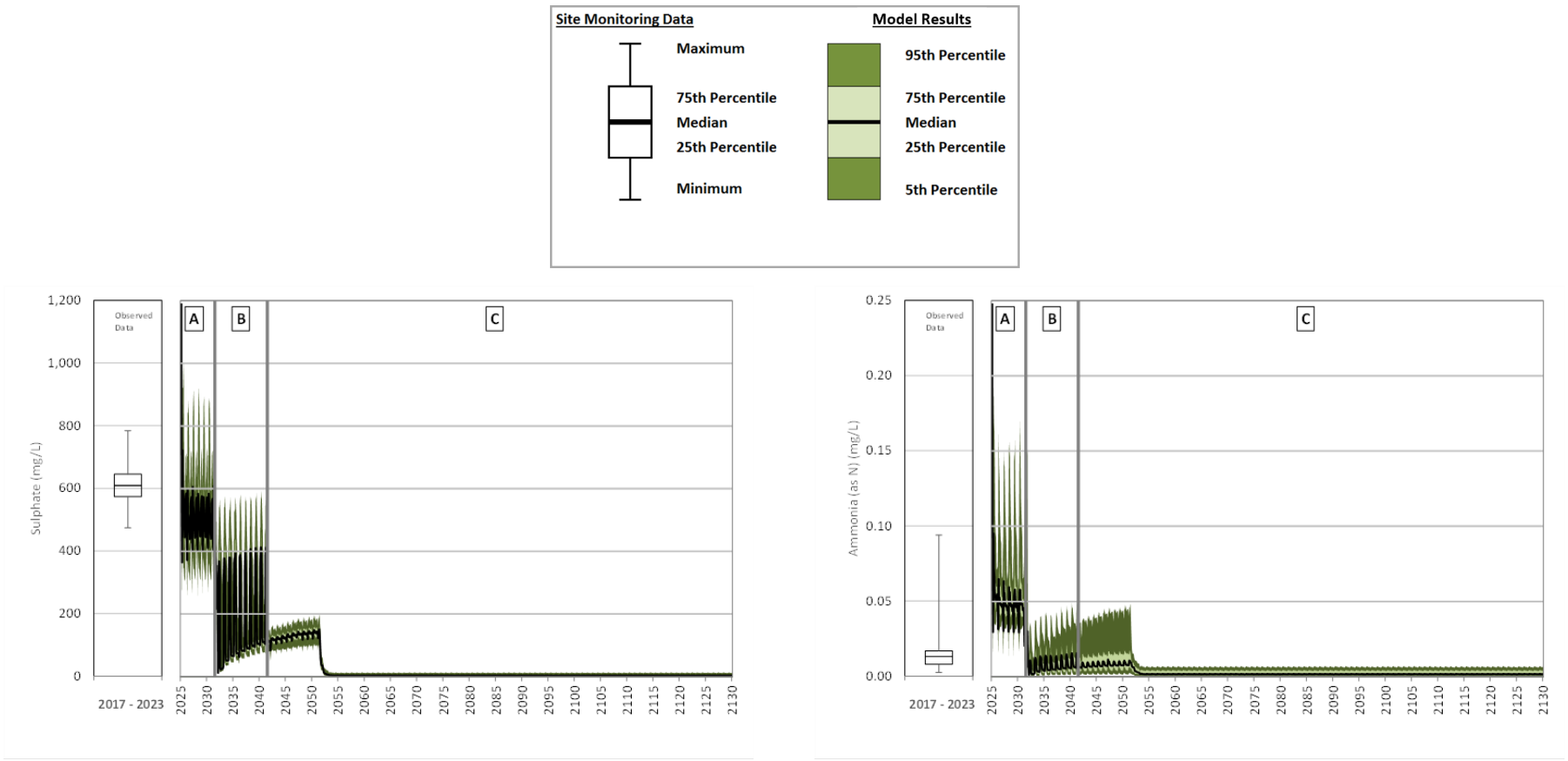
Figure B-267: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Silicon concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for silicon than the disturbed runoff water quality input.

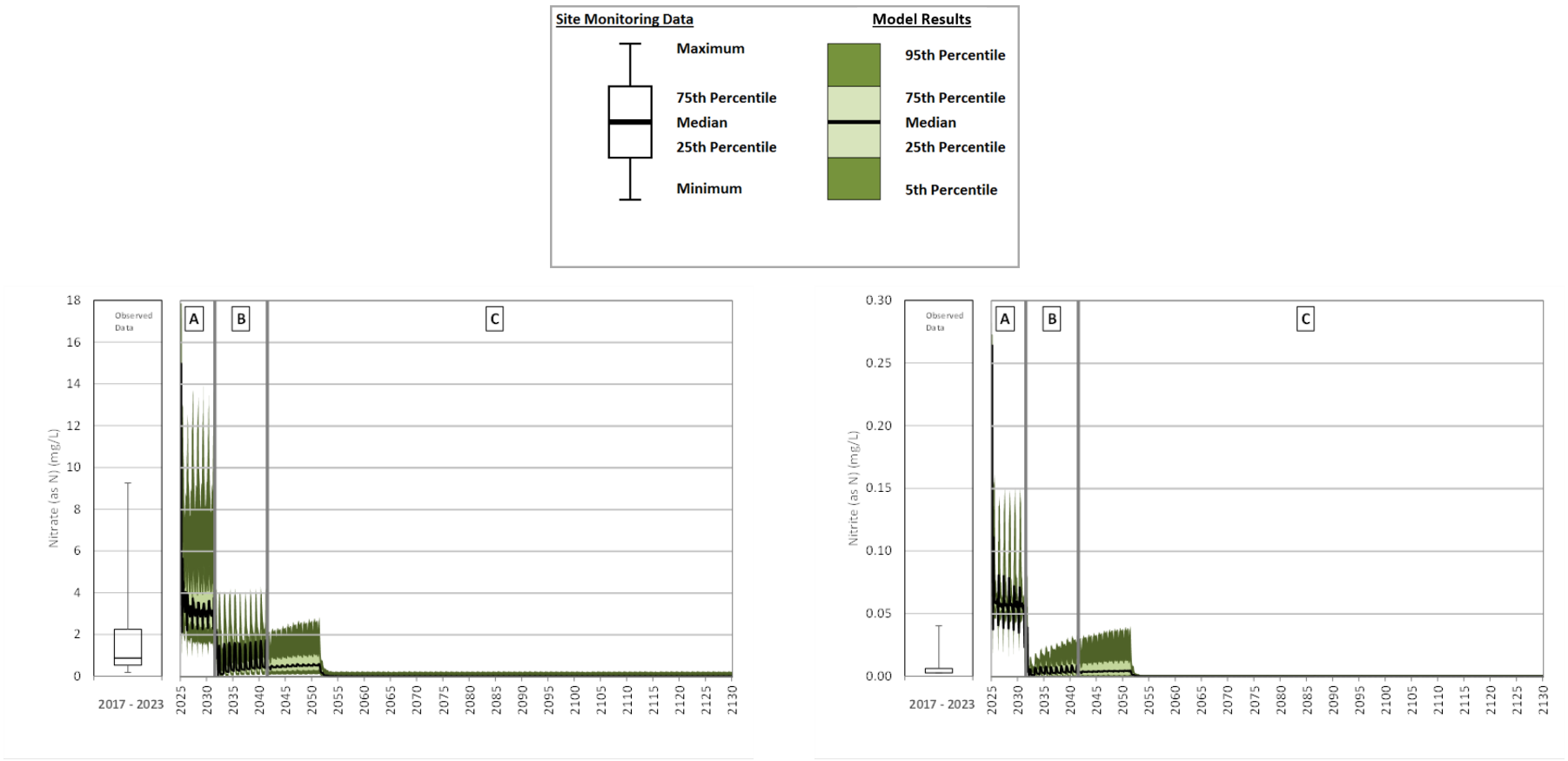
Figure B-268: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

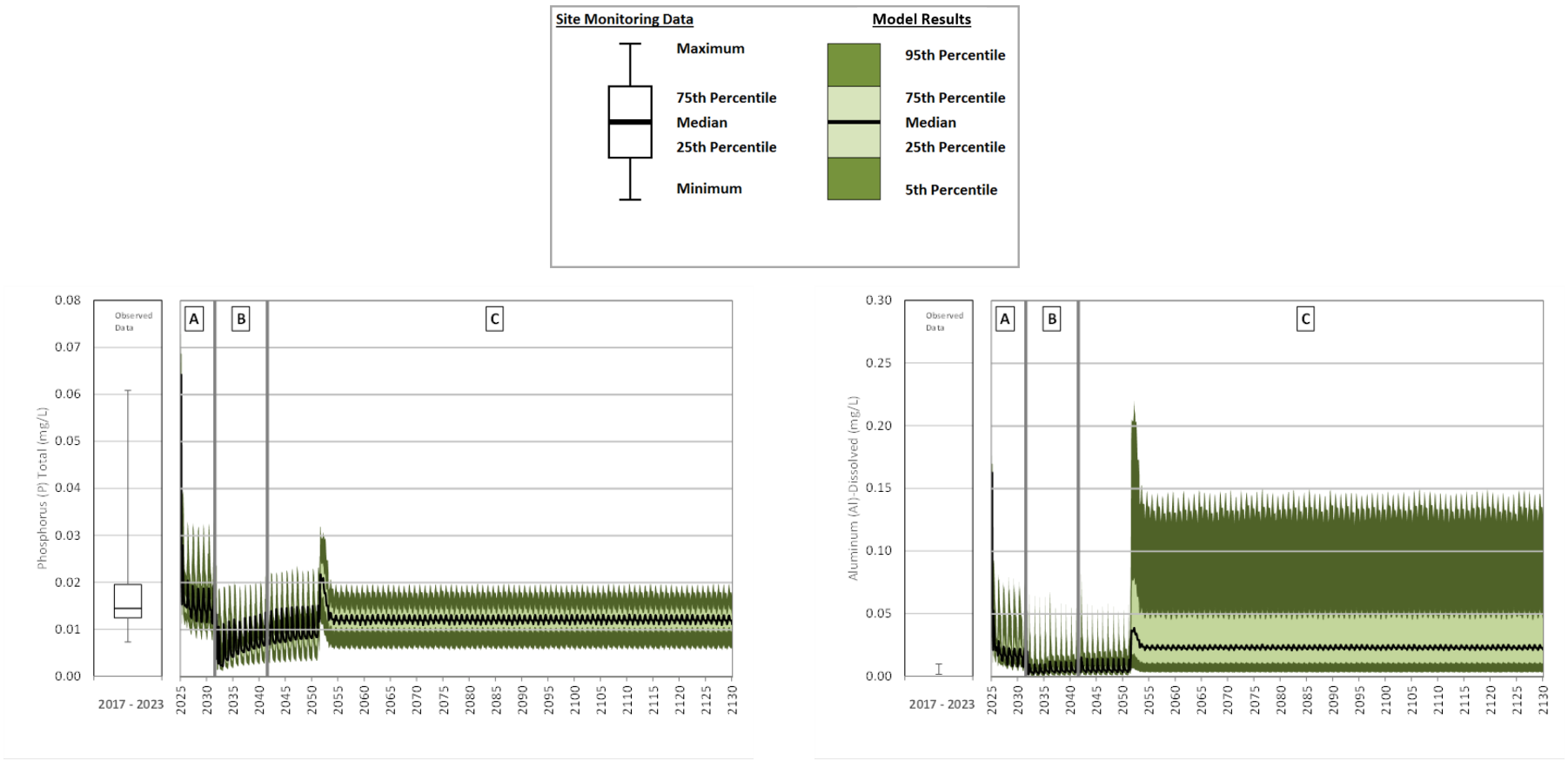
Figure B-269: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

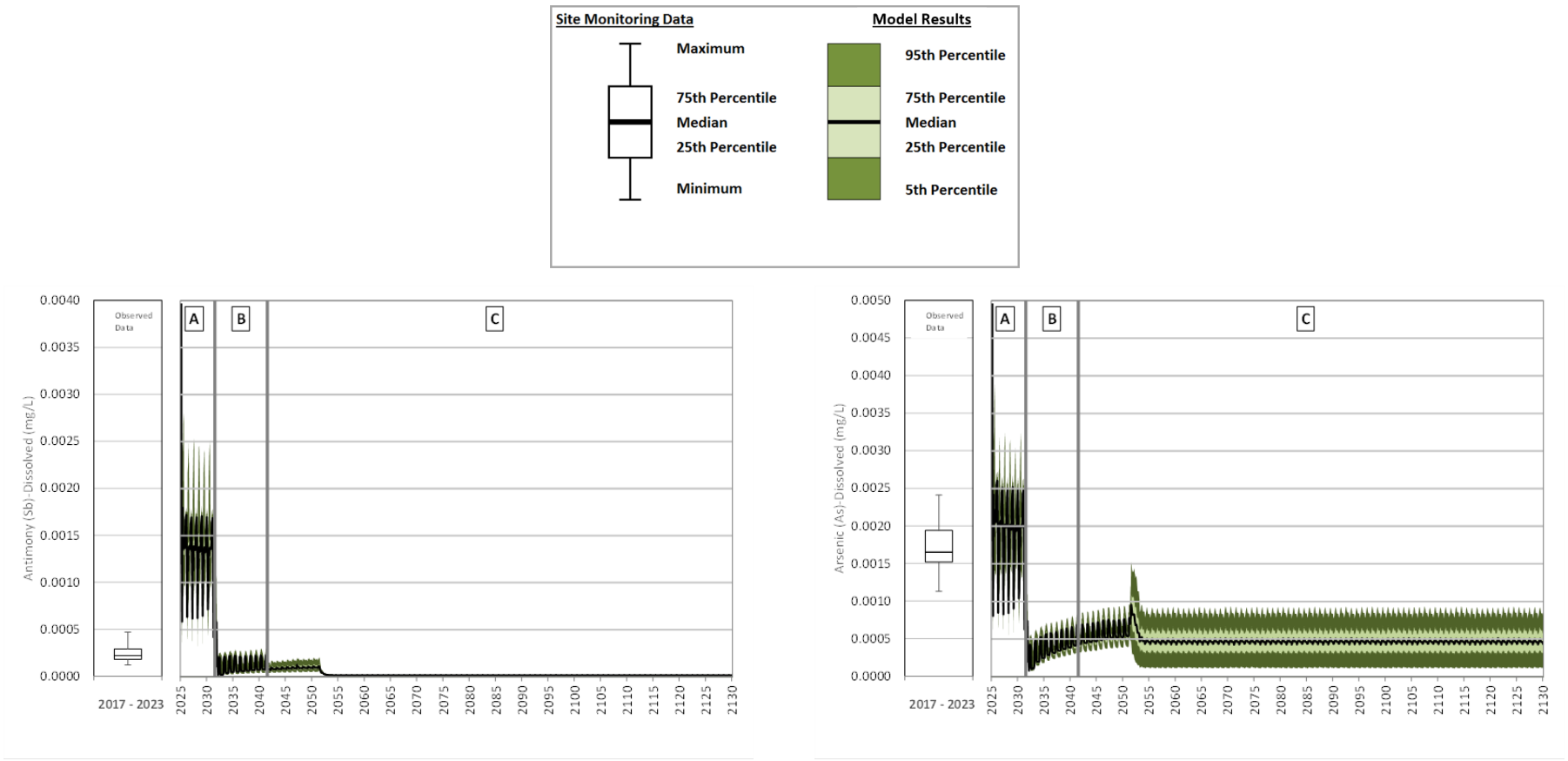
Figure B-270: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total phosphorus and dissolved aluminum concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolvedaluminum than the disturbed runoff water quality input.

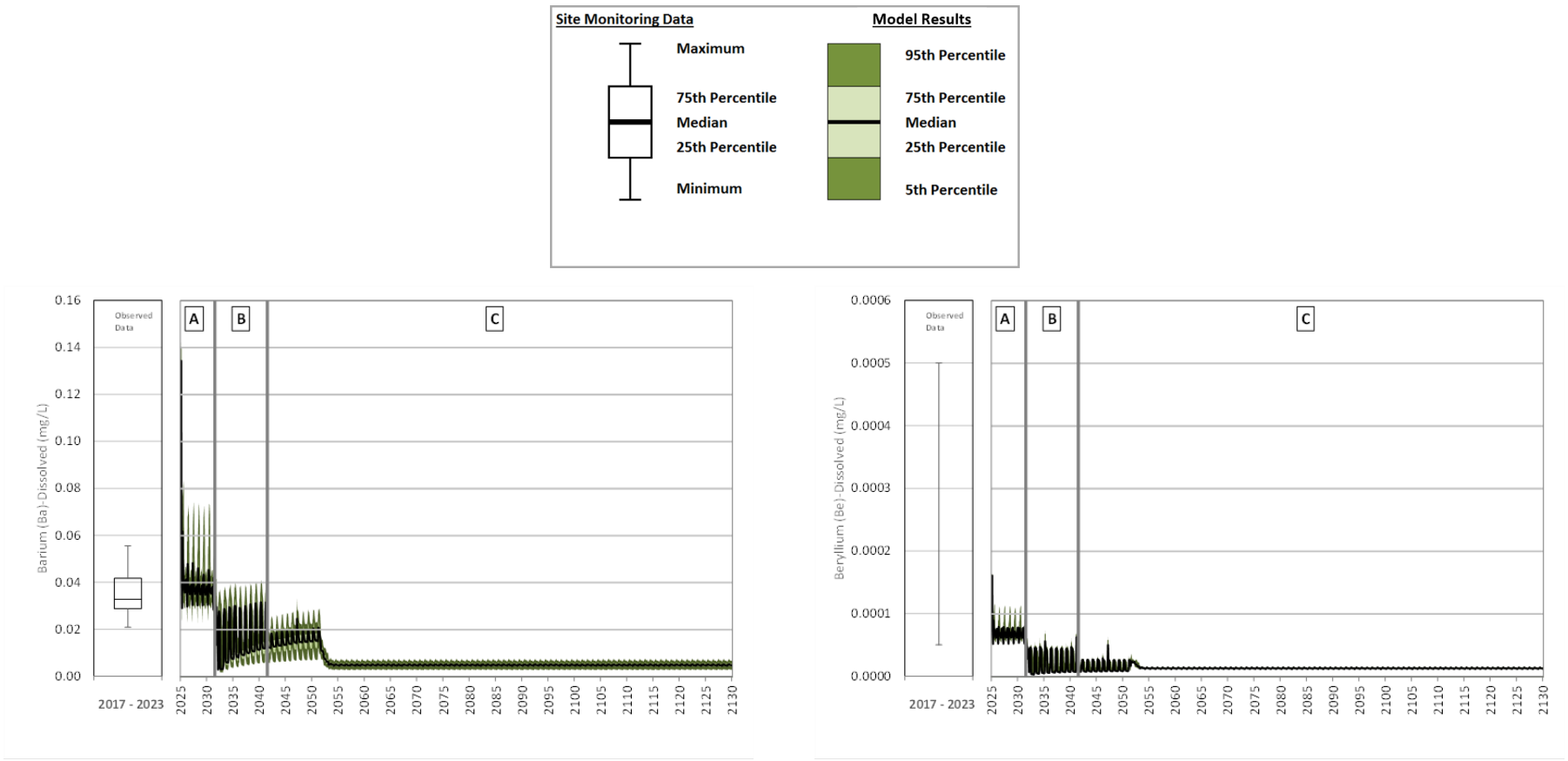
Figure B-271: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved arsenic concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved arsenic than the disturbed runoff water quality input. .

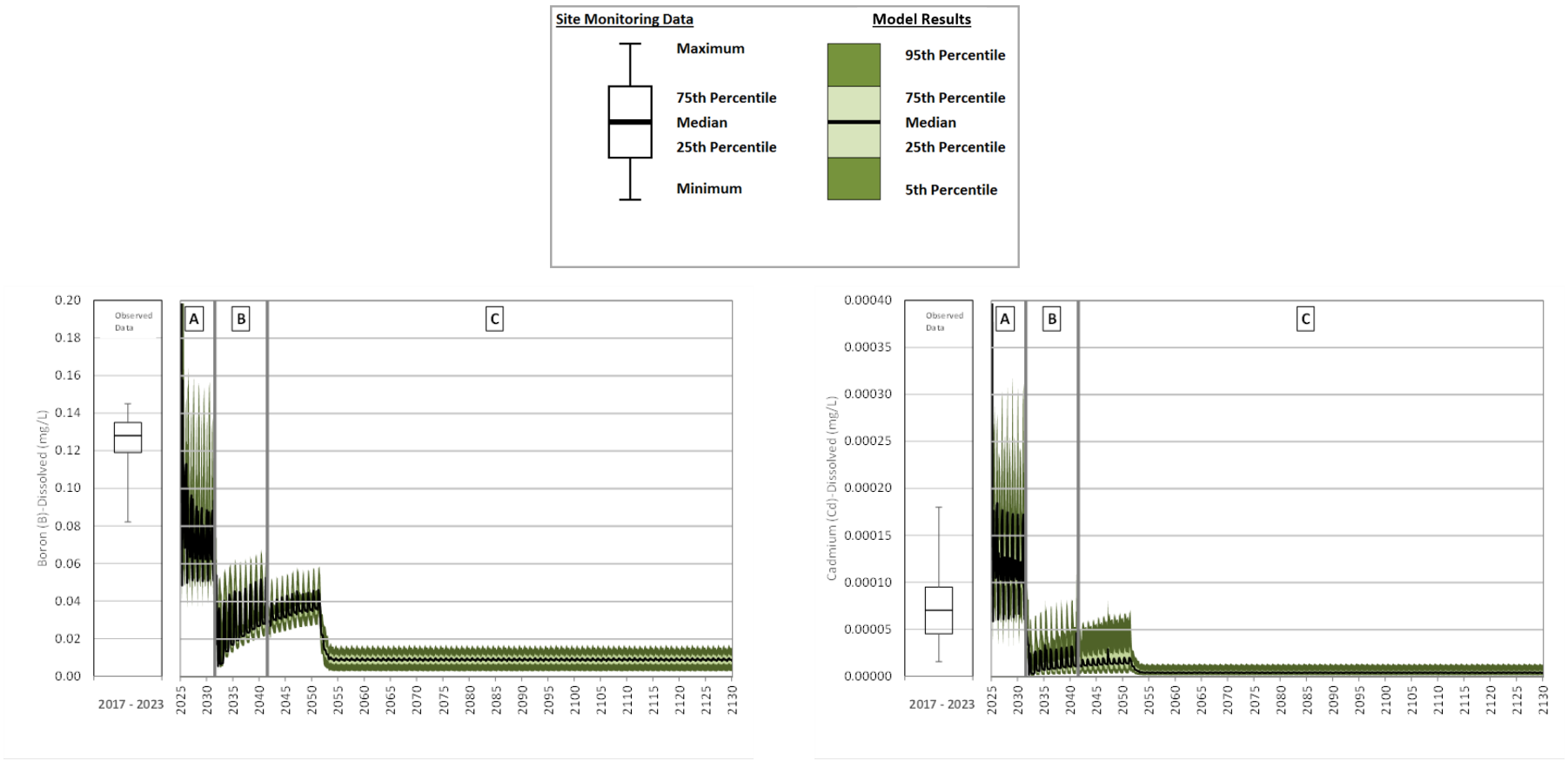
Figure B-272: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

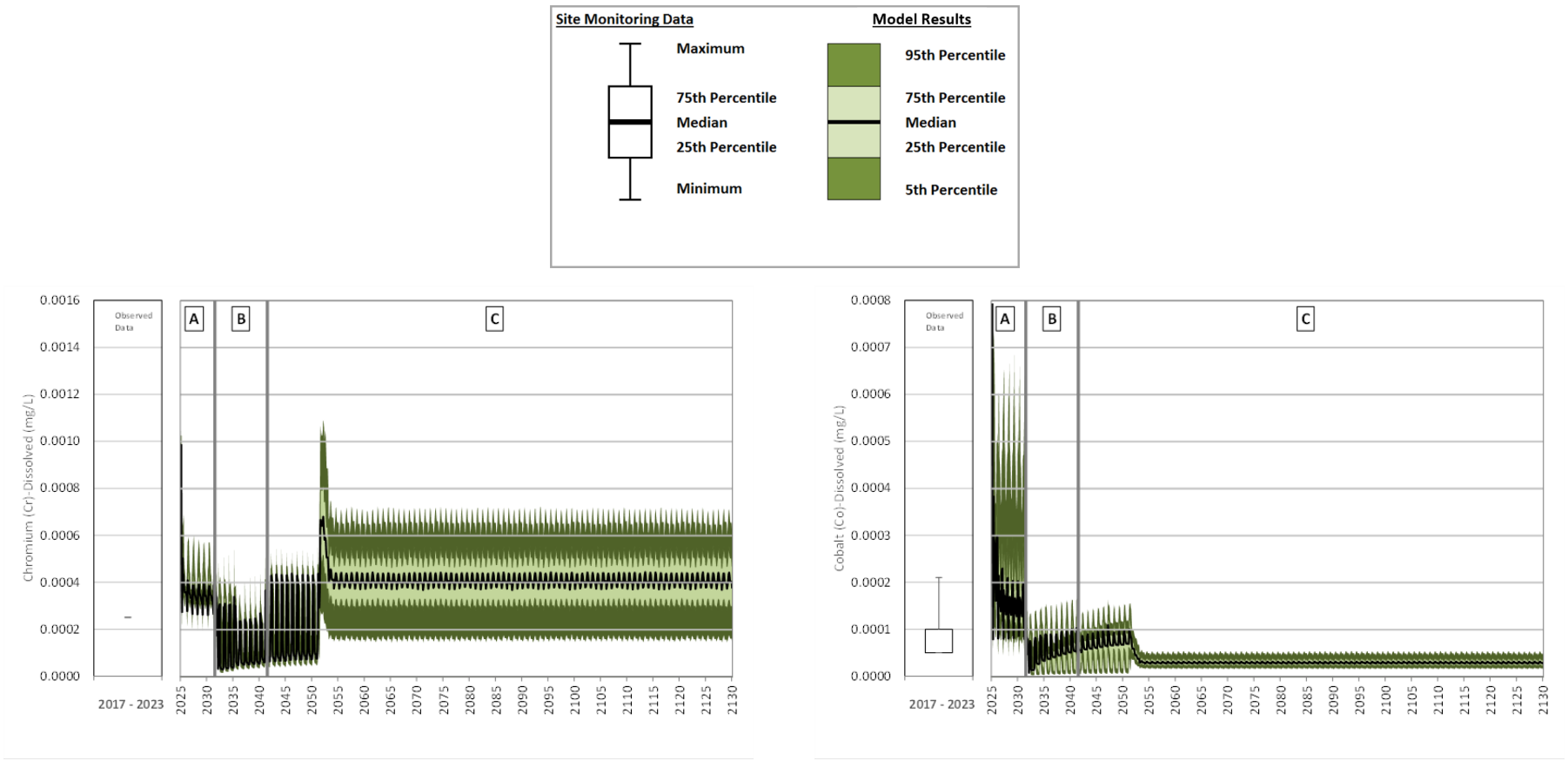
Figure B-273: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

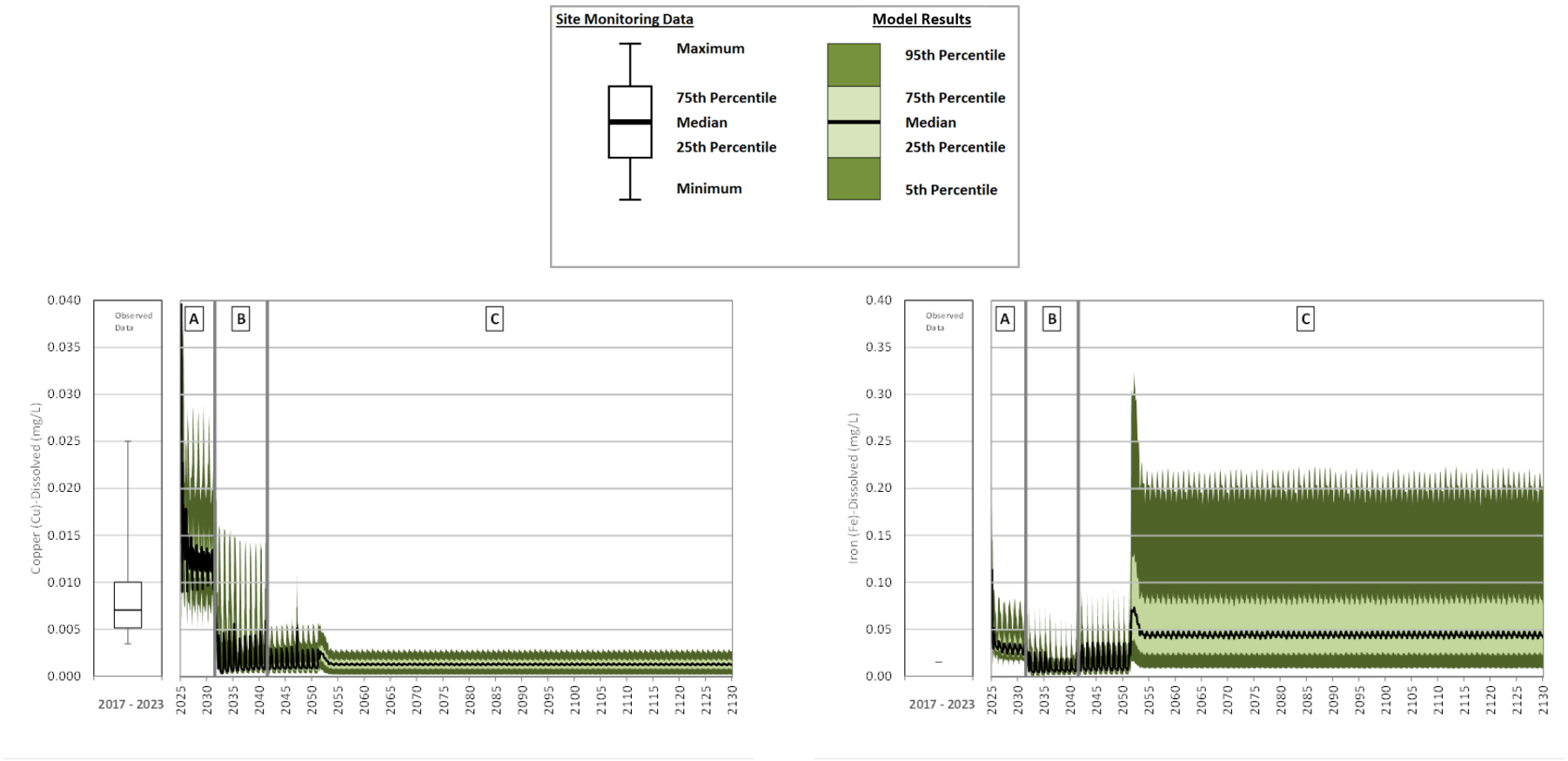
Figure B-274: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved chromium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the disturbed runoff water quality input.

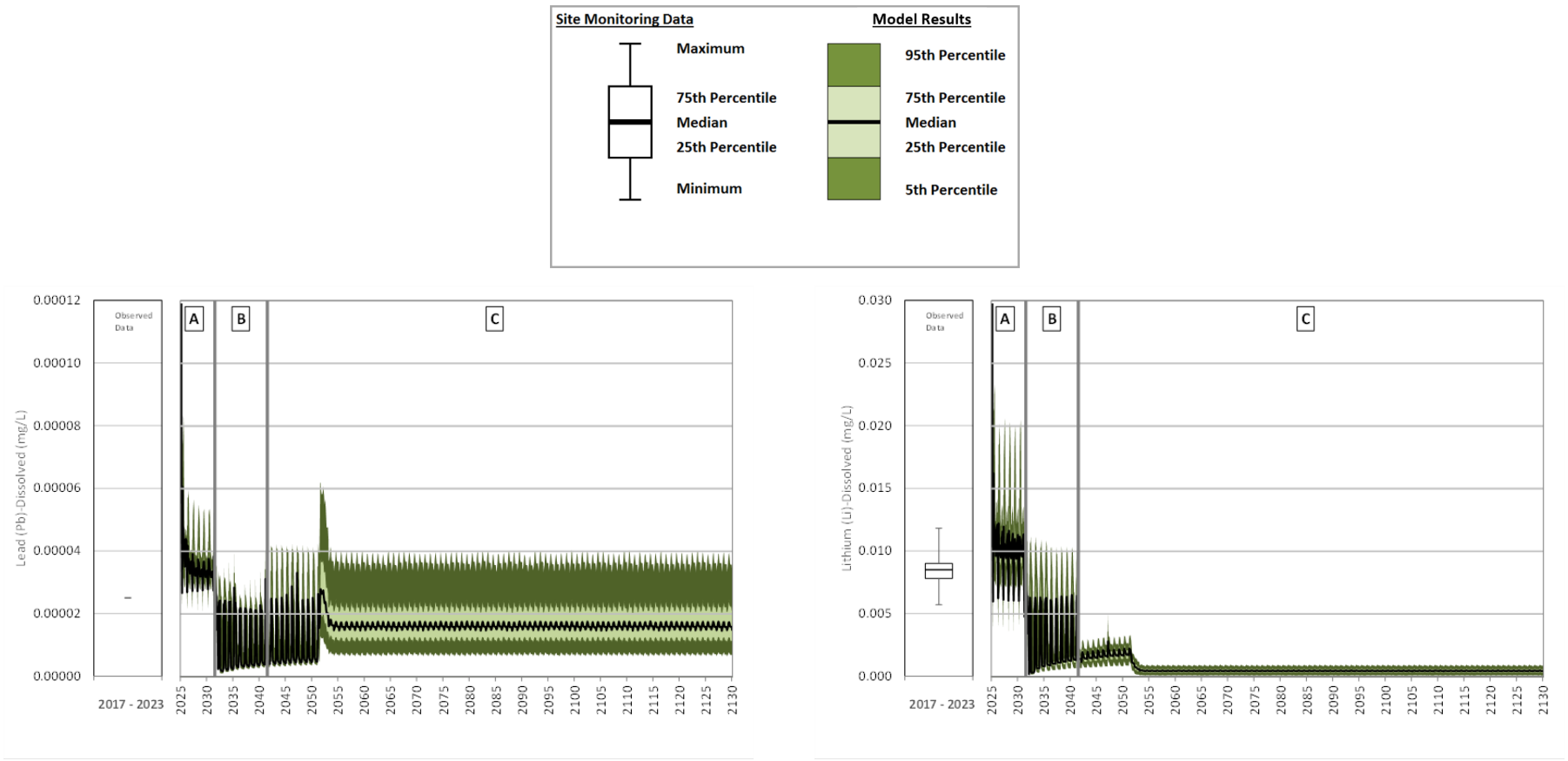
Figure B-275: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved iron concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved iron than the disturbed runoff water quality input.

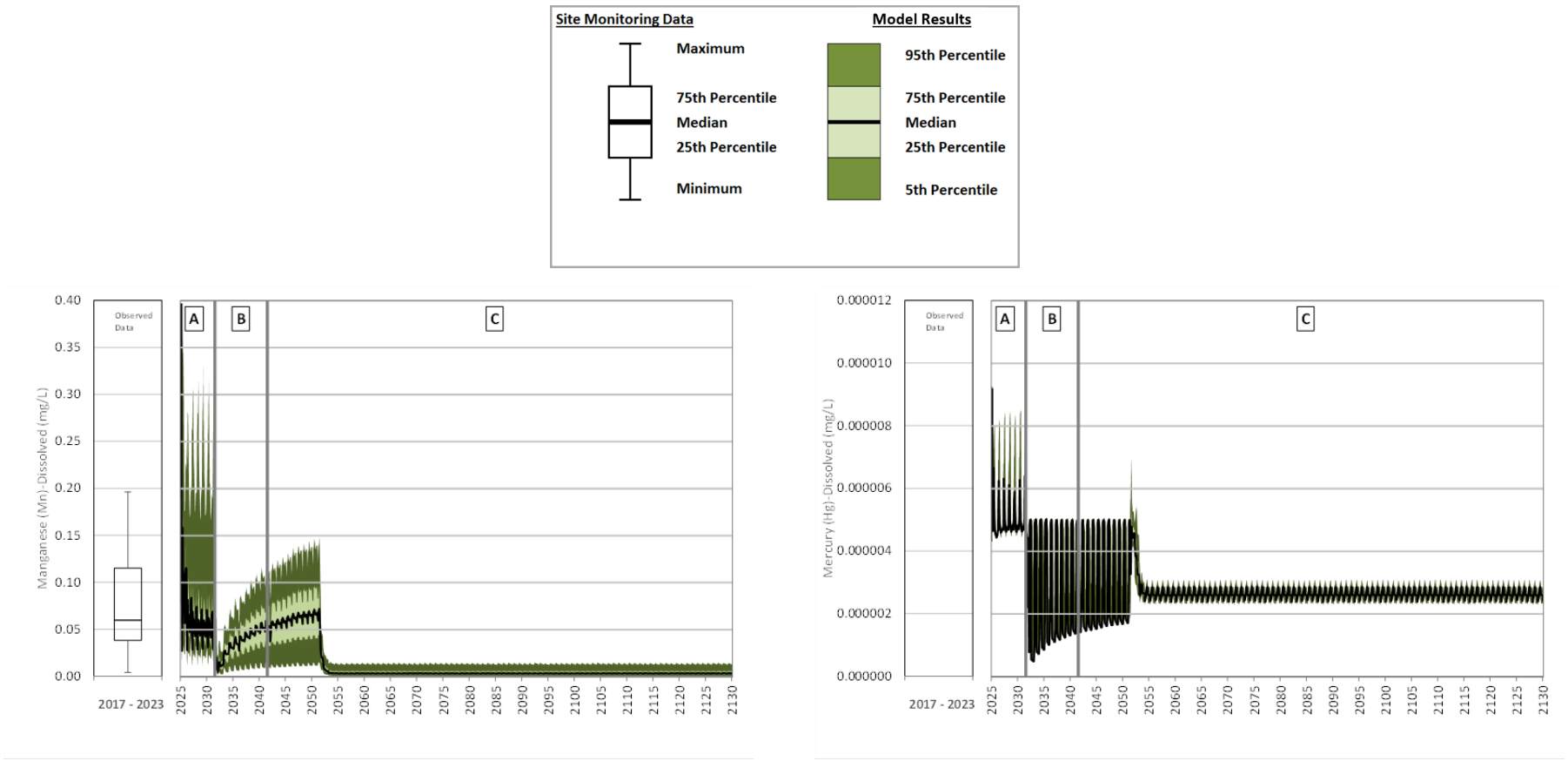
Figure B-276: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved lead concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved lead than the disturbed runoff water quality input.

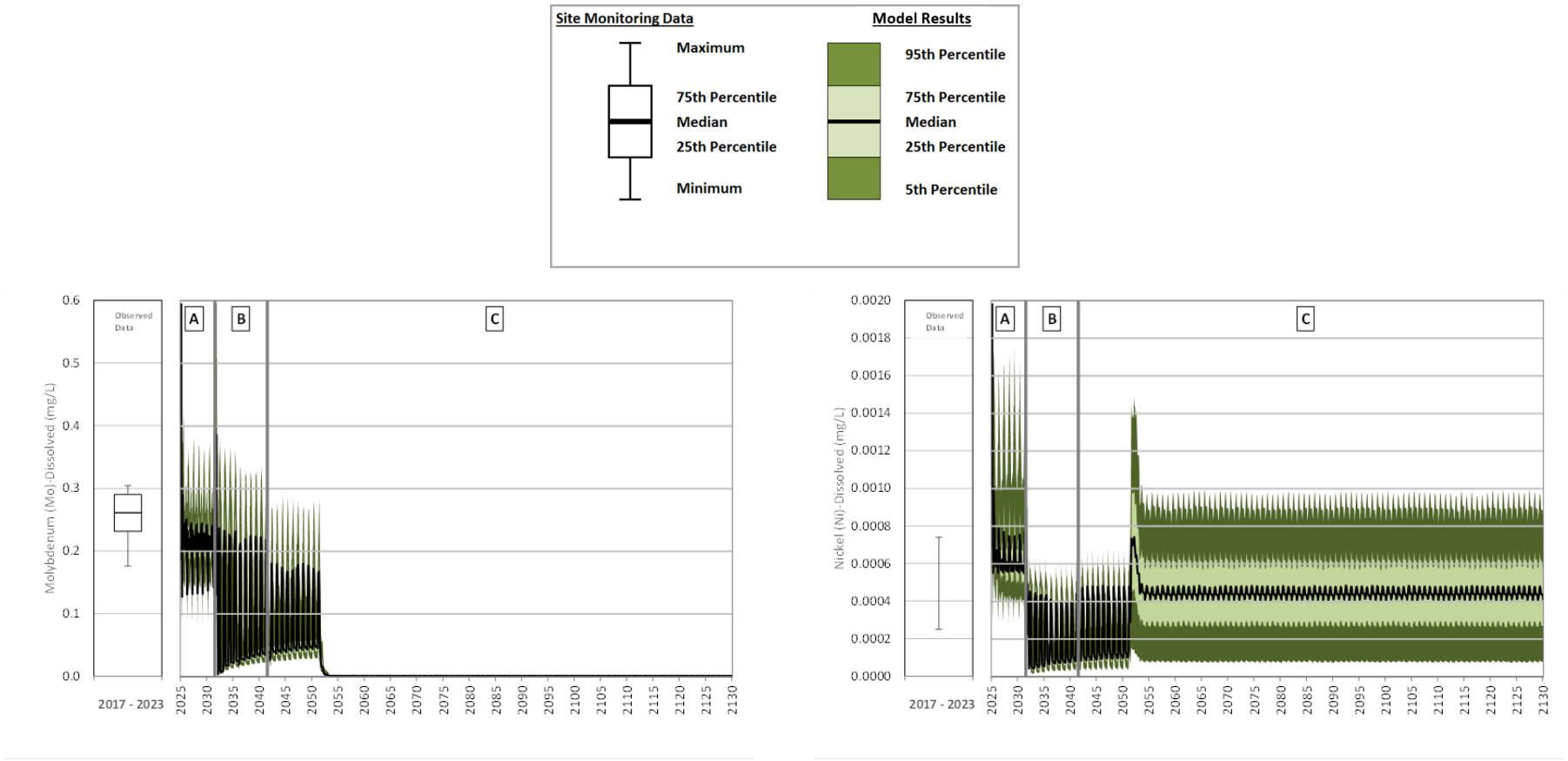
Figure B-277: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

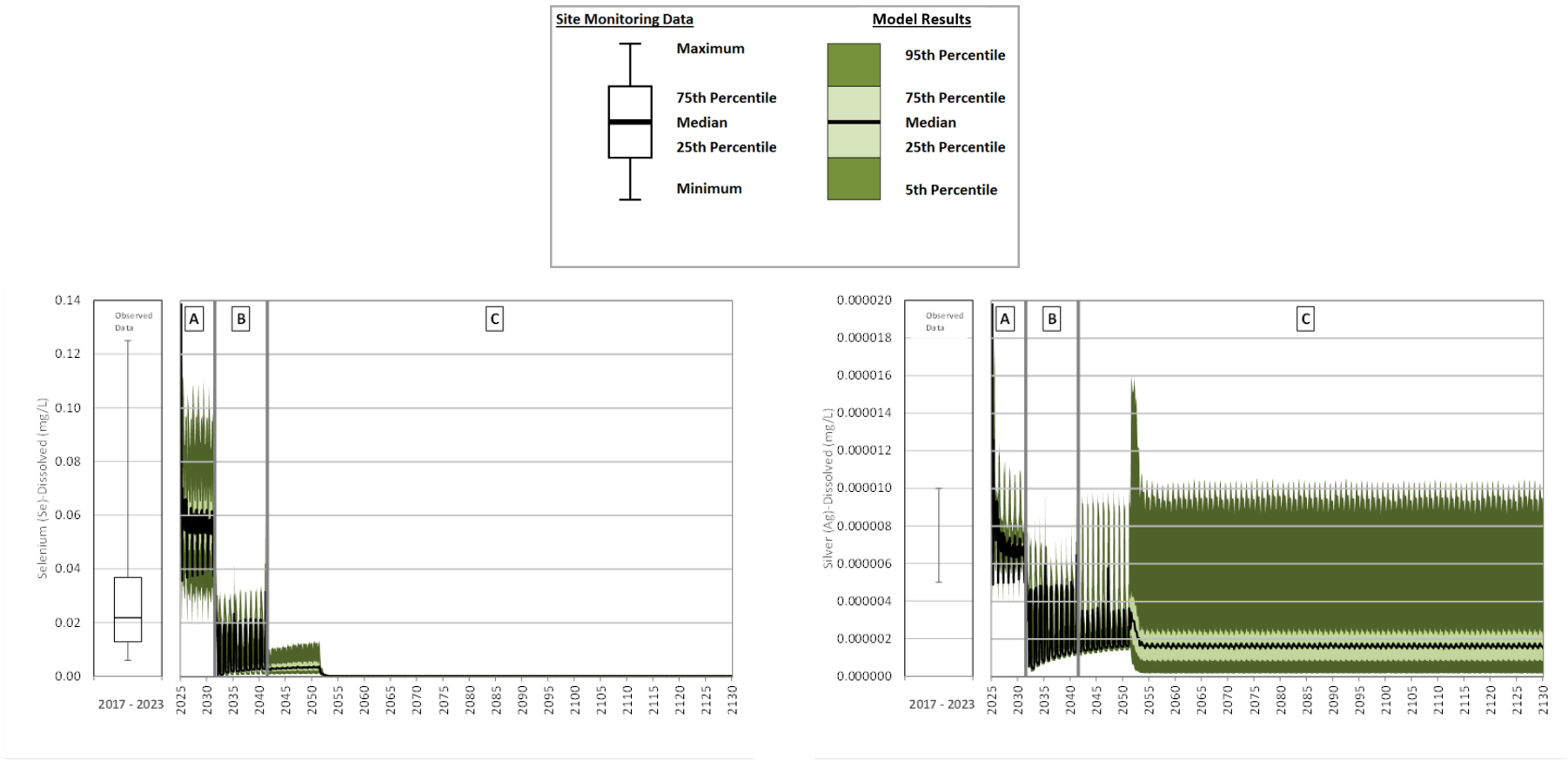
Figure B-278: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved nickel concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the disturbed runoff water quality input.

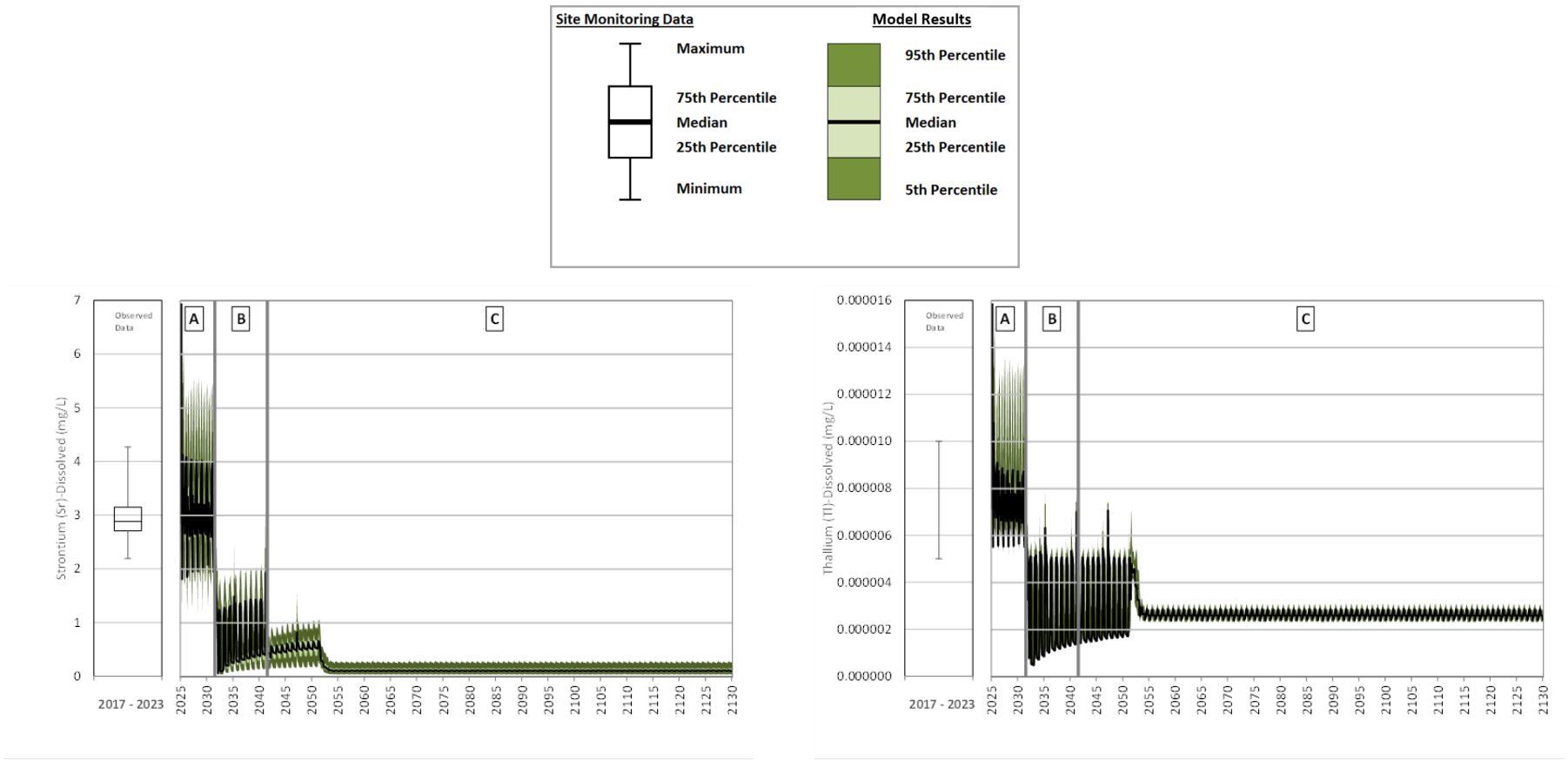
Figure B-279: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved silver concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the disturbed runoff water quality input.

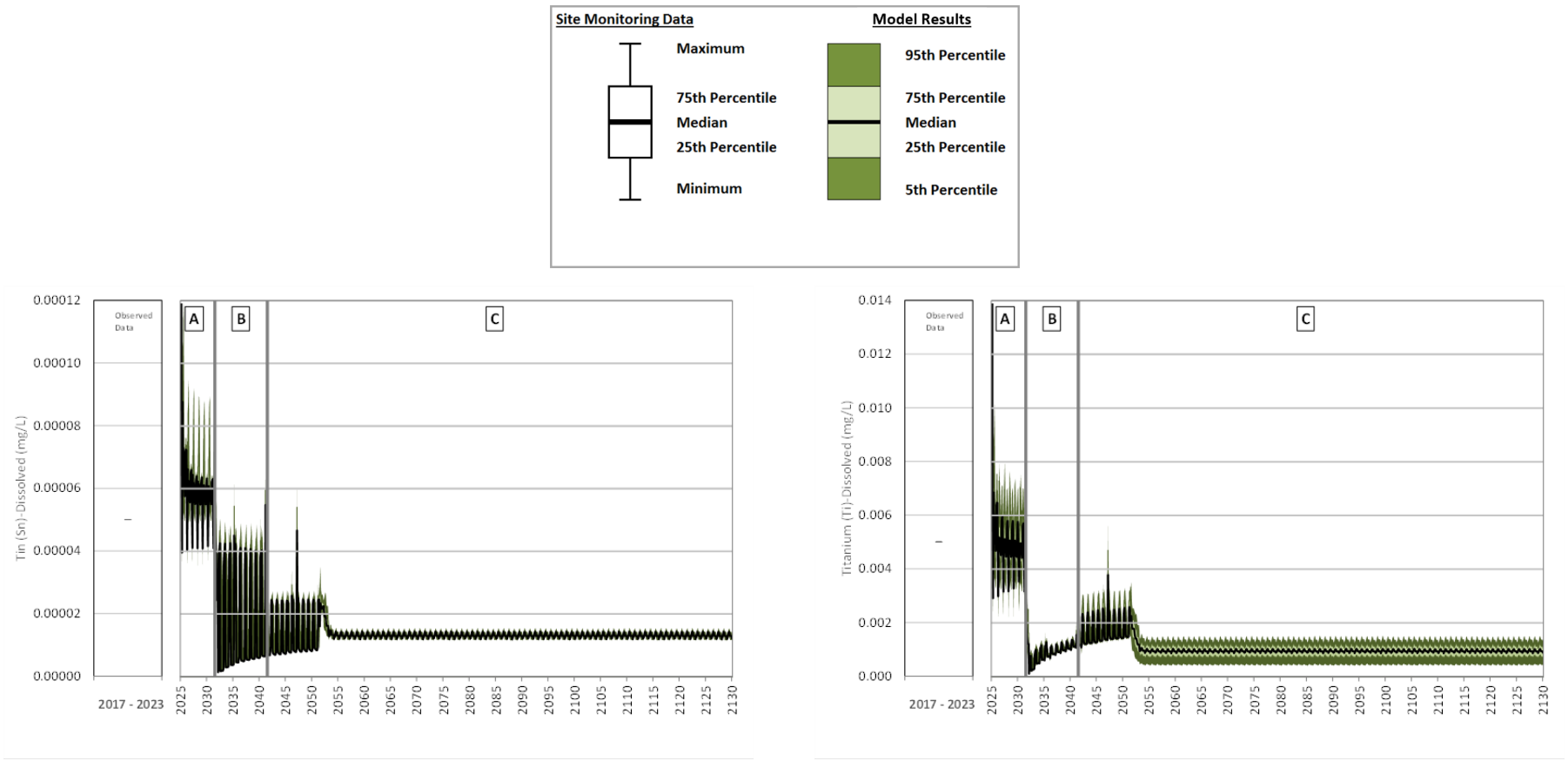
Figure B-280: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

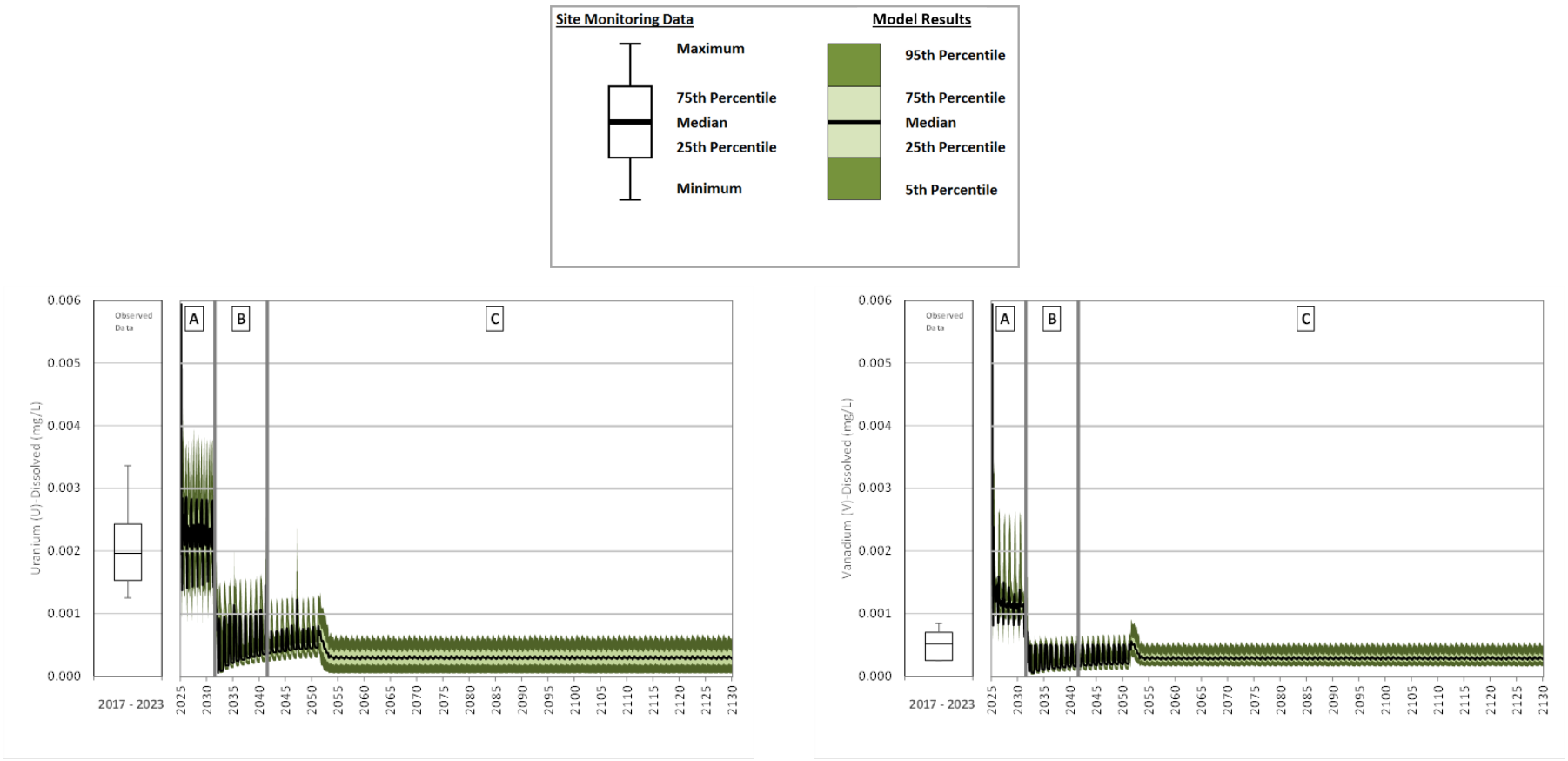
Figure B-281: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved titanium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved titanium than the disturbed runoff water quality input.

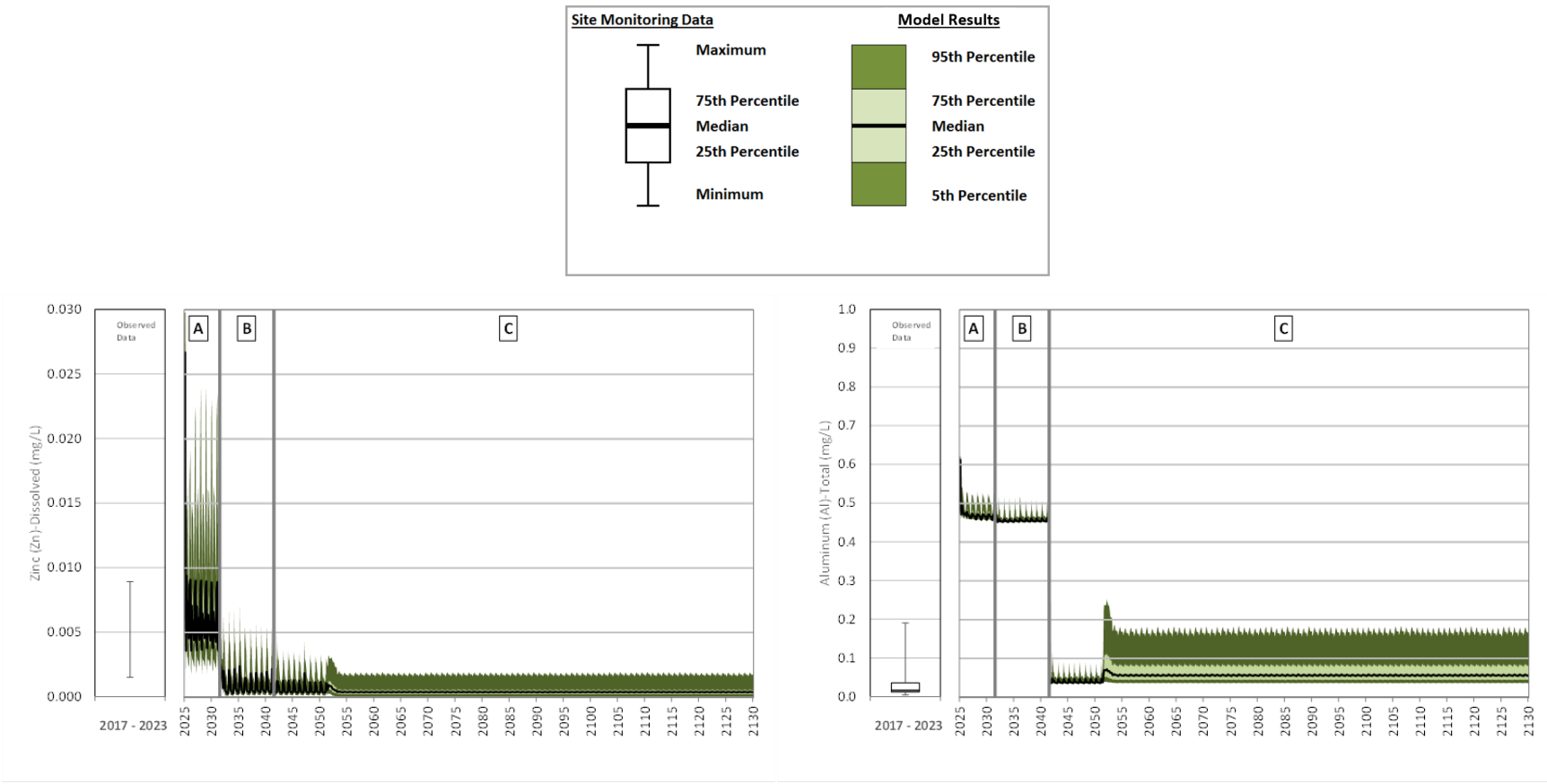
Figure B-282: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Dissolved vanadium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved vanadium than the disturbed runoff water quality input.

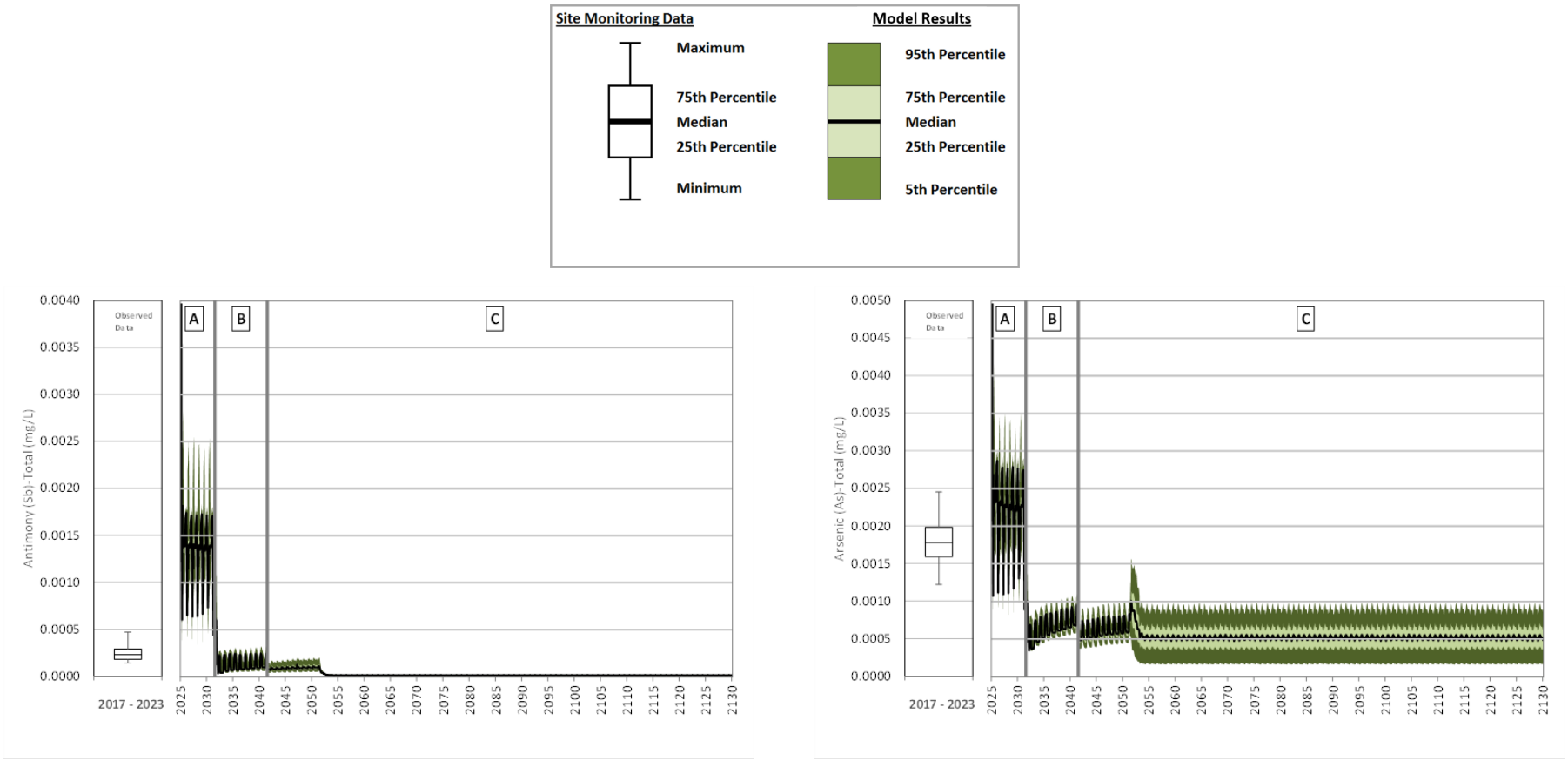
Figure B-283: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total aluminum concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total aluminum than the disturbed runoff water quality input.

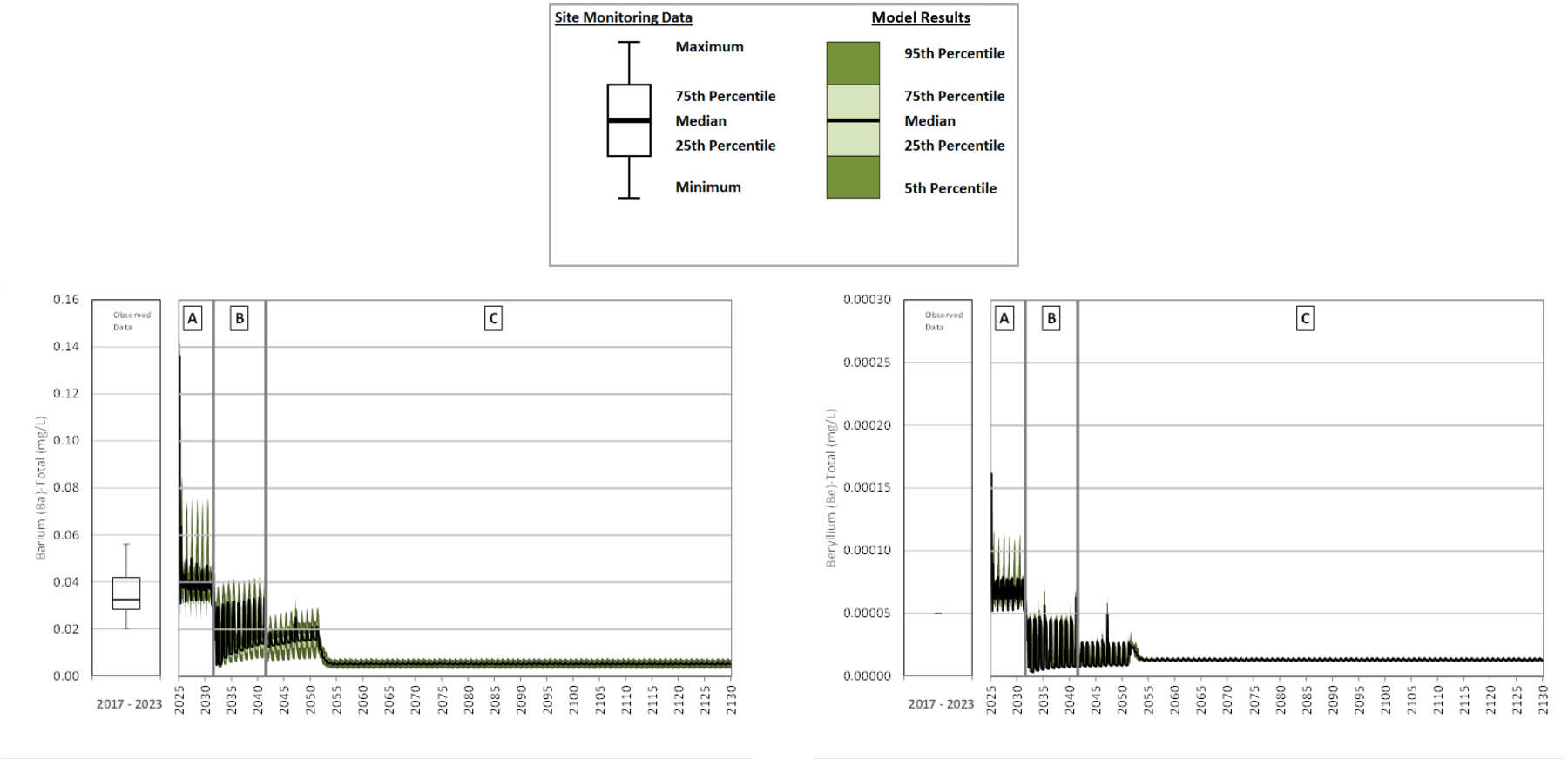
Figure B-284: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total arsenic concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total arsenic than the disturbed runoff water quality input.

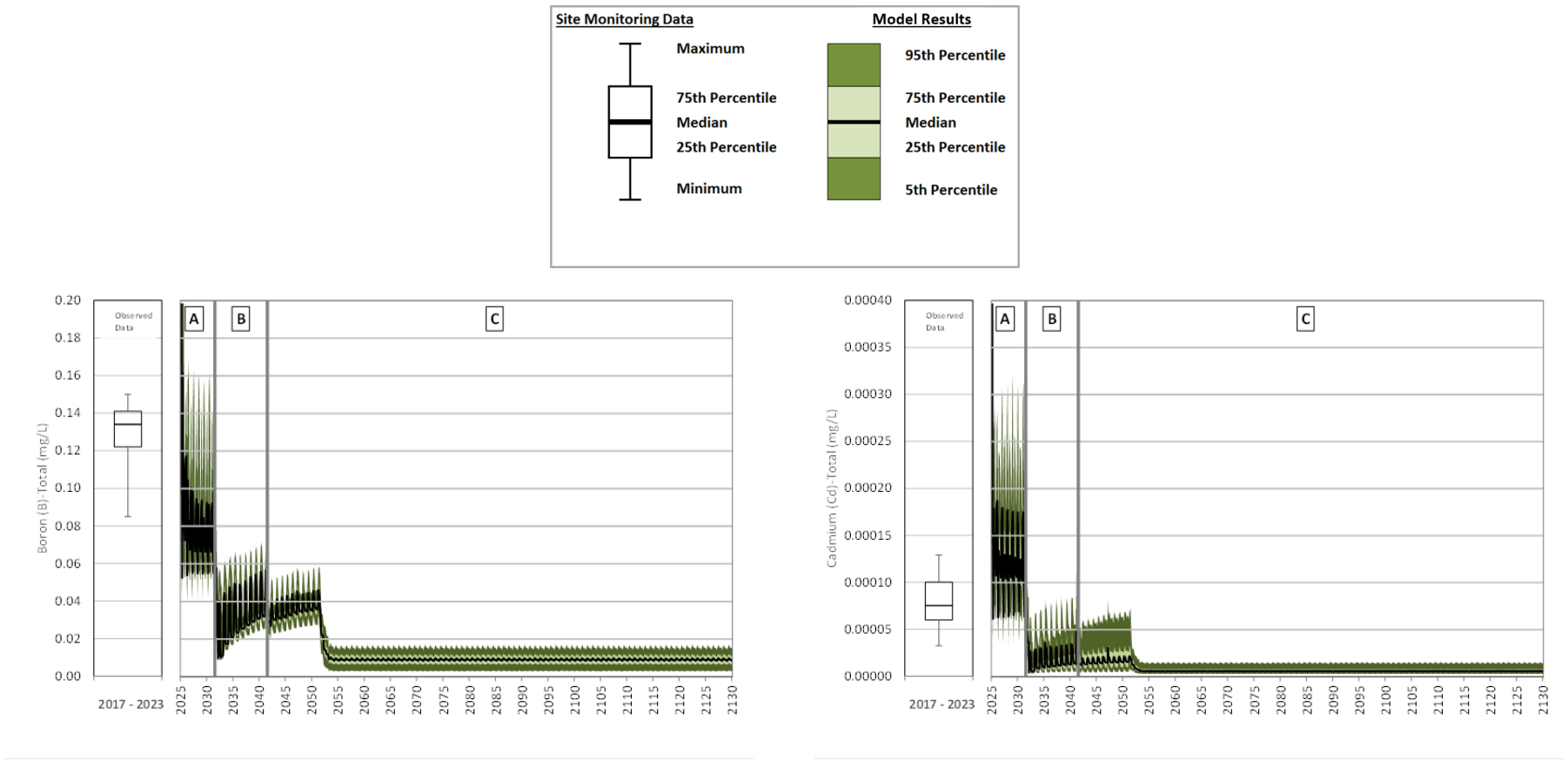
Figure B-285: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

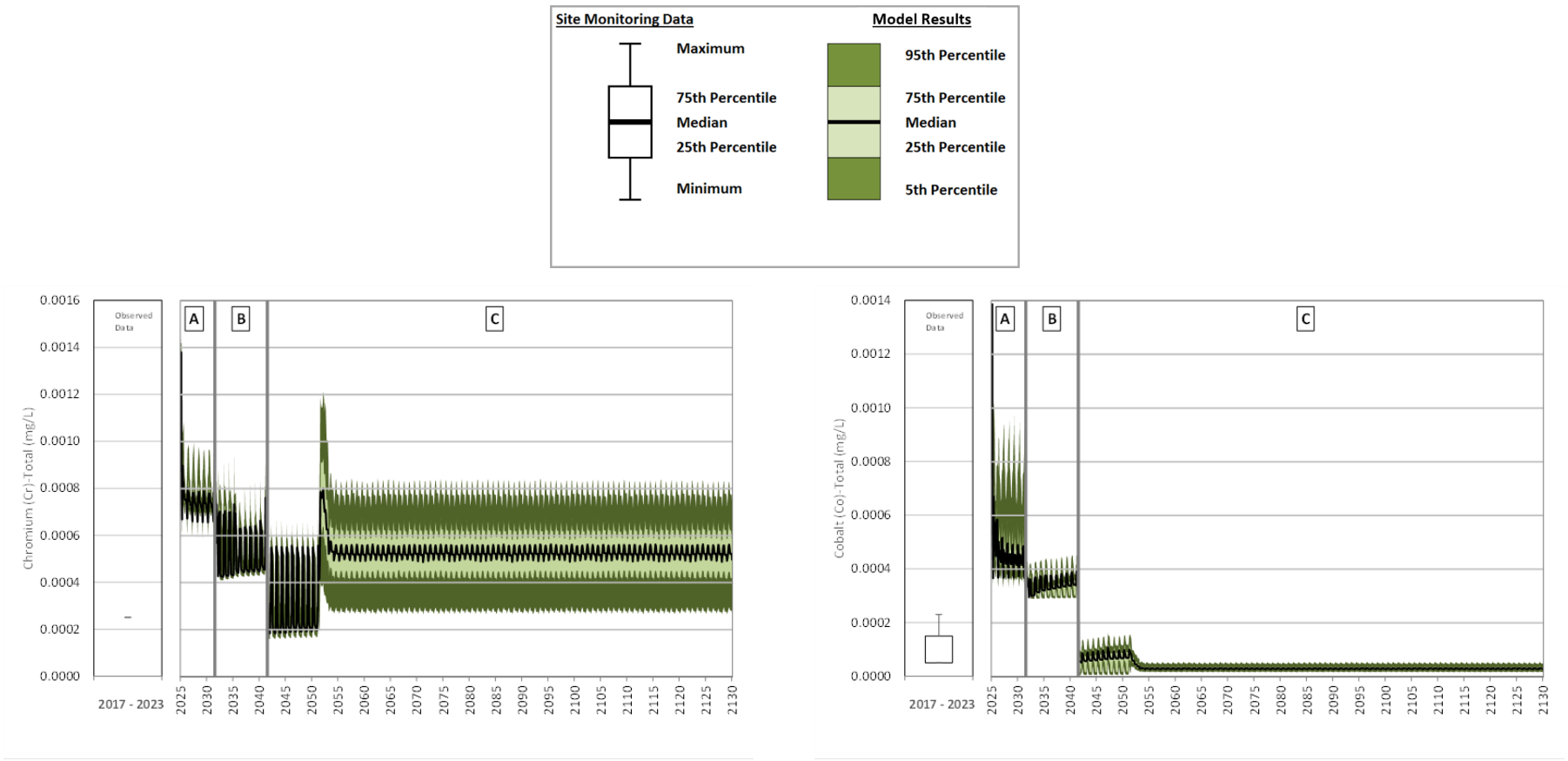
Figure B-286: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

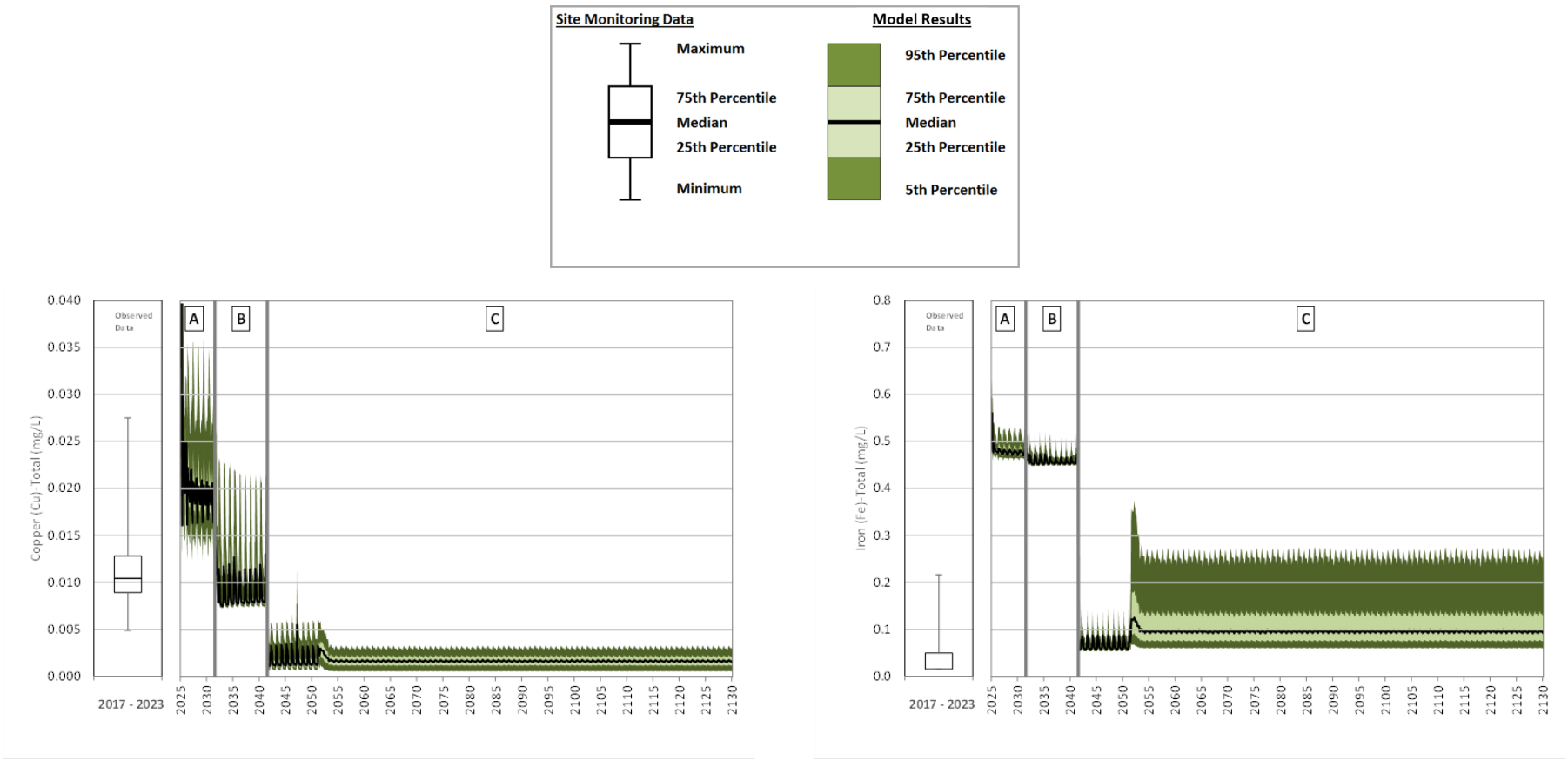
Figure B-287: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total chromium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total chromium than the disturbed runoff water quality input.

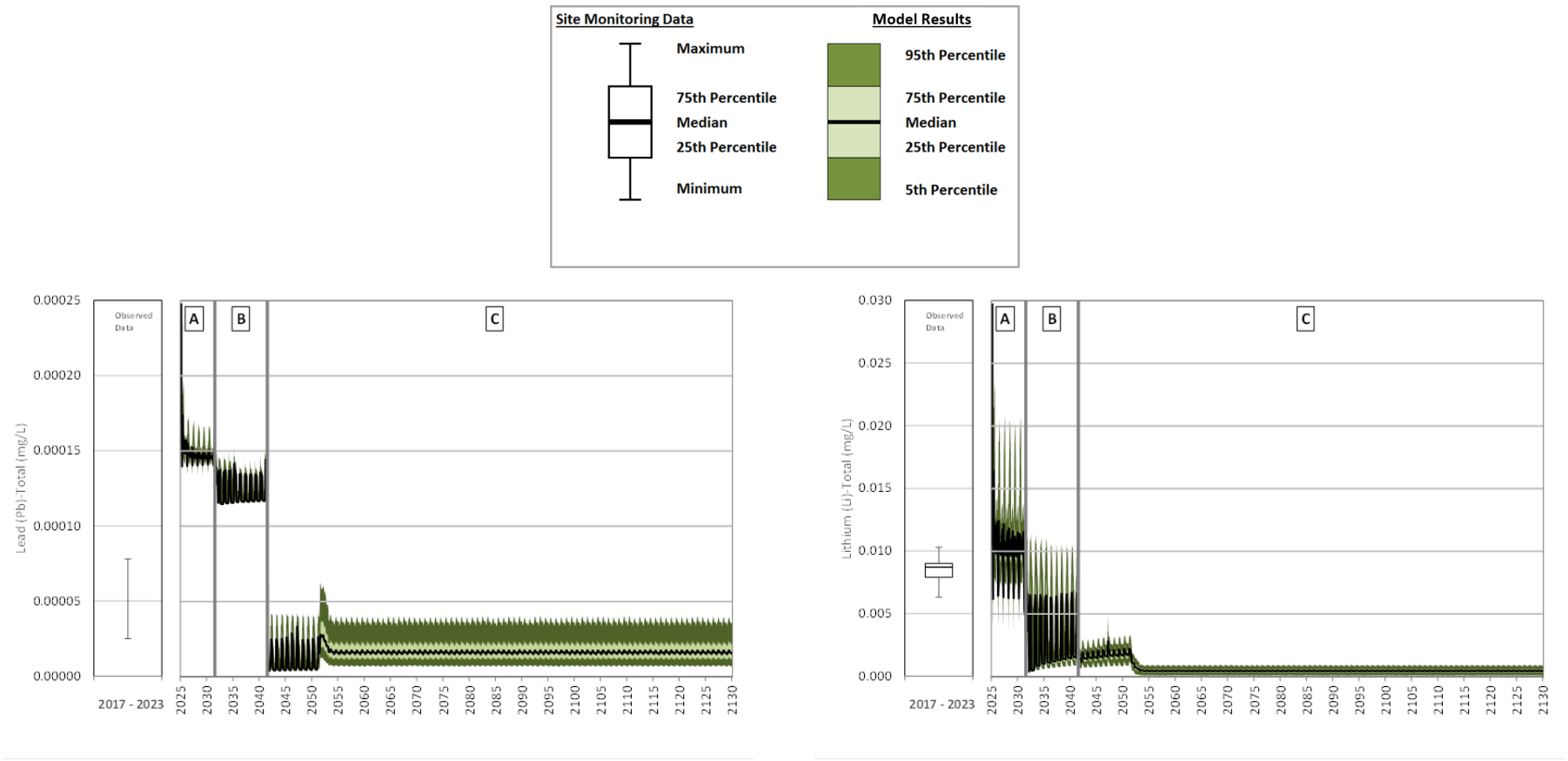
Figure B-288: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total iron concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total iron than the disturbed runoff water quality input.

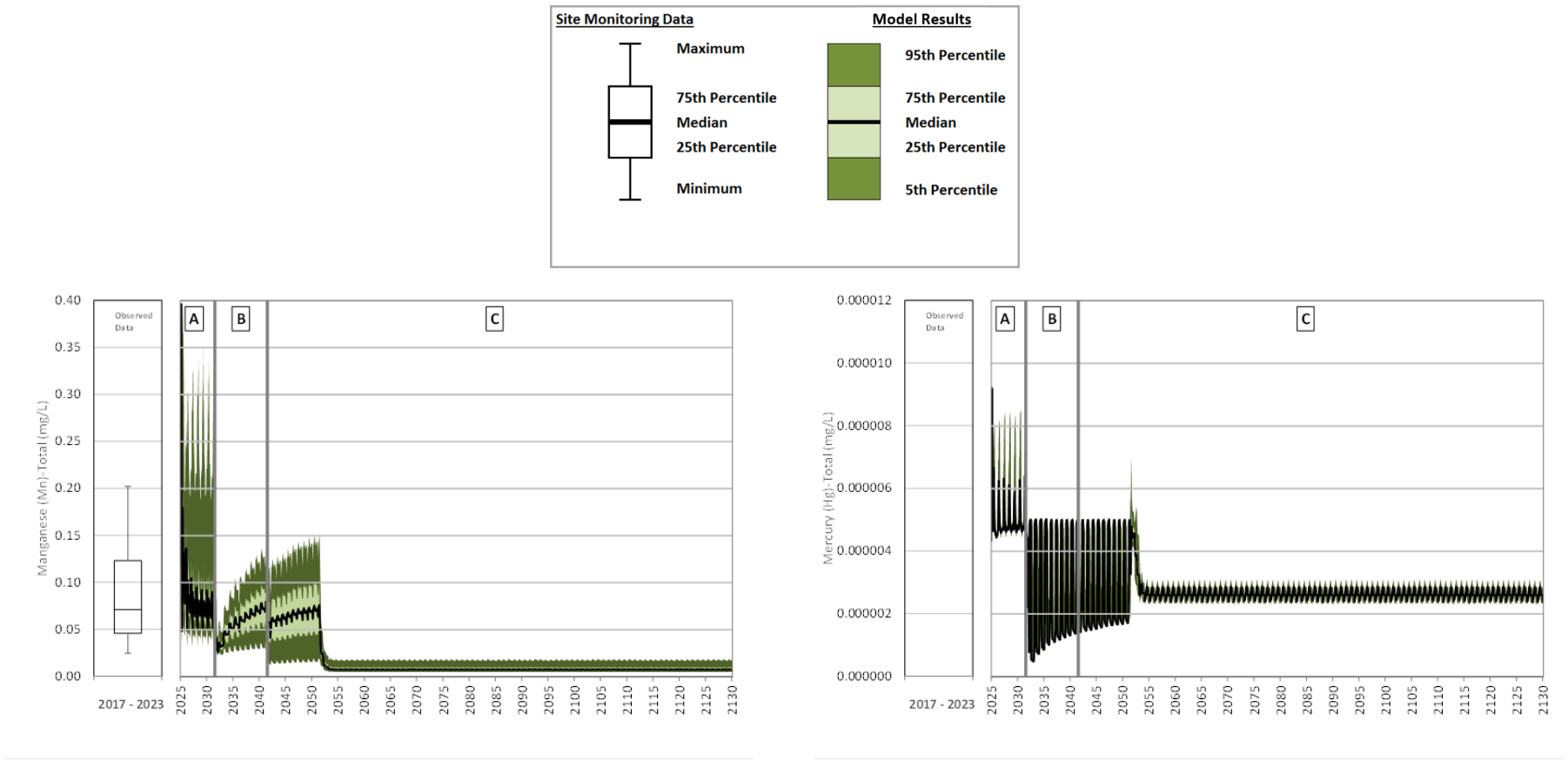
Figure B-289: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total lead concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total lead than the disturbed runoff water quality input.

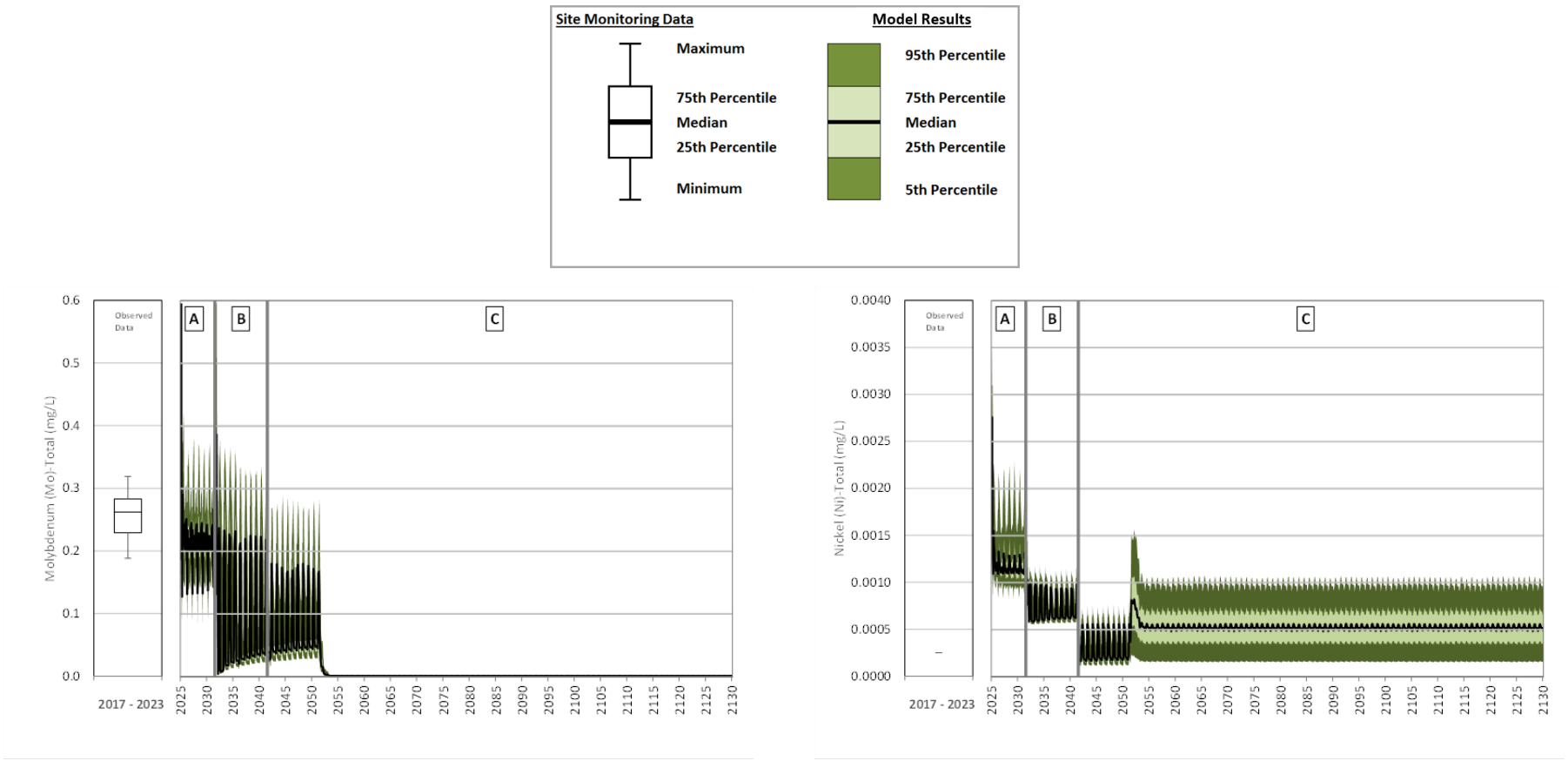
Figure B-290: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

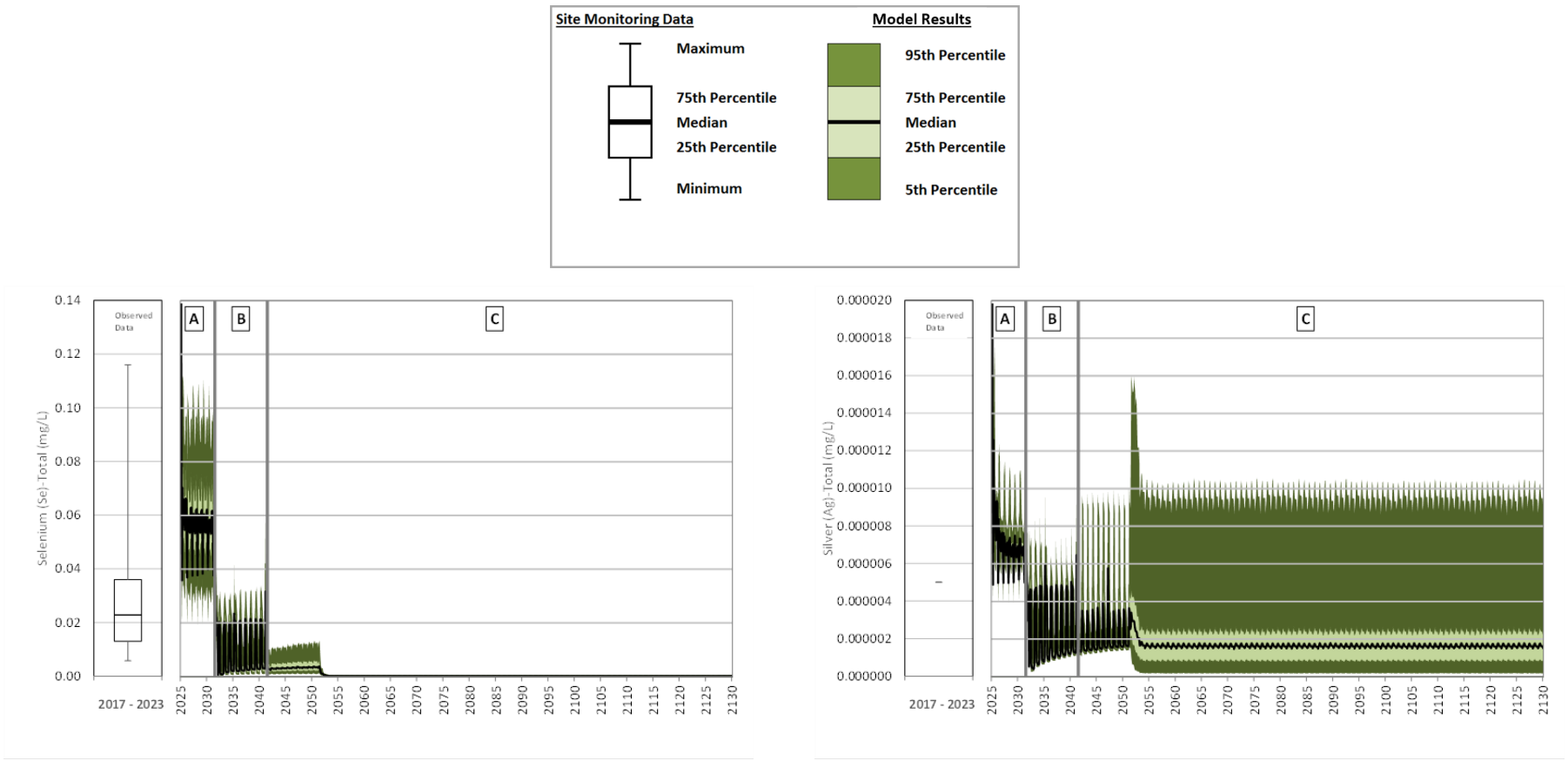
Figure B-291: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total nickel concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total nickel than the disturbed runoff water quality input.

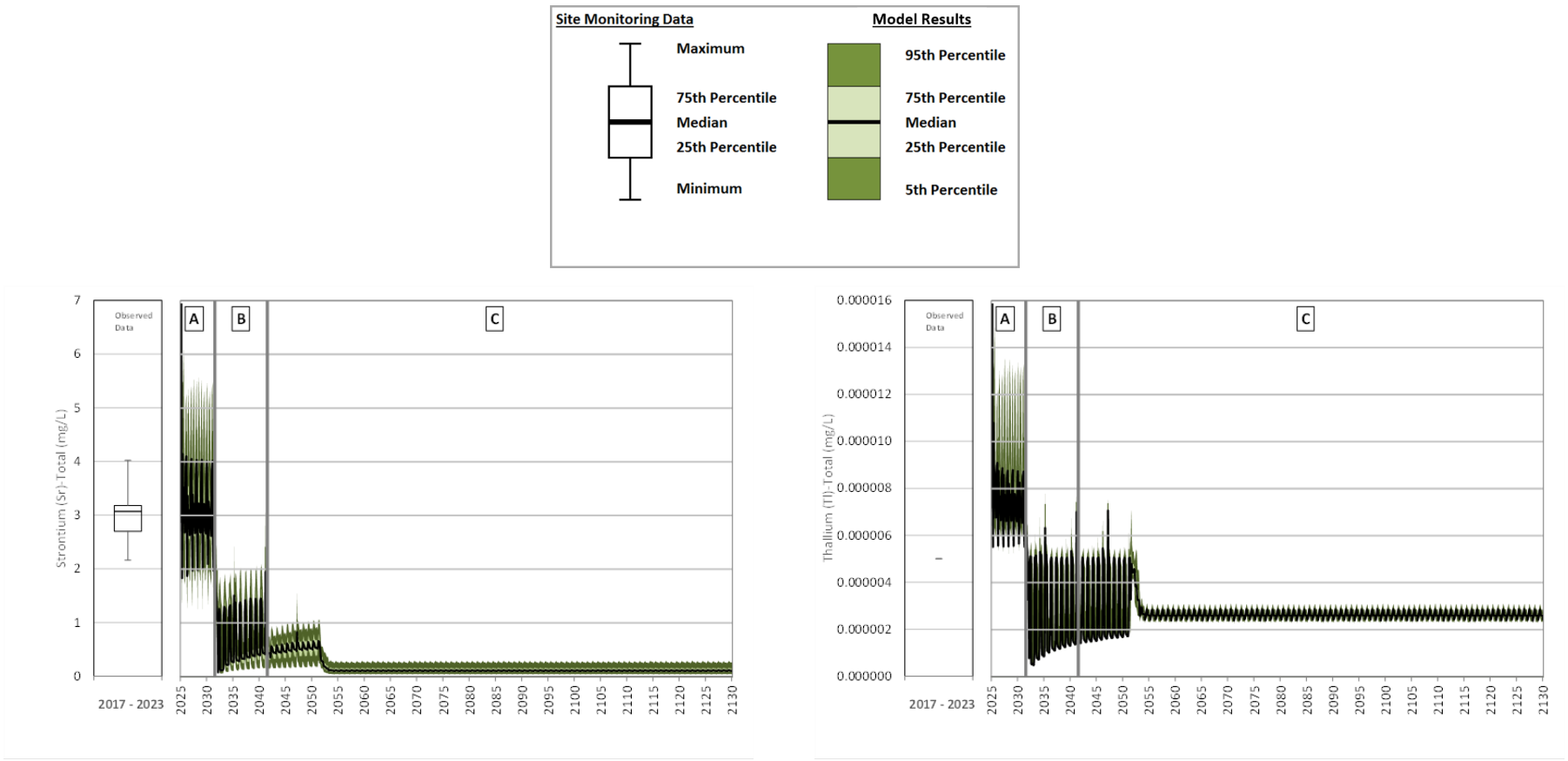
Figure B-292: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total silver concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total silver than the disturbed runoff water quality input.

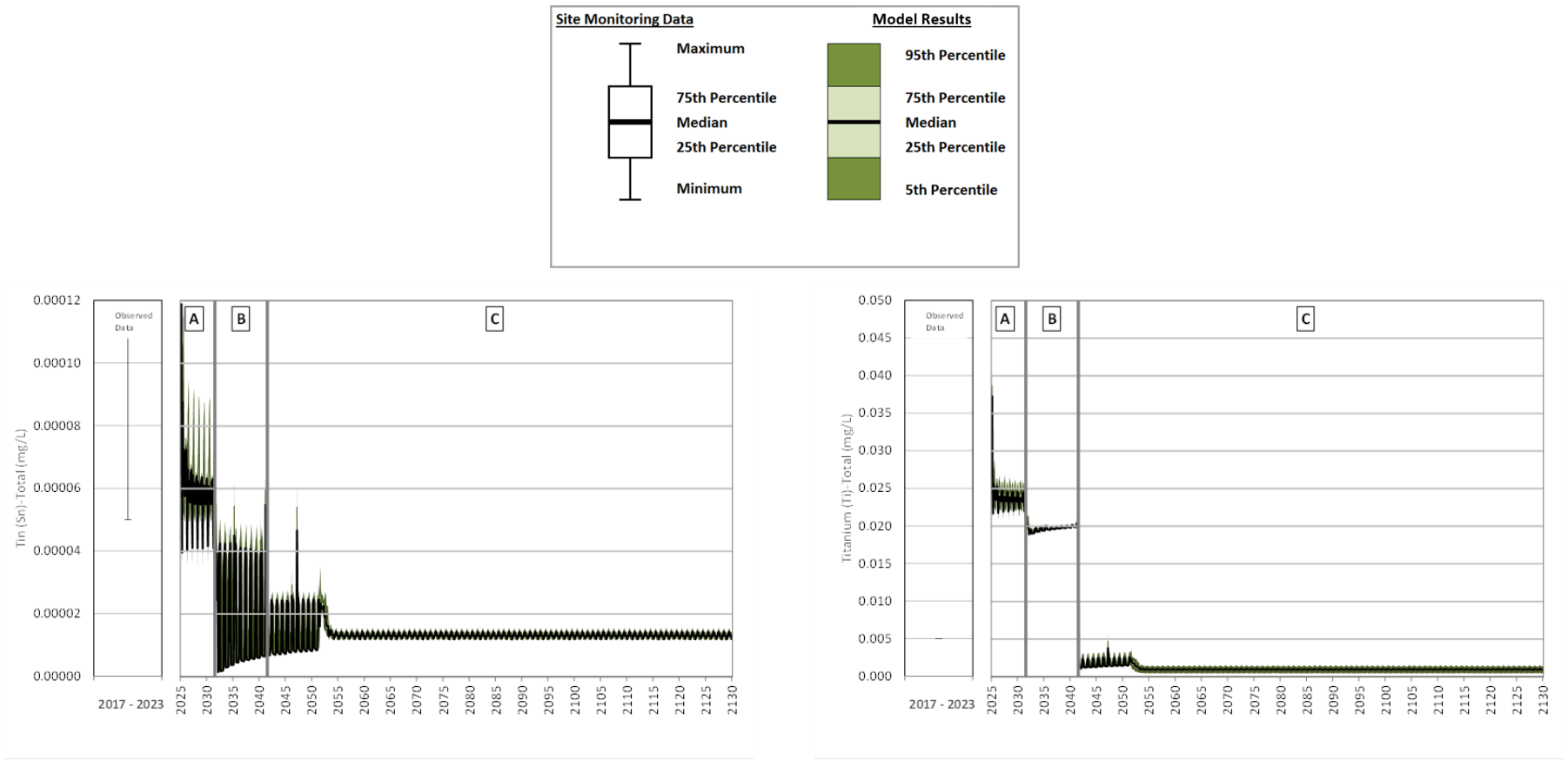
Figure B-293: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

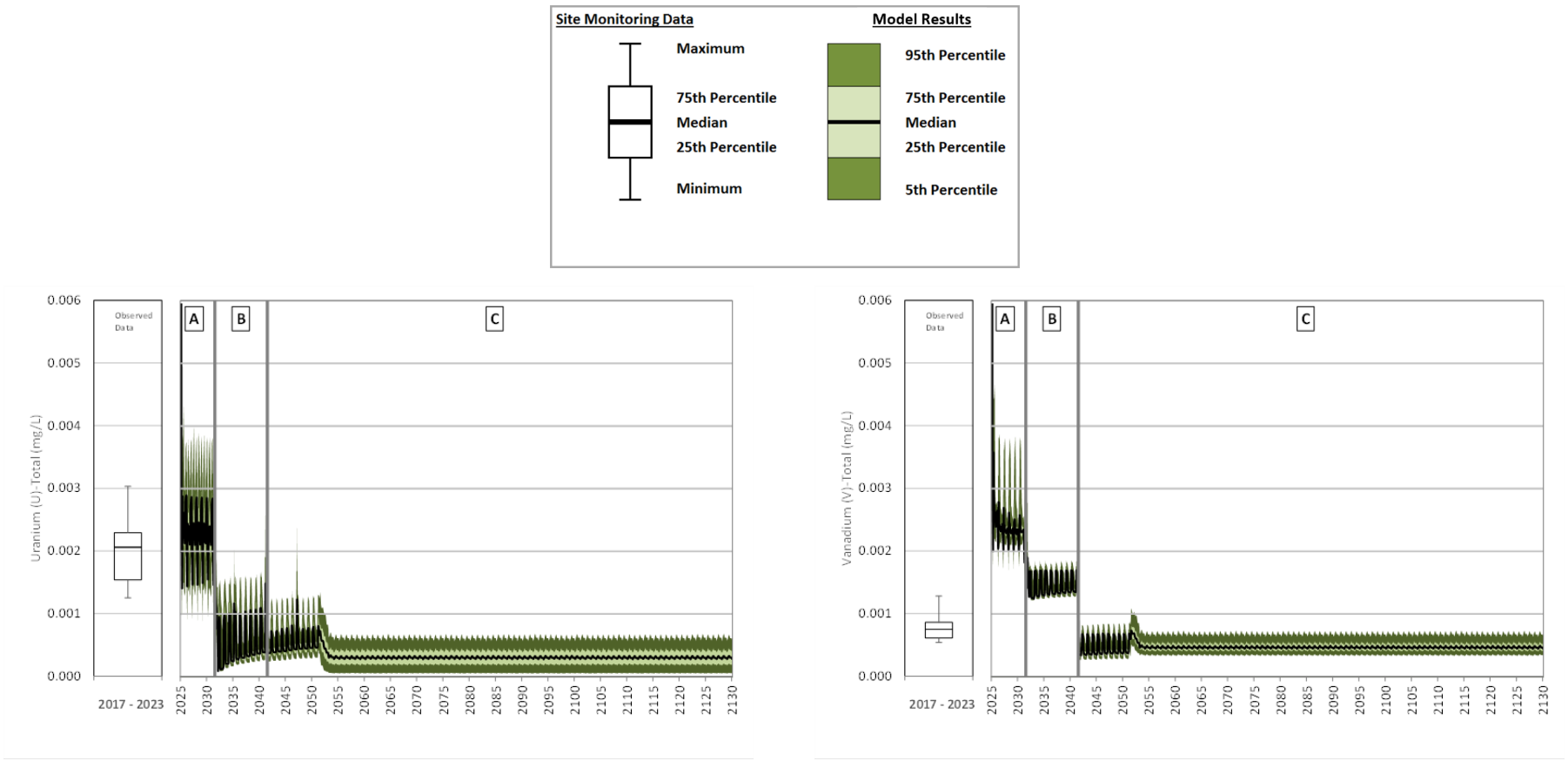
Figure B-294: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total titanium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total titanium than the disturbed runoff water quality input.

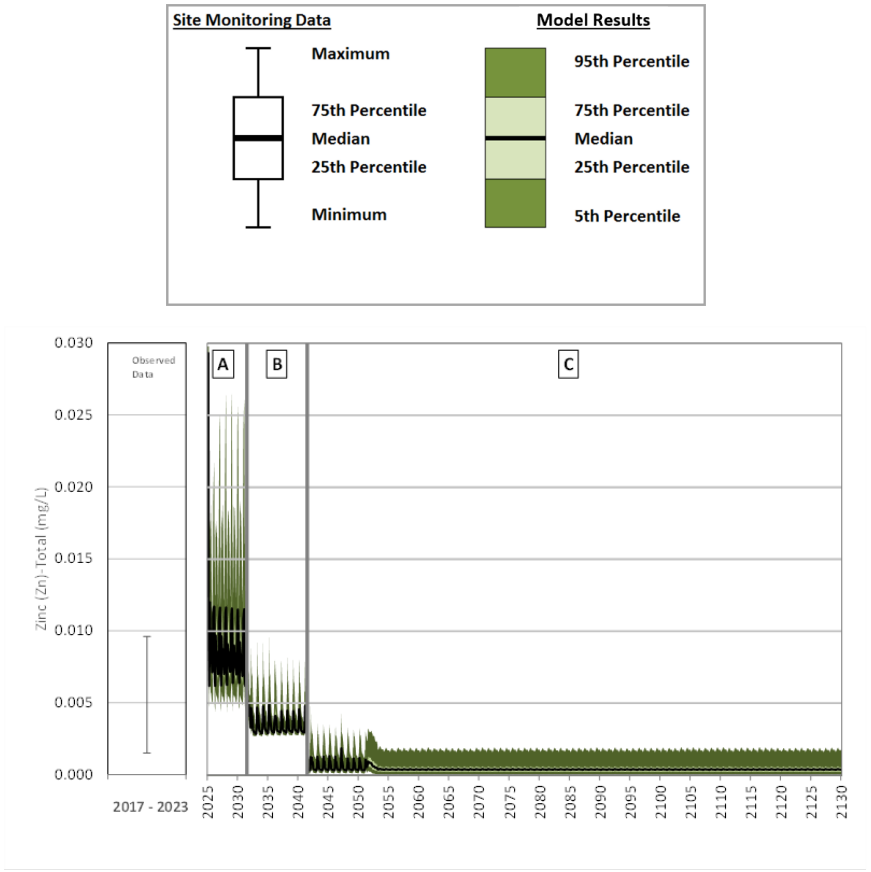
Figure B-295: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051. Total vanadium concentrations increase ten years after the start of post-closure as mine site areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for Total vanadium than the disturbed runoff water quality input.

Figure B-296: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Uranium and Total Vanadium

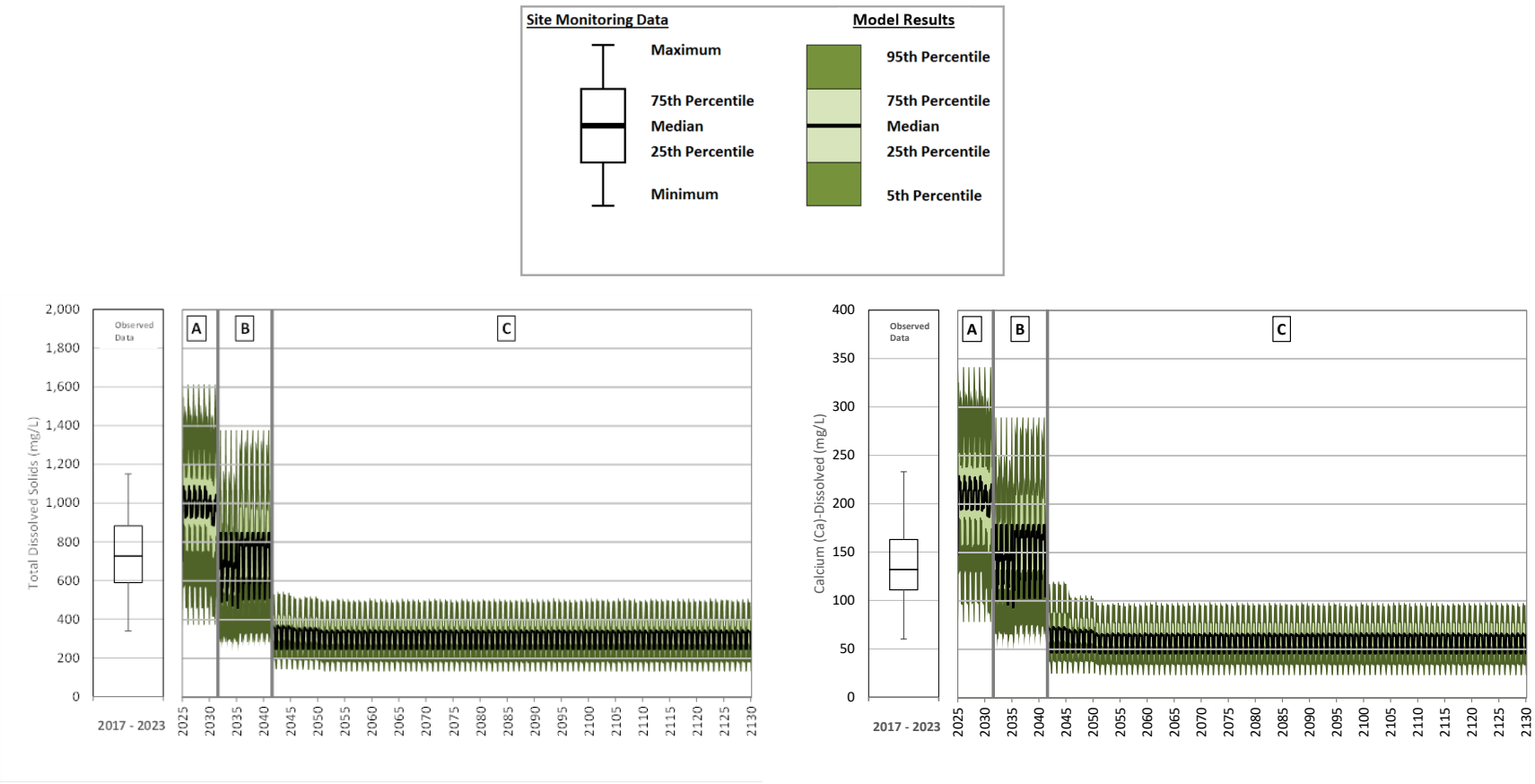


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and post-closure is caused by the reclamation of runoff areas. The increase in concentrations from 2031 to 2051 is due to pumping from the SESCP to the MESCP which ends in 2051.

Figure B-297: Main Embankment Seepage Collection Pond Operations, Closure and Post-closure – Total Zinc

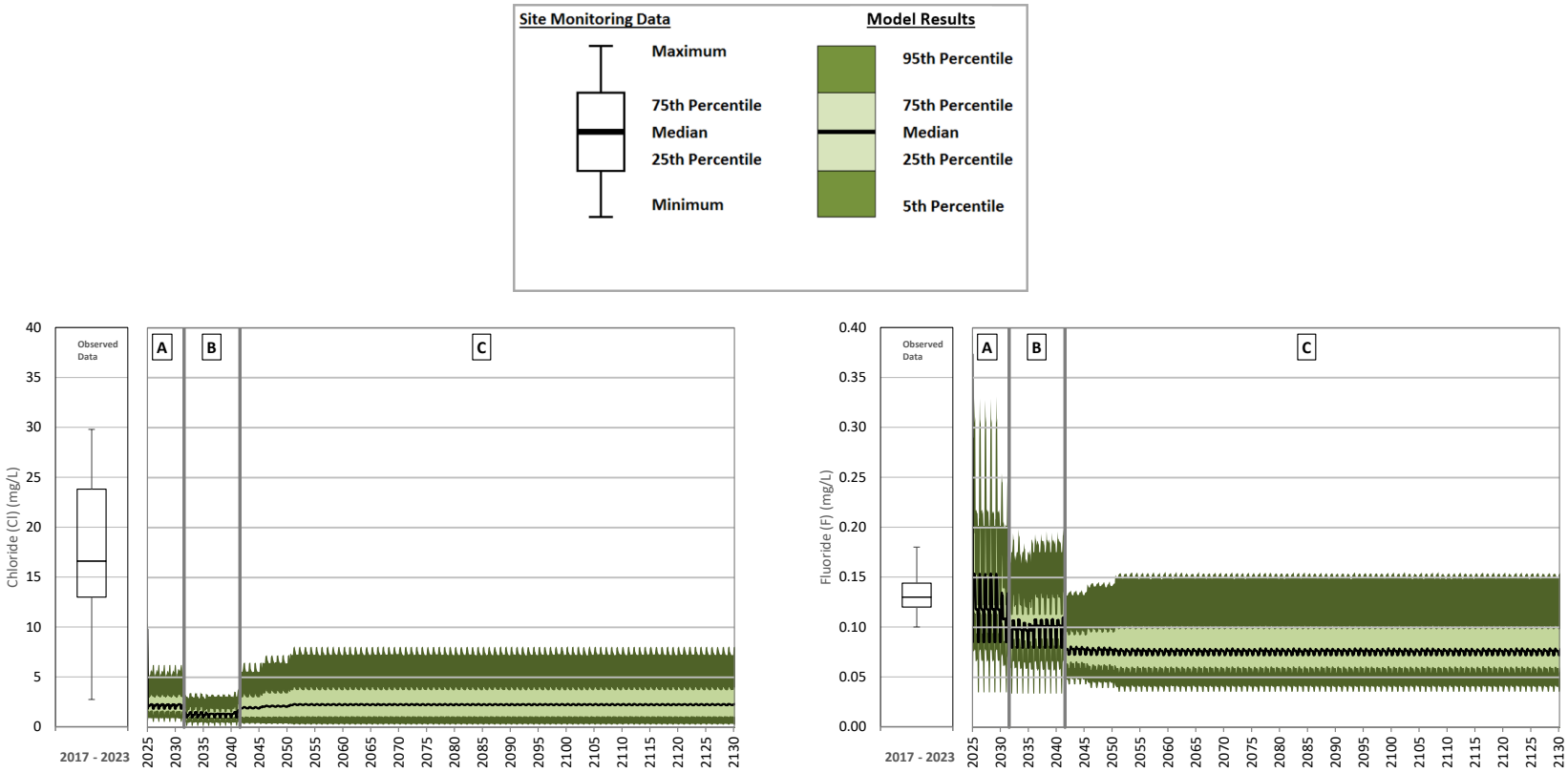
Mine Drainage Creek Sump Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

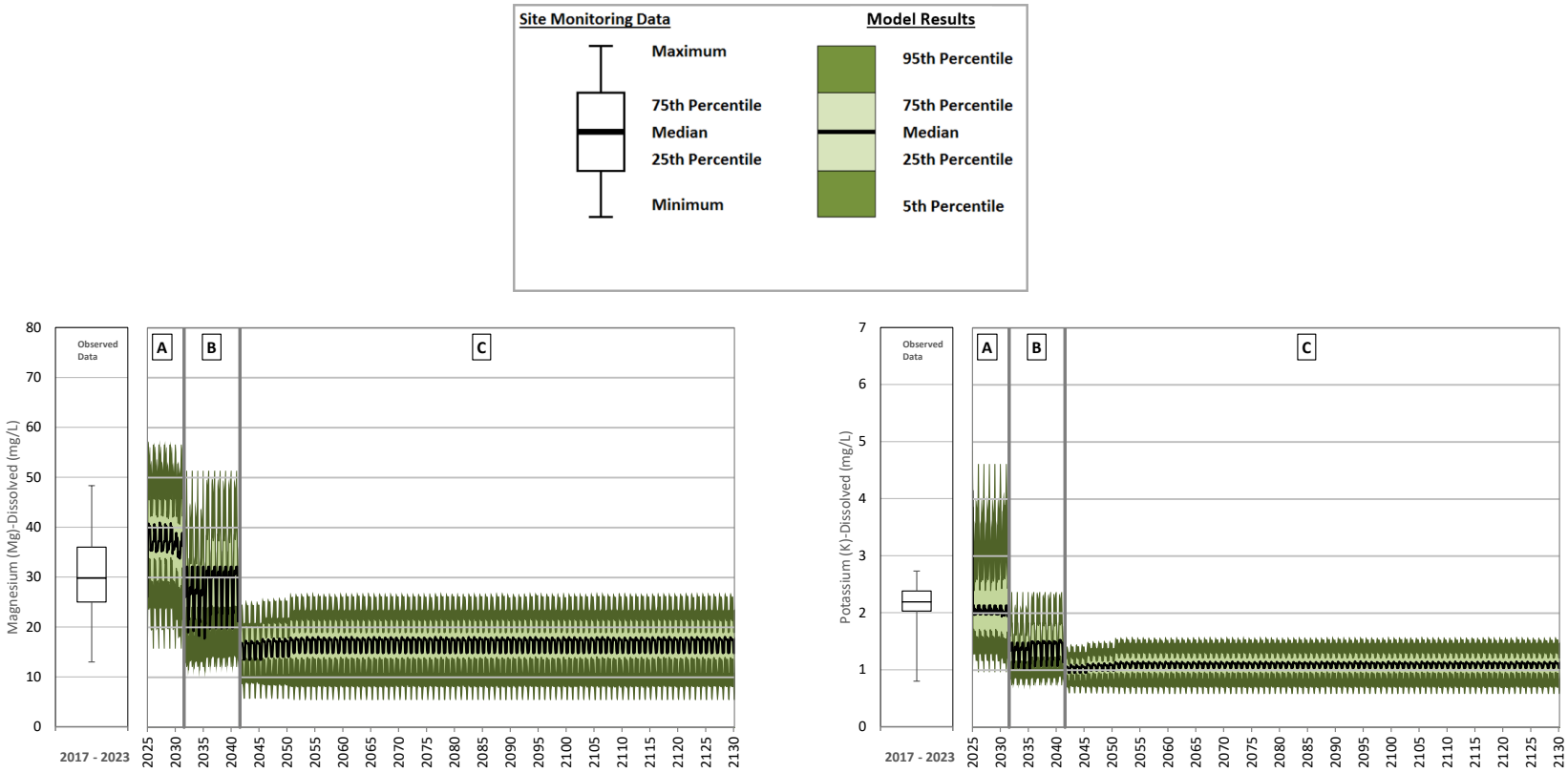
Figure B-298: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Chloride and fluoride concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for chloride and fluoride than the disturbed runoff water quality inputs.

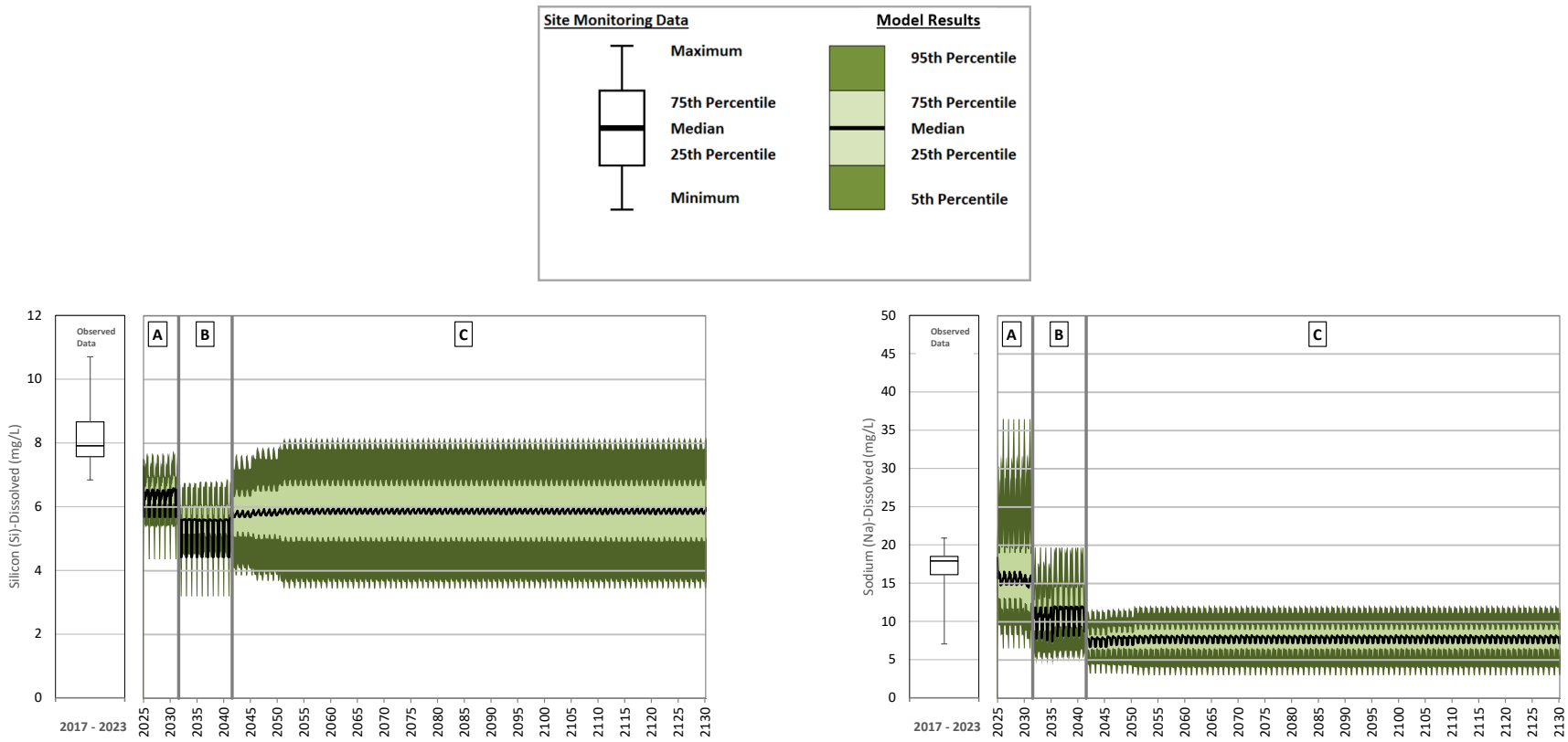
Figure B-299: Mine Drainage Creek Sump Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Magnesium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for magnesium than the disturbed runoff water quality inputs.

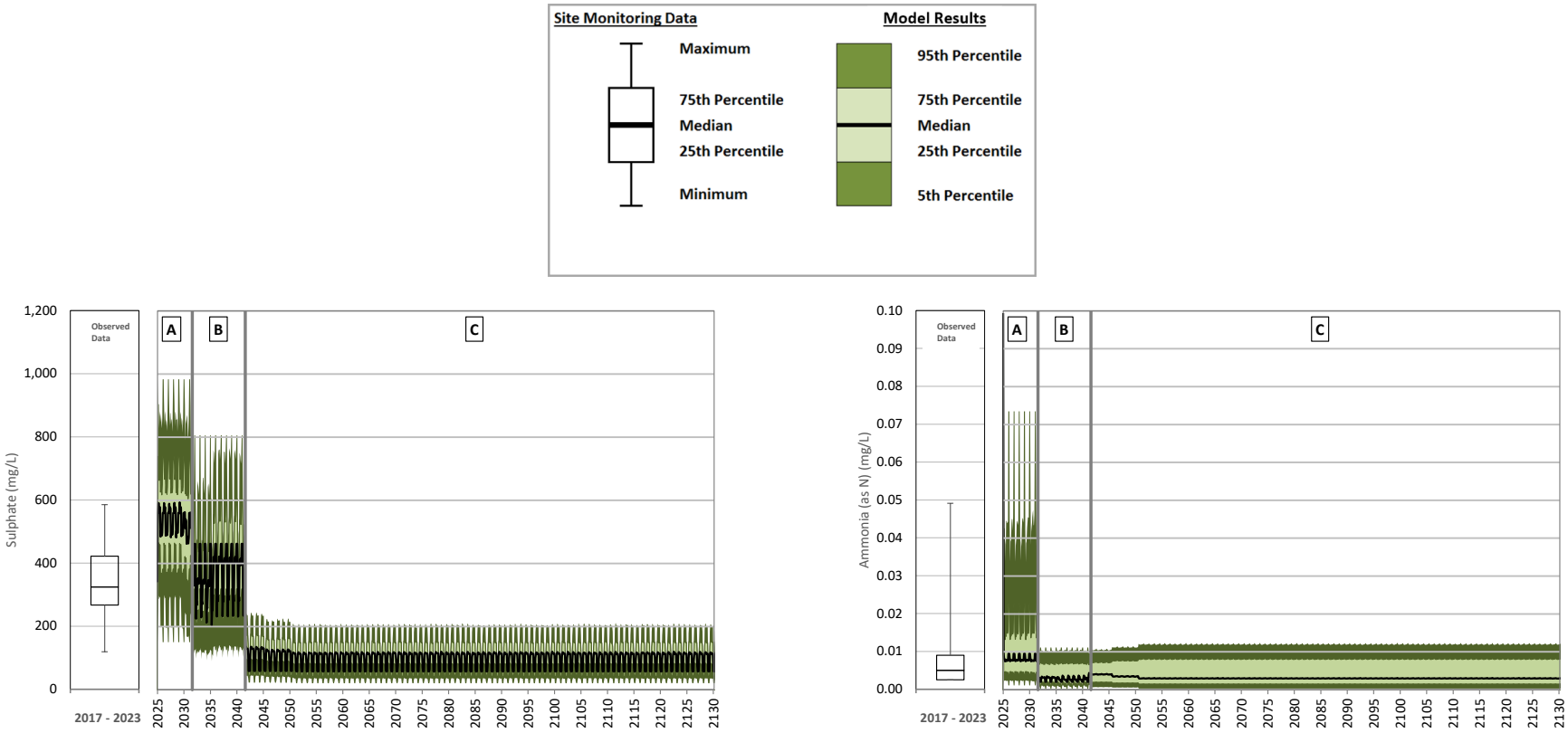
Figure B-300: Mine Drainage Creek Sump Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Silicon concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for silicon than the disturbed runoff water quality inputs.

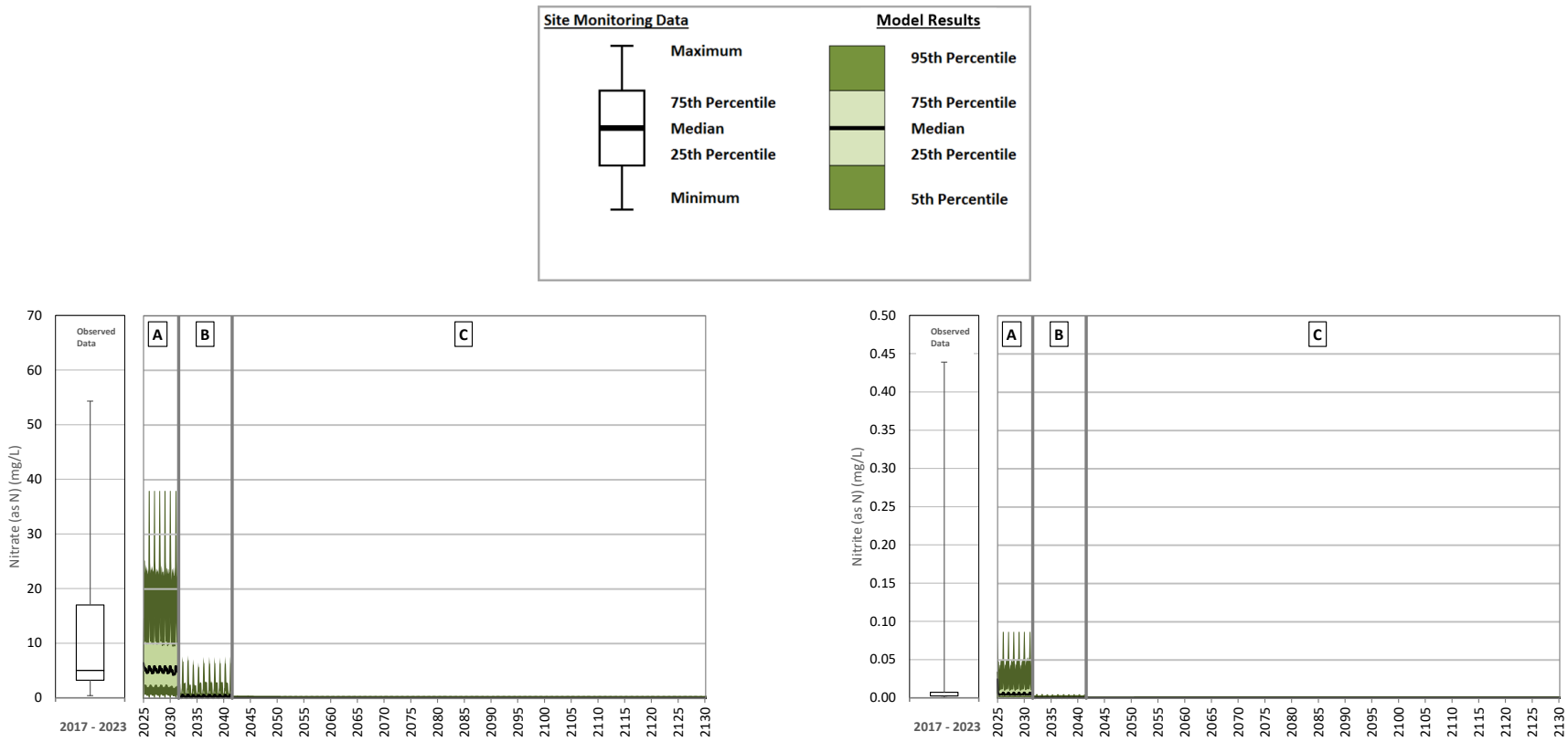
Figure B-301: Mine Drainage Creek Sump Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total ammonia concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total ammonia than the disturbed runoff water quality inputs.

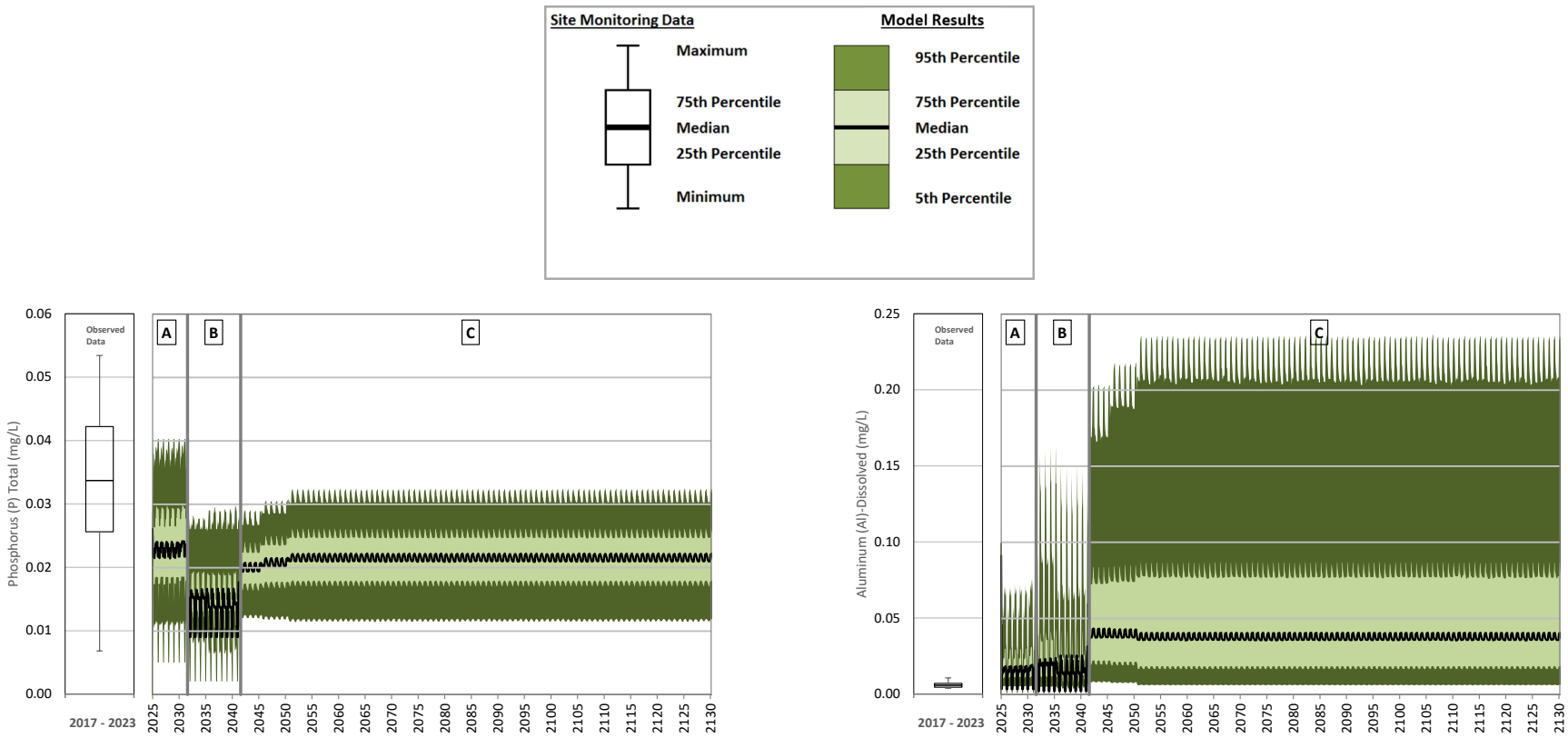
Figure B-302: Mine Drainage Creek Sump Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

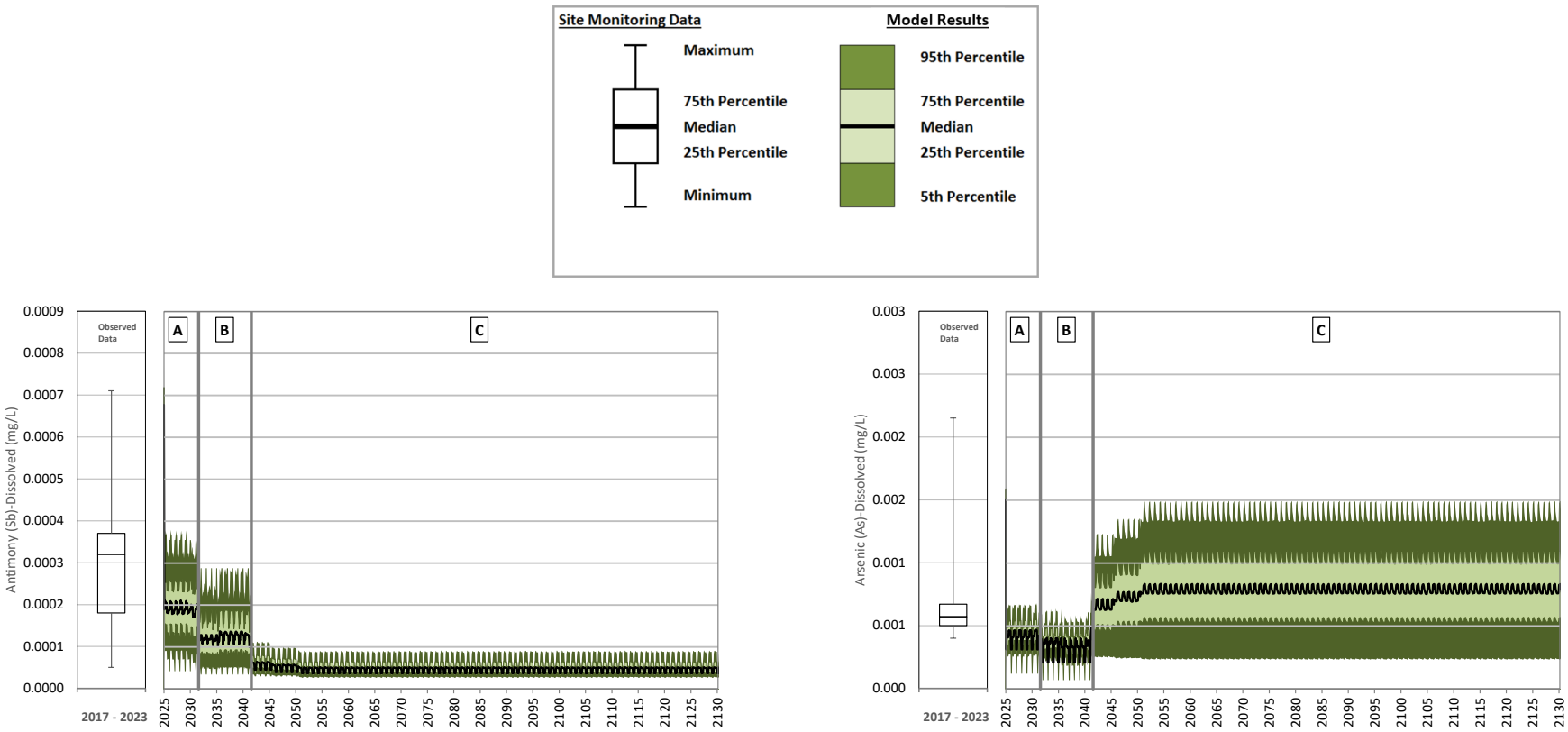
Figure B-303: Mine Drainage Creek Sump Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total phosphorus and dissolved aluminum concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the disturbed runoff and NAG waste rock water quality inputs.

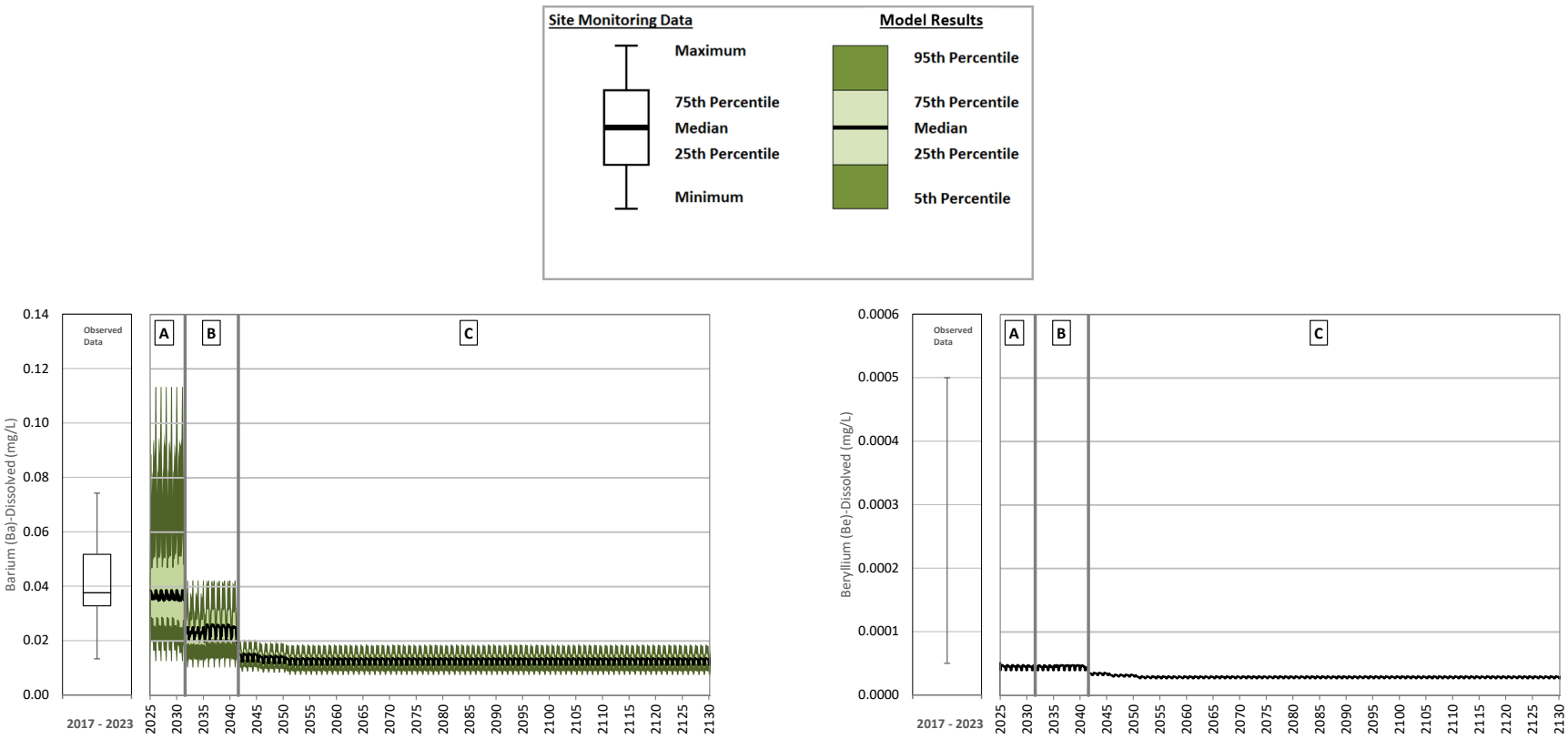
Figure B-304: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved arsenic concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved arsenic than the disturbed runoff water quality inputs.

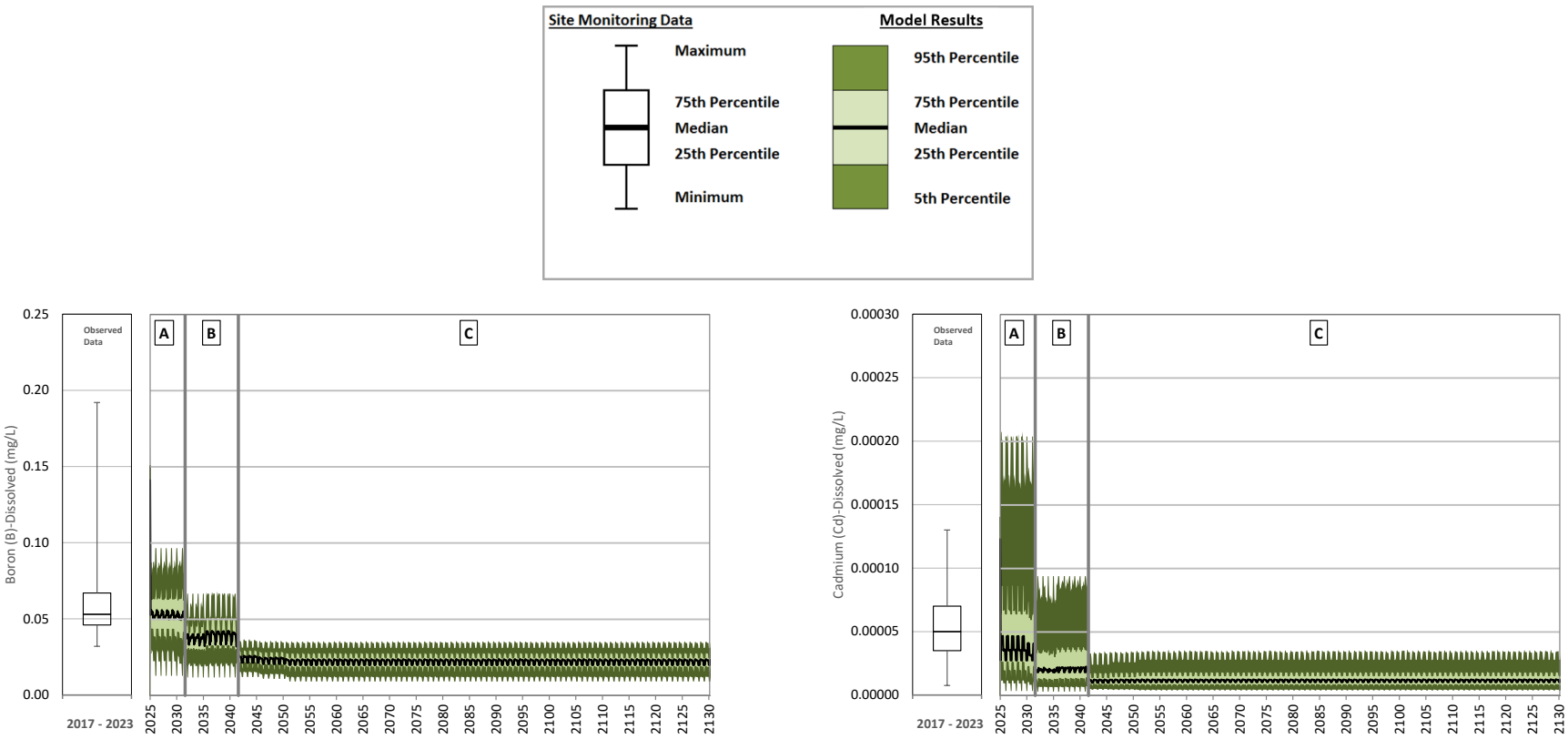
Figure B-305: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

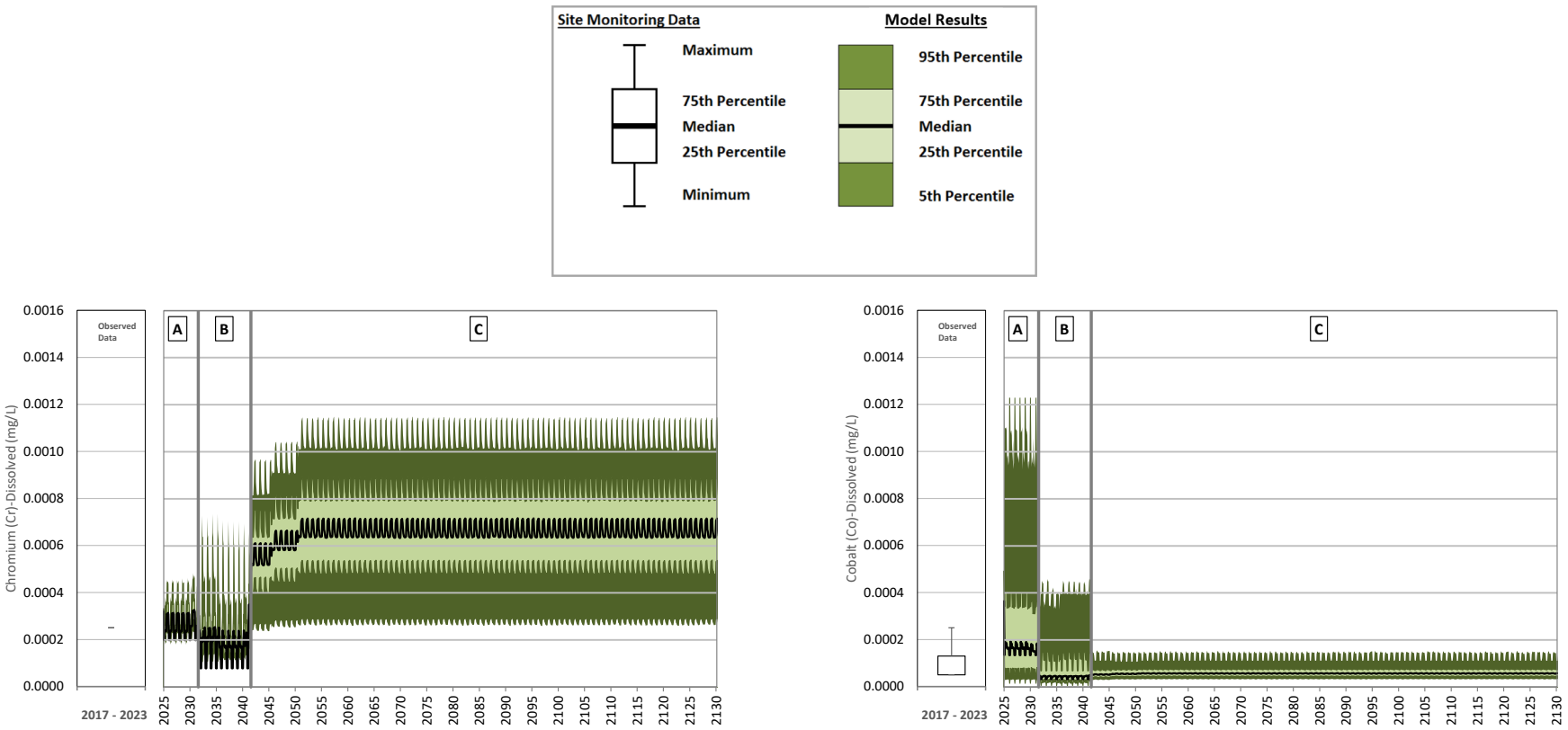
Figure B-306: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

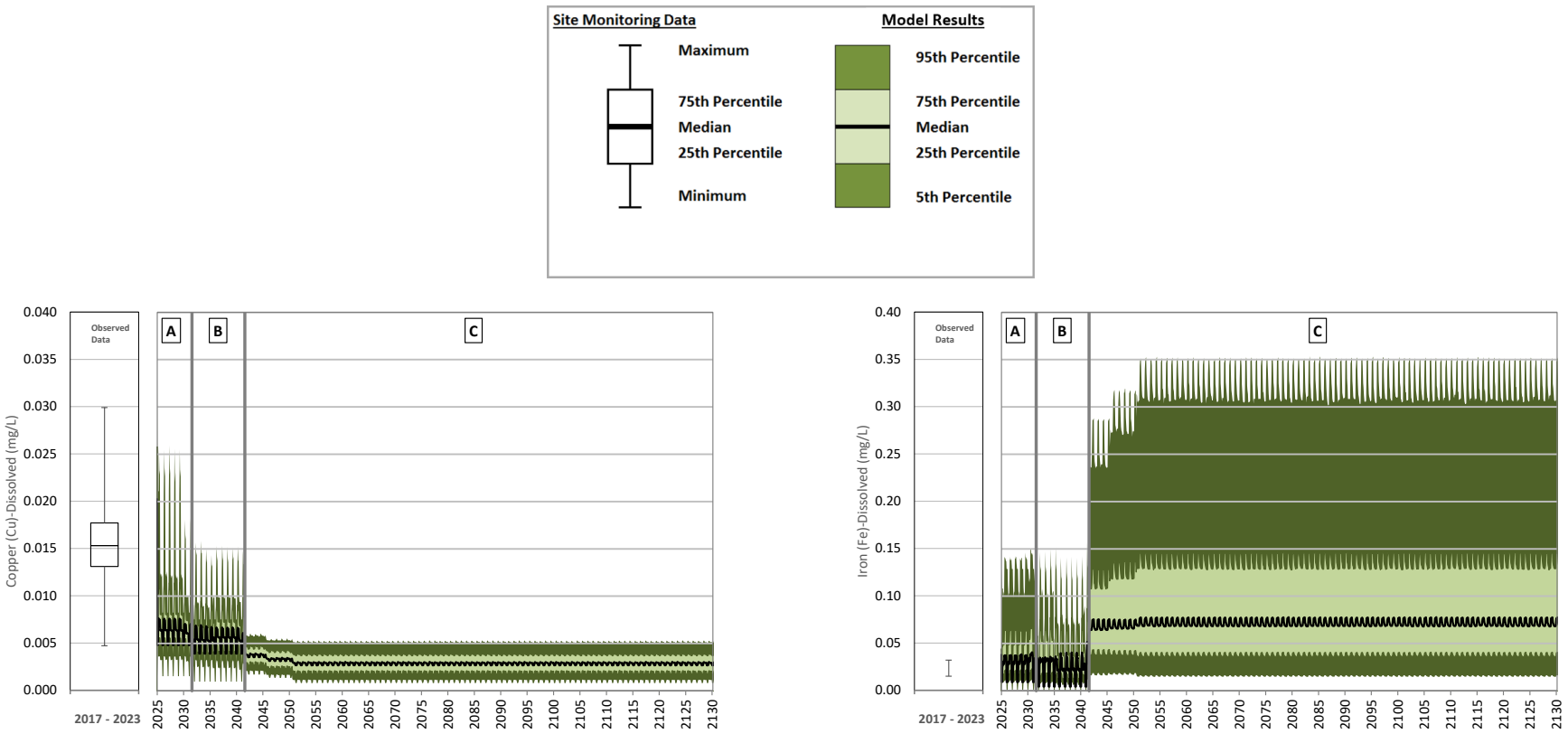
Figure B-307: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved chromium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the disturbed runoff and NAG waste rock water quality inputs.

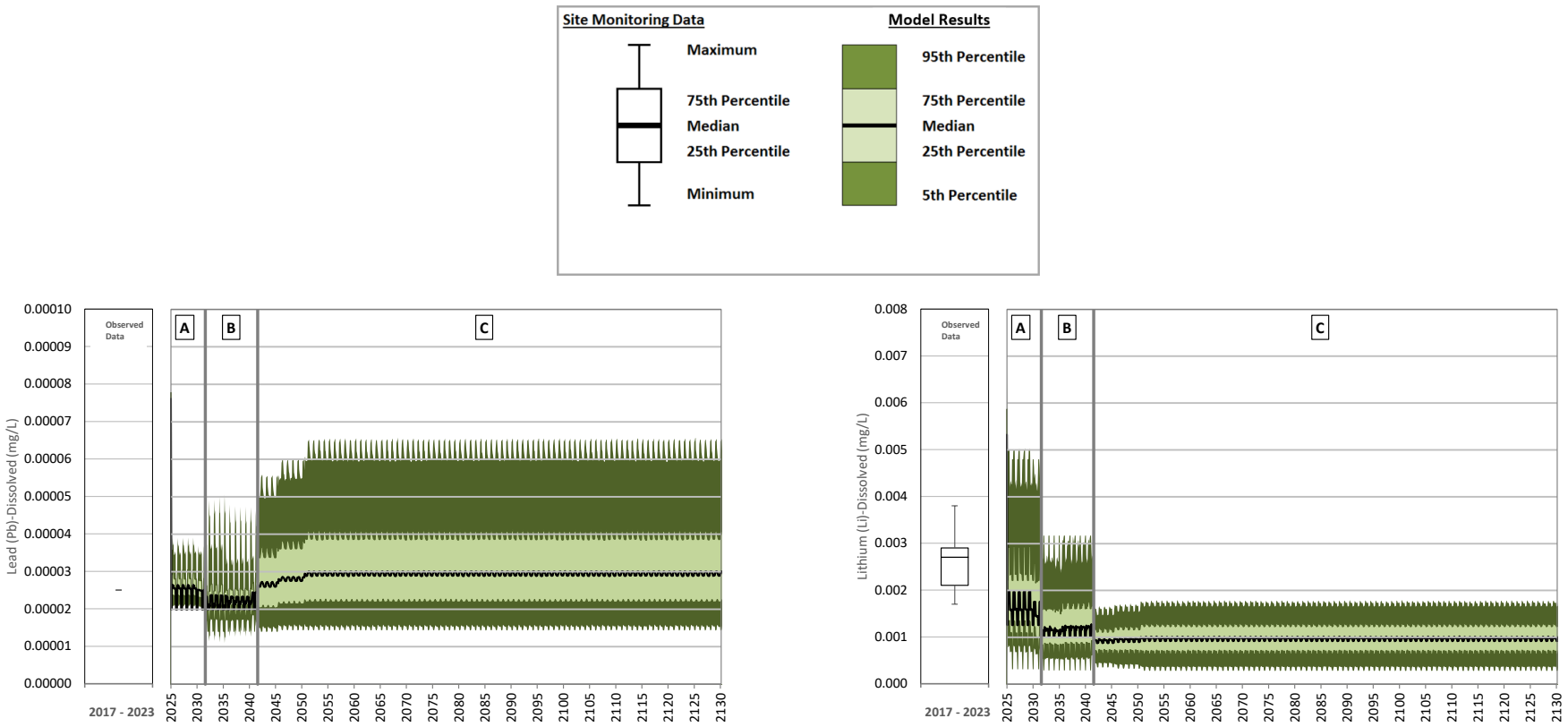
Figure B-308: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved iron concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved iron than the disturbed runoff water quality inputs.

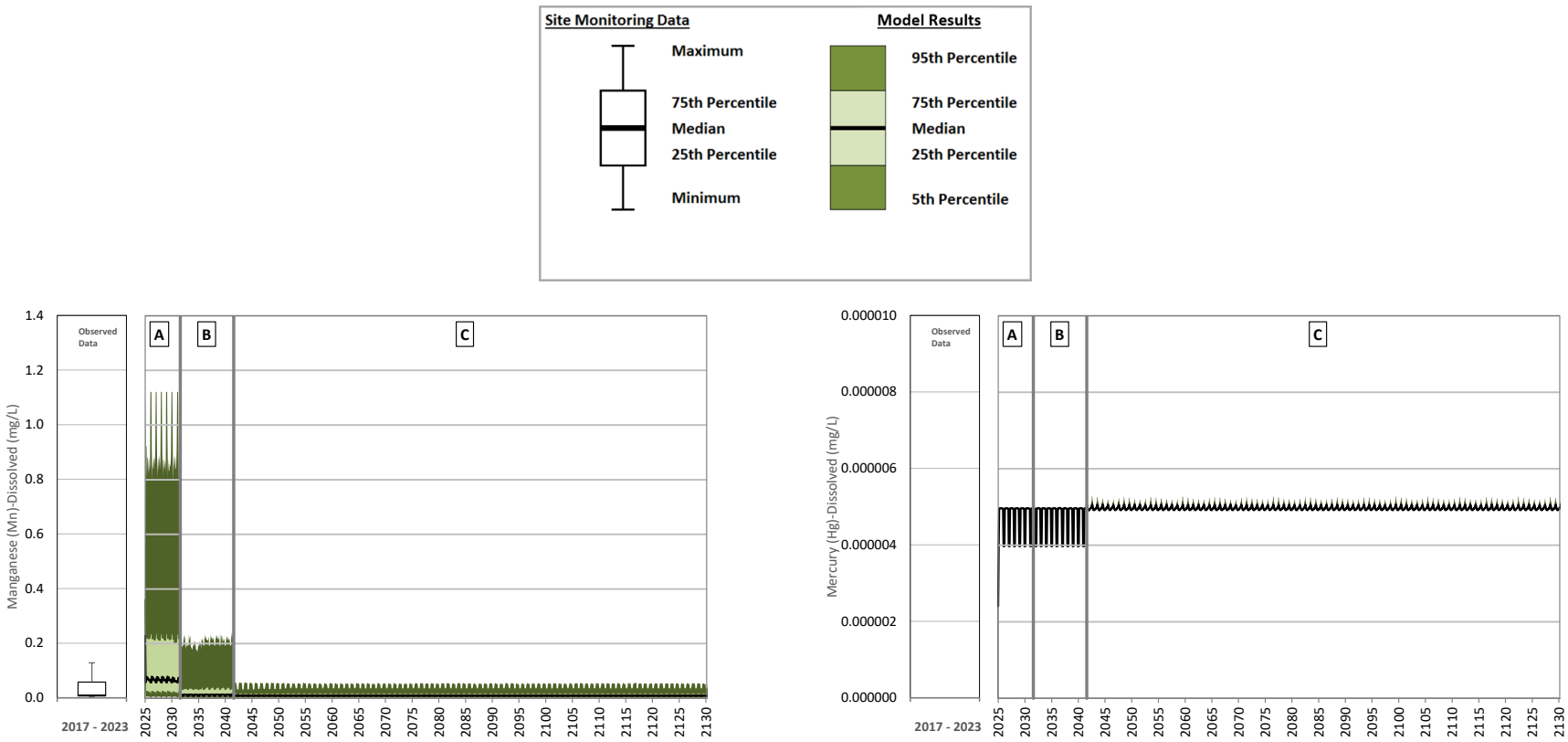
Figure B-309: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved lead and lithium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for dissolved lead and lithium than the disturbed runoff water quality inputs.

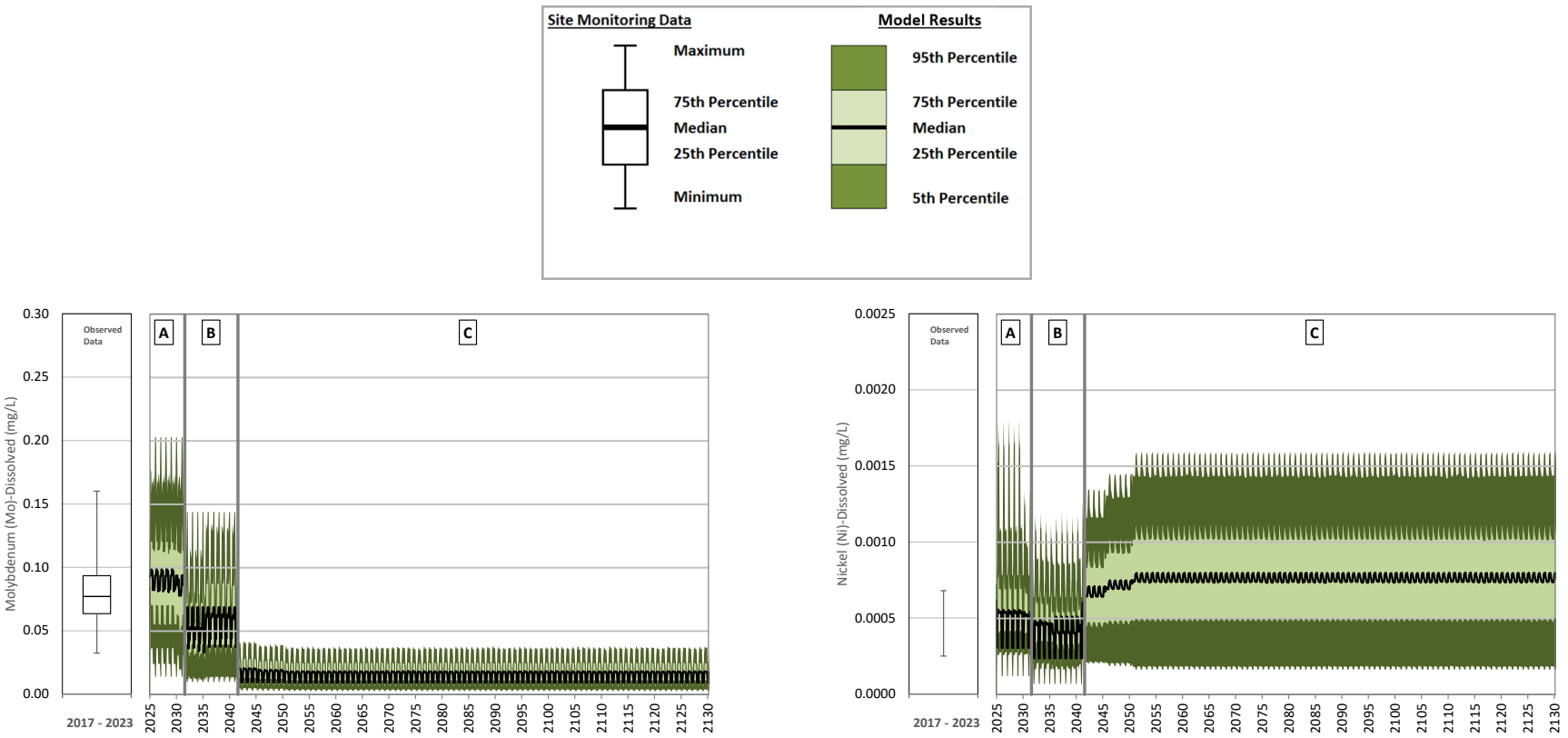
Figure B-310: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

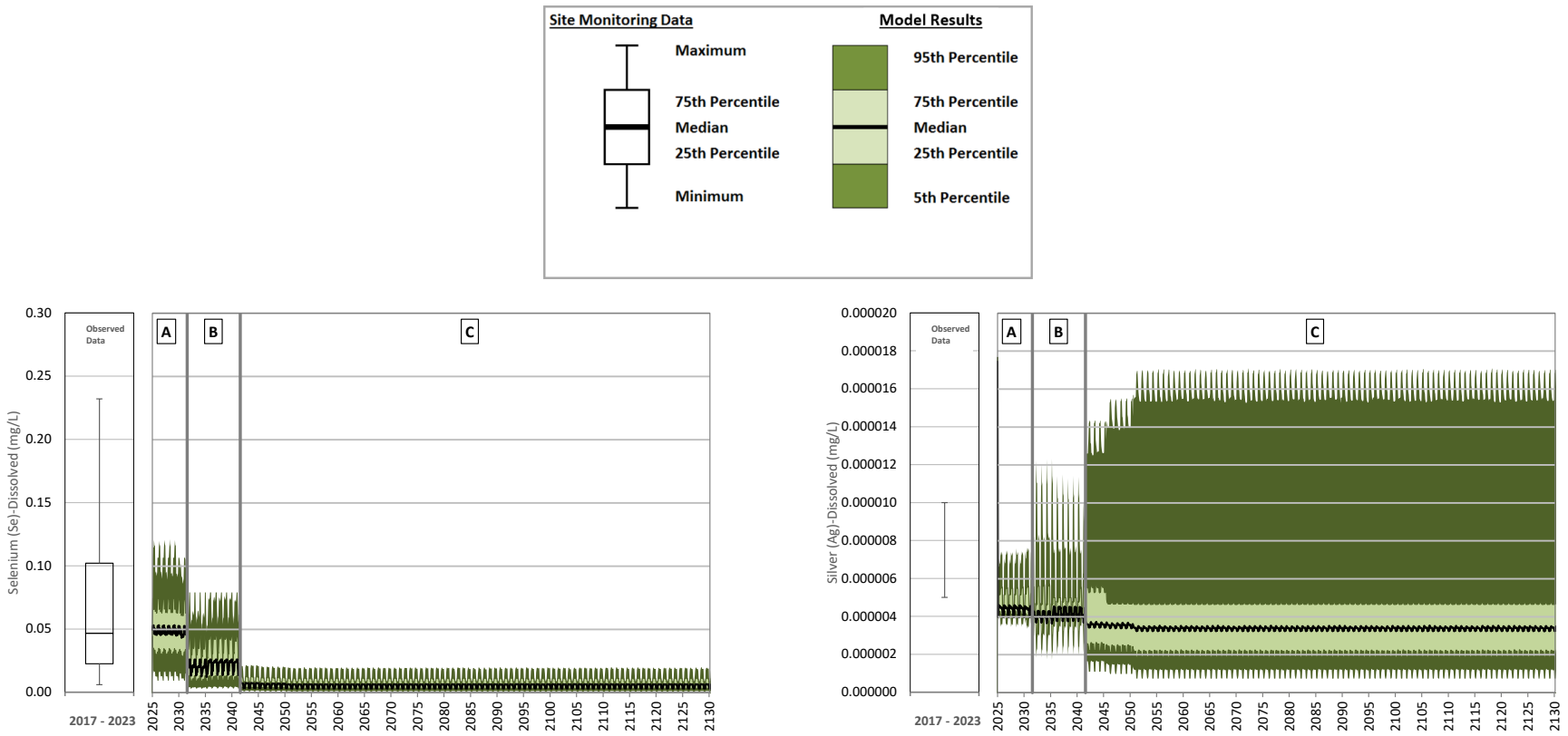
Figure B-311: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved nickel concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the disturbed runoff water quality inputs.

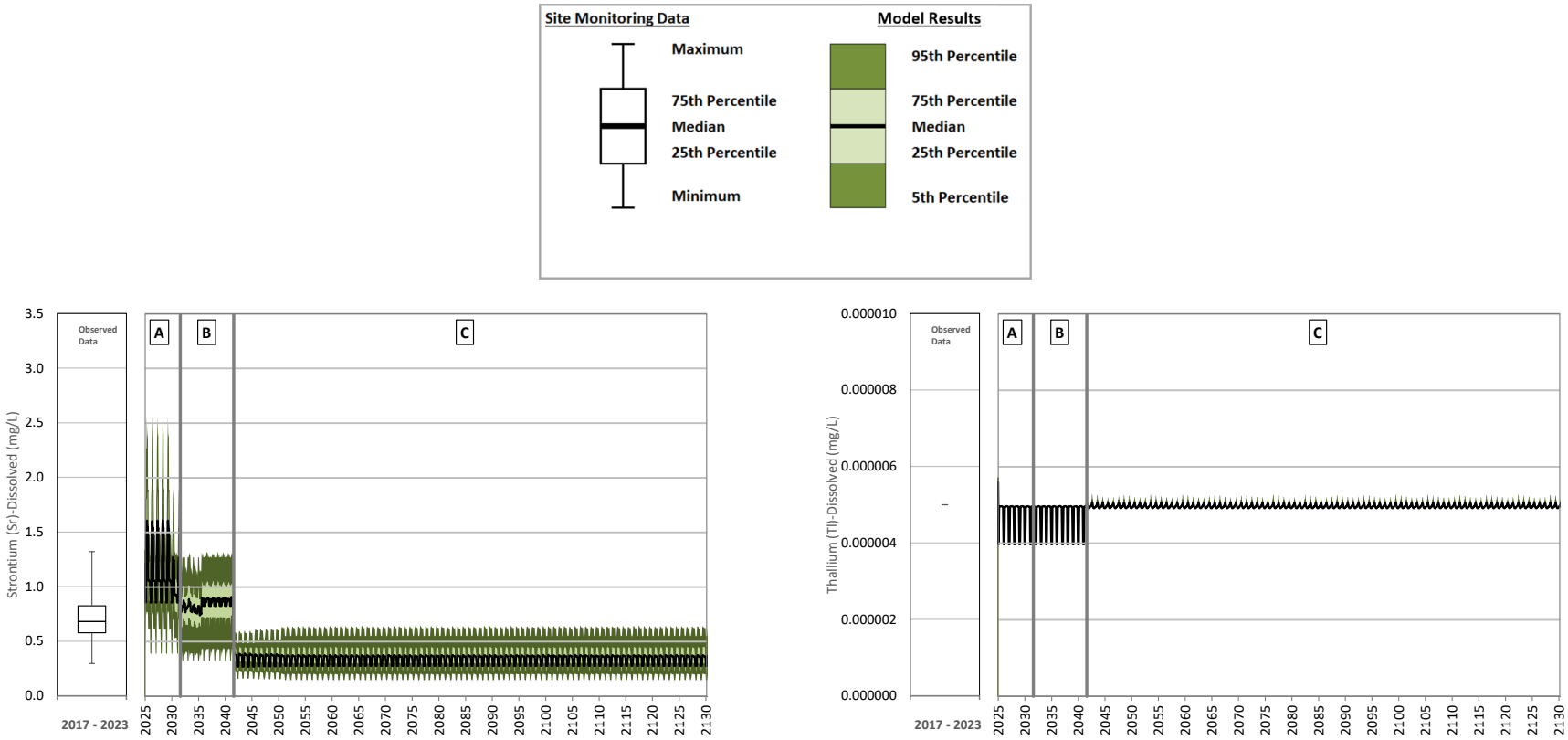
Figure B-312: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved silver concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the disturbed runoff water quality inputs.

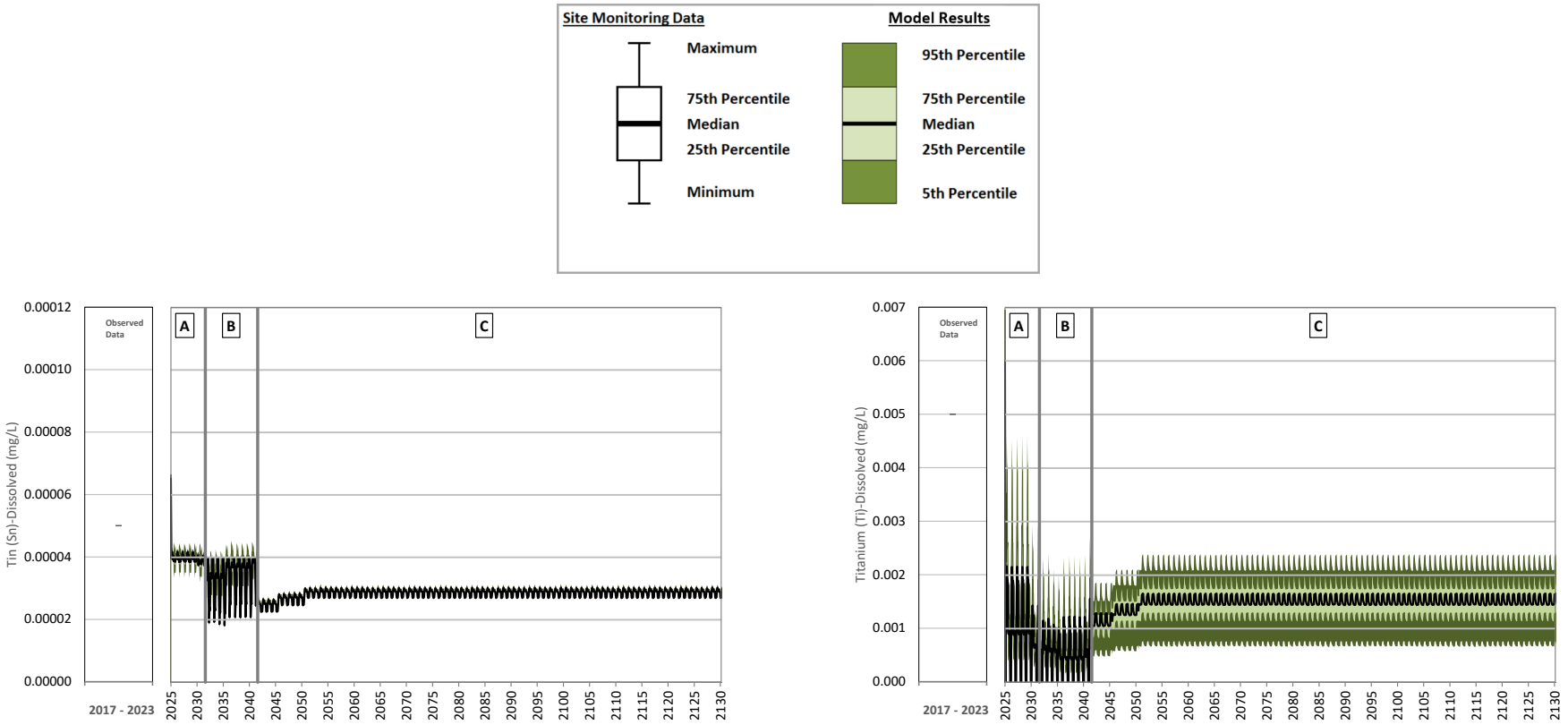
Figure B-313: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas.

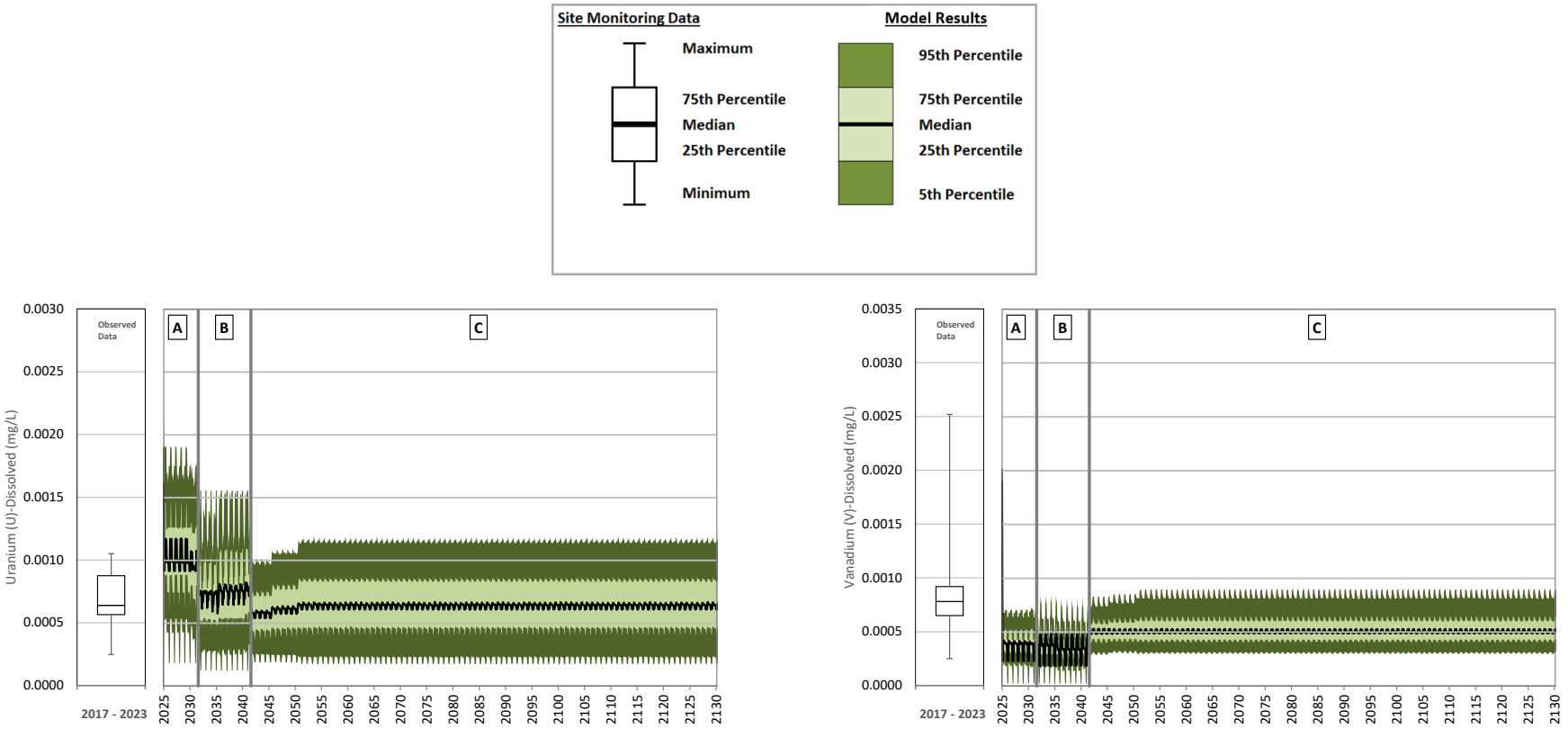
Figure B-314: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved titanium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for dissolved titanium than the disturbed runoff water quality inputs.

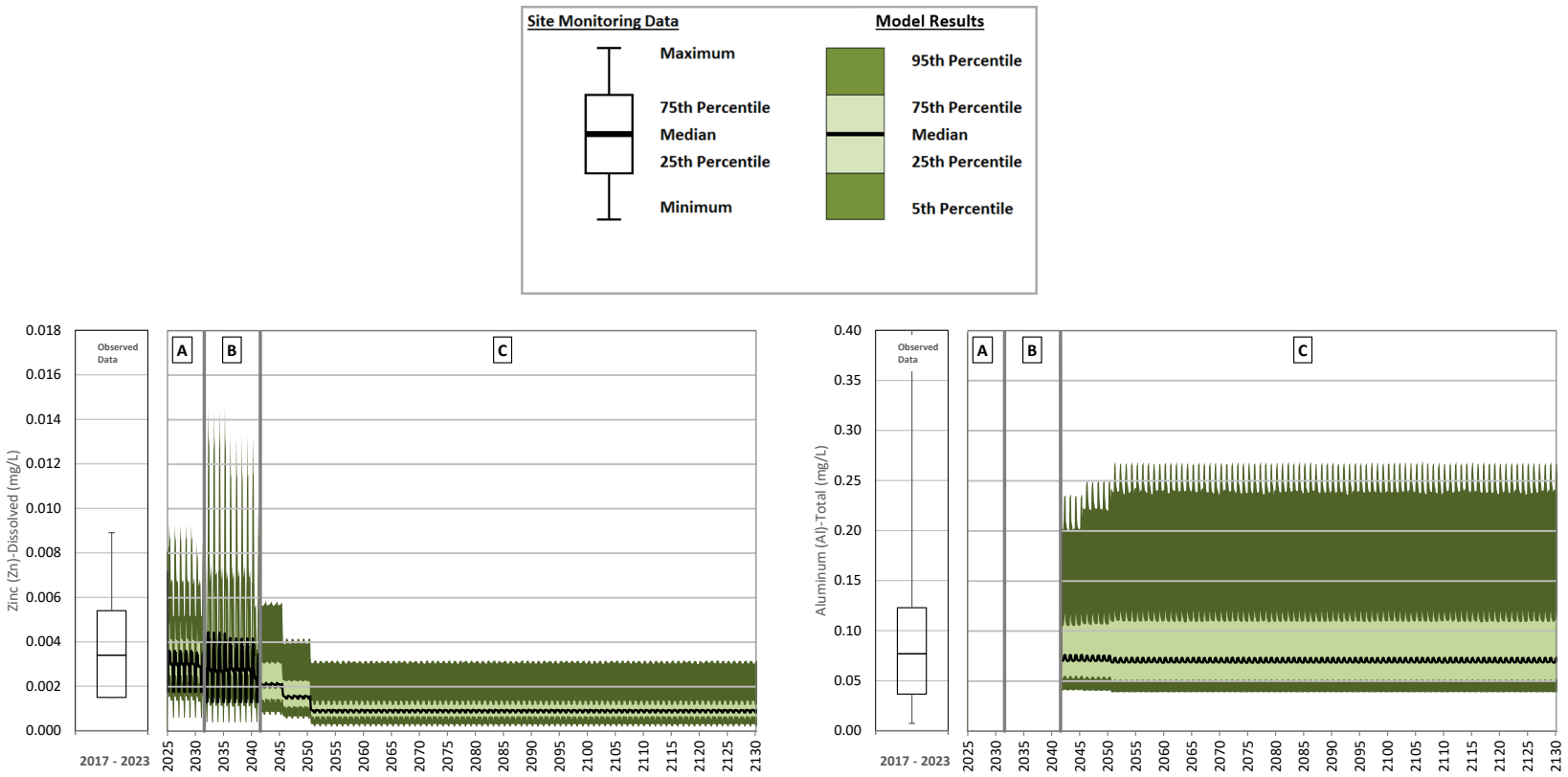
Figure B-315: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved uranium and dissolved vanadium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved uranium and vanadium than the disturbed runoff water quality inputs.

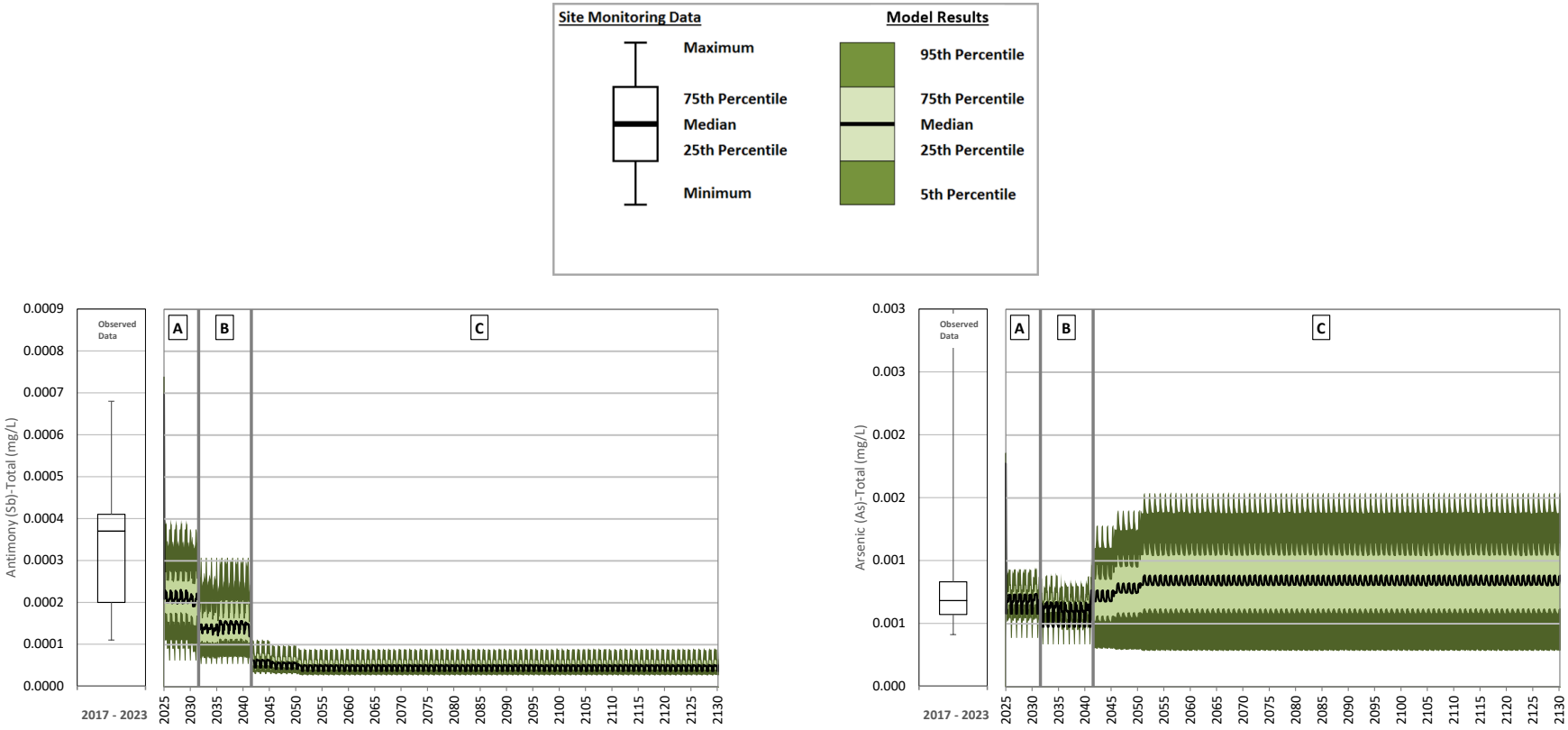
Figure B-316: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete. Total aluminum concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total aluminum than the disturbed runoff and NAG waste rock water quality inputs.

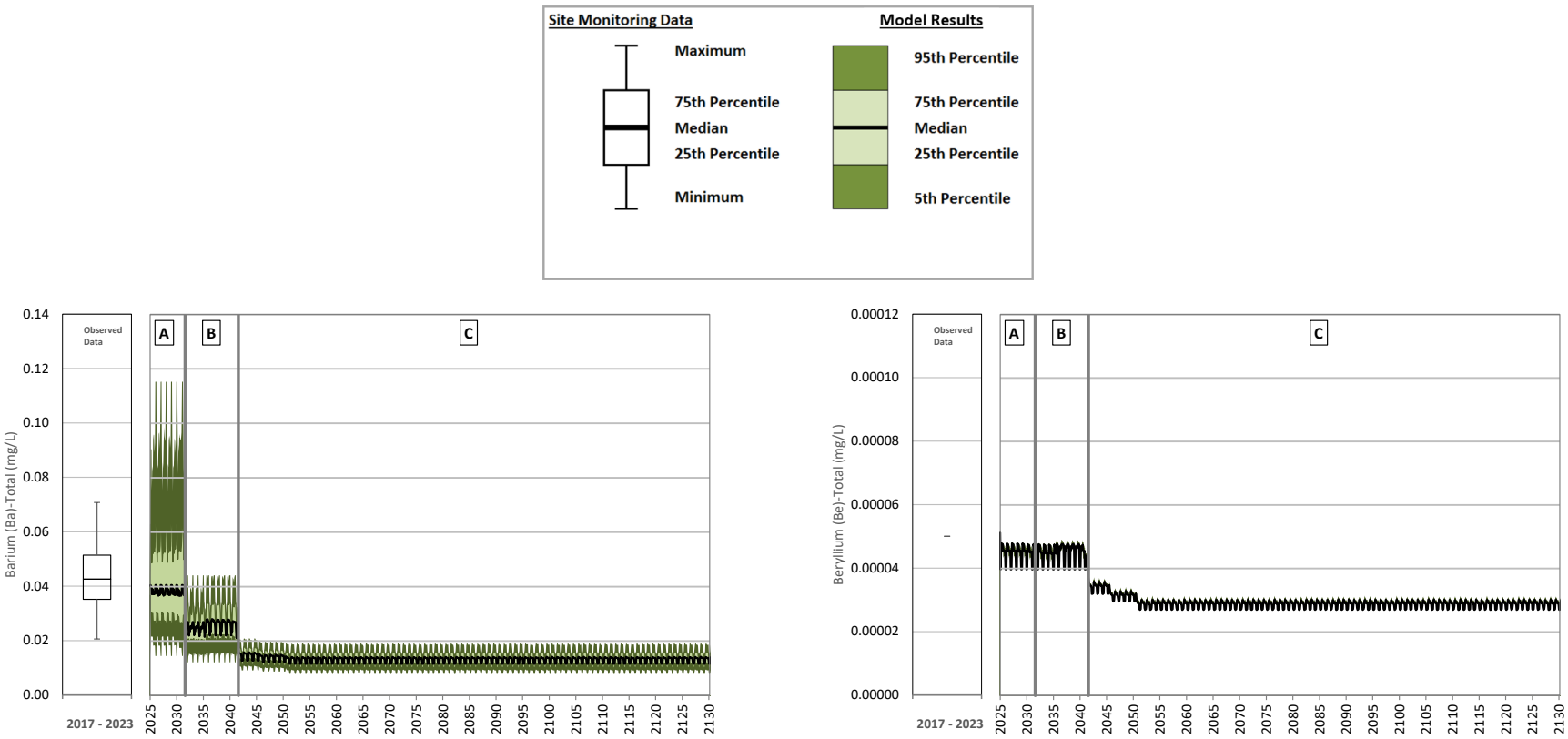
Figure B-317: Mine Drainage Creek Sump Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total arsenic concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total arsenic than the disturbed runoff water quality inputs.

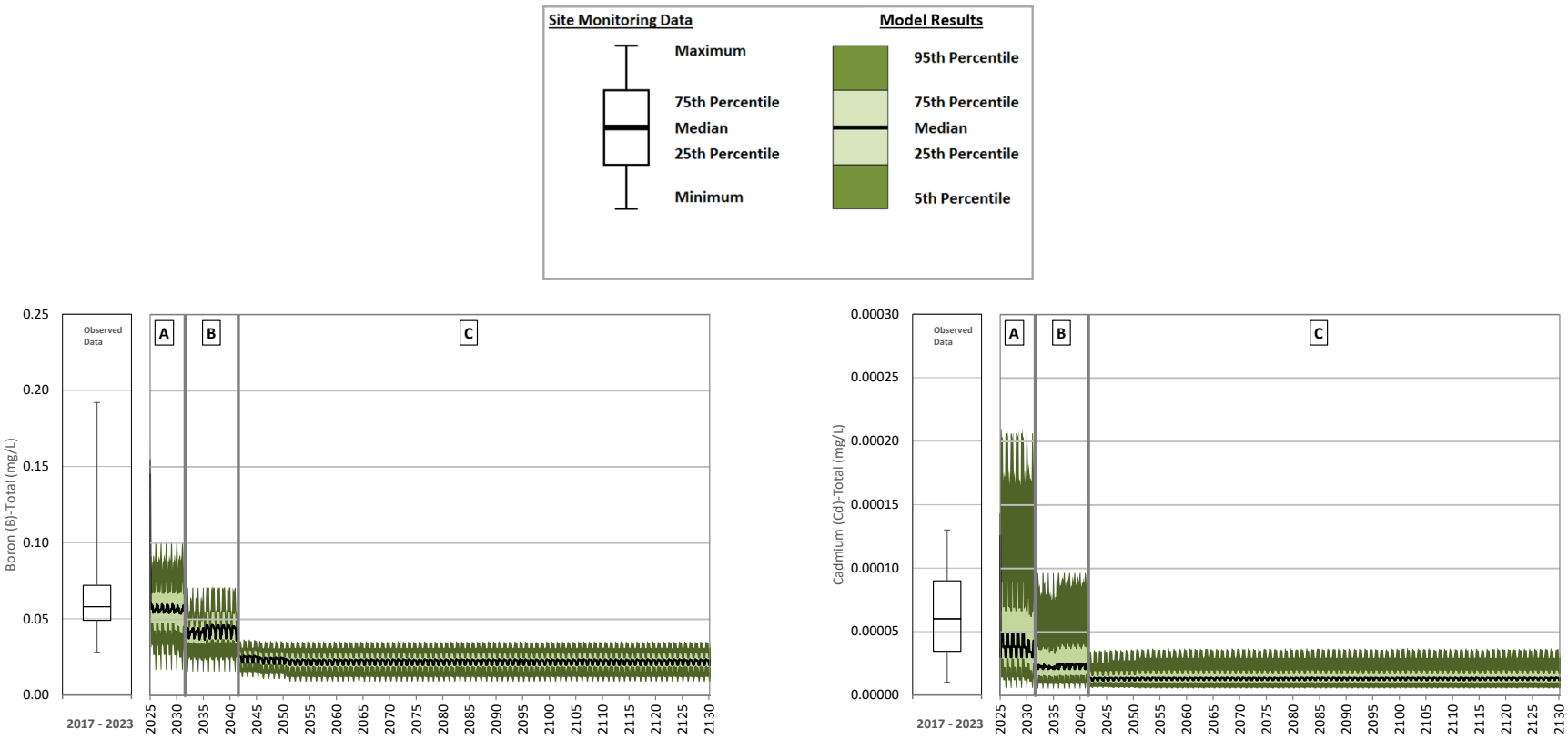
Figure B-318: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

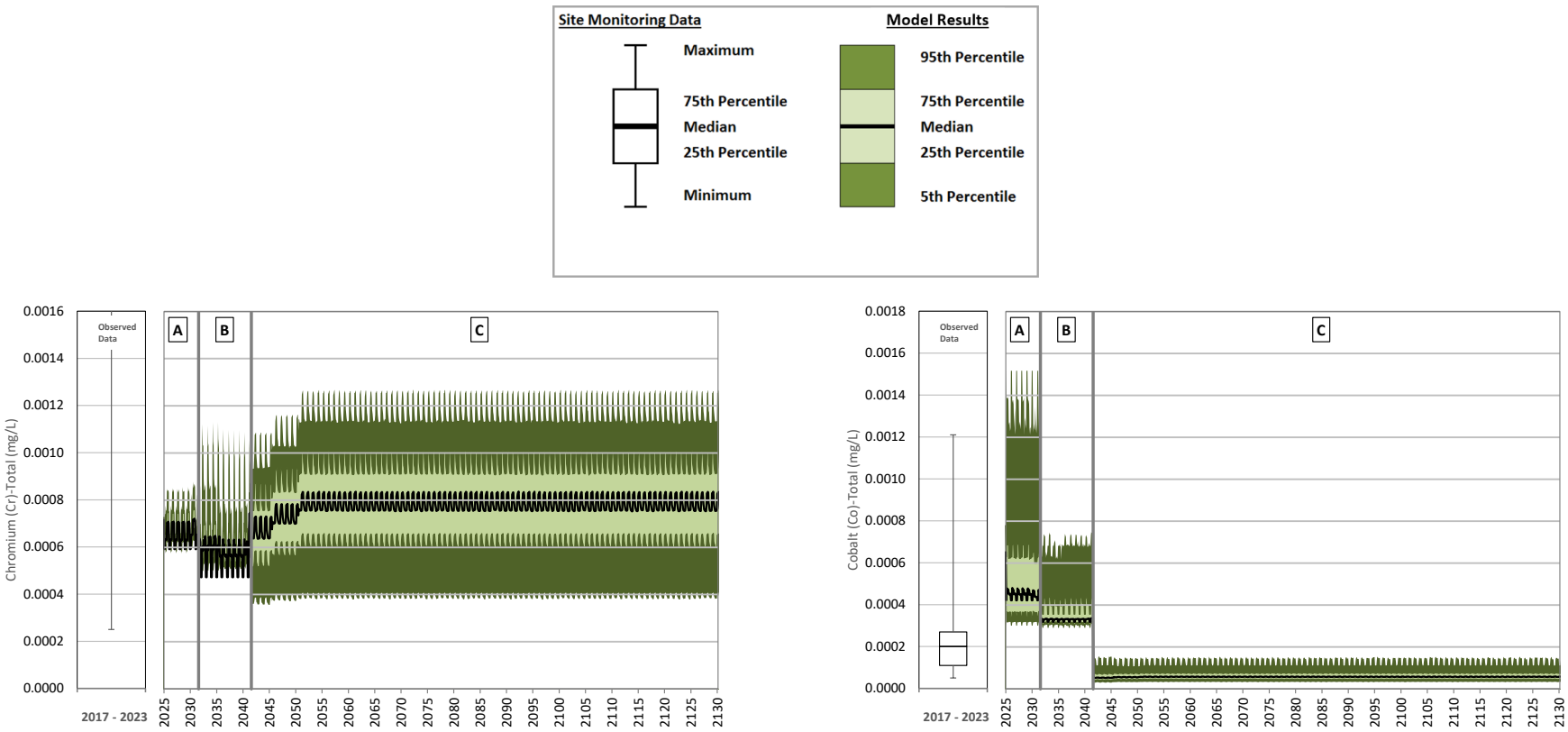
Figure B-319: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

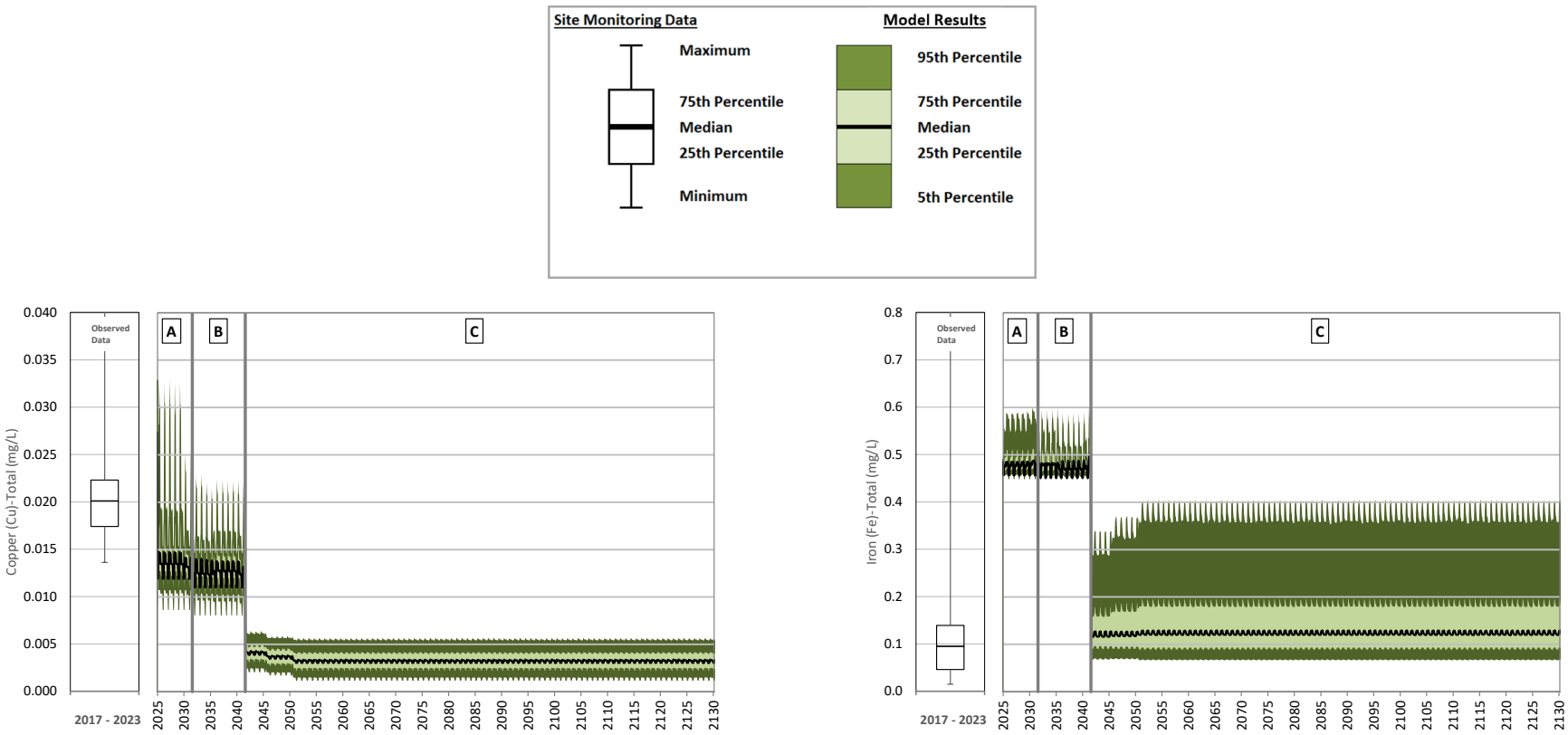
Figure B-320: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total chromium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the disturbed runoff and NAG waste rock water quality inputs.

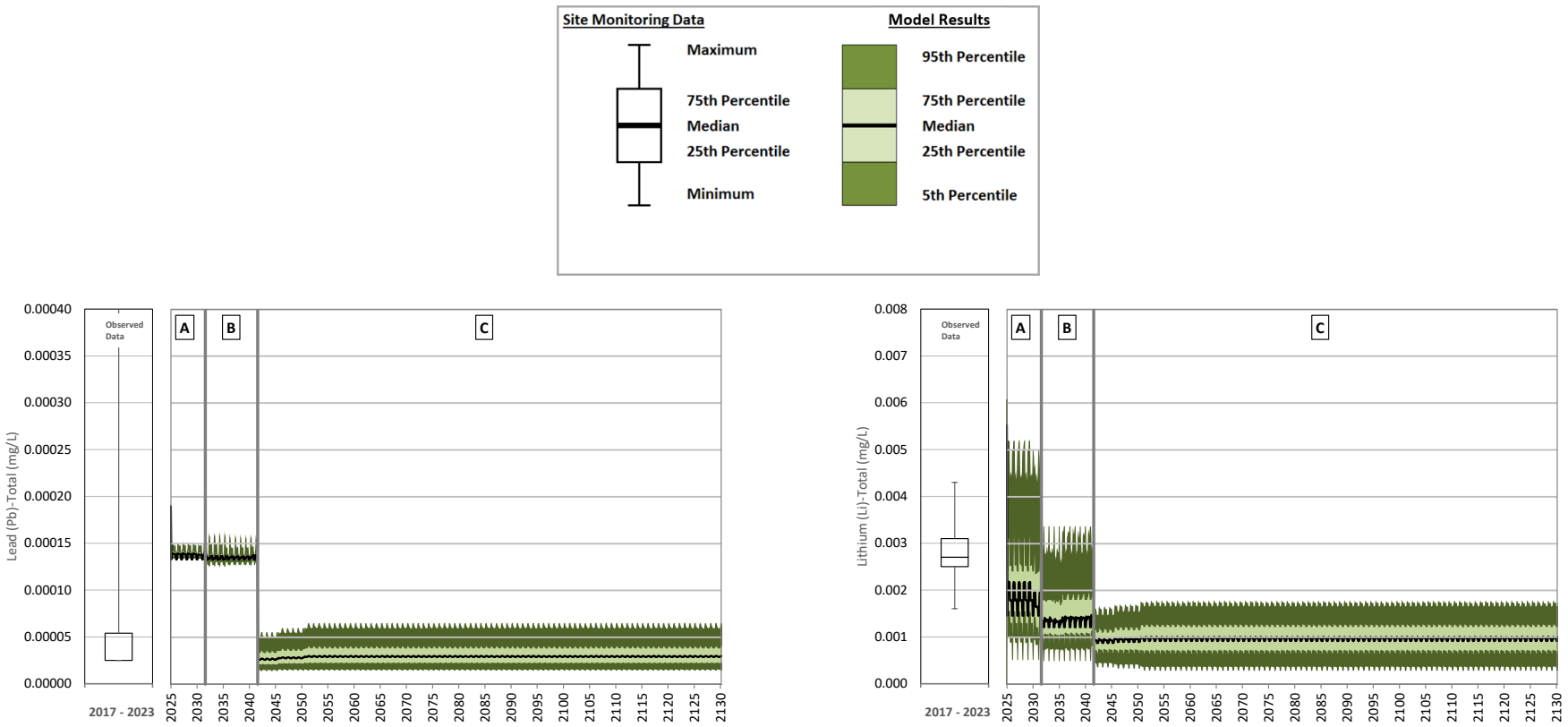
Figure B-321: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total iron concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total iron than the disturbed runoff water quality inputs.

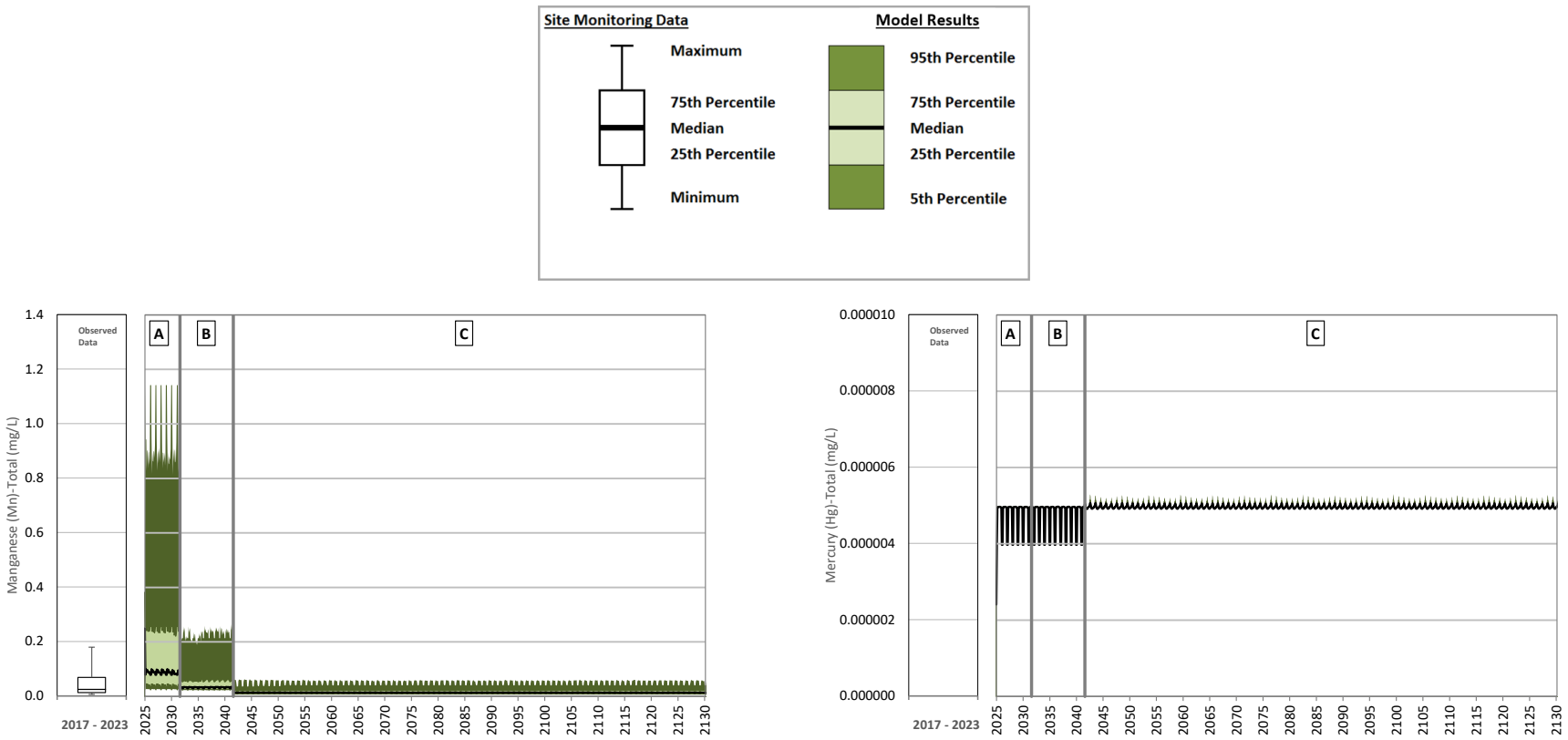
Figure B-322: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total lead and lithium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total lead and lithium than the disturbed runoff water quality inputs.

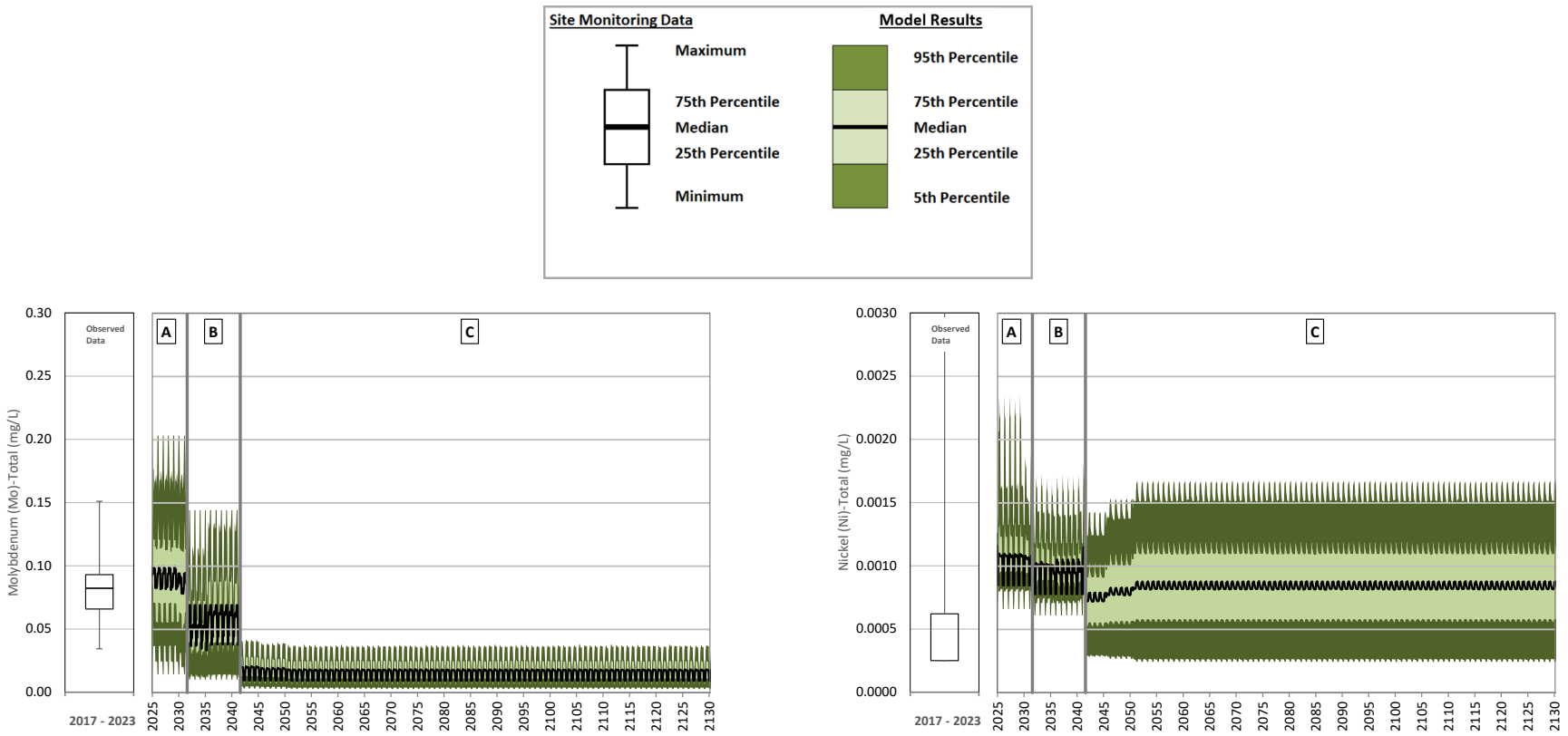
Figure B-323: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

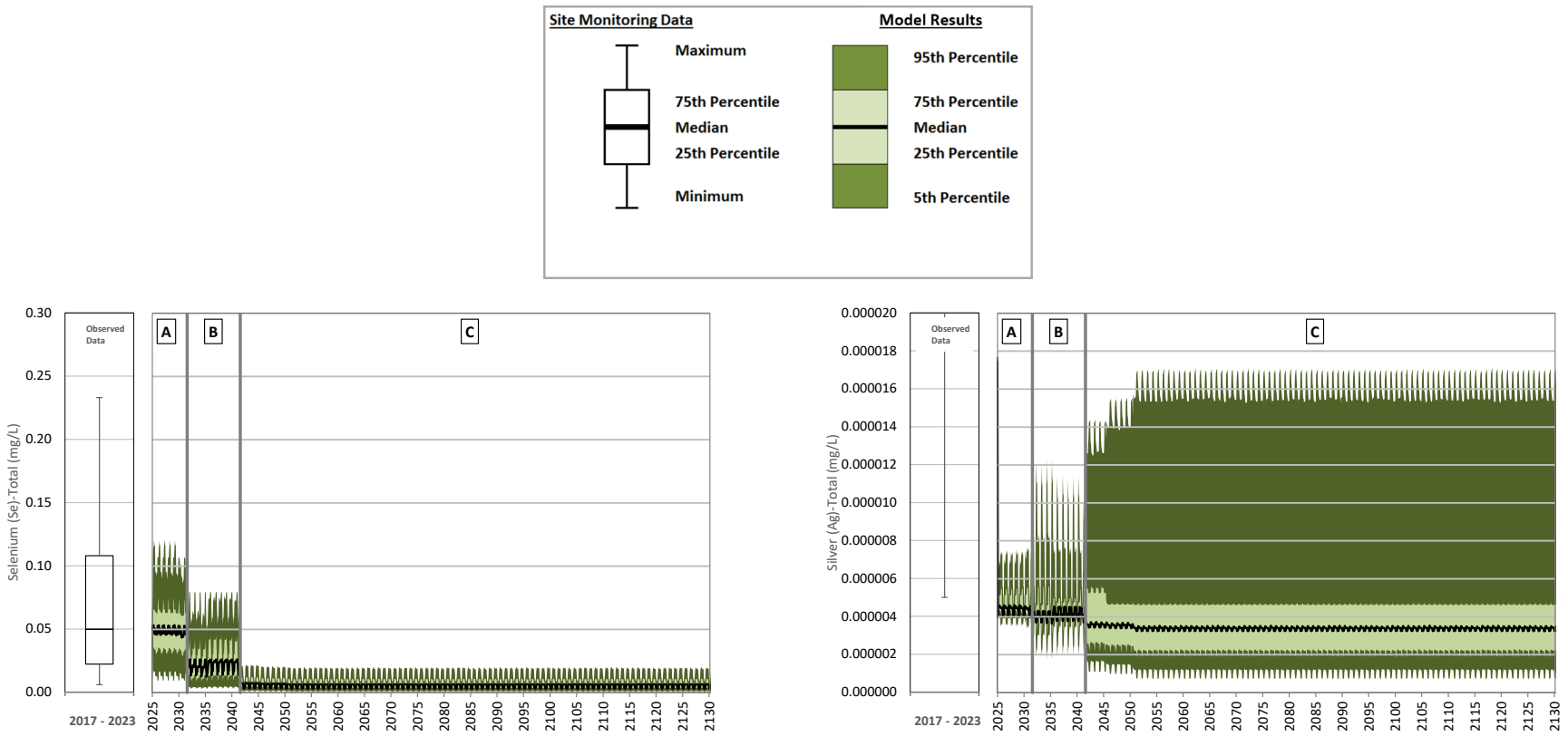
Figure B-324: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total nickel concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the disturbed runoff water quality inputs.

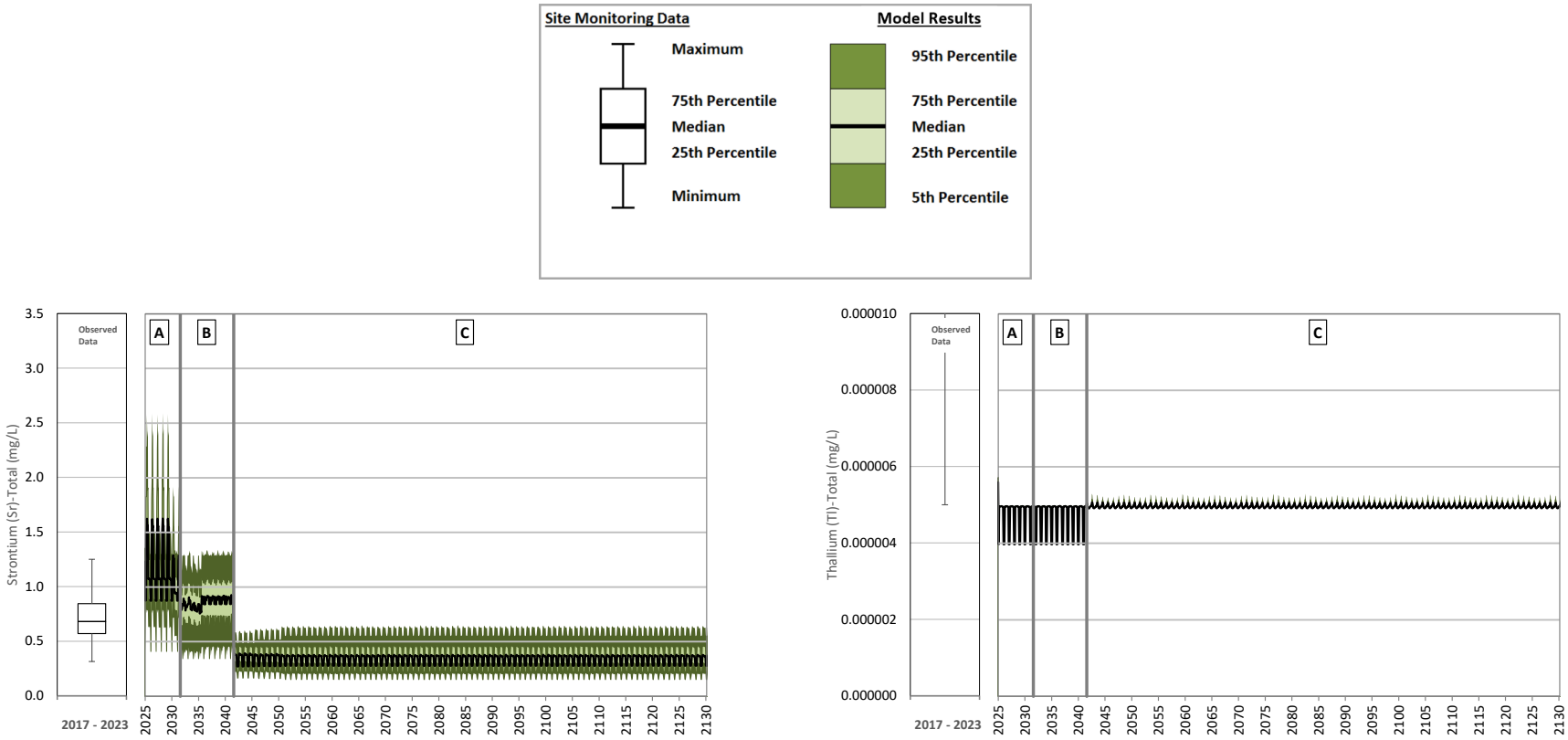
Figure B-325: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total silver concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the disturbed runoff water quality inputs.

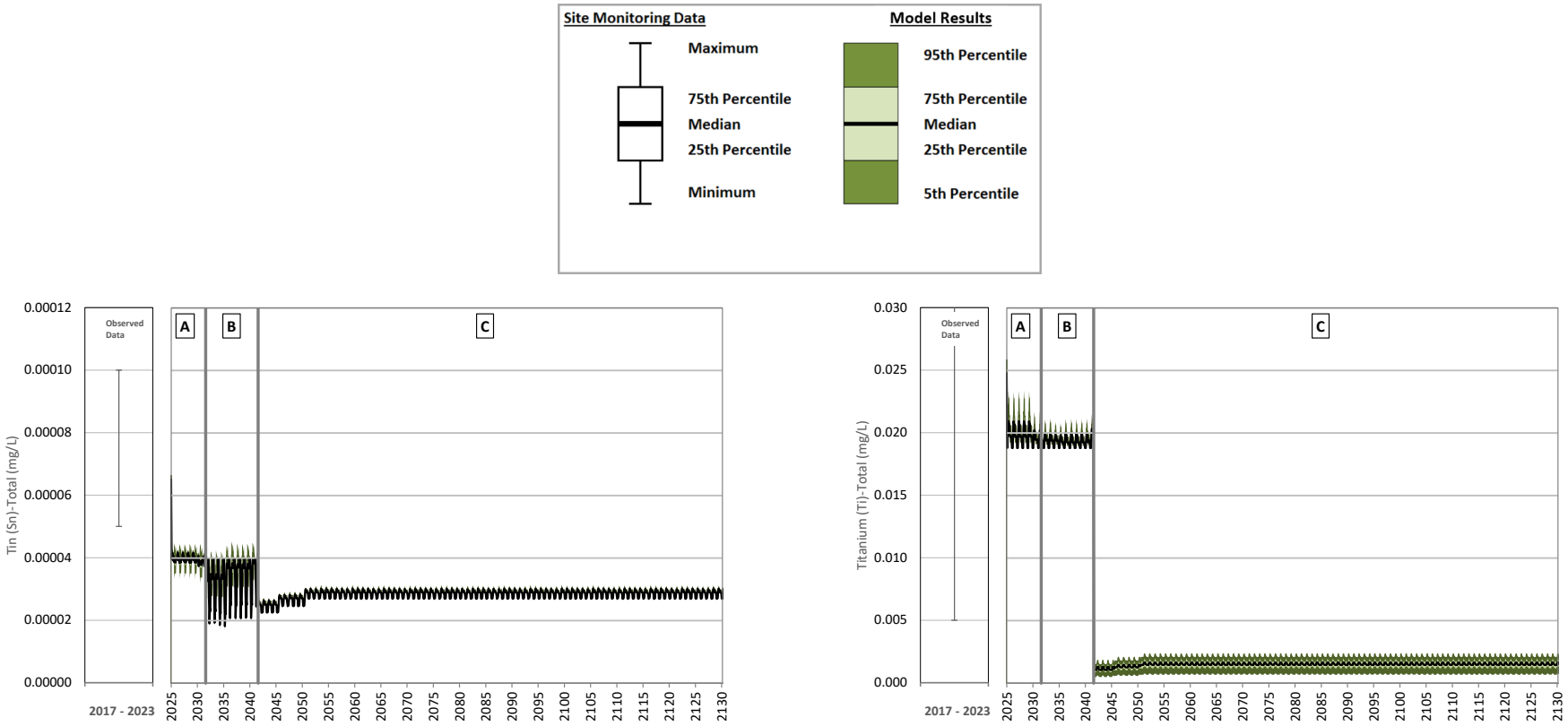
Figure B-326: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas.

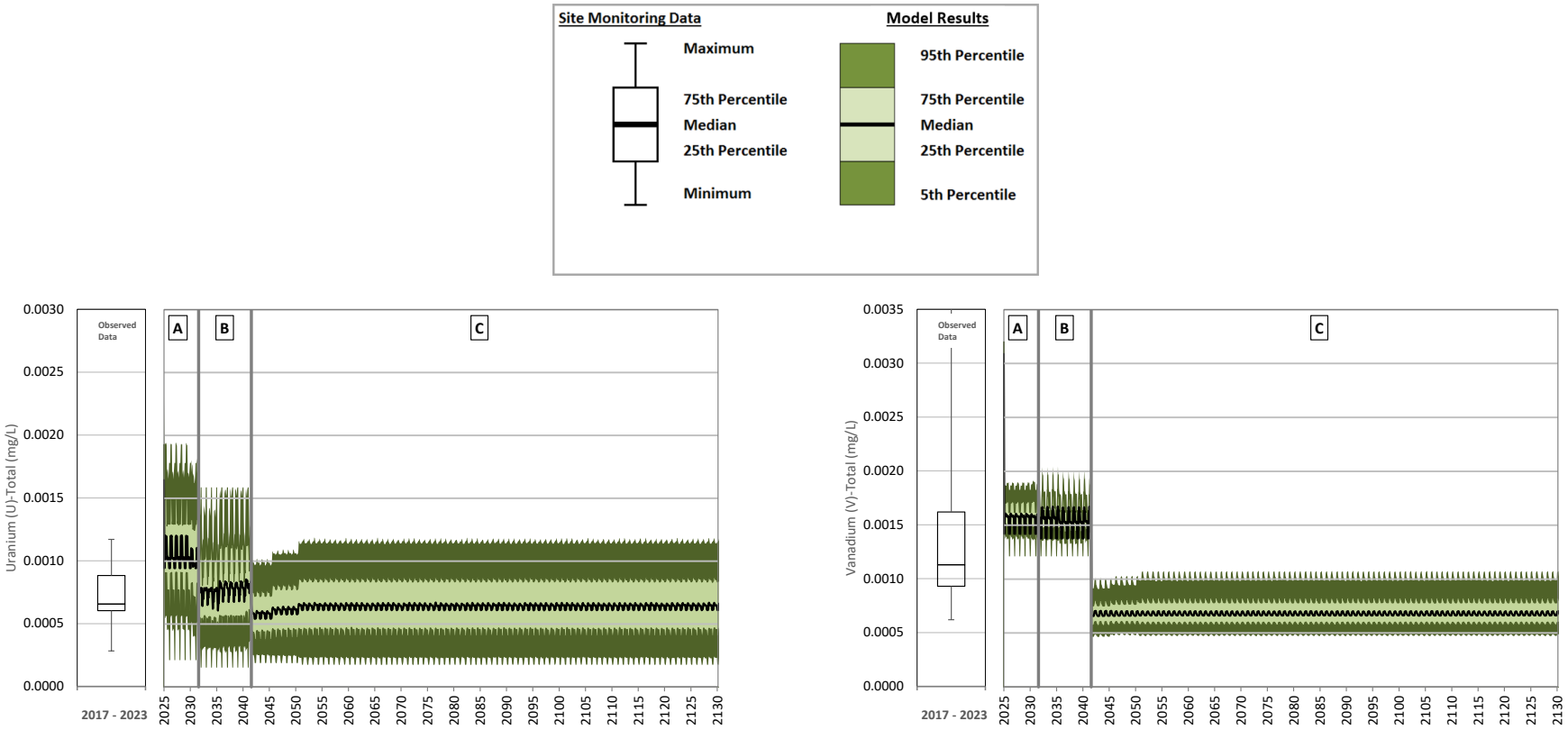
Figure B-327: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total titanium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total titanium than the disturbed runoff water quality inputs.

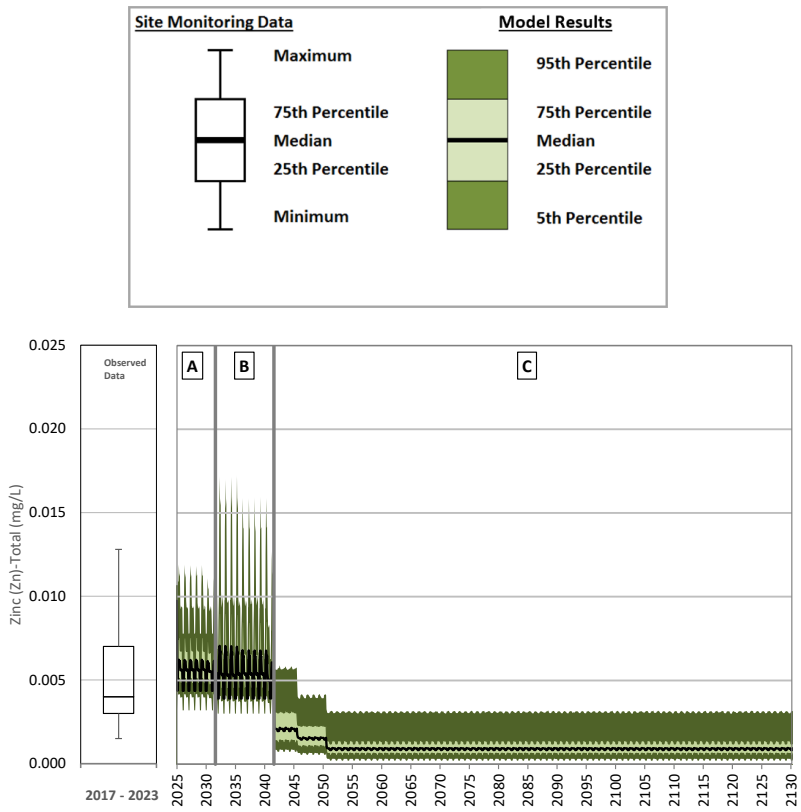
Figure B-328: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total uranium and total vanadium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total uranium and total vanadium than the disturbed runoff water quality inputs.

Figure B-329: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Uranium and Total Vanadium

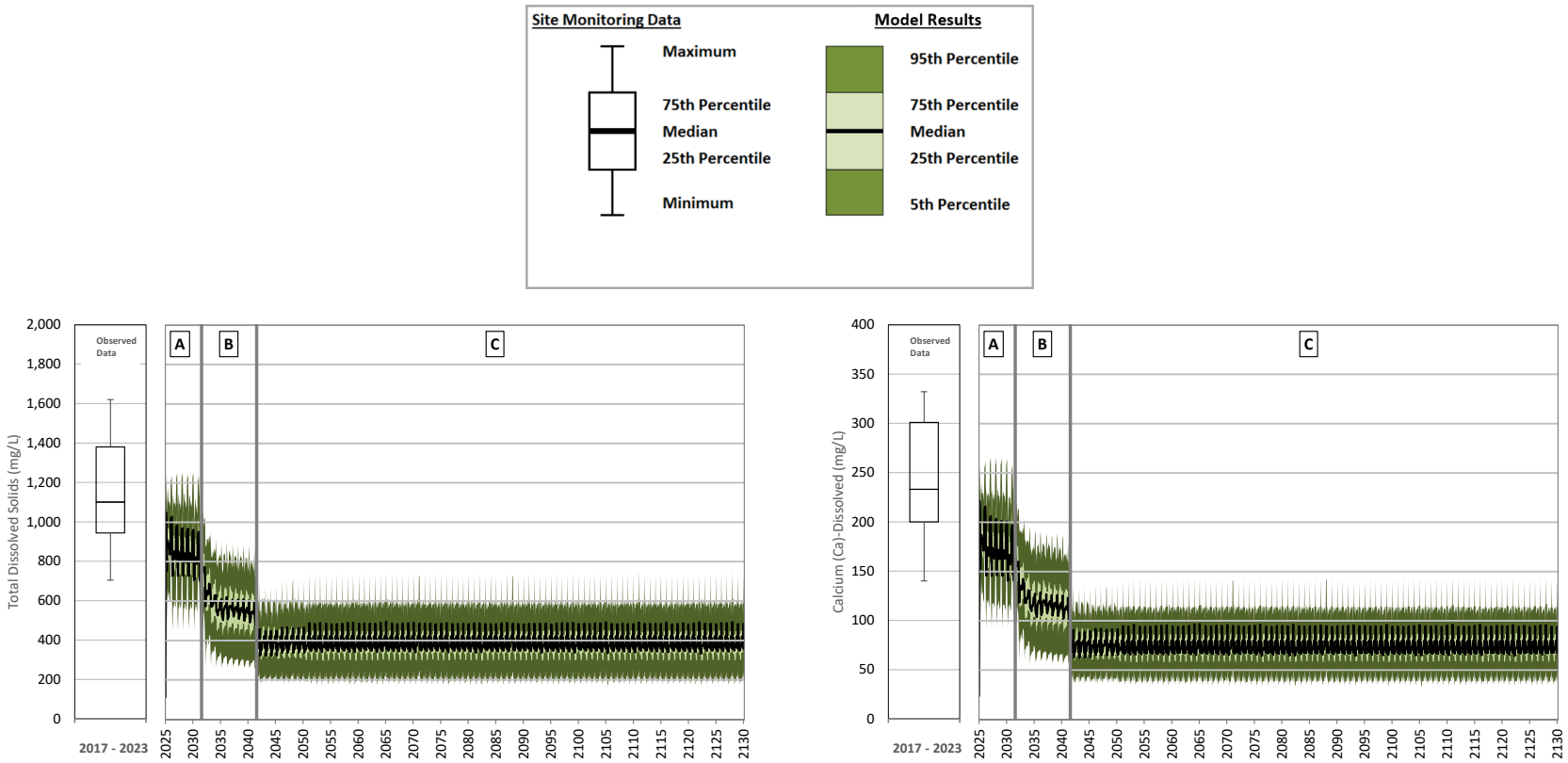


A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-330: Mine Drainage Creek Sump Operations, Closure and Post-closure – Total Zinc

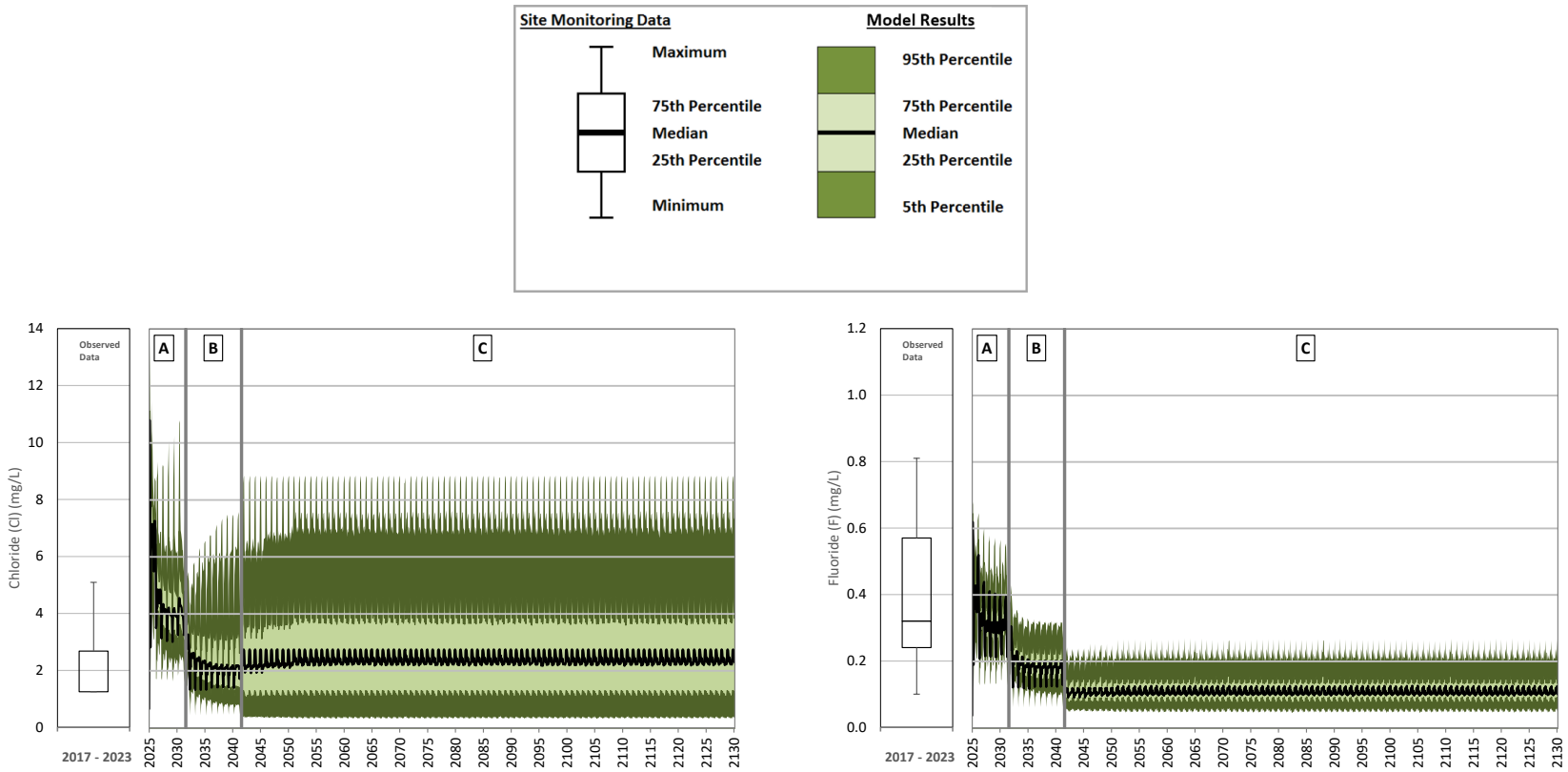
Long Ditch Operations, Closure and Post-closure



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

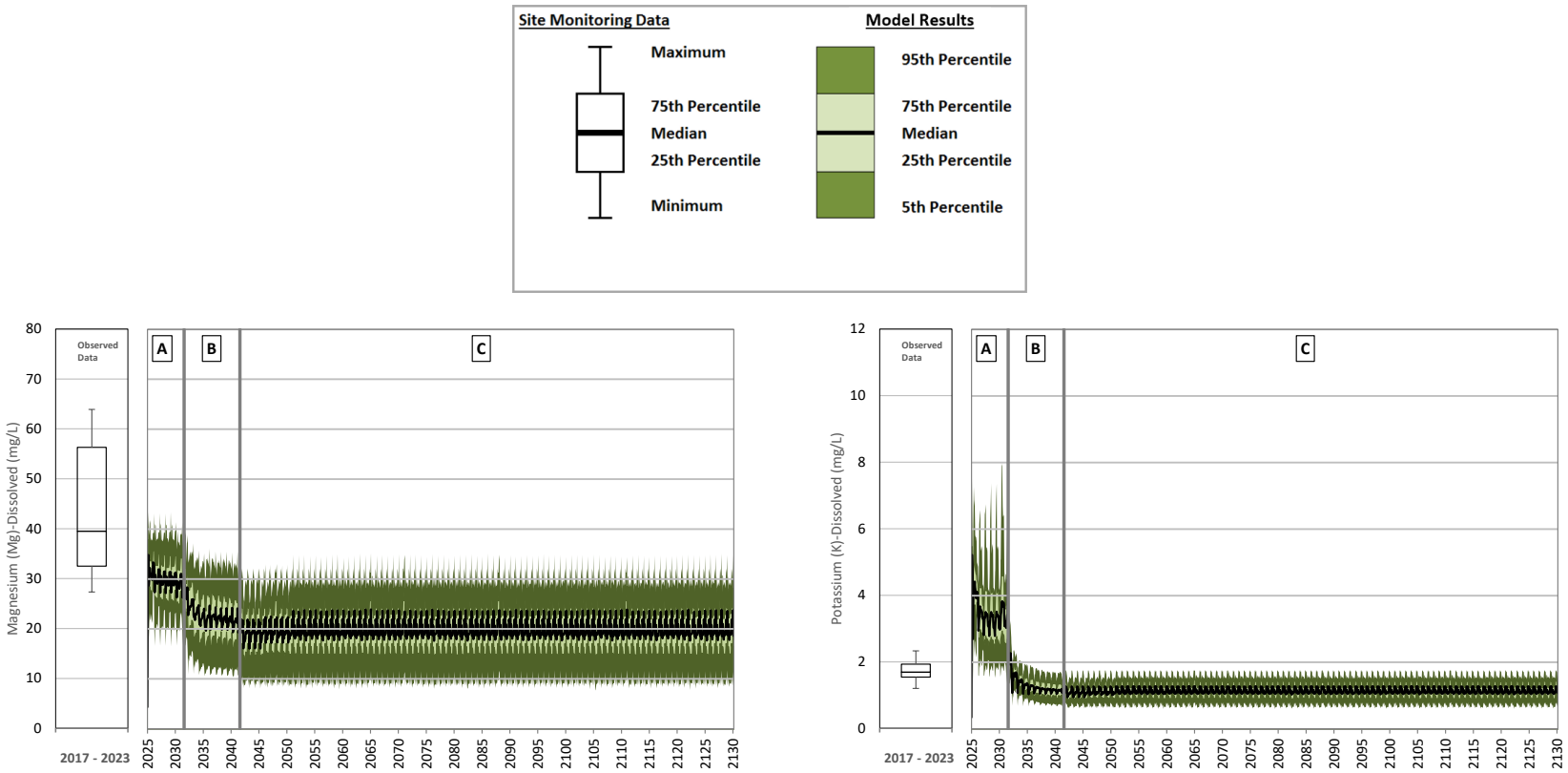
Figure B-331: Long Ditch Operations, Closure and Post-closure – Total Dissolved Solids and Calcium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Chloride and fluoride concentrations increase from closure to post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for chloride and fluoride than the disturbed runoff water quality inputs.

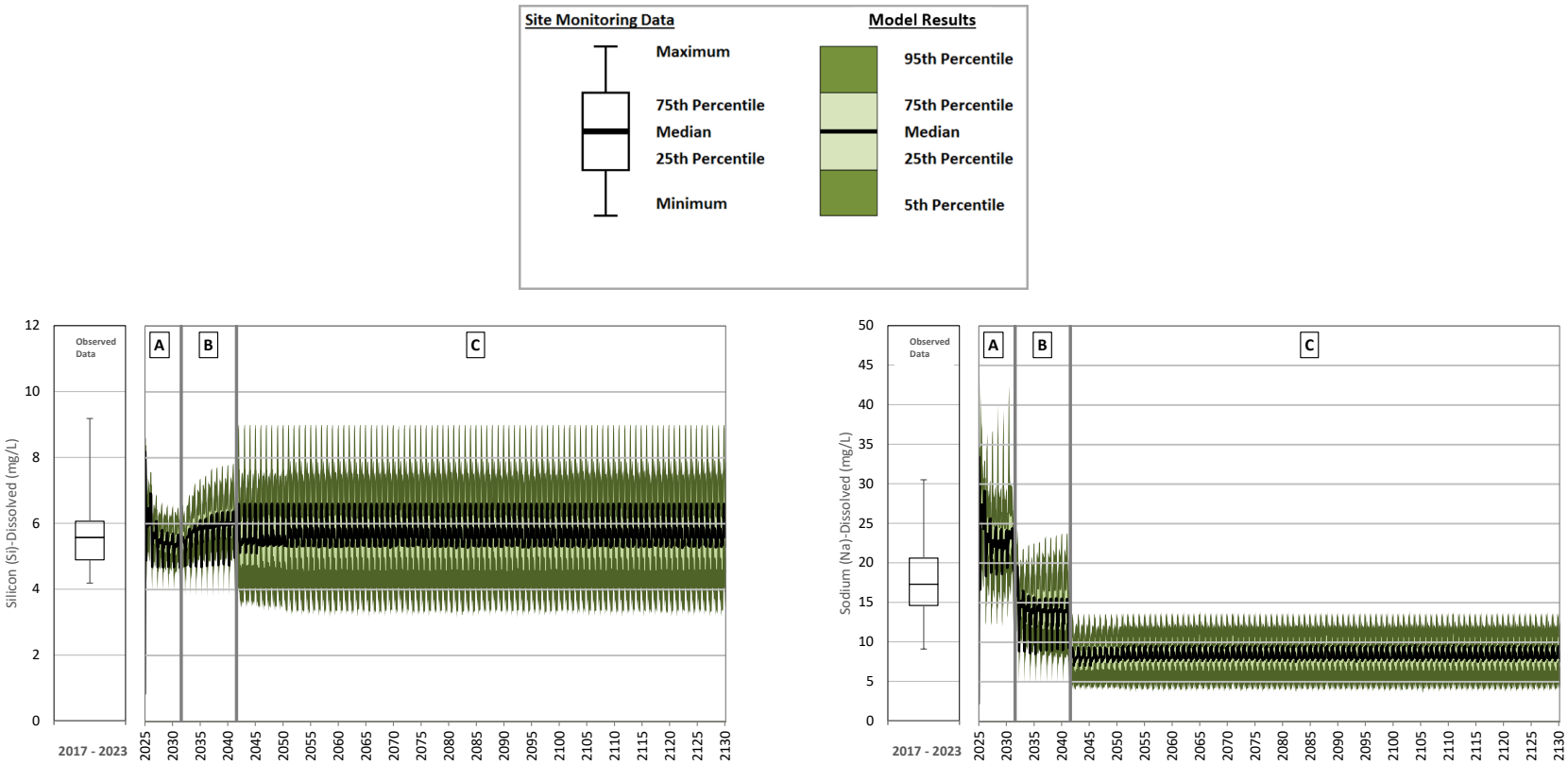
Figure B-332: Long Ditch Operations, Closure and Post-closure – Chloride and Fluoride



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Magnesium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for magnesium than the disturbed runoff water quality inputs.

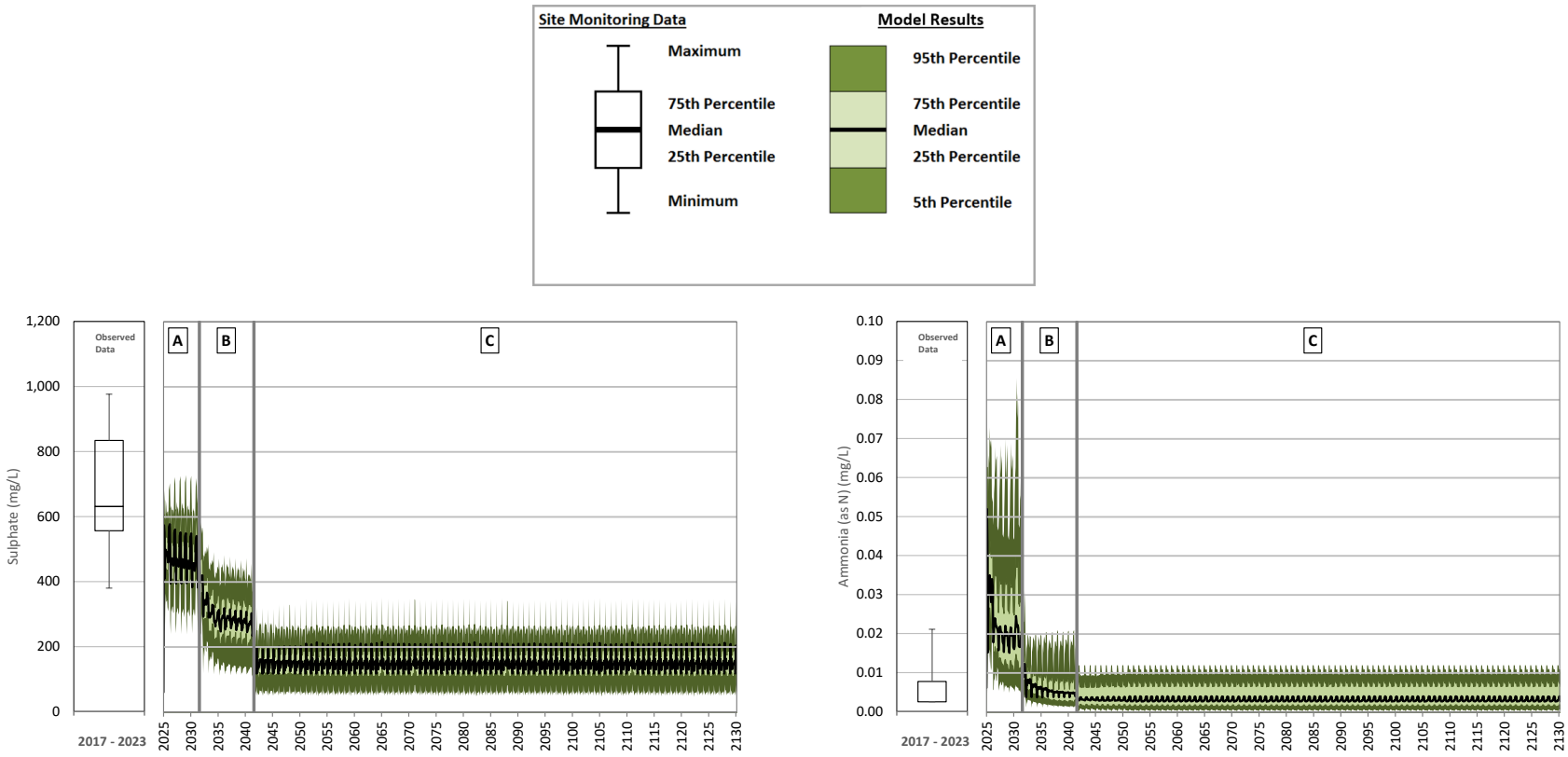
Figure B-333: Long Ditch Operations, Closure and Post-closure – Magnesium and Potassium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Silicon concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for silicon than the disturbed runoff water quality inputs.

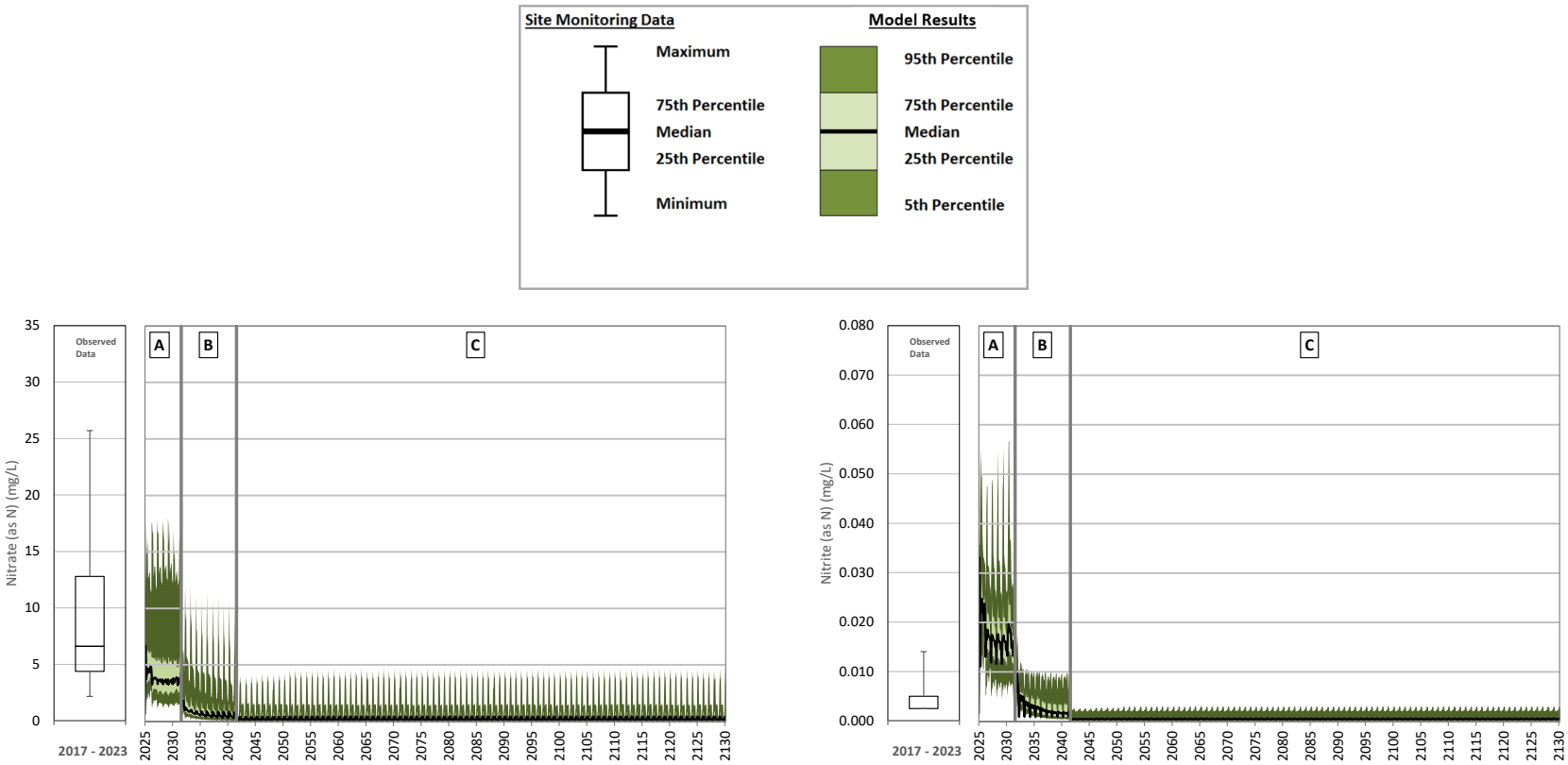
Figure B-334: Long Ditch Operations, Closure and Post-closure – Silicon and Sodium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total ammonia concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total ammonia than the disturbed runoff water quality inputs.

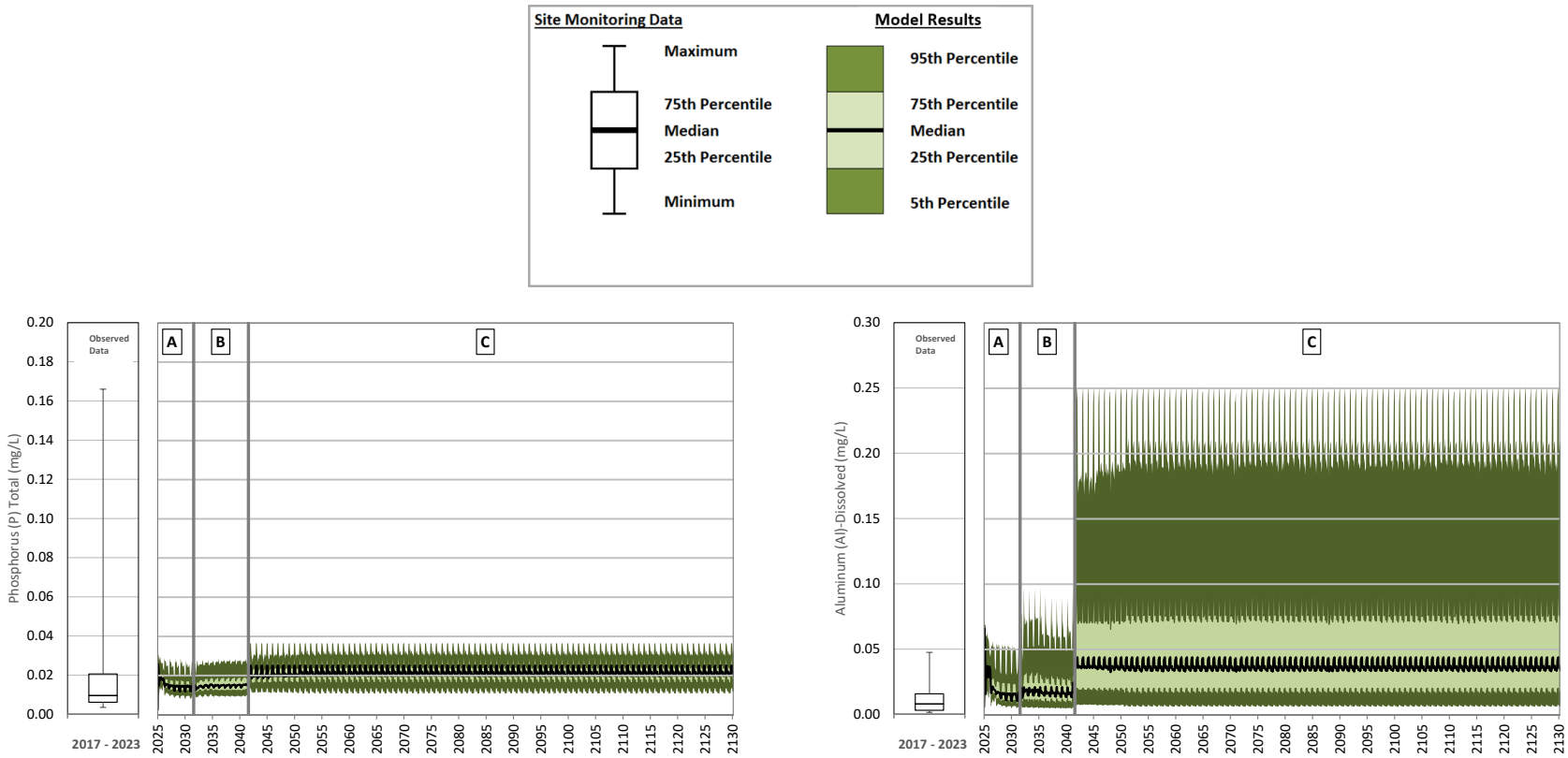
Figure B-335: Long Ditch Operations, Closure and Post-closure – Sulphate and Total Ammonia



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

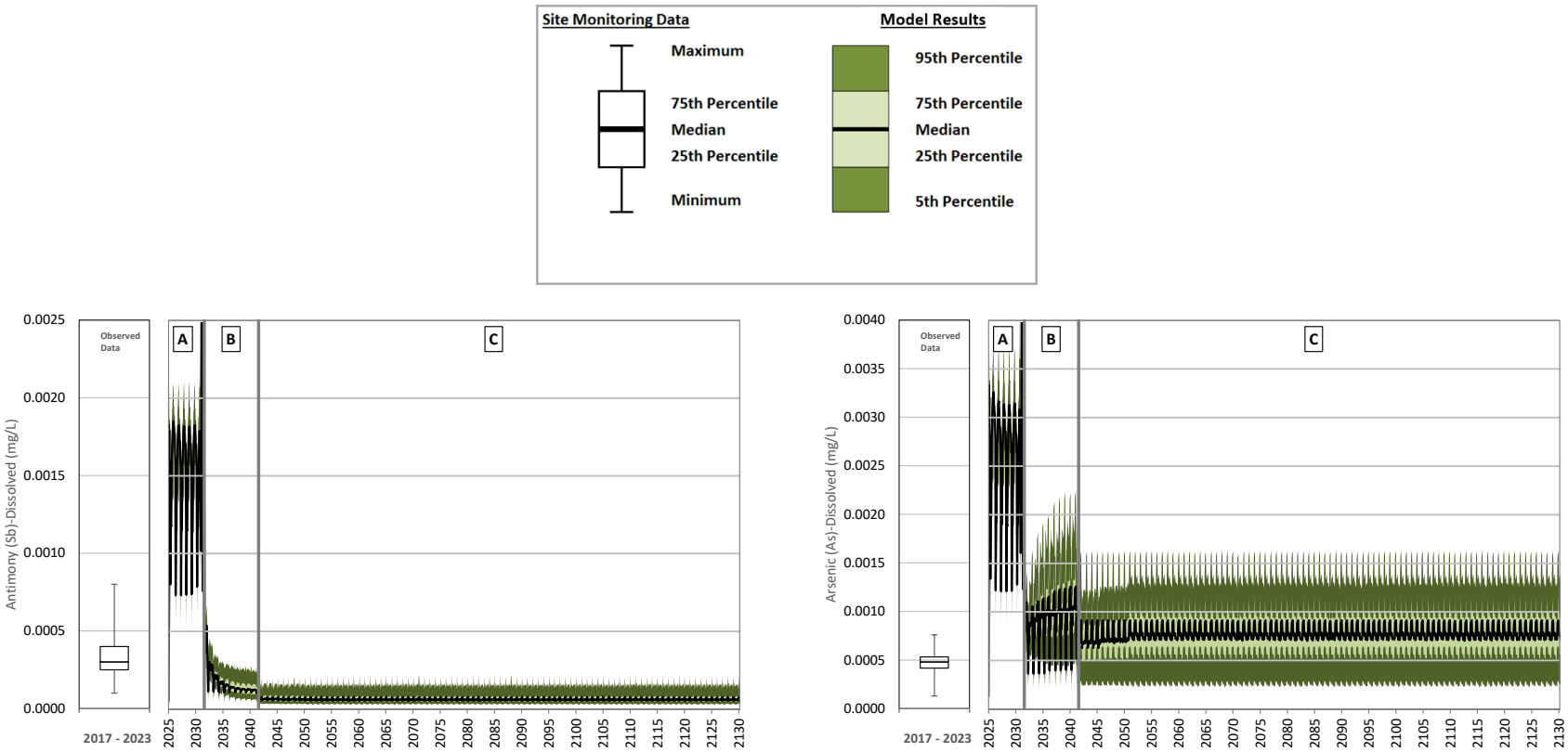
Figure B-336: Long Ditch Operations, Closure and Post-closure – Nitrate and Nitrite



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total phosphorus and dissolved aluminum concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total phosphorus and dissolved aluminum than the disturbed runoff and NAG waste rock water quality inputs.

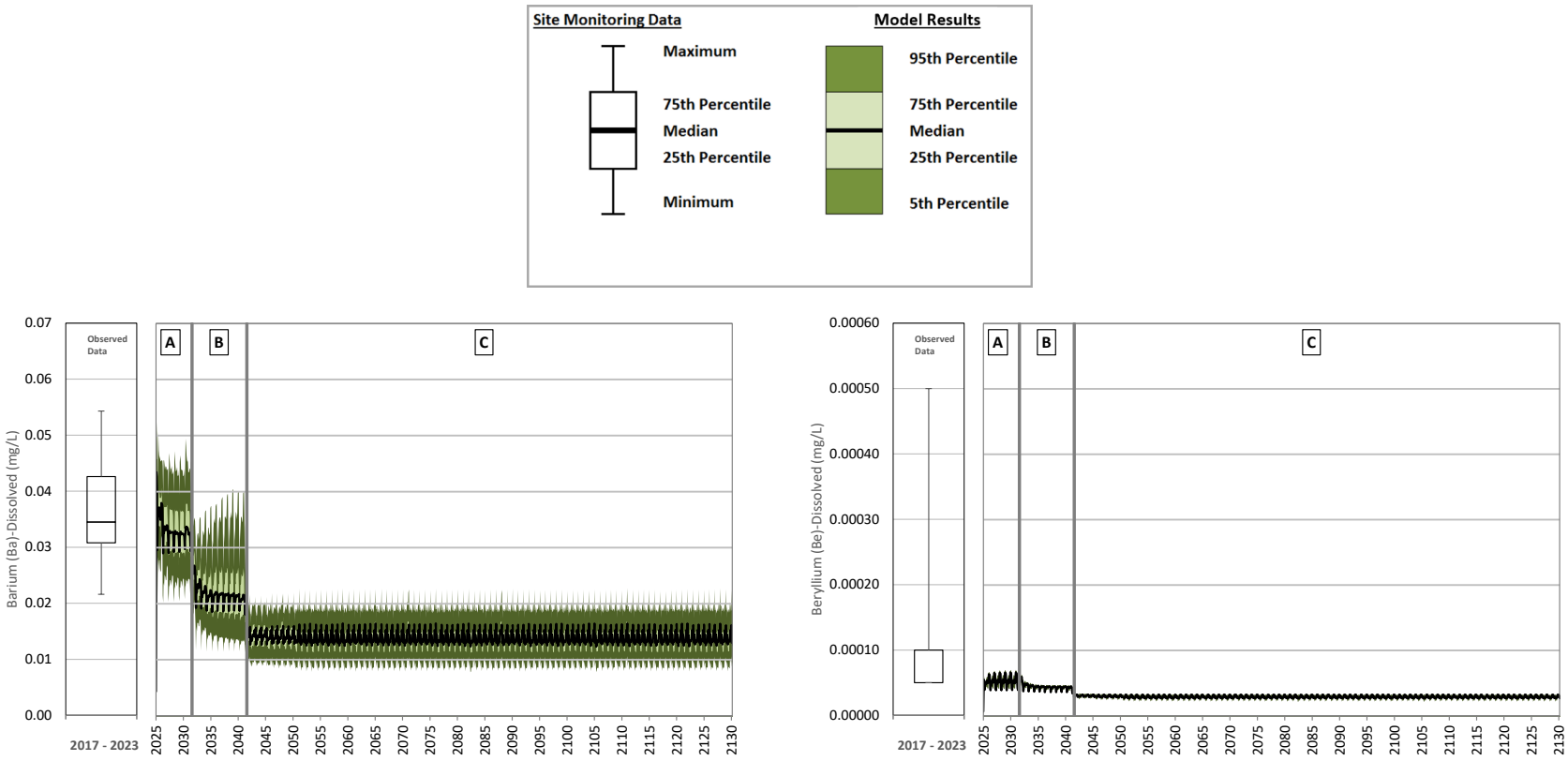
Figure B-337: Long Ditch Operations, Closure and Post-closure – Total Phosphorus and Dissolved Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved arsenic concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved arsenic than the disturbed runoff water quality inputs.

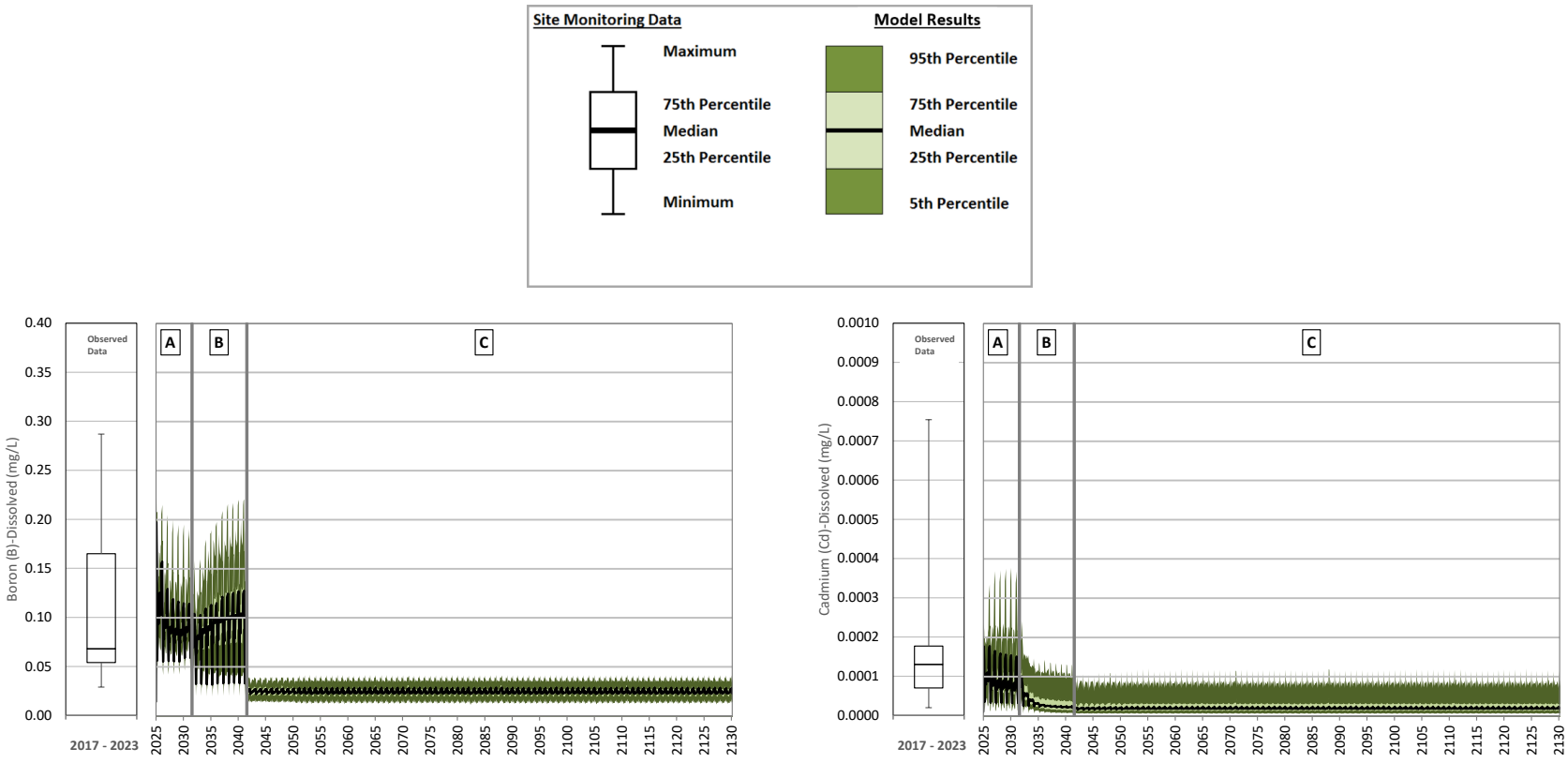
Figure B-338: Long Ditch Operations, Closure and Post-closure – Dissolved Antimony and Dissolved Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

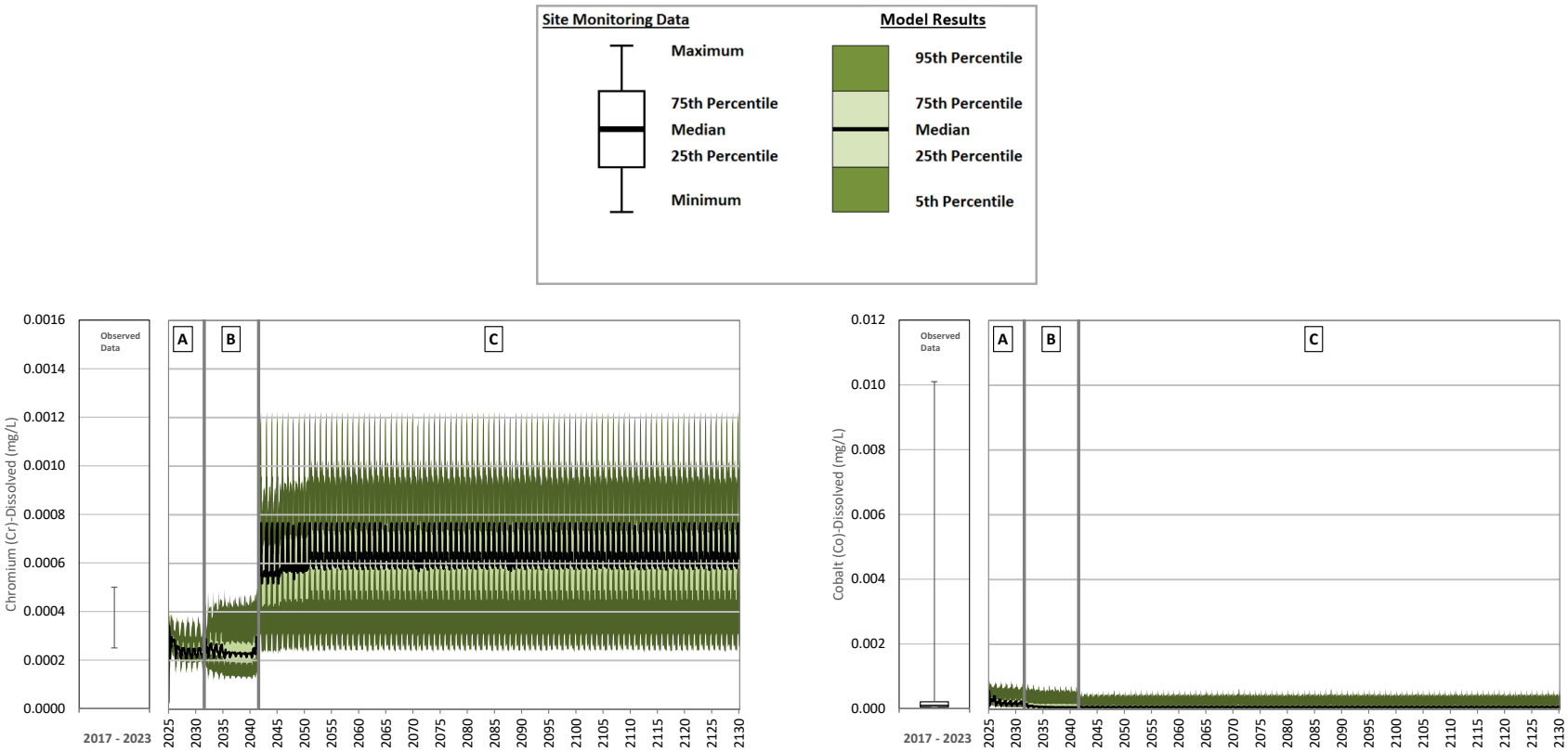
Figure B-339: Long Ditch Operations, Closure and Post-closure – Dissolved Barium and Dissolved Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

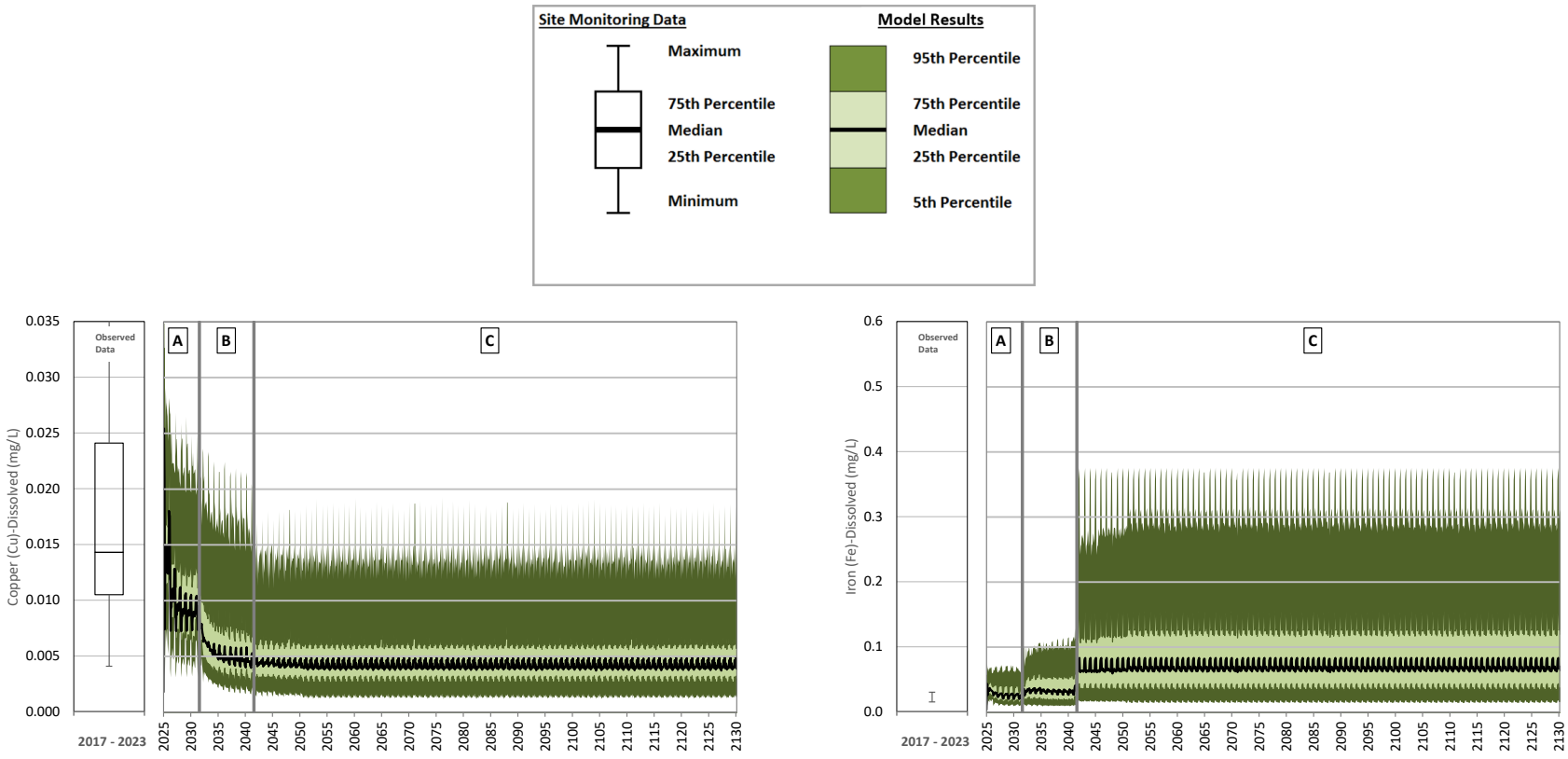
Figure B-340: Long Ditch Operations, Closure and Post-closure – Dissolved Boron and Dissolved Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved chromium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved chromium than the disturbed runoff and NAG waste rock water quality inputs.

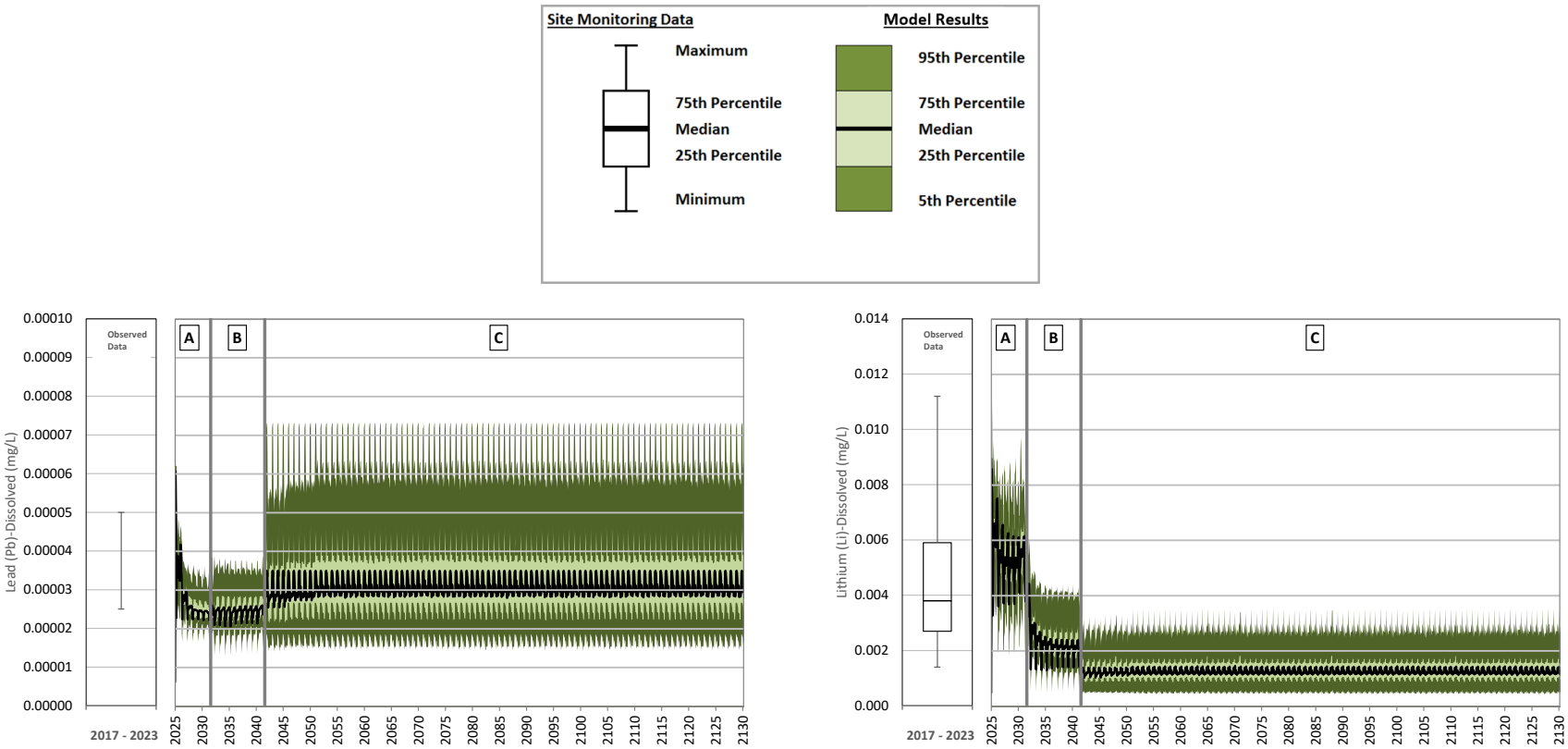
Figure B-341: Long Ditch Operations, Closure and Post-closure – Dissolved Chromium and Dissolved Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved iron concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved iron than the disturbed runoff water quality inputs.

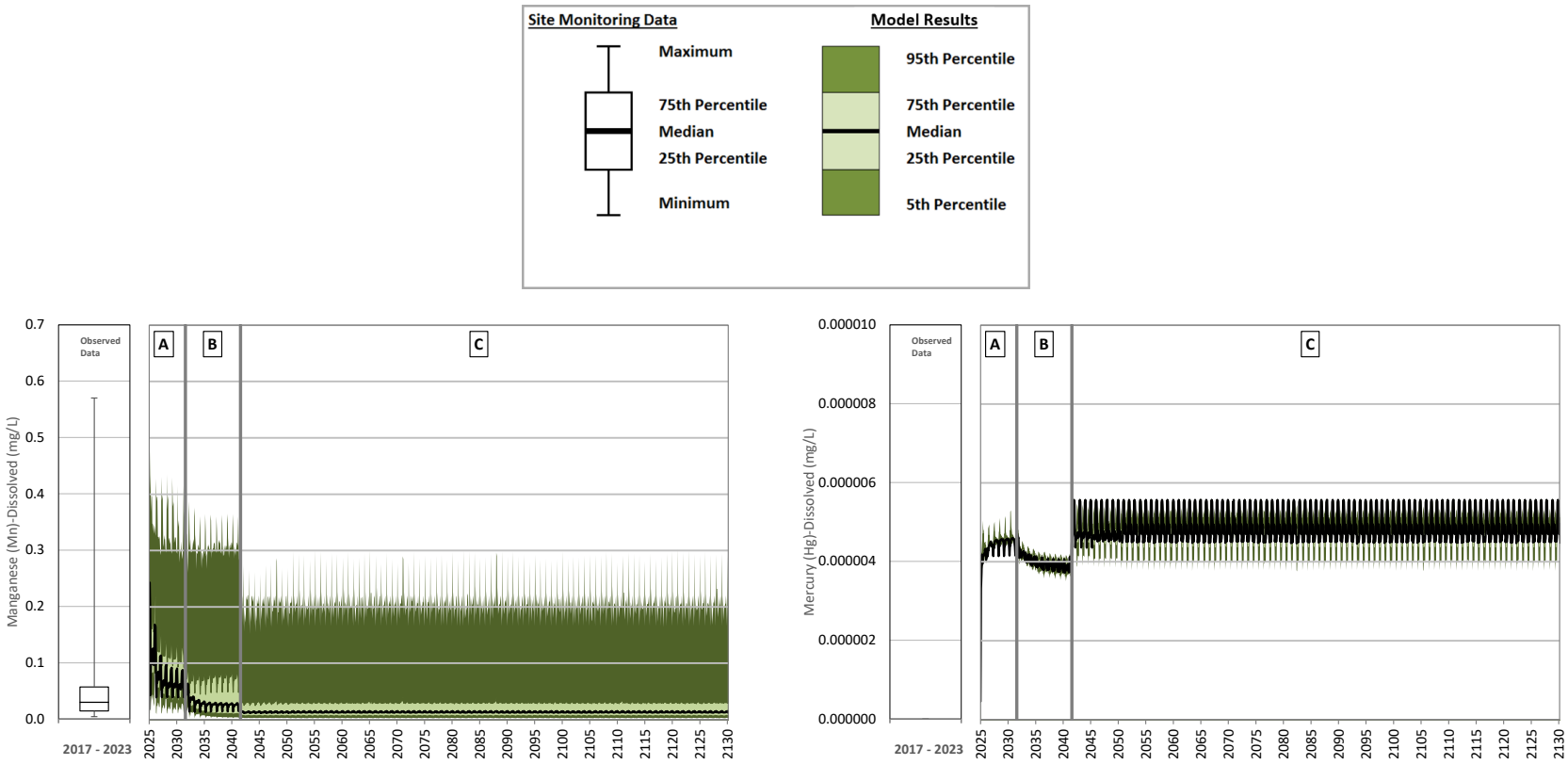
Figure B-342: Long Ditch Operations, Closure and Post-closure – Dissolved Copper and Dissolved Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved lead and lithium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for dissolved lead and lithium than the disturbed runoff water quality inputs.

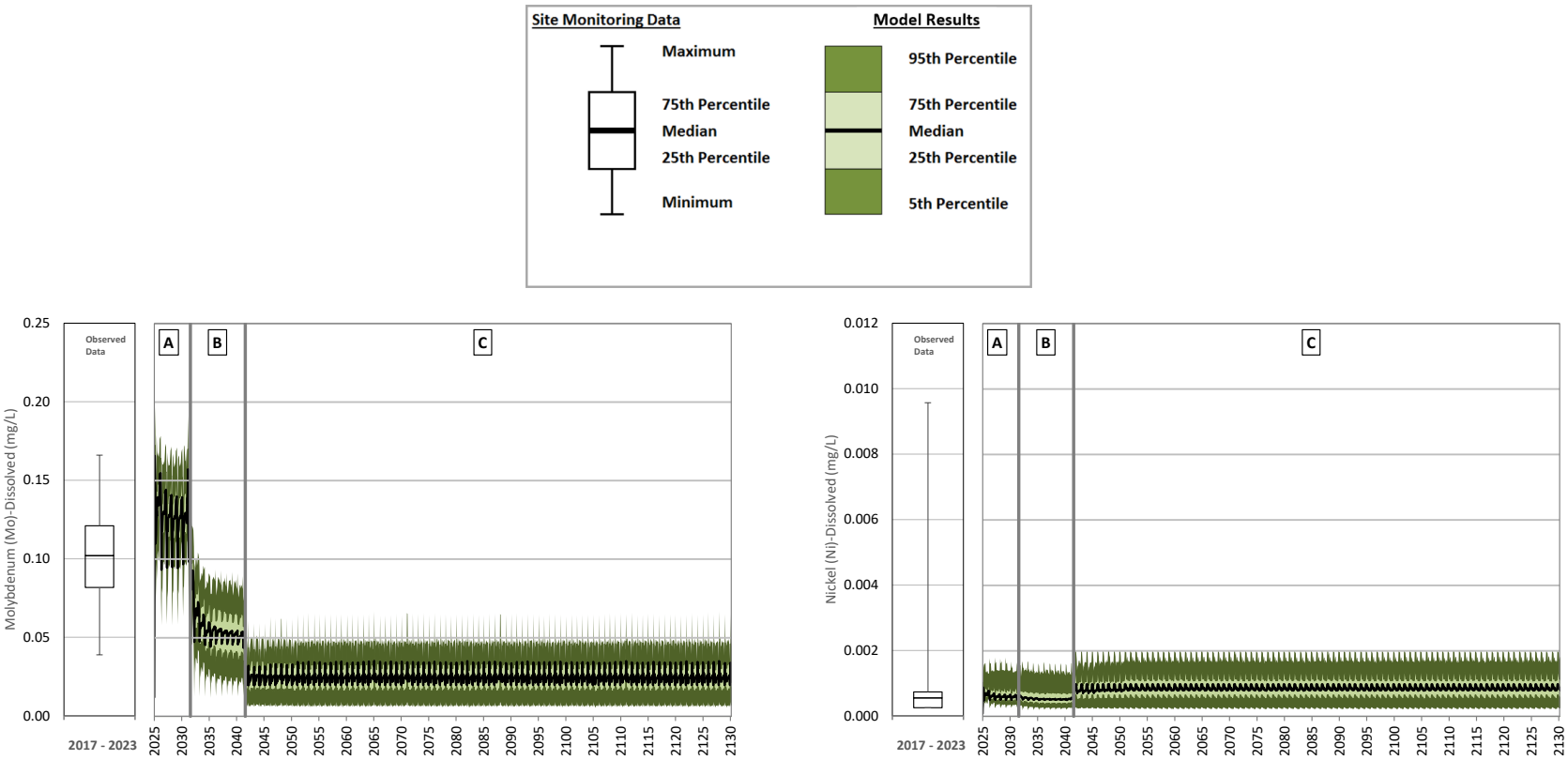
Figure B-343: Long Ditch Operations, Closure and Post-closure – Dissolved Lead and Dissolved Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

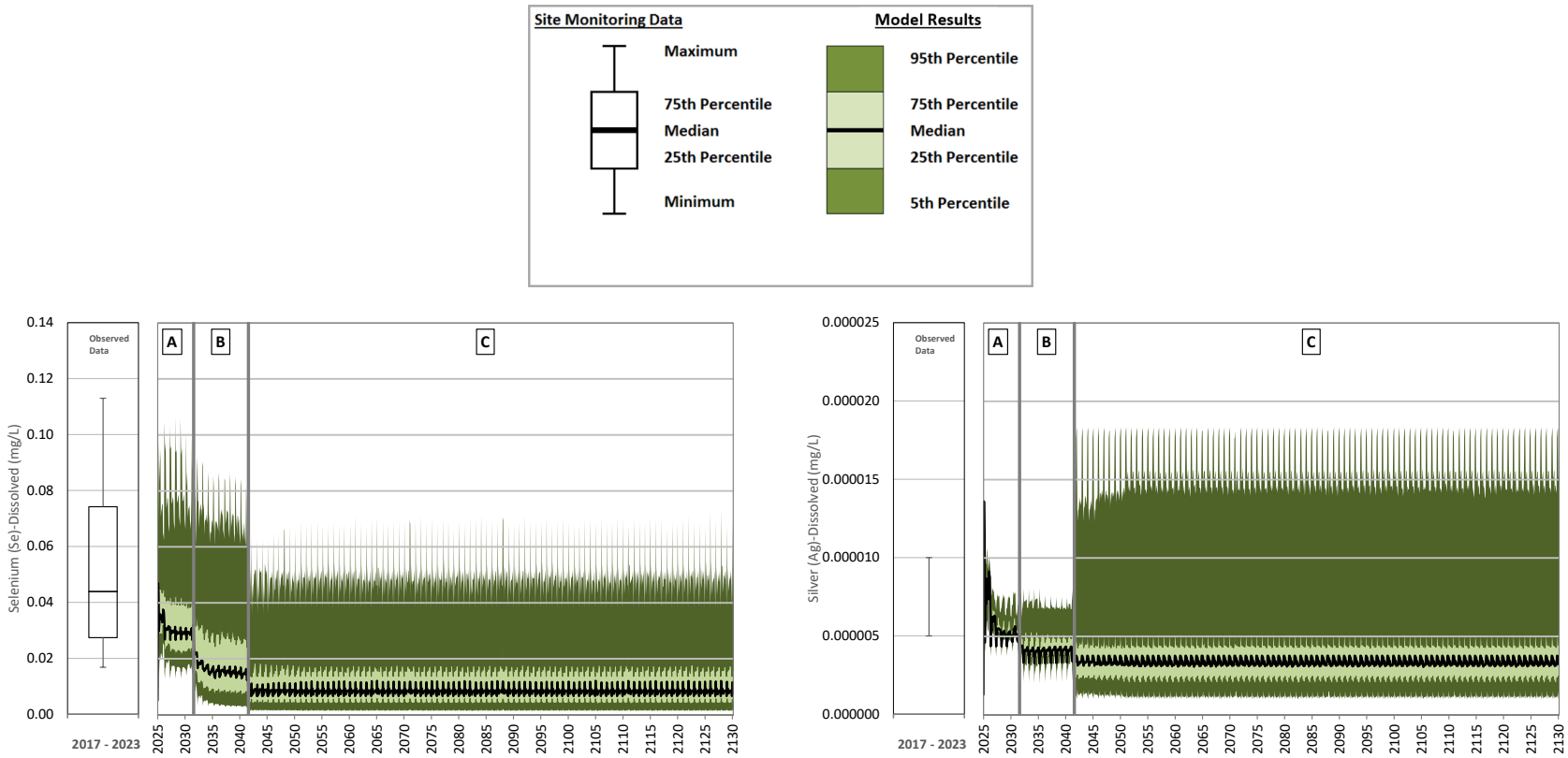
Figure B-344: Long Ditch Operations, Closure and Post-closure – Dissolved Manganese and Dissolved Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved nickel concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved nickel than the disturbed runoff water quality inputs.

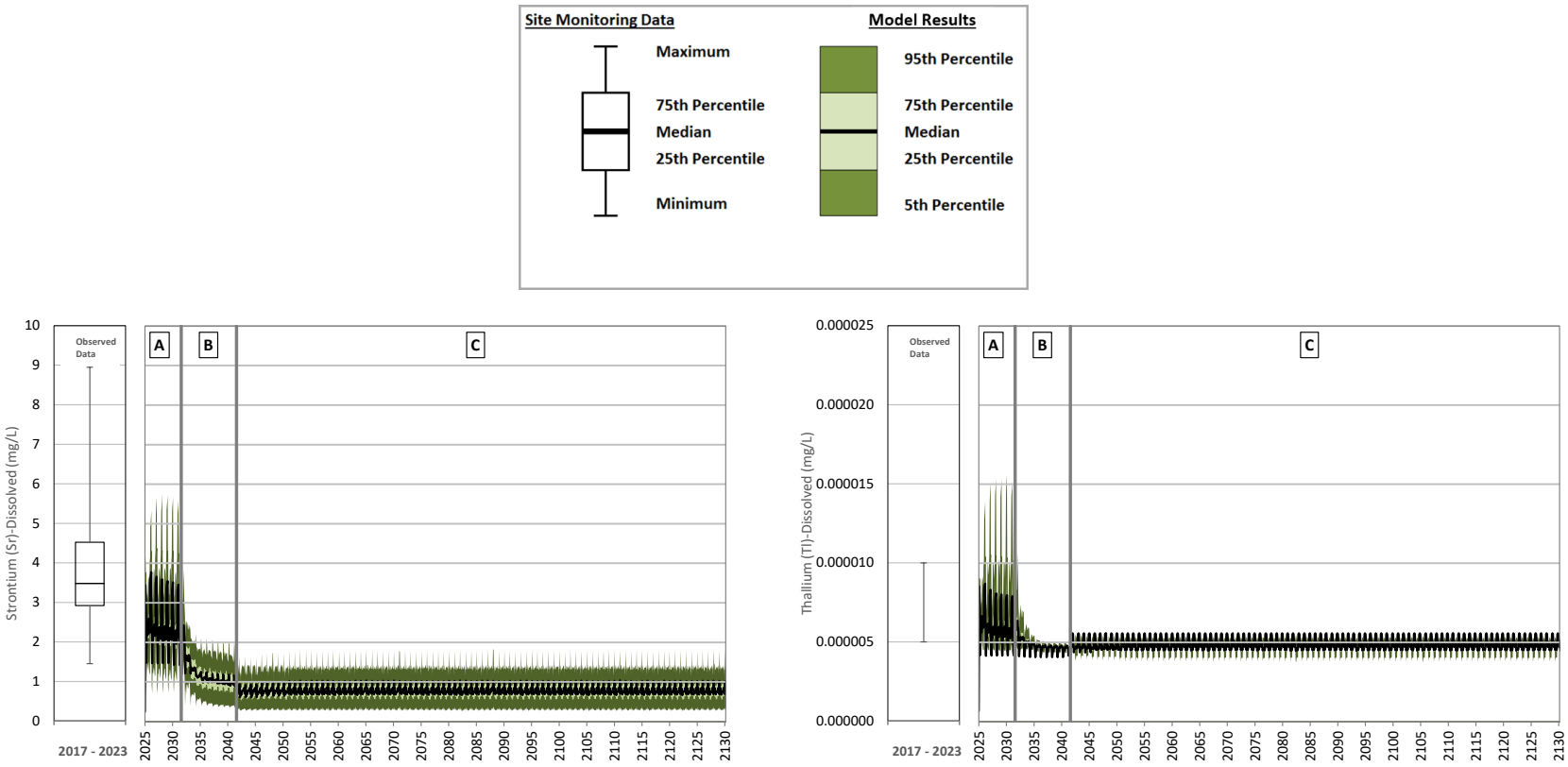
Figure B-345: Long Ditch Operations, Closure and Post-closure – Dissolved Molybdenum and Dissolved Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved silver concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved silver than the disturbed runoff water quality inputs.

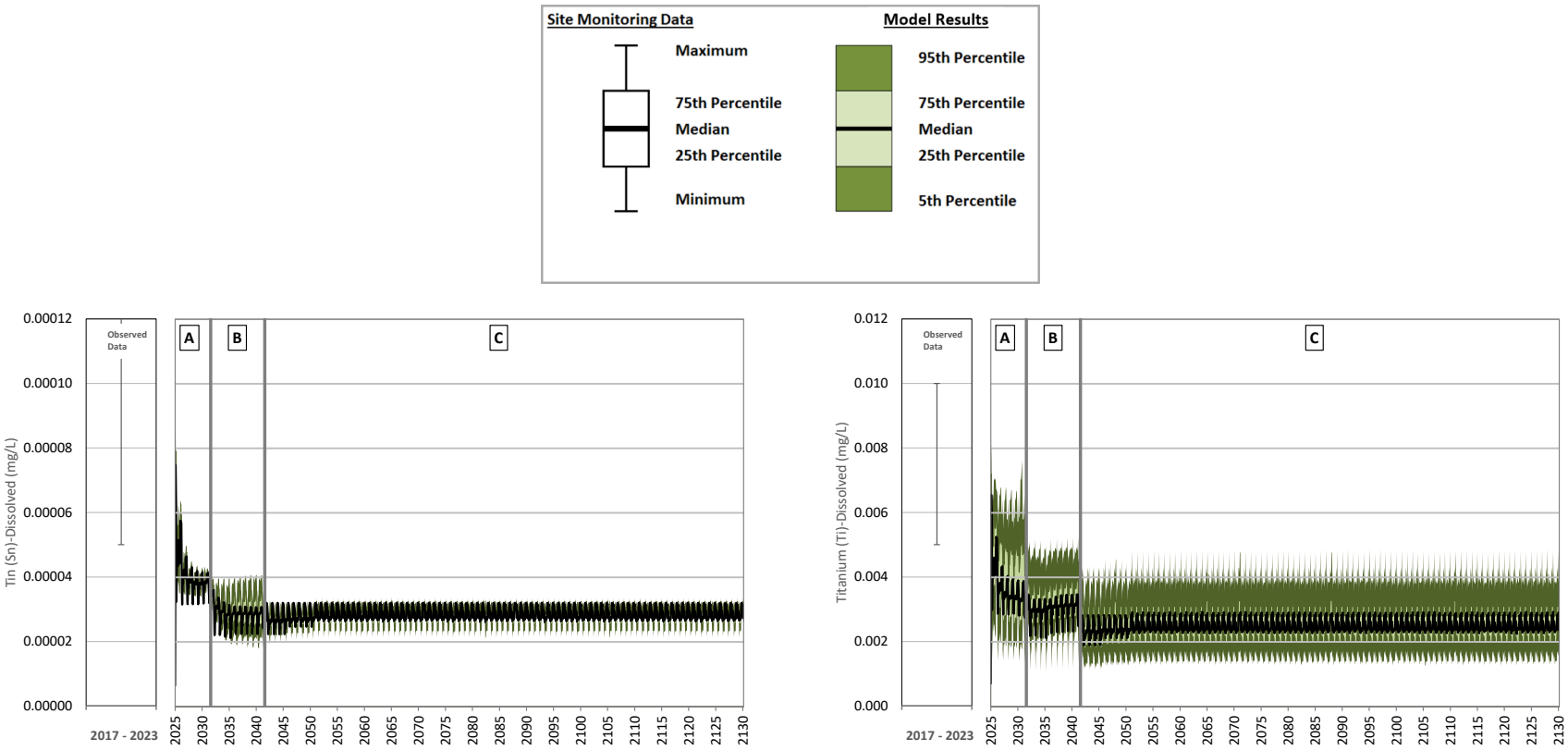
Figure B-346: Long Ditch Operations, Closure and Post-closure – Dissolved Selenium and Dissolved Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas.

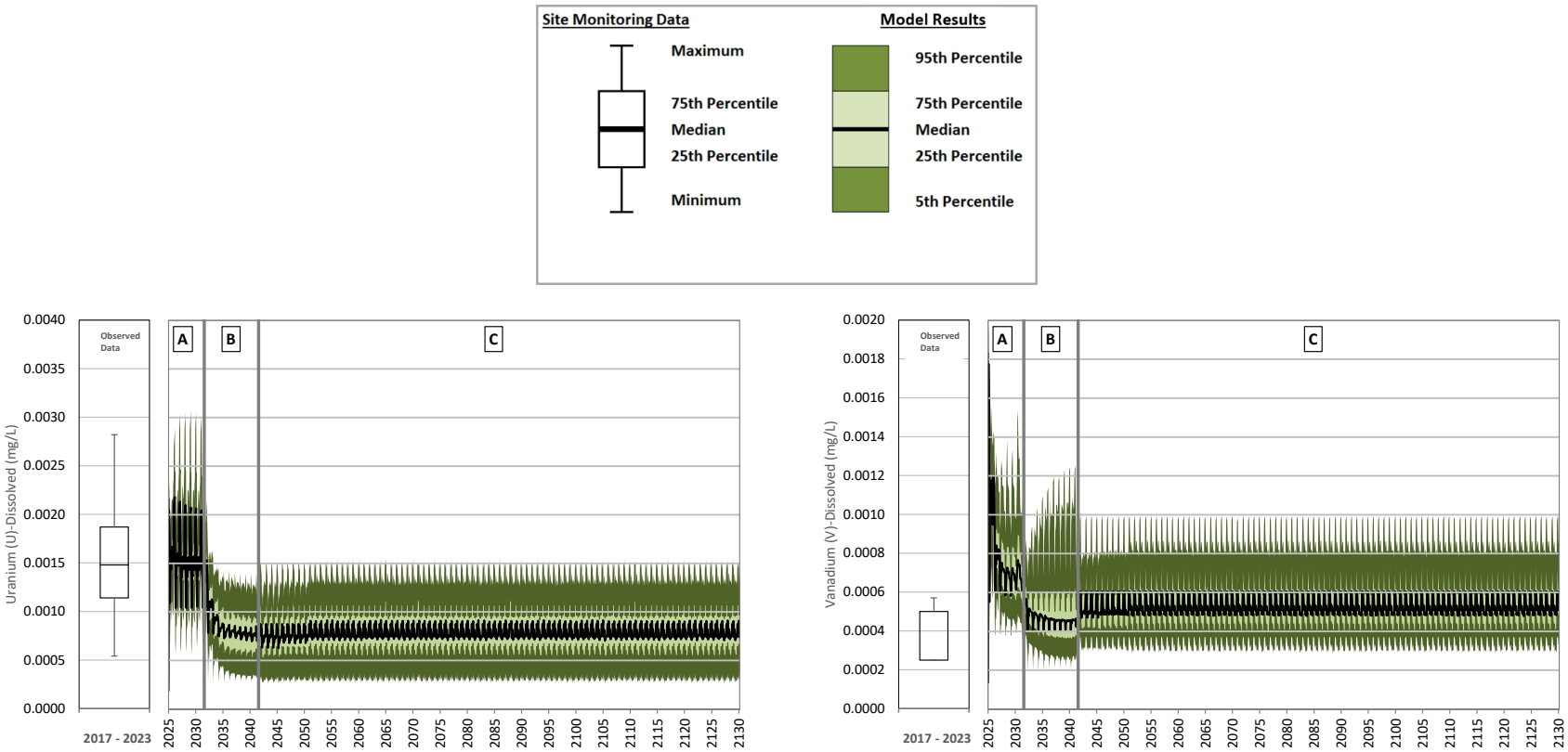
Figure B-347: Long Ditch Operations, Closure and Post-closure – Dissolved Strontium and Dissolved Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved titanium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for dissolved titanium than the disturbed runoff water quality inputs.

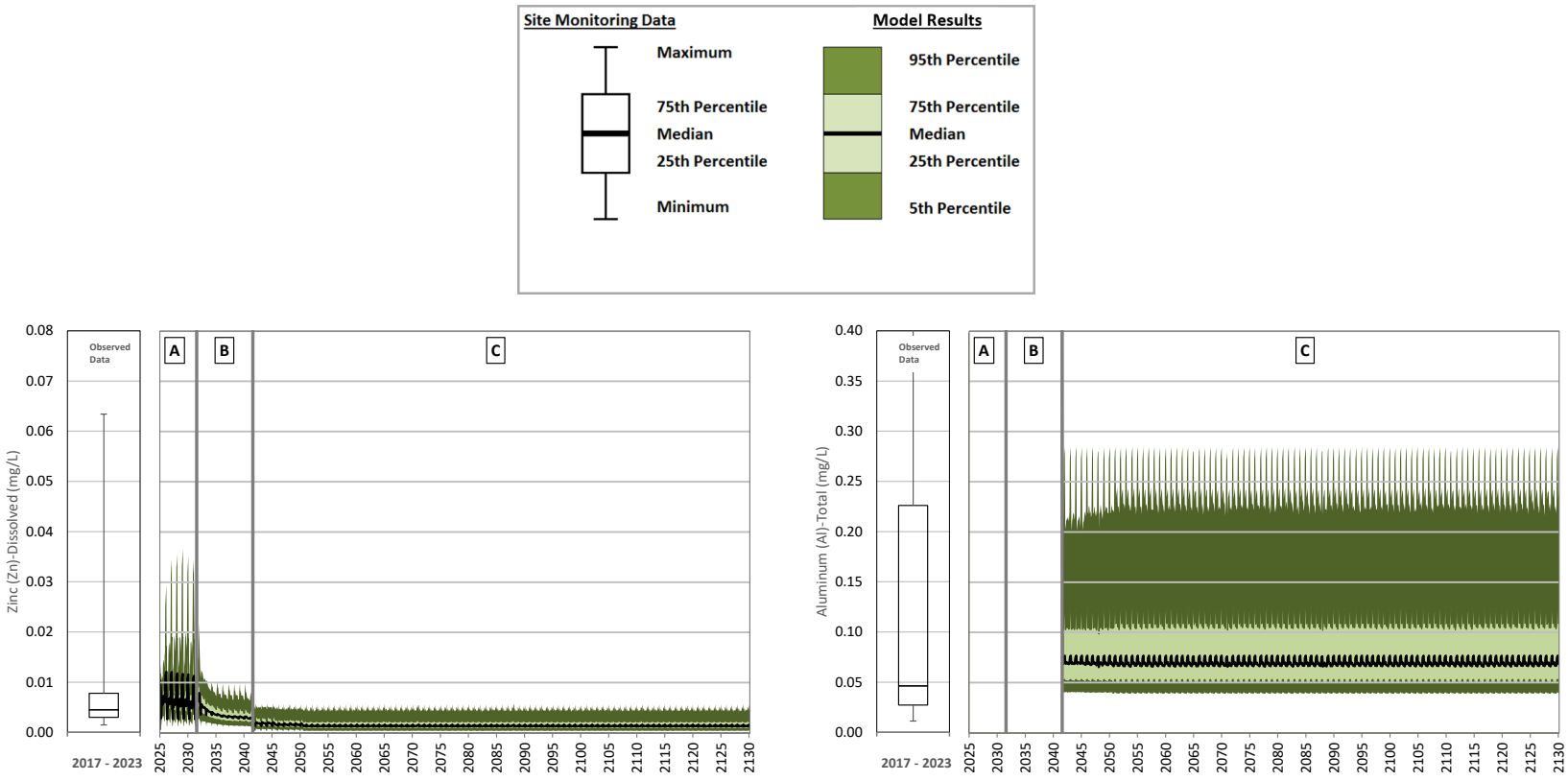
Figure B-348: Long Ditch Operations, Closure and Post-closure – Dissolved Tin and Dissolved Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Dissolved uranium and dissolved vanadium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for dissolved uranium and vanadium than the disturbed runoff water quality inputs.

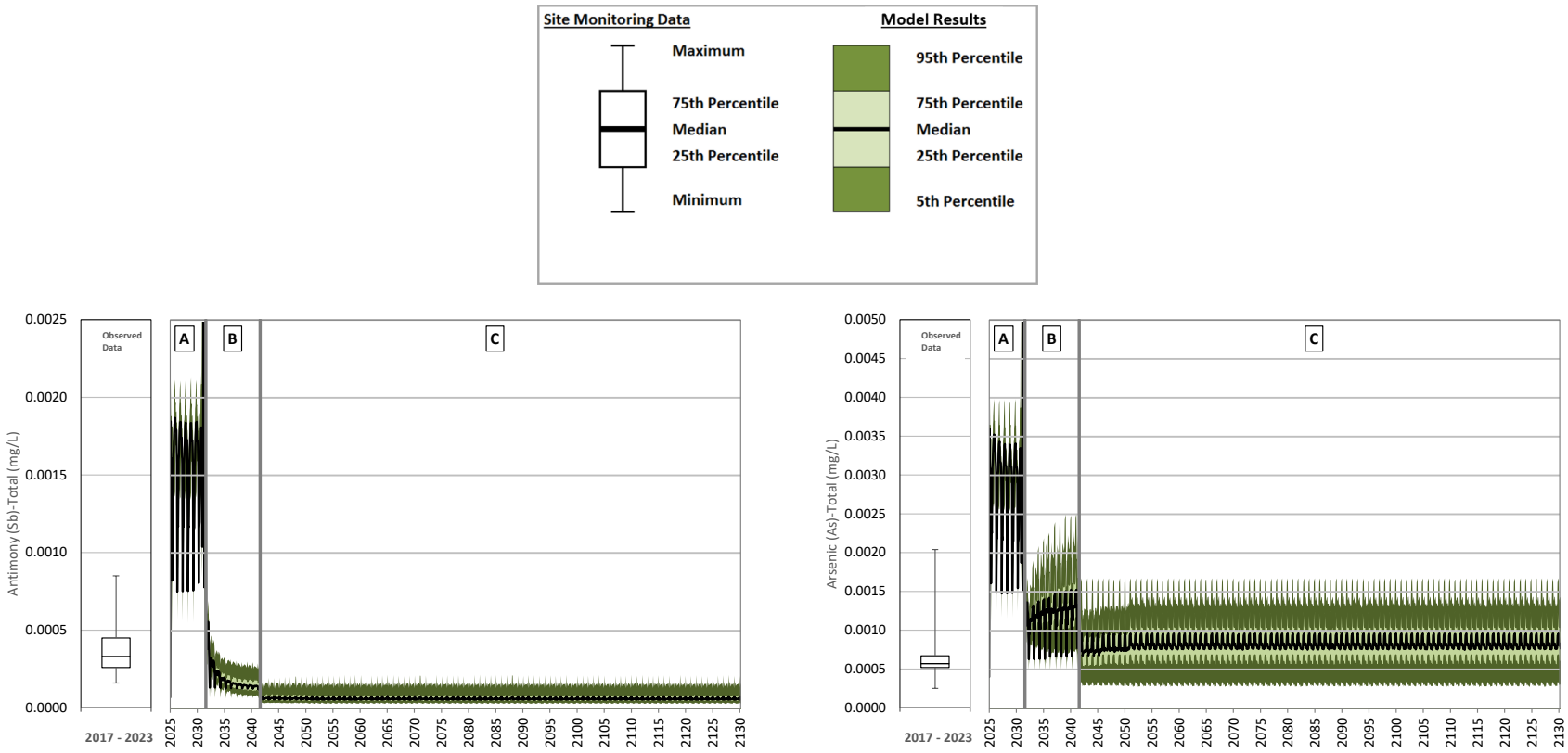
Figure B-349: Long Ditch Operations, Closure and Post-closure – Dissolved Uranium and Dissolved Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

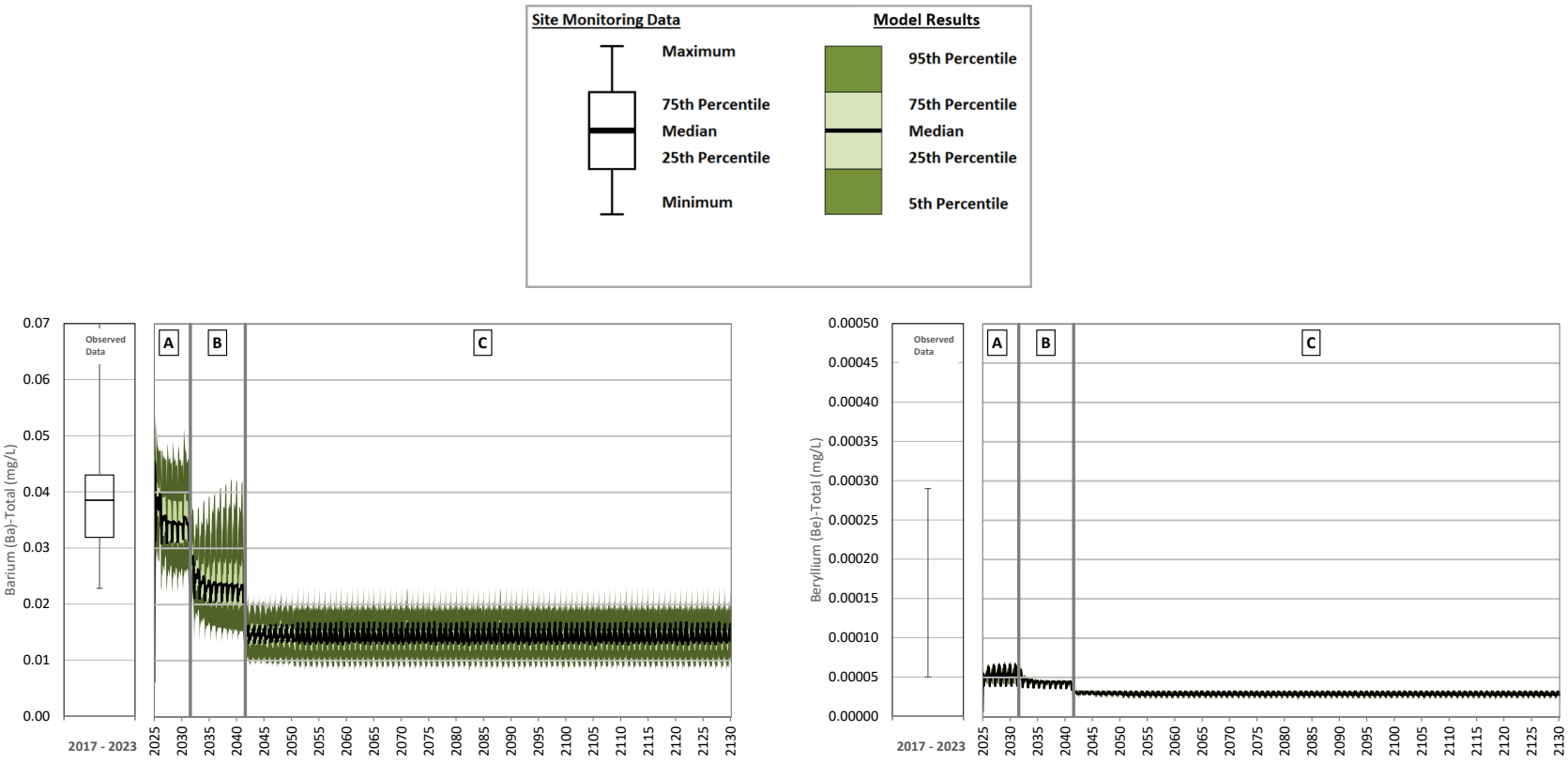
Figure B-350: Long Ditch Operations, Closure and Post-closure – Dissolved Zinc and Total Aluminum



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total arsenic concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total arsenic than the disturbed runoff water quality inputs.

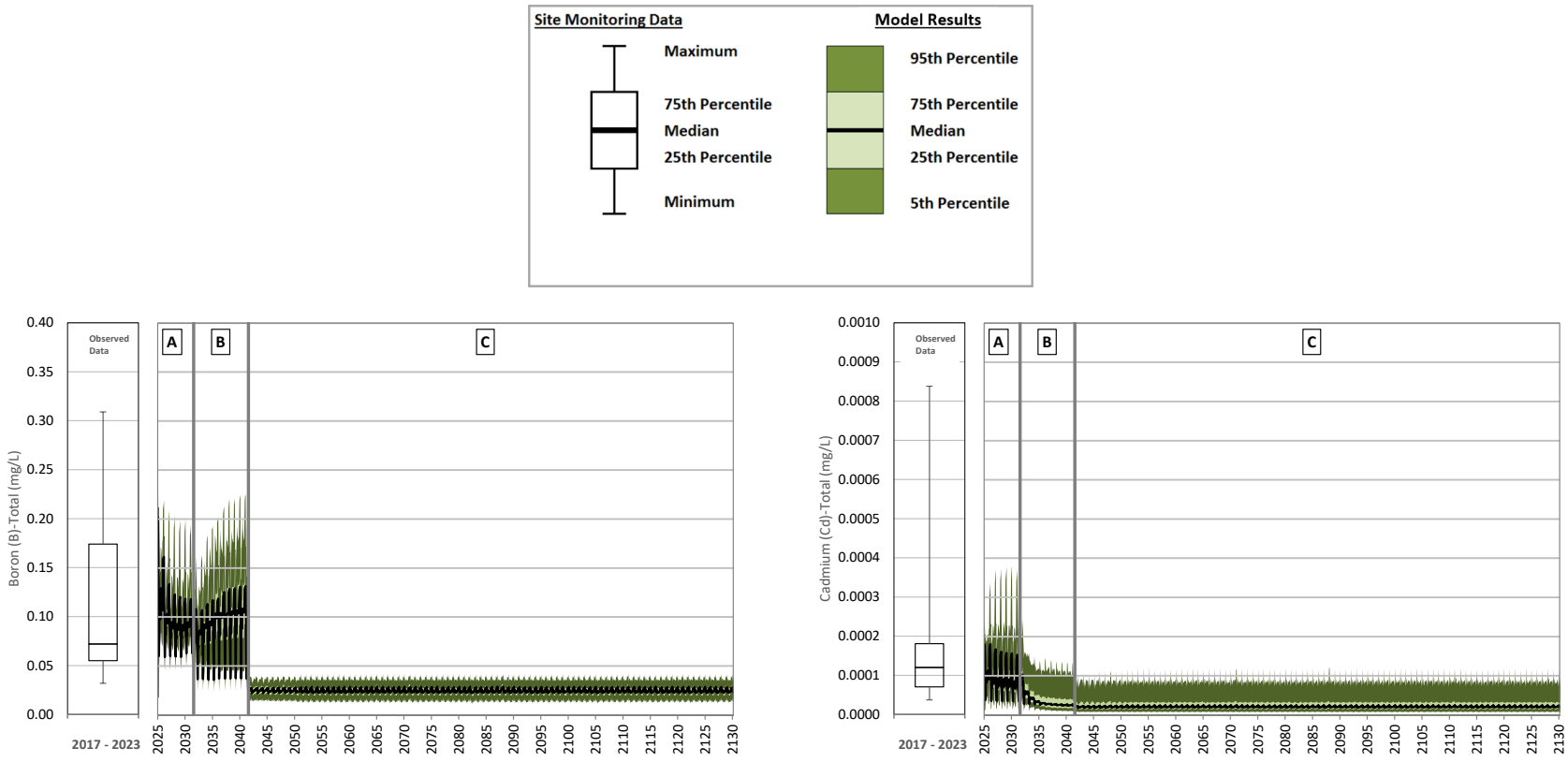
Figure B-351: Long Ditch Operations, Closure and Post-closure – Total Antimony and Total Arsenic



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

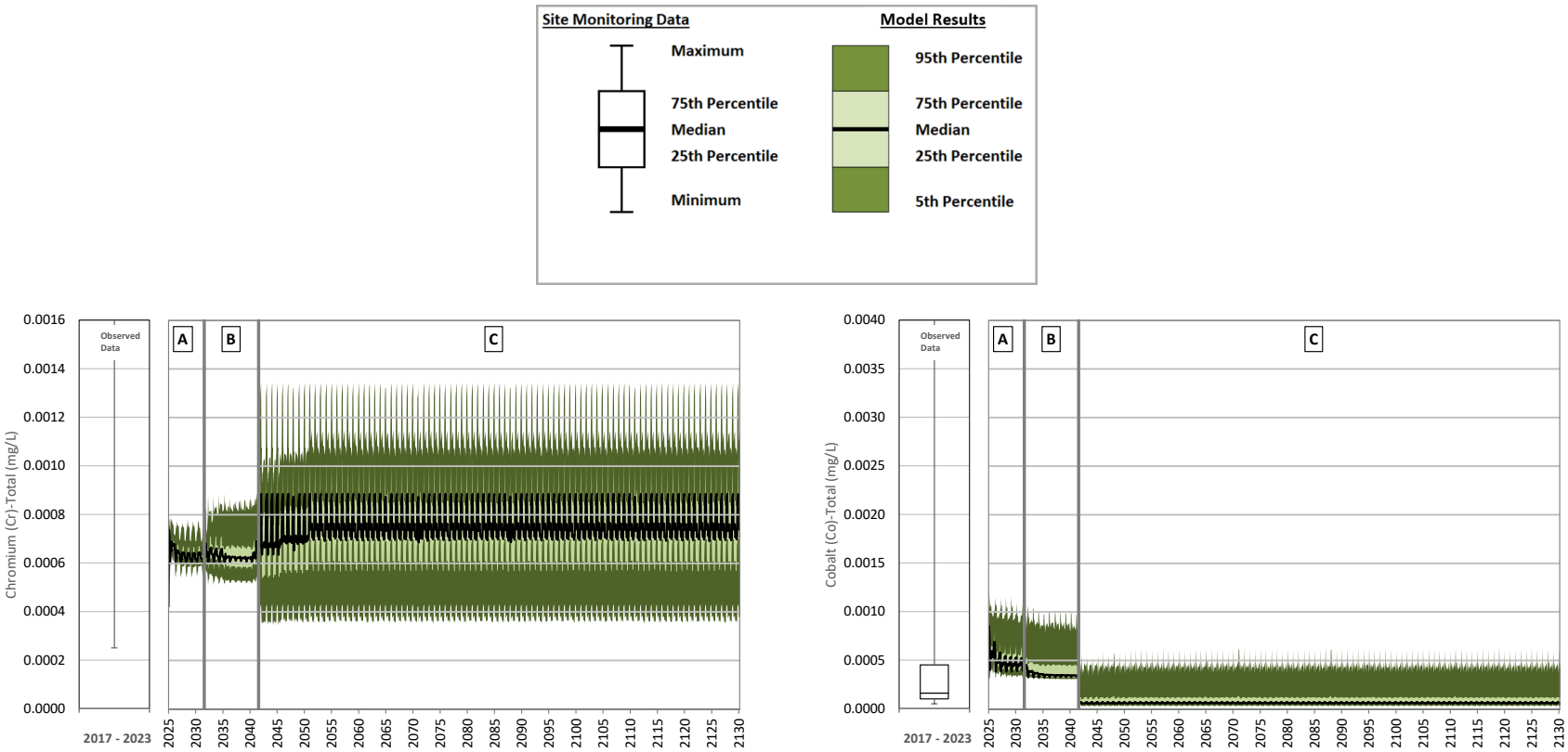
Figure B-352: Long Ditch Operations, Closure and Post-closure – Total Barium and Total Beryllium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

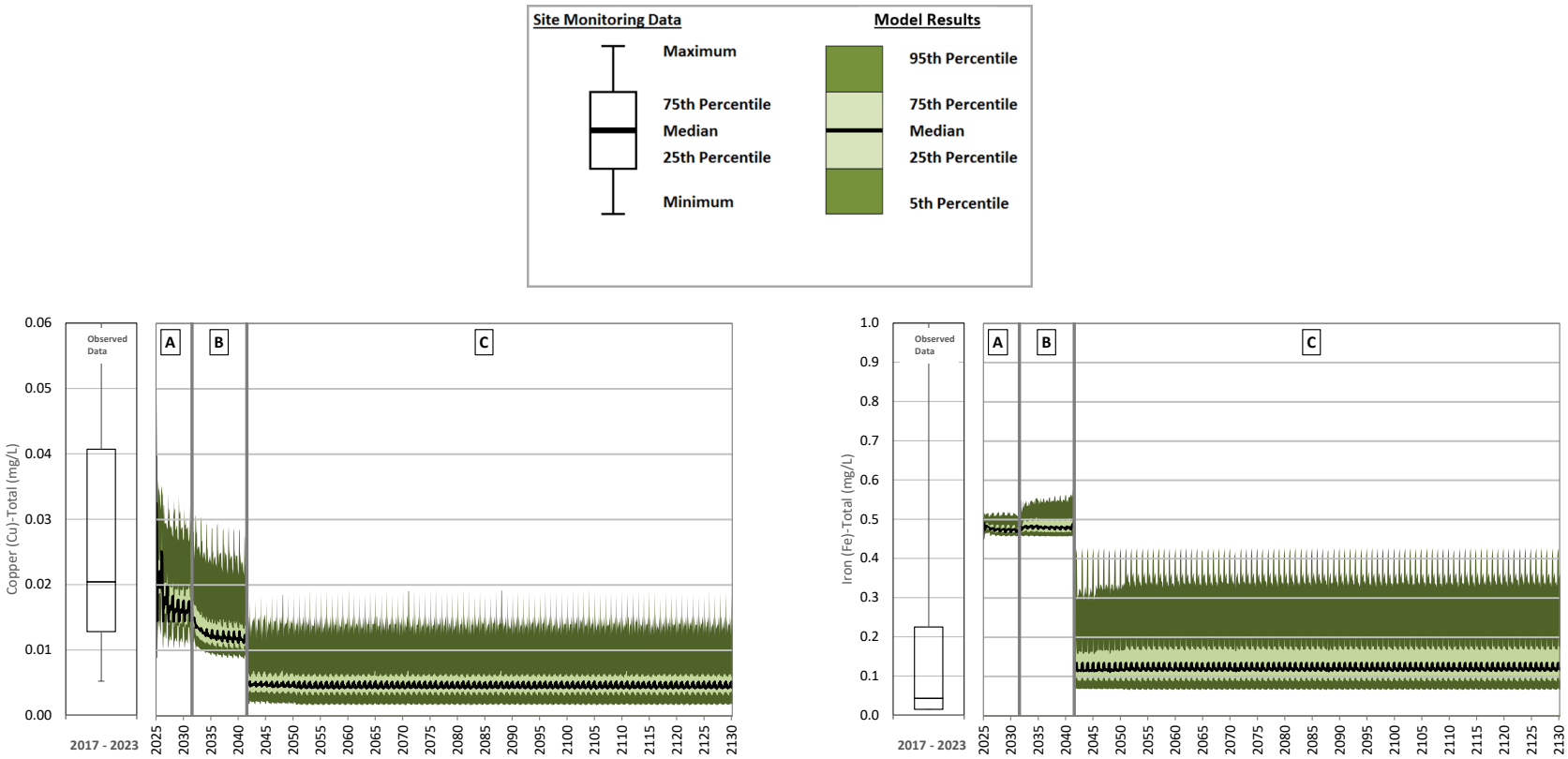
Figure B-353: Long Ditch Operations, Closure and Post-closure – Total Boron and Total Cadmium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total chromium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total chromium than the disturbed runoff and NAG waste rock water quality inputs.

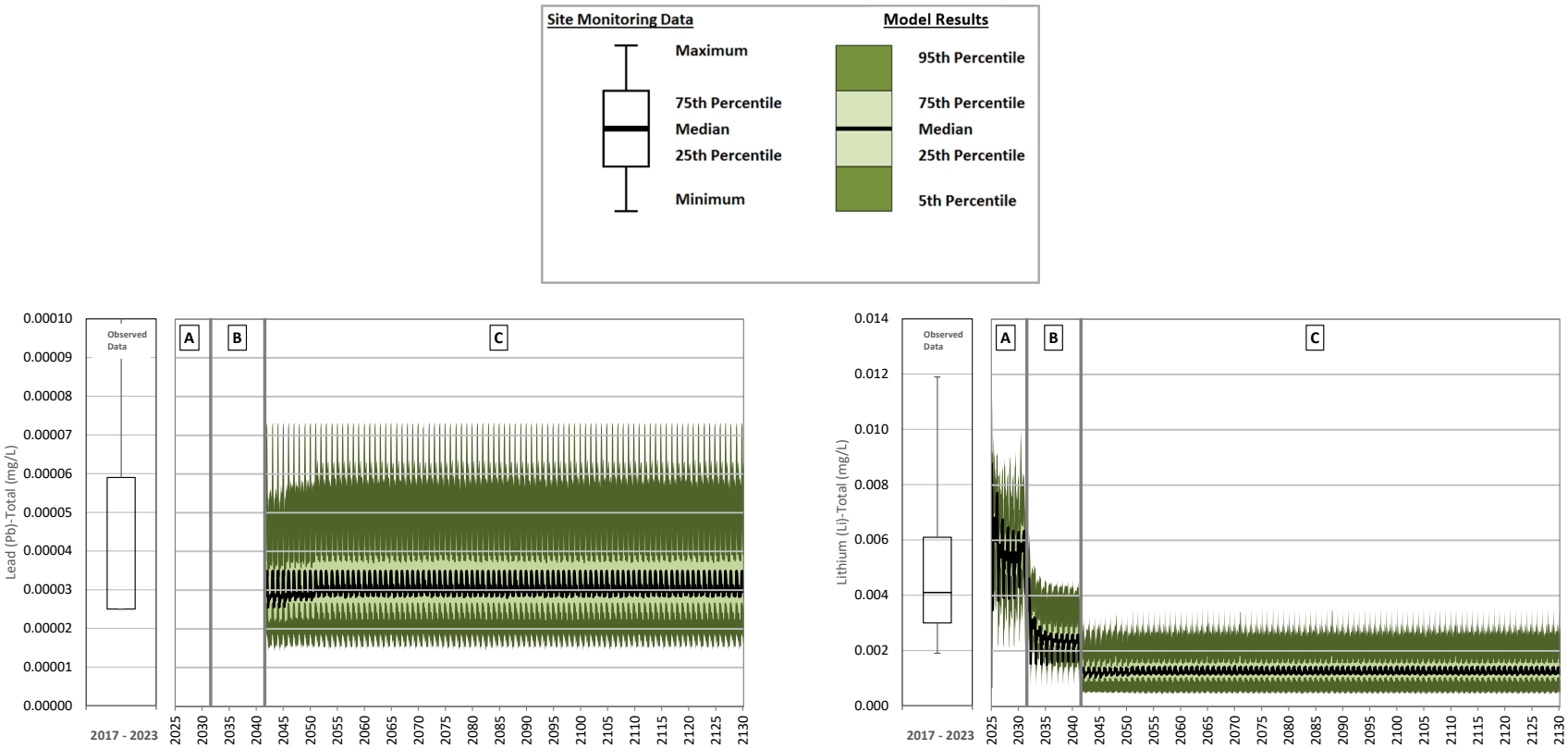
Figure B-354: Long Ditch Operations, Closure and Post-closure – Total Chromium and Total Cobalt



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total iron concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total iron than the disturbed runoff water quality inputs.

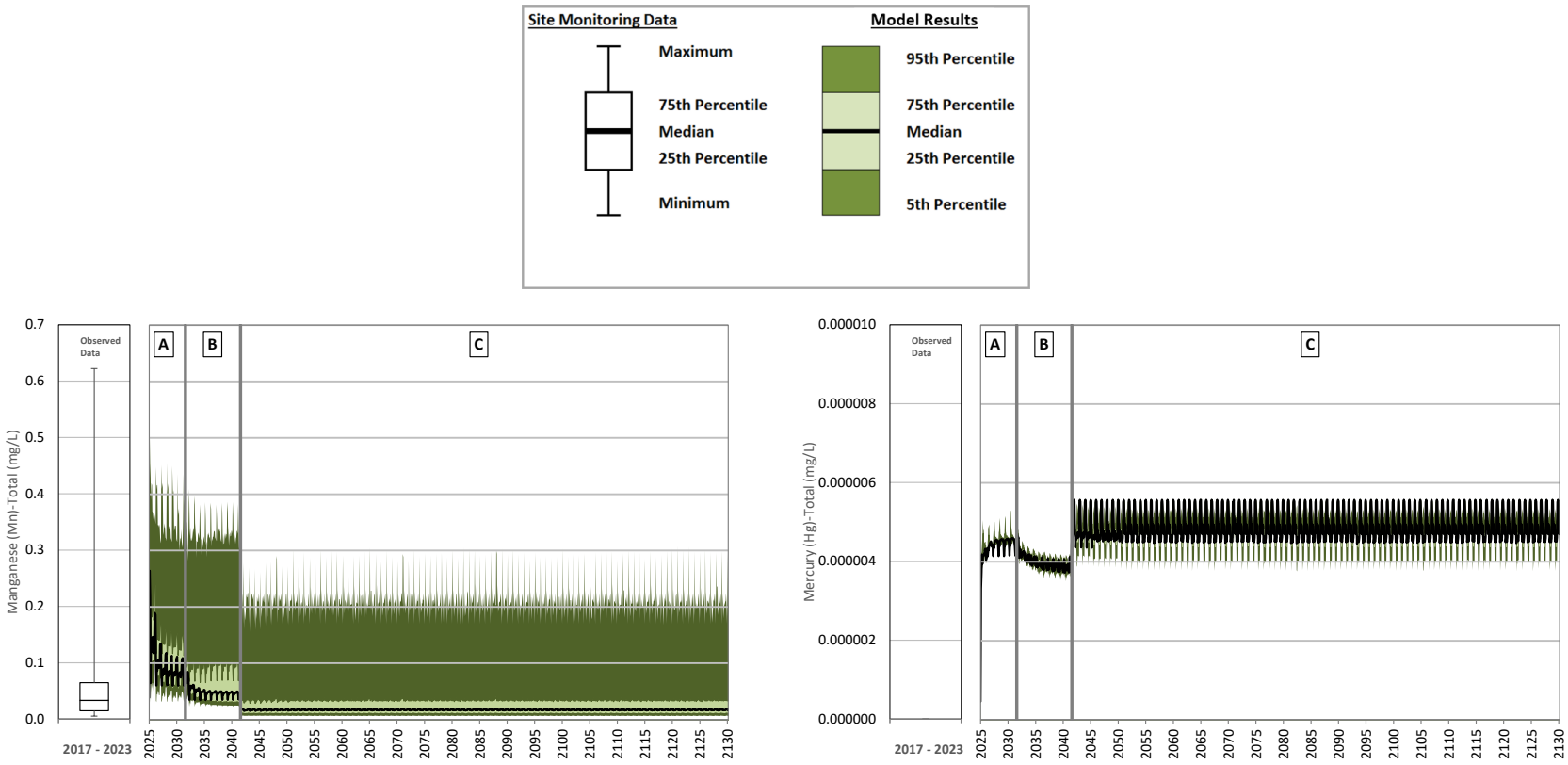
Figure B-355: Long Ditch Operations, Closure and Post-closure – Total Copper and Total Iron



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total lead and lithium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total lead and lithium than the disturbed runoff water quality inputs.

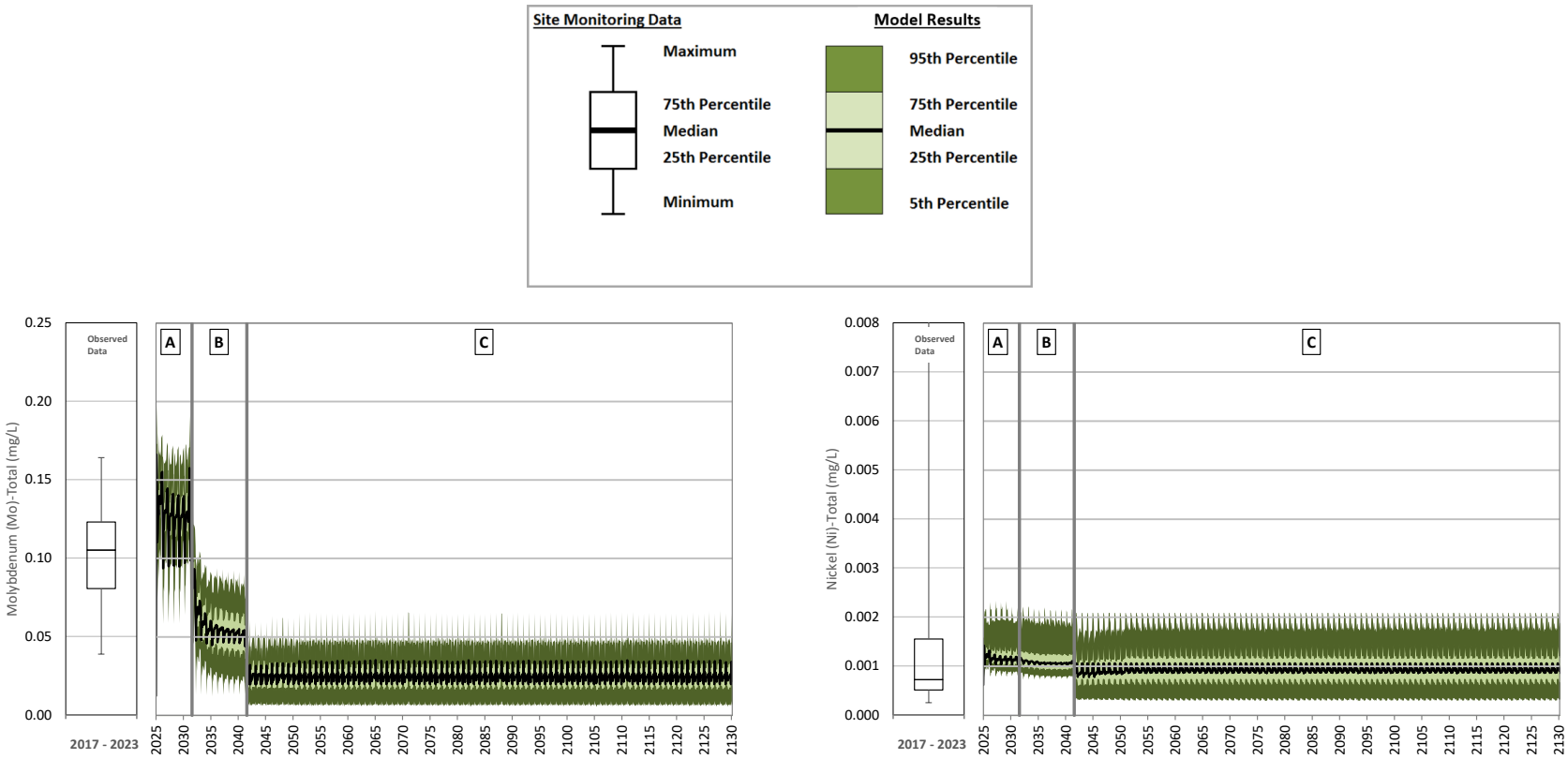
Figure B-356: Long Ditch Operations, Closure and Post-closure – Total Lead and Total Lithium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

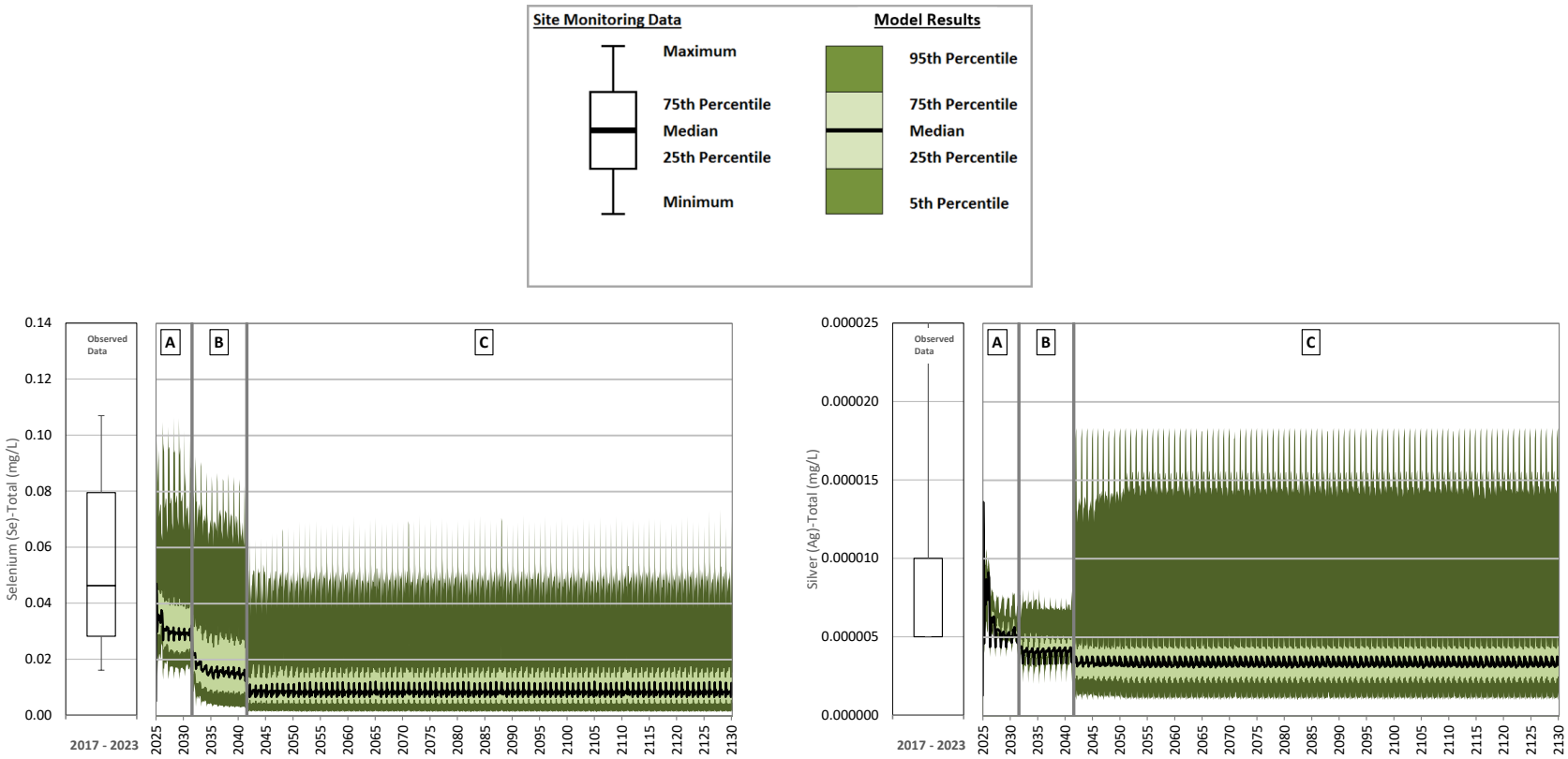
Figure B-357: Long Ditch Operations, Closure and Post-closure – Total Manganese and Total Mercury



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total nickel concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total nickel than the disturbed runoff water quality inputs.

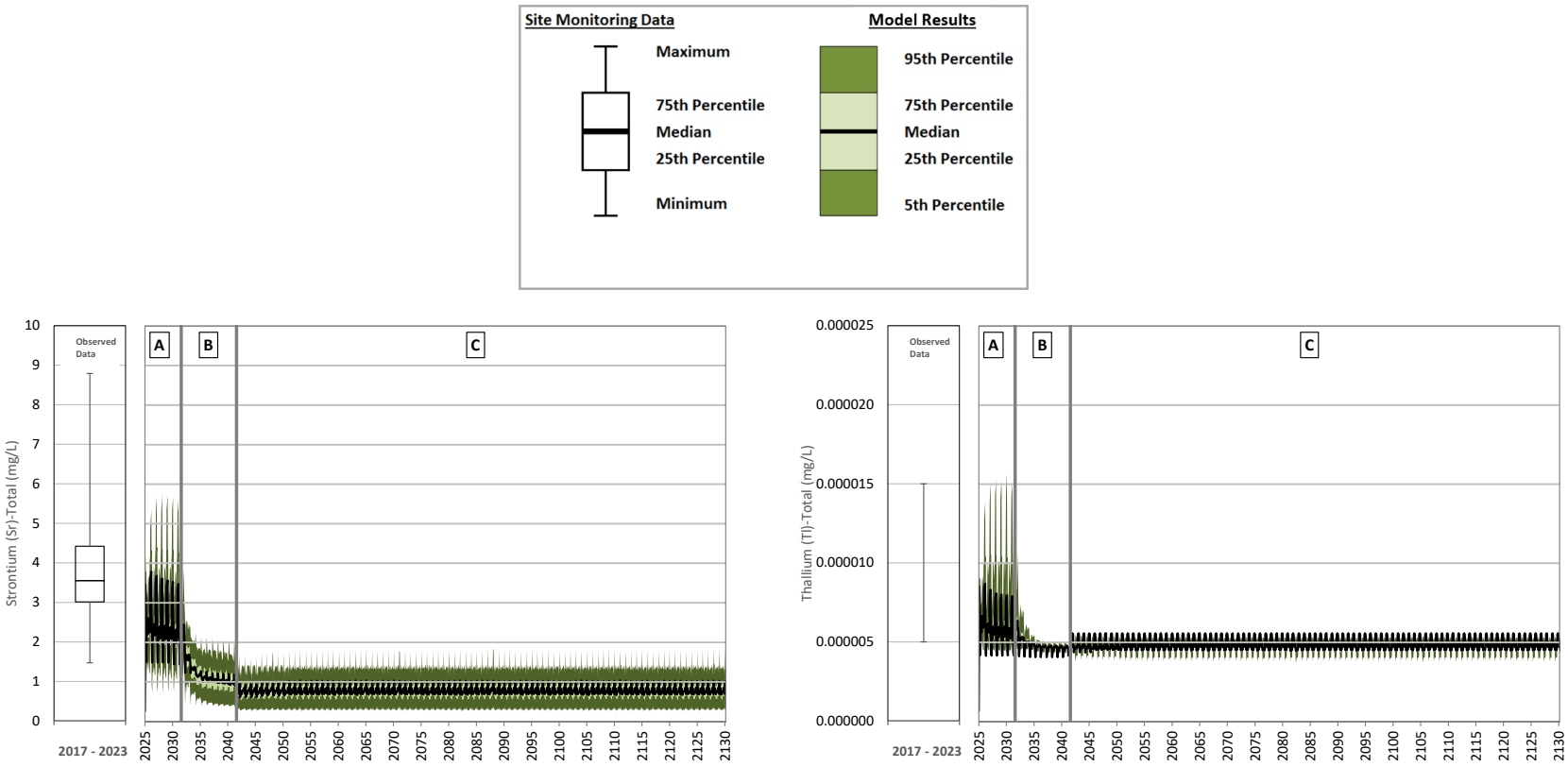
Figure B-358: Long Ditch Operations, Closure and Post-closure – Total Molybdenum and Total Nickel



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total silver concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total silver than the disturbed runoff water quality inputs.

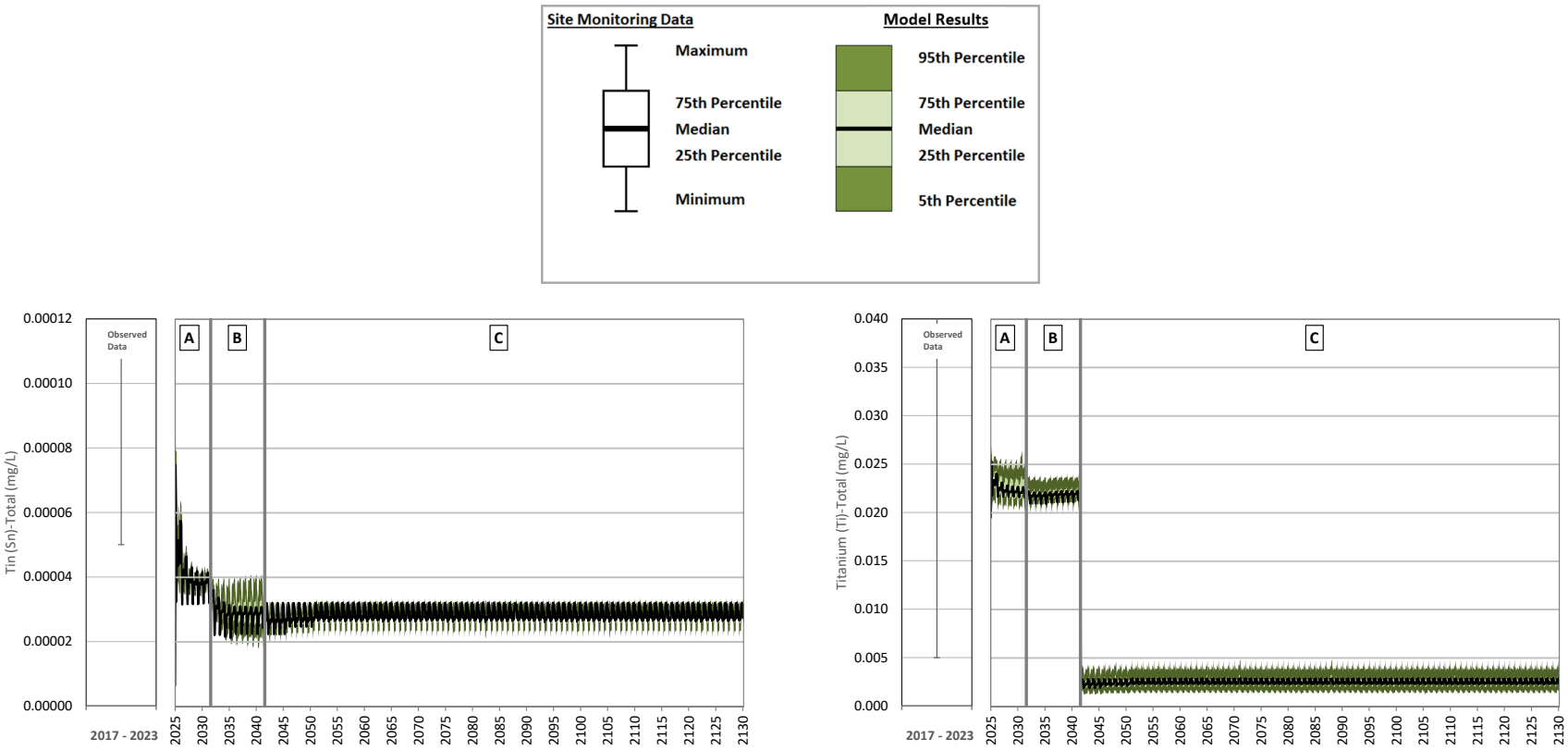
Figure B-359: Long Ditch Operations, Closure and Post-closure – Total Selenium and Total Silver



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas.

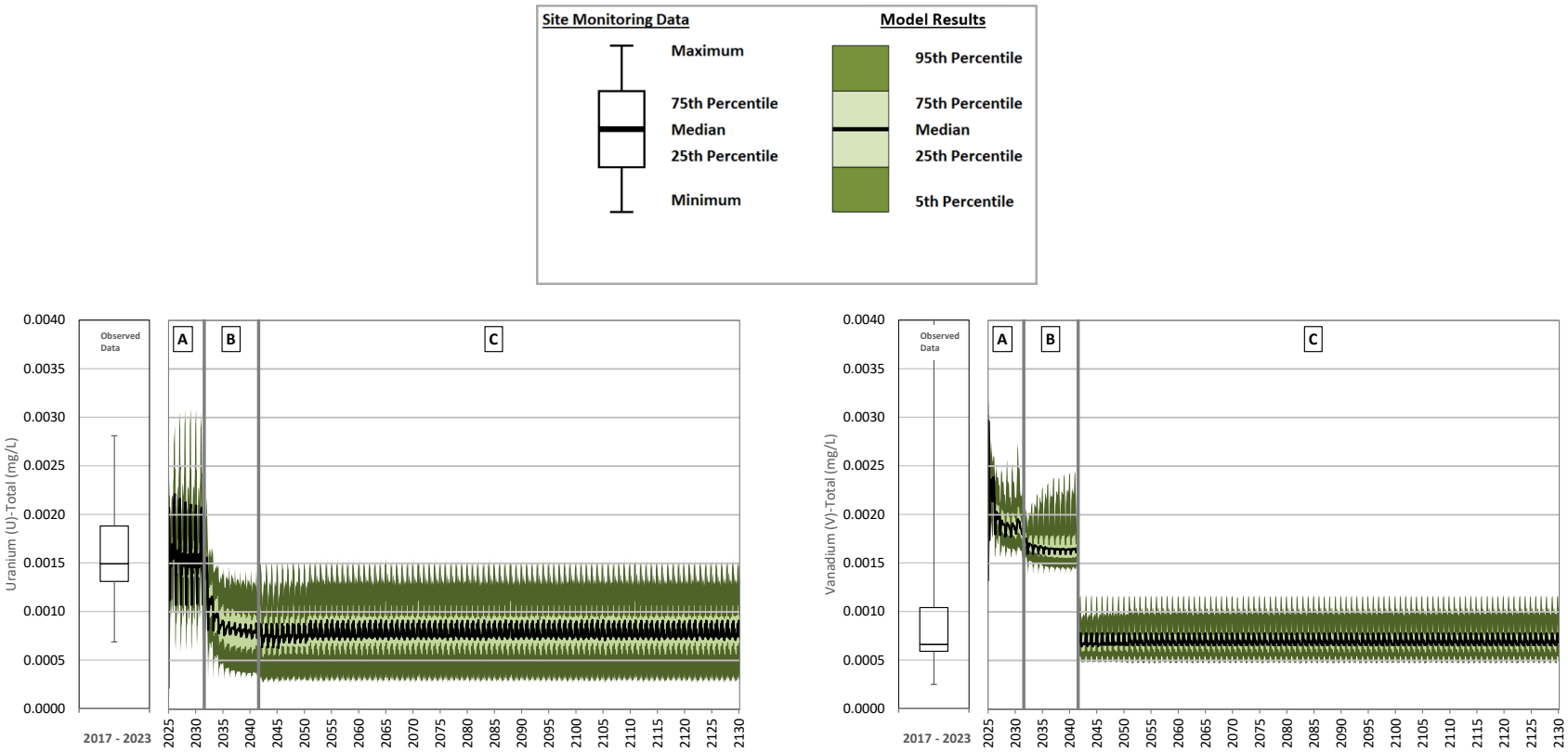
Figure B-360: Long Ditch Operations, Closure and Post-closure – Total Strontium and Total Thallium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total titanium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher maximum concentrations for total titanium than the disturbed runoff water quality inputs.

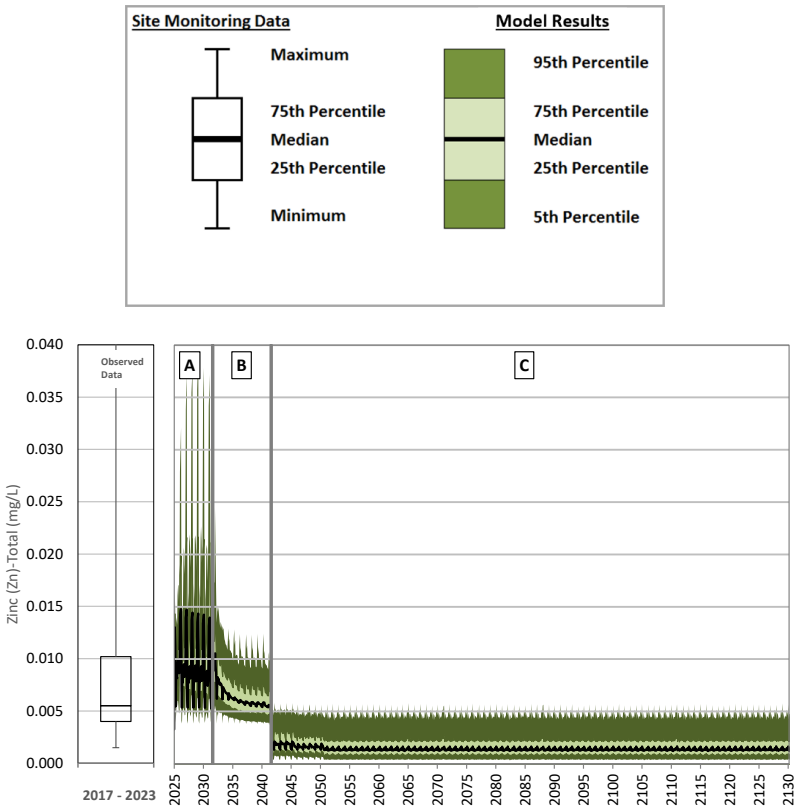
Figure B-361: Long Ditch Operations, Closure and Post-closure – Total Tin and Total Titanium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure is caused by the reclamation of runoff areas. Total uranium and total vanadium concentrations increase from the start of post-closure as runoff areas are remediated and assigned the undisturbed runoff water quality input. The undisturbed runoff water quality input has higher concentrations for total uranium and vanadium than the disturbed runoff water quality inputs.

Figure B-362: Long Ditch Operations, Closure and Post-closure – Total Uranium and Total Vanadium



A = Operations; B = Closure; C = Post-closure

Note: The change in concentrations from operations to closure and into early post-closure is caused by reclamation of mine site areas. Predicted concentrations reach a steady state 10 years after the start of post-closure when reclamation of the mine site areas is complete.

Figure B-363: Long Ditch Operations, Closure and Post-closure – Total Zinc



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APPENDIX 10-6: VEGETATION AND INVASIVE PLANT MANAGEMENT PLAN

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Environmental Management Plan:

Vegetation and Invasive Plant Management Plan

Last Update/Review: June 2025

Document Revision Control

Rev. No.	Revision	Date	Author
0	Original	January 2014	GH
1	Update of site specific components and plans	July 9, 2015	KM
2	Update of site specific components and plans; updated to reflect current government regulations/documents; added document tracking and formatting to be consistent with other MPMC EMPs	March 29, 2016	KM
3	Review	December 2019	GH
4	Review, update permit conditions, minor verbiage	June 2025	GH

1 Introduction

The BC Ministry of Forest, Lands and Natural Resource Operations (as per the British Columbia [BC] Inter-Ministry Invasive Plant Working Group) defines invasive plants as “non-native (alien) plants whose introduction into BC cause, or are likely to cause, economic or environmental damage, or harm to human health” (MFLNRO, 2014). The Invasive Species Council of BC has a similar definition, and notes that invasive plants can establish quickly and easily on both disturbed and un-disturbed sites, causing widespread negative economic, social, and environmental impacts (ISCBC, 2015).

Mining operations result in disturbed areas, which can be susceptible to invasion of invasive plants. Such invasions have the potential to hinder reclamation efforts or interfere with regional invasive plant management programs. To manage this risk, Mount Polley Mining Corporation (MPMC) has developed this Invasive Plant Management Plan (the “Plan”). The purpose of the Plan is to outline procedures for the prevention and, if necessary, control (mitigation) of the establishment of invasive plants or noxious weeds in the Mount Polley Mine (the “Mine”) area throughout the Mine project life, including closure.

1.1 Regulatory Framework

The BC *Weed Control Act* (RSBC, 1996) requires owners or occupiers of crown and private lands in BC (excluding those under federal jurisdiction) to control listed noxious weeds. As such, MPMC is under legal obligation to control these species. At the time of last update of this Plan, the BC Proposed Prohibited Noxious Weeds List (MFLNRO, 2016) was the most up to date applicable listing.

As per the BC *Mines Act* Section 10.7, mine land surfaces must be reclaimed to an approved end land use at closure, excluding lands that are not to be reclaimed, and the average land capability should be equal to or greater than the average land capability present prior to mining. While these requirements do not specifically mention invasive plants, they are inherently included; given the undesirable nature of invasive plants, their associated negative environmental and economic impacts, and the fact that invasive plants are non-native, such species are likely inconsistent with closure revegetation objectives and could result in a mining company not meeting their closure revegetation targets.

In addition, under MPMC’s *Mines Act* Permit M-200, the following additional specific conditions apply to invasive species management at the site:

- The Permittee must limit the disturbance to vegetation to those areas approved by this Permit.
- The Permittee must manage and control weeds that establish on the site and must ensure that weeds do not migrate from the site to adjacent areas. The Permittee must consider using non-toxic means for weed control.
- Prior to blending or applying commercially purchased seed, the Permittee must ensure a Qualified Professional reviews the Seed Analysis Certificate(s) to confirm compliance with the BC Weed Control Regulation and/or confirm the absence of noxious or regionally high priority invasive plant seeds. The Permittee must report on the results of seed analysis and recommendations of the Qualified Professional in the Annual Reclamation Report, by March 31 annually.
- The Permittee must not burn or dispose of woody debris suitable for use in reclamation.

And consideration made for the following:

- Revegetation species shall be selected based on the principles of ecological succession and traditional use and cultural significance, including all reasonable efforts to use only native species

unless short-lived agronomic species are required to temporarily control erosion or prevent ingress of invasive species.

While not associated with regulatory requirements, the Cariboo Chilcotin Coast Invasive Plant Council (CCCIPC) is a non-profit organization that coordinates the invasive plant management efforts of government agencies, individuals, communities and industry sectors, and promotes awareness and education about invasive plants in the region. The CCCIPC produces an Annual Strategic Plan (http://cccipc.ca/index.php/S=0/resources/regional-strategic-plans/) which incorporates provincial requirements (e.g., noxious weeds listings) and is to be used as a guide for invasive plant management activities and resource allocation in region.

2 Objectives

As described above, the purpose of the Plan is to outline procedures for the prevention and, if necessary, mitigation of the establishment of invasive plants or noxious weeds in the Mount Polley Mine area throughout the Mine project life and closure. The specific objectives are to:

- Minimize vegetation disturbance where possible
- Control invasive plant establishment on the site, such that reclamation objectives are achieved. Reclamation objectives include establishing self-sustaining vegetative covers on disturbed areas at the Mine site with native vegetation this is appropriate to the target site series and consequently promotes the target end land use(s); and
- Implement invasive plant control measures consistent with the Regional Strategic Plan and the BC Proposed Prohibited Noxious Weeds List.

This Plan applies to the M-200 permitted mine area as well as areas being rehabilitated following the tailings dam embankment breach. However, only the Mine site is regulated under the BC *Mines Act* and associated items (e.g., permit requirements and land capability requirements) do not apply to rehabilitation areas affected by the TFS dam failure.

The Plan follows the Plan, Do, Check, and Act cycle developed by the International Standards Organization guidelines. The cycle is described as follows:

- **PLAN** - identifies potential sources of invasive plant ingress that may challenge achieving the objectives of the program;
- **DO** - documents the prevention and control management practices in place at the Mine;
- **CHECK** - describes the monitoring procedures and methods for evaluating monitoring results against the objectives; and
- **ACT** - describes review of the management program and update of procedures based on monitoring results in order to promote its continuous improvement and mitigate identified deficiencies.

3 Plan: Identification of Potential Sources of Invasive Plant Ingress

Mining activities can facilitate the introduction or spread of invasive plants by removing native vegetation, which decreases competition for weedy plants, and creating exposed soil in disturbed areas. Exposed areas create a soil bed which may allow invasive plants to establish. These areas include:

- Soil stockpiles and areas from which the soil was salvaged;
- Soil applied to reclamation areas;
- Road and powerline construction and maintenance activities; and
- Exposed areas around the Mill site, maintenance areas and other associated infrastructure.
- Any area that can harbor and support weed establishment and spread

Table 1 provides an overview of potential sources of invasive plant ingress to the site. Each potential source is classified into if control is possible or not. If control is not possible, for example the movement of wildlife or wind transport of seed, only prevention methods (and, if necessary, mitigation measures) are applicable to management.

Table 1 Potential sources of invasive plant ingress and/or spread at the Mount Polley Mine site

Category	Source	Control Method Possible
Animals	Livestock	×
	Wildlife	×
Natural spread	Wind (long-distance)	×
	Rhizome spread or seed drop (short-distance)	✓ (within Mine site only)
Human-mediated spread	People – on-site (e.g., employees, and contractors)	✓
	People – off-site (e.g., tourists and recreationists; spread to areas immediately adjacent to site)	×
	Vehicles and equipment – on-site	✓
	Vehicles and equipment – off-site (spread to areas immediately adjacent to site)	×
Reclamation Activities	Application of soil from contaminated soil stockpiles	✓
	Use of contaminated seed or soil amendments	✓
	Use of contaminated soil amendments	✓

4 Do: Prevention and Control Measures

4.1 Preventative Measures

The primary goal involved in managing invasive plant infestations in the project area is to carry out mining activities in a manner that prevents the introduction or spread of invasive plants and supports the ability to establish desired species during site reclamation activities.

MPMC is to implement the following best management practices for preventing invasive plant establishment on disturbed areas at the Mine, which are to minimize disturbance during all phases of the mining operation in order to limit the availability of exposed, un-vegetated ground to invasive plant seed deposition; and establish a suitable vegetative cover as soon as possible after ground disturbance. Specifics for establishing ground cover vegetation are as follows:

- Seed ground disturbed due to construction or mining activity with a rapidly establishing seed mix for erosion protection and invasive plant control if reclamation of the area is not imminent. Active areas (e.g., open pits or areas without appropriate substrates for vegetation growth) at the Mine do not require invasive plant control as vegetation does not have a chance to become established;
- Seed soil stockpiles; water management features such as ditches and sediment pond berms; borrow pits; road edges; powerline access roads and power pole installation sites; inactive sections of mill site areas, storage and equipment yards; and generally any disturbed ground where invasive plant establishment is possible;

- Use only high quality grade seed in the reclamation and interim invasive plant control seed mixtures. Low quality grade seed may contain a higher portion of weed seed in the seed lot. At minimum, ensure that the seed used for revegetation is of the grade Common #1 Forage Mixture or Canada No. 1 Ground Cover Mixture.
- Assess soil amendments that may contain invasive plant seeds or propagules. This is currently only applicable to biosolids, and MPMC's supplier (Metro Vancouver) tests the material to verify that invasive plant seeds are not present.

MPMC typically conducts a seeding program annually in the spring and/or fall, and any disturbed areas (as described above) or areas that were previously seeded but lack appropriate native vegetative cover, should be added to the list of areas to be seeded.

4.2 Control Measures

If monitoring results (Section 5) show areas of invasive species infestation that are not consistent with the objectives of this Plan (Section 2), available control or mitigation options for managing established invasive plants include mechanical, biological, and chemical methods.

Mechanical methods include:

- Hand weeding or pulling (if plants are hand-pulled, propagules are to be removed from the site and disposed of in a way that does not allow the spread of seeds. i.e., burned, not composted);
- Mowing or cutting; and
- Burning.

Biological control agents are natural organisms that are another option for reducing invasive species populations. Typically, they are insects, nematodes, fungi or viruses that infect or invade the invasive plants and weaken the target species by decreasing seed production and reducing density. Biological control is only an option for select invasive species

Chemical control through application of herbicides will be the method of last resort because applications are limited by proximity to watercourses and can potentially have detrimental effects on native vegetation.

In addition to these mitigation methods, contingency control programs that could be reviewed for feasibility and implementaion are:

- Inspection and/or cleaning of vehicles or equipment coming from offsite or moving from an infested area to an uninfested area within the site;
- Refraining from driving through areas infested with invasive plants;
- Limiting road maintenance to the road surface to retain vegetation along the roadsides;
- Keeping equipment yards and vehicle storage facilities free of invasive plants; and
- Training personnel on preventing invasive plant spread by checking and removing seeds from clothing and equipment.

It is important to note that majority of the invasive plants observed at the Mine are designated in the CCCIPC Regional Strategic Plans as "established" or are designated as non-native species (not invasive species), and management options are not implemented regionally because control of these species is not currently feasible. As such, MPMC does not actively manage these species, unless they are directly impeding

reclamation efforts. These aforementioned control measures are listed as options for future use, as required, and are currently not a routine component of MPMC's invasive plant management activities, as the Plan objectives are being met without their use.

Mitigation measures will focus on the "new invaders" and "containment" categories, as well as any "established" species if they are directly impeding reclamation efforts. Consistent with the Regional Strategic Plan, the treatment goal for "new invaders" is eradication (elimination of all individuals and their propagules), while the treatment objective for species listed for "containment" is prevention of invasive plants from spreading to uninfested areas. For species that are impeding reclamation revegetation, but are regionally listed under "containment" or "established" categories, the primary option will be suppression (reduction in plant population size and abundance). These control measures generally follow the following process, based on the level of infestation:

1. Prevent new infestations from becoming established;
2. Eradicate small or isolated "satellite" infestations;
3. Contain the perimeter of large "core" infestations; and
4. Suppress the interior of large "core" infestations.

If control measures area applied in the future, any sites that have treatments applied will be monitored through the established methods (described in Section 5) in subsequent years to assess if treatment measures have been successful.

5 Check: Monitoring Program

The MPMC invasive plant monitoring program includes visual surveys conducted in combination with routine assessments of progressive reclamation sites and annual soil stockpiles inspections; invasive plant species present and their percent cover are documented and compiled with revegetation results.

In addition, more formal invasive plant inventories are to be conducted routinely at the Mine site. These inventories should encompass disturbed areas, including any that are undergoing reclamation, as well as adjacent undisturbed areas from which invasive plants could ingress. Inventories may be conducted by MPMC Environmental Department staff with sufficient expertise or an external consultant. Each inventory should include the following items, with the results presented in a report:

- Surveying and mapping of infestation locations, with a focus on reclamation areas and soil stockpiles;
- Identification of invasive plant species present;
- Assessment of the degree of invasive plant growth, distribution, and density present at infestation sites;
- Assessment of success of any prevention and control measures that were previously implemented;
- Recommendations for any prevention and control measures that should be implemented; and
- Recommendations for when the next inventory should be conducted.

Where possible, all assessments and inventories should take place in the late spring/early summer so that eradication measures can be undertaken prior to seed dispersal in late summer/early fall. Alternatively, assessments and inventories can be conducted in mid to late summer, when plants are readily identifiable, with interpretation of results to take place over winter and management applications to be implemented early the following growing season.

6 Act: Program Review and Continuous Improvement

Each year, the results of invasive species monitoring should be reviewed with respect to the objectives outlined in Section 2, and the Plan and associated site invasive plant management activities should be updated accordingly. Specific items that should be reviewed and associated actions are listed in Table 2. When the Plan is updated, it is to be submitted to the Ministry of Energy and Mine with the Annual Environmental and Reclamation Report. In addition, an update on invasive plant monitoring, prevention and control activities at the Mine (including any pertinent results from progressive reclamation and soil stockpile inspections, and site invasive plant inventory reports) is to be included in the Annual Environmental and Reclamation Report each year.

Table 2 Invasive plant management program review process

Item to Review	Associated Actions
Verify that all seed mixes used were certified weed-free (i.e., comply with Canadian Food Inspection Agency standards).	If seed utilized is not certified weed-free (or invasive plants were suspected to be present in the seed mixtures used): • Change seed suppliers and/or seed mixtures.
Verify that all soil amendments (where appropriate) were tested to confirm they did not contain invasive plant propagules or seeds.	If soil amendments were not tested: • Conduct post-application assessments for any soil amendments not tested; • Discontinue use of any soil amendments not tested until appropriate testing has been completed; and • Plan appropriately to test all amendments prior to use in the future.
Verify that no invasive plants identified in monitoring are on provincial noxious weed lists.	If any noxious weeds are identified: • Implement appropriate control measures (Section 4.2), with the objective of eradication; and • Ensure that measures taken are monitored as per the program in Section 5.
Verify that all invasive plants identified in monitoring are being managed according to the most recent CCCIPC Annual Strategic Plan.	If invasive plant management is inconsistent with the Regional Strategic Plan: • Implement prevention and/or control actions (Section 4) until management actions are consistent with the Regional Strategic Plan; and • Ensure that measures taken are monitored as per the program in Section 5.
Verify that results from reclamation revegetation assessments are consistent with closure objectives (with respect to species composition and/or functional groups). If results are not consistent, verify that invasive plants are not a constraining factor. The prioritization matrix in Figure 1 can be used to aid in separating innocuous species from disruptive species in reclamation areas and prioritize management actions accordingly.	If invasive plants are identified as a constraint to meeting revegetation objectives: • Delineate the specific species and areas of concern; • Implement prevention and/or control actions (Section 4) appropriate for the level of infestation, the life history of the identified invasive plants, and available control options; and • Ensure that measures taken and target native reclamation species are monitored in the identified reclamation areas as per the program in Section 5.

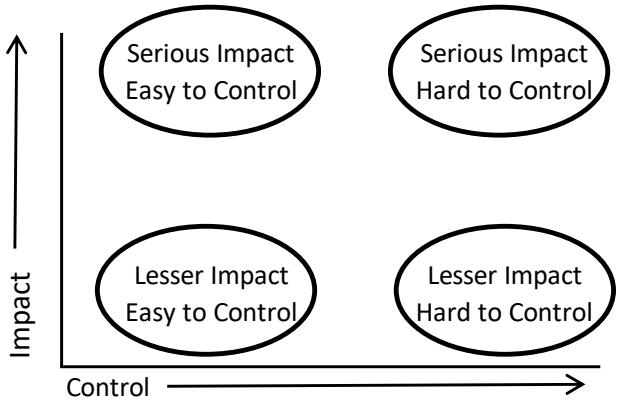


Figure 1 Invasive plant management prioritization matrix (adapted from USFWS, 2009)

7 Responsibilities

Responsible individuals for implementing this Plan are described below.

Environmental Superintendent or designate (e.g., Environmental Supervisor):

- Be knowledgeable of, adhere to, and coordinate implementation of all aspects of this Plan;
- Ensure all other responsible individuals have reviewed the most up to date version of this Plan;
- Ensure this Plan and monitoring data are reviewed periodically and updated accordingly, with updates submitted in the Annual Environmental and Reclamation Report and appropriate management actions implemented;
- Be aware of high level mine planning to ensure that seeding of disturbed areas can be done in a timely manner and transport of soil is appropriately managed;
- Review updates to the MPMC *Mines Act* Permit 11678, BC *Mines* Act, CCCIPC Regional Strategic Plan and provincial noxious weed lists and regulations;
- Schedule and assign staff or external contractors to carry out all requirements of this Plan, including monitoring programs and reporting;
- Plan and budget for necessary invasive plant control measures;
- Obtain and permits or authorizations required for control measures that are implemented; and
- Ensure that individuals conducting monitoring, data interpretation, reporting, and planning and implantation of prevention and control measures have appropriate training.

Qualified individual conducting monitoring and reporting (e.g., Environmental Technician, contractor):

- Be knowledgeable of and adhere to all aspects of this Plan;
- Conduct assigned activities, such that all requirements of this Plan (at minimum) are met; and
- Have appropriate training and expertise for assigned components of this Plan.

Staff or contractors conducting control measures

- Have appropriate training and expertise for prevention and control actions they are implementing.

Mine Planning Engineer and General Foreman:

- Notify the Environmental Superintendent or designate of planned disturbances and any transport of soil materials;
- Where possible, minimize the disturbance of vegetated areas; and
- Transmit relevant information related to the aforementioned points to the Mine Operations Supervisors.

Mine Operations Supervisors:

- Supervise operators such that new disturbances and soil handling are conducted as planned.

8 References

ISCBC (Invasive Species Council of British Columbia). What are invasive species? Retrieved online September 28, 2015 from: http://bcinvasives.ca/invasive-species/about/what-are-invasive-species/

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Appendix A

Invasive Plant Monitoring Report Mount Polley Mining Corporation 2024

APPENDIX 10-7: WILDLIFE MANAGEMENT PLAN

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Wildlife Management Plan

Submitted to:

BC Ministry of Environment and Climate Change Strategy
Environmental Protection Division
South Interior Region – Cariboo

Prepared by:

DWB Consulting Services Ltd.

Prepared for:

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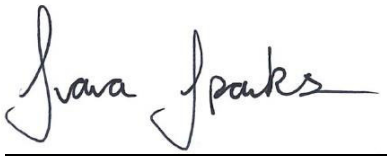
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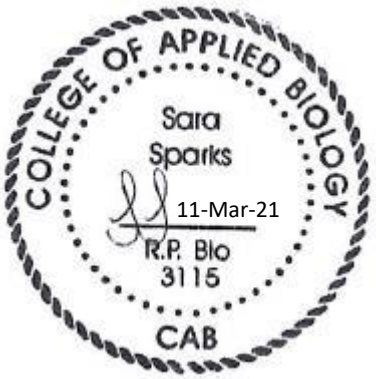
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Signature Page

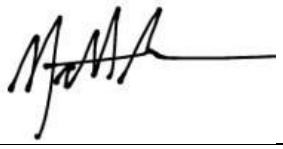
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1 INTRODUCTION

The Wildlife Management Plan (the Plan) was developed for the Mount Polley Mining Corporation (MPMC) for all operational activities of the Mount Polley Mine (the Facility). The Facility is located approximately 100 km northeast of the city of Williams Lake, British Columbia (BC), near the town of Likely, BC. For the purposes of this Plan, the term 'wildlife' will collectively refer to mammals, birds, amphibians, reptiles, and fish unless otherwise specified.

The objectives of the Plan are to:

- Meet the requirements of permits approved under the *Environmental Management Act* and *Mines Act*, in addition to all relevant provincial and federal wildlife regulations,
- Develop guidelines for minimizing the potential for mine-related impacts to wildlife at the Facility and its surrounding areas, with emphasis on protecting wildlife that have been designated as a *Species at Risk*,
- Describe concrete measures for how mine personnel can help minimize wildlife impacts through implementing best management practices, following protocols for specific types of wildlife encounters, and documenting and reporting observations,
- Ensure wildlife management is incorporated into the long-term goals of the Facility through comprehensive monitoring programs and reporting plans, recommendations for reclamation and closure planning, stakeholder consultation, and incorporation of adaptive management.

The Plan is a living document that may be periodically updated as new information becomes available or as authorizations and regulations change.

1.1 PERMIT REQUIREMENTS

The Plan is a component of the Comprehensive Environmental Management Plan (CEMP) which is a requirement of Permit 11678 issued under the provision of the *Environmental Management Act* (SBC 2003, c. 53.) by the BC Ministry of Environment and Climate Change Strategy (ECCCS, 2020). The implementation of wildlife monitoring programs that track the progress of wildlife and wildlife habitat impacted by mine-related activities is one of the objectives of the CEMP and is addressed in Section 5.4 of the Plan.

The Plan also addresses conditions outlined in the M-200 Permit issued under the provision of the *Mines Act* (RSBC 1996, c. 293) by the BC Ministry of Energy, Mines and Low Carbon Innovation, formerly known as the Ministry of Energy, Mines and Petroleum Resources (MEMPR, 2020). Conditions under the M-200 Permit include restrictions and requirements that protect wildlife and personnel (Section 5.3.1) and ensure wildlife habitat is incorporated into long-term land use goals during reclamation and closure planning (Section 5.5).

1.2 PROVINCIAL AND FEDERAL REGULATIONS

All phases of the Facility, including construction, operation, decommissioning, and reclamation, are regulated under the BC *Environmental Management Act* (EMA), BC *Mines Act*, as well as other legislation implemented by the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) as outlined in MPMC (2019). The following provincial and federal *Acts* are additional legislation specifically relevant to wildlife and wildlife habitat:

- BC *Wildlife Act,*
- BC *Forest and Range Practices Act,*
- BC *Water Sustainability Act,*
- Canada's *Migratory Birds Convention Act,* and
- Canada's *Species at Risk Act.*

Not all the relevant *Acts* will be applicable for every activity carried out by MPMC. For further information on how the *Acts* relate to the management of specific wildlife and activities, refer to Section 3.0.

2 FACILITY DESCRIPTION

The Facility represents the permitted areas of the mine where most mine-related activities occur, as shown in Figure 1 of MEMPR (2020). The Facility generally includes:

- The tailings storage facility (TSF),
- The crusher and mill processing site, and,
- Operations areas (open pits, waste rock dumps, stockpiles, roads, etc.).

The Facility has been in a temporary Care and Maintenance phase since May 31, 2019. Care and Maintenance operations are focused primarily on general site maintenance to ensure that all pumps, sumps and water management systems are functioning as intended. Eleven full time employees work in four shifts, including day and night shifts. Environmental monitoring and sampling activities continue to be followed during the Care and Maintenance phase, as required by all permits. For further details regarding Facility operations, refer to the CEMP (MPMC, 2019).

2.1 TAILINGS STORAGE FACILITY (TSF)

The TSF at the Facility consists of tailings material and a single embankment made up of three dams, including the Main Embankment, Perimeter Embankment, and the South Embankment. During the TSF embankment failure that occurred on August 4, 2014, water (both supernatant and interstitial) was released from the TSF, resulting in much of the tailings within the TSF being exposed to the elements (i.e., no longer submerged).

The embankment failure of the Mount Polley TSF resulted in the deposition of tailings between Polley Lake and Hazeltine Creek (known as the Polley Flats); for the purpose of this Plan, the impacted areas between Polley Lake and Hazeltine Creek are also referred to as the Surrounding Areas (see Section 2.4).

2.2 CRUSHER AND MILL PROCESSING SITE

The crusher and mill processing site are comprised of the crusher and mill building, the coarse ore pile, tertiary pile, fine ore (mill feed) pile, and pebble pile. No crushing operations are conducted during the Care and Maintenance period.

2.3 PITS

Open pits at the Facility include the Cariboo and Springer Pits, while the waste rock dumps include the Temporary Northwest Potential Acid-Generating (PAG) Stockpile, North East Zone (NEZ) Rock Dump and the South East Rock Dump (SERD). Mineral extraction activities are not occurring during the Care and Maintenance period.

2.4 SURROUNDING AREAS

Surrounding Areas are defined as the areas outside the Facility (i.e., permitted mine area) that were impacted by the TSF embankment failure (Section 2.1), including Polley Flats and the Hazeltine Creek Corridor, which are now subject to ongoing remedial works and monitoring (Golder, 2017; MPMC, 2019). For the purpose of this Plan, the Surrounding Area will also refer to the primary road networks that connect to the Facility, such as the Morehead-Bootjack Forest Service Road (FSR), Gavin Lake Road, and Mitchell Bay Road.

The Surrounding Area is characterized by Interior Cedar Hemlock (ICH) biogeoclimatic (BEC) zone vegetation, which consists of Western red cedar, Douglas-fir, hybrid spruce, and subalpine fir, with a lesser presence of trembling aspen, black cottonwood, and paper birch (MPMC, 2019). Much of the area has previously been harvested in commercial logging operations and is currently used for cattle grazing (MPMC, 2019).

2.4.1 Polley Flats

Polley Flats is located south of Polley Lake and east of the TSF embankment failure (Section 2.1). Prior to the TSF embankment failure, Polley Flats was an established wetland with a riparian vegetation community that encompassed approximately 900 m of the upstream portion of Hazeltine Creek, where it immediately drained from Polley Lake. The wetland, Hazeltine Creek corridor, and their associated riparian vegetation were significantly impacted by the release of water and tailings during the TSF embankment failure. The release deposited large volumes of mine-related materials into the Polley Flats wetland area and Hazeltine Creek corridor, stripping the riparian vegetation and native soil (Golder, 2017). Since the TSF embankment failure, MPMC has been conducting ongoing remediation of Polley Flats, including removal of tailings, wetland reconstruction, earth mounding, soil placement, planting native seeds, shrubs, and trees, and installing coarse woody debris (CWD; Golder, 2017; MPMC, 2019). Multiple avian nest boxes were also installed to increase nesting sites for secondary cavity-nesting species, such as Tree Swallows and Mountain Bluebirds.

2.4.2 Hazeltine Creek Corridor

Hazeltine Creek (WSC: 160-585700) commences from the southern point of Polley Lake (WSC: 160-585700) and subsequently drains southeast for 8.5 km before terminating at Quesnel Lake (WSC: 160). Edney Creek (WSC: 160-5857-038) and Bootjack Creek (WSC: 160-5857-487) are tributaries of Hazeltine

Creek and are located approximately 1 km and 8.5 km upstream of the confluence of Hazeltine Creek and Quesnel Lake (Pedersen, 1998; Province of BC, 2021).

Hazeltine Creek provided extensive spawning habitat for Sockeye Salmon and Rainbow Trout prior to the TSF embankment failure (Pedersen, 1998). Following the TSF embankment failure, Hazeltine and Edney Creek were re-channelized and armoured, and engineered log structures were installed to improve fish rearing habitat (Golder, 2017). Passive wetland (sediment settling) ponds were constructed near the Quesnel Lake confluence to improve water quality and increase wildlife forage (Golder, 2017). Rehabilitation of the riparian habitat was initiated by planting native trees, shrubs, and seeds, and by using landscape techniques to improve site growing conditions, such as mounding soil, spreading CWD, and adding mulch (Golder, 2017).

3 WILDLIFE REGULATION OVERVIEW

The following provincial and federal regulations are the most relevant legislation applicable to wildlife and wildlife habitat during the life of the mine and, along with the applicable permit conditions, are the foundation for the guiding principles in this document. Not all provincial and federal legislation will be applicable for every operational activity at the Facility. If there are any concerns regarding whether a specific activity will contravene one of the following regulations in this section, personnel should consult with the Operations Supervisor or Accountable Facility Representative for further clarification and guidance.

3.1.1 BC *Wildlife Act*

The BC *Wildlife Act* protects almost all vertebrate species from direct harm, except from activities that are authorized under regulation. The *Wildlife Act* includes provisions for wildlife prohibitions and authorizations, where applicable, such as:

- Hunting and trapping,
- Angling,
- Beaver dam removal,
- Attracting dangerous wildlife,
- Wildlife capture,
- Birds, nests and eggs,
- Transportation of wildlife,
- Accidental killing of wildlife,
- Destruction of animals,
- Endangered wildlife (Species at Risk), and
- Fines and penalties.

Section 34 of the BC *Wildlife Act* also provides specific instructions for the protection of birds, nests, and eggs, including for bird species not adopted under Canada's *Migratory Bird Convention Act* (MBCA). Under this section, it is an offence to possess, take, injure, molest, or destroy a bird, its egg, and its nest when occupied (*Wildlife Act*, RSBC 1996, c. 488., s. 34). Nests belonging to an eagle, peregrine falcon, gyrfalcon,

osprey, heron, or burrowing owl are also protected year-round regardless of occupancy (*Wildlife Act*, RSBC 1996, c. 488., s. 34).

Prior to initiating any activity that may be in contravention of the BC *Wildlife Act*, authorization under a provincial permit would be required. A permit associated with the listed activities under the *Act* are typically only authorized if the activity does not contravene a federal act (e.g., *MBCA*).

The Minister responsible for the BC *Wildlife Act* may designate a wildlife species as a *Species at Risk* subject to additional protection under the *Act*. Most species that have been designated as a *Species at Risk* in BC by the responsible Minister have been designated through Provincial Order under the BC *Forest and Range Practices Act* (FRPA) to enable conditions that will protect these species during forest and range activities on Crown land (see Section 3.1.2). However, only four species to date have been designated as a *Species at Risk* under the BC *Wildlife Act*. Refer to Table 1 in Section 4.0 for a list of the designated *Species at Risk* under the *Act* which have been previously documented in the Cariboo Region.

Mine activities that have the potential to impact wildlife should occur within the applicable timing windows, where possible, to avoid contravention of the BC *Wildlife Act* (see Section 5.1).

3.1.2 BC *Forest and Range Practices Act* (FRPA)

The Minister responsible for the BC *Wildlife Act* has the authority to issue a Provincial Order that identifies wildlife species that may require management and protection during activities that occur on Crown Land (Section 3.1.1). To date, most of these Orders have been established under Sections 11 and 13 of the *Government Actions Regulations* (BC Reg. 582/2004) of FRPA (SBC 2002, c. 69.). Wildlife species protected under FRPA through Provincial Order fall into one of two categories, including *Species at Risk* and Ungulates. Species in one of these two categories are subject to additional protection under FRPA during forest and range activities on Crown land through management of habitat areas, ungulate winter ranges, and implementation of general wildlife measures associated with the target species. A third category for *Regionally Important Wildlife* is still under consideration by the Minister.

The Order for the Ungulate category currently includes elk (*Cervus canadensis*), moose (*Alces americanus*), and three populations of Caribou (*Rangifer tarandus*), including the boreal, southern mountain, and northern mountain populations. For a summary of wildlife species that have been designated as a *Species at Risk* under FRPA in the Cariboo Region, refer to Table 1 in Section 4.0.

Activities governed by FRPA generally include timber harvesting, road construction, road maintenance, road use, road deactivation, silviculture treatments, collection of botanical forest products, fire use, control and suppression, or activities carried out under the BC *Forest Act*, a special use permit, or a road use permit (*Forest and Range Practices Act*, SBC 2002, c. 69.). Not all mining activity is expected to fall into the prescribed categories governed by FRPA; however, should any activity undertaken by the mine fall under FRPA's mandate, additional protection measures for the species identified by the Orders may apply.

3.1.3 BC *Water Sustainability Act* (WSA)

The BC *Water Sustainability Act* (WSA) provides protection for aquatic systems and fish habitat and includes mechanisms for authorizations to conduct work activities in and around streams (*Water Sustainability Act*, SBC 2014, c. 15.). Additional provisions for protecting and reducing risk to sensitive streams that contain fish are outlined in Sections 18 – 20 of the *Water Sustainability Regulation* (BC Reg. 36/2016). Work activities occurring in, or around, streams should target the appropriate Fisheries Timing Window to reduce the risk to aquatic organisms (see Section 5.1). Consultation with a Qualified Environmental Professional (QEP) may be required if additional instream mitigation is requested as part of the authorization to conduct the works.

3.1.4 Canada's *Species at Risk Act* (SARA)

Additional prohibitions may apply for species that have been designated as extirpated, endangered, or threatened under Schedule 1 of Canada's *Species at Risk Act* (SARA). It is prohibited to kill, harm, harass, capture, take, possess, collect, buy, sell, or trade any species listed under Schedule 1 of the *Act* (*Species at Risk Act*, SC 2002, c. 29., s. 32.). In addition, the damage or destruction of the residence (e.g., den, nest, etc.), or any part of the critical habitat of a listed species, is prohibited for endangered or threatened species, or for extirpated species that have a recovery strategy that recommends its reintroduction into the wild (*Species at Risk Act*, SC 2002, c. 29., s. 33., s. 58.). Critical habitat is defined as, "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species" (*Species at Risk Act*, SC 2002, c. 29., s. 2(1).).

Except for listed aquatic species and listed bird species also protected under Canada's MBCA, prohibitions under SARA apply on federal lands only. However, a Federal Order can be issued to the Province by the Governor in Council requesting further intervention for a SARA-listed species on non-federal lands. Therefore, most terrestrial species that are listed under Schedule 1 of SARA, including their associated residence and critical habitat, fall within the jurisdiction of the Province and will be subject to protection measures that will vary depending on the recovery strategy for that species, scope of works, habitat present, and whether the species is part of a Federal Order that requires the Province to adopt the prohibitions of SARA on non-federal lands.

For a summary of wildlife species adopted under Schedule 1 of SARA that have been documented in the Cariboo Region, refer to Table 1 in Section 4.0.

3.1.5 Canada's *Migratory Bird Convention Act* (MBCA)

The MBCA protects most birds in Canada (including non-migratory species) through provisions outlined in the *Migratory Birds Regulations* (MBR) which stipulate that an individual must not (CRC, c. 1035., s. 5(1)):

- Capture, kill, take, injure or harass a migratory bird (i.e., a bird listed under the *Act*),
- Destroy, take or disturb an egg; or,
- Damage, destroy, remove or disturb a nest, nest shelter, eider duck shelter or duck box.

Permits authorizing some of the actions listed in Section 5(1) of the MBR is possible to obtain for certain activities, such as scientific research. However, there is no permitting process to undertake an activity that

may incidentally result in one of the actions outlined in Section 5(1) of the MBR, such as vegetation clearing. Therefore, incidental disturbance to breeding birds protected under the MBCA, including their eggs, young, and nests, constitutes a non-compliance under the MBCA. The best method of avoiding a non-compliance under the MBCA is to avoid work activities in an area where birds are actively breeding (see Section 5.1.2). When this option is not feasible, there are risk-management strategies that may be utilized as outlined in Section 5.2.1.

4 SPECIES AT RISK

In BC*, Species at Risk* are collectively managed under the BC *Wildlife Act*, the BC *FRPA*, and Canada's *SARA.* Wildlife that are designated as a *Species at Risk* may fall under one or more of these *Acts*. Prohibitions that may apply for species protected under these *Acts* are summarized in Section 3.0.

A list of *Species at Risk* adopted under provincial and/or federal legislation were narrowed down to highlight species that have the potential to occur at the Facility and in the Surrounding Areas, or within the Cariboo Region (BC CDC, 2021). However, *Species at Risk* that were determined to be primarily habitat specialists based on elevation or vegetation requirements (e.g., Bunchgrass BEC zone) in the Cariboo Region were excluded from the final list. Refer to Table 1 for the list of *Species at Risk* that were determined to have the highest potential of occurring at the Facility or in the Surrounding Areas.

Most species in Table 1 are not anticipated to be encountered on the grounds of the Facility. Instead, species in Table 1 are more likely to be encountered in transit to the mine, or in the Surrounding Areas. The exception may include barn swallows or *Myotis* (bat) species attempting to utilize anthropogenic structures for nesting and hibernacula. Refer to Section 5.2 for guidelines regarding wildlife encounters that have a higher potential of occurring at the Facility.

A number of wildlife species have been identified by the BC Conservation Data Centre as vulnerable (i.e., Blue or Red-listed) but have not yet been legally adopted under any statute. For a list of these species, refer to Appendix A.

Table 1. *Species at Risk* adopted under the BC *Wildlife Act*, BC *Forest and Range Practices Act* (FRPA), and/or Schedule 1 of Canada's *Species at Risk Act* (SARA)[1]

Wildlife Species			Adopted under Act? (YES / no)			Conservation Status	
English Name	Scientific Name	Category	FRPA	Wildlife Act	SARA	BC List[2]	SARA[3]
American Badger	*Taxidea taxus*	Mammal	YES	no	YES	Red	E (2018)
American White Pelican	*Pelecanus erythrorhynchos*	Bird	YES	YES	no	Red	no status
Barn Swallow	*Hirundo rustica*	Bird	no	no	YES	Blue	T (2017)
Black Swift	*Cypseloides niger*	Bird	no	no	YES	Blue	E (2019)
Bobolink[4]	*Dolichonyx oryzivorus*	Bird	no	no	YES	Blue	T (2017)
Bull Trout	*Salvelinus confluentus*	Fish	YES	no	no	Blue	no status
Caribou (Southern Mountain Pop.)	*Rangifer tarandus pop. 1*	Mammal	YES	no	YES	Red	T (2003)
Common Nighthawk	*Chordeiles minor*	Bird	no	no	YES	Yellow	T (2010)
Evening Grosbeak	*Coccothraustes vespertinus*	Bird	no	no	YES	Yellow	SC (2019)
Fisher	*Pekania pennanti*	Mammal	YES	no	no	no status	no status
Flammulated Owl[4]	*Psiloscops flammeolus*	Bird	YES	no	YES	Blue	SC (2003)
Great Blue Heron, *herodias* subspecies	*Ardea herodias herodias*	Bird	YES	no	no	Blue	no status
Grizzly Bear	*Ursus arctos*	Mammal	YES	no	YES	Blue	SC (2018)
Lewis's Woodpecker	*Melanerpes lewis*	Bird	YES	no	YES	Blue	T (2012)
Little Brown Myotis	*Myotis lucifugus*	Mammal	no	no	YES	Yellow	E (2014)
Long-billed Curlew	*Numenius americanus*	Bird	YES	no	YES	Blue	SC (2005)
Northern Myotis	*Myotis septentrionalis*	Mammal	no	no	YES	Blue	E (2014)
Olive-sided Flycatcher	*Contopus cooperi*	Bird	no	no	YES	Blue	T (2010)
Painted Turtle - Intermountain - Rocky Mountain Population	*Chrysemys picta pop. 2*	Reptile	no	no	YES	Blue	SC (2007)
Red-necked Phalarope	*Phalaropus lobatus*	Bird	no	no	YES	Blue	SC (2019)
Rusty Blackbird	*Euphagus carolinus*	Bird	no	no	YES	Blue	SC (2009)
Sharp-tailed Grouse, *columbianus* subspecies	*Tympanuchus phasianellus columbianus*	Bird	YES	no	no	Blue	no status
Short-eared Owl	*Asio flammeus*	Bird	YES	no	YES	Blue	SC (2012)
Western Grebe	*Aechmophorus occidentalis*	Bird	no	no	YES	Red	SC (2017)
Western Toad	*Anaxyrus boreas*	Amphibian	no	no	YES	Yellow	SC (2018)
Wolverine	*Gulo gulo*	Mammal	no	no	YES	no status	SC (2018)
Yellow-breasted Chat[4]	*Icteria virens*	Bird	YES	no	YES	Red	E (2003)

[1] BC CDC Search criteria: Vertebrates AND SARA Schedule 1 Status: True OR Identified Wildlife Status: True AND Area of Interest: User Defined Polygon. The exported BC CDC list was further filtered by comparing the results to the CDC mapped locations, COSEWIC distribution maps, and Habitat Wizard wildlife observation points.

[2] Based on Status designated by BC Conservation Data Centre – Yellow = Least Risk, Blue = Special Concern, Red = Endangered/Threatened.

[3] Based on Status designated under SARA – SC = Special Concern, T = Threatened, E = Endangered. The year the status was adopted is in brackets.

[4] These species are at the northern extent of their range but may occur periodically in the region as vagrants.

5 WILDLIFE MANAGEMENT

5.1 TIMING WINDOWS

Reduced Risk Timing Windows for fish and wildlife are intended to provide specific timing windows to target during operational planning to lower the potential for impacts to fish and wildlife. Least risk timing windows typically coincide with the breeding period for a given species, although they may also encompass other life history activities, such as juvenile dispersal and migration events. These timing windows do not guarantee that there will be zero risk to fish and wildlife during these periods, and do not authorize anyone to conduct or participate in activities that are contrary to any statute.

5.1.1 Fisheries Timing Window

To reduce the risk of contravening the WSA (see Section 3.1.3), all work activities that occur instream should utilize the appropriate fisheries timing window for the region. Fisheries timing windows (also referred to as in-stream work windows) apply to all fish-bearing streams and watercourses that have direct connectivity to fish-bearing waters downstream. Within the Central Cariboo District, all streams located at elevations less than 1325 m have a reduced risk timing window of **July 22 – August 15** to account for the presence of both spring and fall spawning fish species occupying the system (Province of BC, 2004). However, this timing window does not necessarily protect anadromous salmonids in freshwater systems; therefore, the regional Department of Fisheries and Oceans (DFO) should be consulted prior to working in any streams where salmon may be present to determine whether adjustments to the reduced risk timing window is required.

If instream works must occur outside the fisheries timing window, a Change Approval authorization may be required through MFLNRORD. In addition, the implementation of risk-management strategies under the direction of a QEP may be a condition of authorization.

5.1.2 Bird Nesting Window

To reduce the risk of contravening the BC *Wildlife Act* (see Section 3.1.1) and MBCA (see Section 3.1.5), any activity that may impact breeding birds, including their eggs and nests, should be conducted outside of the peak breeding period for birds in the region; for example, vegetation clearing or removal of buildings that birds are actively nesting on. The least-risk period for nesting birds in the region is from **August 12 – April 14,** which is the period when less than 5% of the majority of actively breeding birds in forest and wetland habitat are expected to be present within the region (ECCCS, 2018). In addition, any nest belonging to an eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl is protected year-round regardless of whether the nest is active (*Wildlife Act*, RSBC 1996, c. 488., s. 34). Should an **inactive** nest belonging to one of these species require removal, authorization through MFLNRORD would be required.

If the peak nesting period cannot be avoided, additional risk-management strategies may be required under the direction of a QEP (see Section 5.2.1).

5.1.3 Amphibian and Reptile Window

An amphibian and reptile timing window has not been formally developed for the Cariboo Region. However, to avoid contravention of the BC *Wildlife Act* (see Section 4.1.1), operational activities should avoid areas where amphibian and reptile species have been confirmed hibernating, breeding or migrating. All amphibian species native to the Cariboo region require different habitat types (both aquatic and terrestrial) at different times of the year. Adult amphibians breed and lay eggs in freshwater, where they hatch into aquatic larvae, that grow and metamorphose into semiterrestrial juveniles. Highest risk periods for amphibians are typically related to movement of individuals between different habitat types, including migration of adults between aquatic breeding habitat and upland foraging or overwinter sites, or dispersal of juvenile amphibians from aquatic breeding sites to nearby terrestrial habitats. Although reptiles in the region, such as the Western Painted Turtle, Common Garter Snake, and Wandering Garter Snake, do not breed aquatically, their life history is also characterized by seasonal movements between different habitats. Due to both groups' heavy reliance on, and association with, freshwater habitats, any work in and around wetlands, streams, or small water bodies (including water-filled ditches), may also pose a risk of harm to individuals or damage to habitat. The highest risk period for amphibians and reptiles occurs between April 1 and September 30, when individuals of these species are expected to be active on the landscape (i.e., not hibernating) (BC MOE, 2017). Therefore, the reduced risk timing window for amphibians and reptiles is estimated to be **October 1 – March 31** for the Cariboo Region.

If amphibians or reptiles have the potential to be impacted by an activity, such as a clearing and grubbing, the completion of a survey under the direction of a QEP may be required to determine if amphibians, reptiles, or their habitats, are present, and/or at risk. If amphibians or reptiles cannot be avoided, a salvage that has been authorized by MFLNRORD through a General Wildlife Permit may be required so that amphibians or reptiles can be safely translocated from the site to nearby suitable habitat.

5.2 WILDLIFE ENCOUNTERS

To avoid contravention of the relevant wildlife legislation outlined in Section 3.0, wildlife-specific strategies may be required during human-wildlife encounters at the Facility, or within the Surrounding Areas. In most circumstances, allowing the animal to leave the area and reporting the incident to the Operations Supervisor or Accountable Facility Representative, will be the best course of action. In certain situations, further mitigation may be required based on the time of year, status of the species, and nature of the anticipated work activity. Individuals should consult with the Operations Supervisor or Accountable Facility Representative if they have any questions regarding protocols for a particular situation that involves a wildlife encounter. Additional in-house training may be required for some personnel to ensure they have the skills to safely handle human-wildlife conflicts, such as bear encounters, and identify sensitive wildlife features.

5.2.1 Birds

The majority of birds in BC are collectively protected under the BC *Wildlife Act*, Canada *MBCA*, and/or Canada's SARA, which generally acknowledge that birds are most vulnerable during the breeding period when adults are caring for nests, eggs, and young (see Sections 3.1.1 and 3.1.5). The following mitigation measures will be implemented if actively breeding birds are encountered at the Facility or in the Surrounding Areas:

- The destruction or disruption of migratory birds, nests, and eggs, is prohibited, including during travel to and from work sites. If destruction or disruption occurs in the form of incidental harm (i.e., unintentional), the incident will be immediately reported to the Operations Supervisor or Accountable Facility Representative.
- To reduce the risk of encountering and disturbing breeding birds, any activity that has the potential to disturb and harm birds, nests, eggs, or young, should be completed outside of the peak avian breeding period for the region (see Section 5.1.2). Vegetation clearing would be a common example of this.
- Report any active bird nests, or repeat observations of breeding pairs, to the Operations Supervisor or Accountable Facility Representative. Birds that are observed at the same location on consecutive days, hover in close proximity to humans, or display agitated behaviour such as persistent alarm-calling or dive-bombing (i.e., swooping down close, before veering away) are evidence that a breeding pair and nest may be present.
- If an active nest or established breeding pair continue to occupy an area of the Facility where the presence of personnel is only periodic and work activity is not constantly occurring (e.g., water sampling), the Accountable Facility Representative may recommend the installation of a buffer around the nest site to signal to other crew members to avoid the area to reduce disturbance. Only the periphery of the buffer should be marked and never the nest or nest tree, itself. Common buffer sizes used according to different avian groups, include (MFLNRO, 2013; MFLNRO, 2014):
    - Songbirds – 30 m radius,
    - Waterfowl – 100 m radius,
    - Swallow colonies – 50 m radius, and
    - Raptors: 100 – 500 m radius (species dependent)
- If an active nest or established breeding pair continue to occupy an area of the Facility where personnel will be regularly present for mine activities that occur for an extended period of time (e.g., geotechnical drilling), or the species is determined to be a designated *Species at Risk* from Table 1, the Accountable Facility Representative may consult with a QEP to determine the most suitable mitigation measures appropriate for the species, habitat, and magnitude of the anticipated disturbance.
- Report the presence of any stick nests to the Operations Supervisor or Accountable Facility Representative since some stick nests are protected year-round regardless of occupancy (see Section 3.1.1).
- Any birds nesting on anthropogenic structures (e.g., barn swallows and cliff swallows) must be allowed to finish nesting once nesting has commenced. If a building with intact barn swallow nests has been scheduled for demolition or removal outside the peak breeding period, consultation with MFLNRORD will be required since barn swallows (and their nests) are protected under Schedule 1 of SARA (see Section 3.1.4).

5.2.2 Mammals

Small and large mammals are regularly documented at the Facility, including black bears, coyotes, lynx, moose, and mule deer. Although the presence of some mammal species on the mine is to be expected due to the remote location of the Facility, the objective is to minimize interactions and, thereby, risks to personnel and animals. The following measures will be implemented if mammals are encountered at the Facility or in the Surrounding Areas:

- Reduce driving speeds to avoid a potential collision with mammal species, especially during hours at dawn and dusk when wildlife activity is heightened, and along known wildlife migration corridors; refer to Section 5.3.2 for further guidelines to prevent wildlife-vehicle collisions.
- Avoid approaching or feeding any mammal species. Food and waste should be securely stored in buildings, approved waste receptacles, or vehicles at all times; Refer to Section 5.3.3 for further guidelines on how to manage for wildlife attractants.
- If a mammal is a designated *Species at Risk* (e.g., caribou), as listed in Table 1 (Section 4.0), disturbance should be reduced to a minimum until the animal has left the area. If driving, temporarily stop the vehicle or pull over if it is safe to do so. If the animal has occupied a work area where mine activities are occurring, temporarily suspend works until the animal has moved out of the work area. All sightings of *Species at Risk* at the Facility should be reported to the Operations Supervisor or Accountable Facility Representative as soon as possible. If repeated observations of a *Species at Risk* occur at a specific location at the Facility, or in the Surrounding Areas, consultation with a QEP may be required to determine the appropriate course of action for that species.
- If a suspected residence (e.g., den or borrow) of a mammal species is encountered, a GPS coordinate will be collected (if possible) and the location will be immediately reported to the Operations Supervisor or Accountable Facility Representative. If there is evidence the suspected residence of a large mammal species is active due to the presence of recent scat, hair, and/or tracks, the crew will immediately leave the area of the residence until further instructions can be provided by the Accountable Facility Representative.
- If a kill site (e.g., carcass locations that will attract wildlife) or mineral lick (e.g., an area where ungulates regularly congregate to obtain mineral nutrients) is discovered, immediately report the location to the Operations Supervisor or Accountable Facility Representative.
- If conflict wildlife, such as habituated bears or cougars, are observed at the Facility or in the Surrounding Areas, the observation should be reported to the Operations Supervisor or Accountable Facility Representative so that the regional Conservation Officer Service can be notified. Personnel should never attempt to engage with conflict wildlife.
- Mine personnel and visitors whose job responsibilities may place them in a situation where a bear encounter is possible must have bear safety awareness training and be trained on how to safely carry and deploy bear deterrents, such as bear spray.

5.2.3 Bats

Fourteen species of bat have the potential to occur within the Cariboo region, including the Northern Myotis and Little Brown Myotis which are both designated as Endangered under Schedule 1 of Canada's *SARA* (Section 4.0). Both the Northern Myotis and Little Brown Myotis have the potential to occur at the Facility or within the Surrounding Areas. Summer roost sites and winter hibernation sites (i.e., hibernacula) are critical for most bats to carry out their sensitive life stages (BC MOE, 2016), and therefore, preservation of these sites is important for the conservation of these species. Roosts may be found in the cavities or loose bark of trees, rock crevices, caves, cliffs, and anthropogenic structures, such as buildings and bridges (BC MOE, 2016).

The following measures will be implemented if bat presence is suspected or confirmed at the Facility or in the Surrounding Areas:

- If the presence of a bat roost or hibernacula is suspected at the Facility or in the Surrounding Areas, a GPS coordinate will be collected (if possible) and the location will be reported to the Operations Supervisor or Accountable Facility Representative.
- If the presence of a bat roost or hibernacula is suspected in an area scheduled for vegetation removal, further instruction will be required from the Accountable Facility Representative. A survey by a QEP may be necessary prior to initiating the works.
- If a natural cave feature is identified, a GPS coordinate will be collected (if possible) and the location will be reported to the Operations Supervisor or Accountable Facility Representative. No personnel shall attempt to enter a natural cave feature that has been identified.
- If bats are observed utilizing an anthropogenic structure at the Facility, the location will be reported to the Operations Supervisor or Accountable Facility Representative. Further recommendation for mitigation may be provided by the Accountable Facility Representative if there is concern bats and personnel will be in close proximity during work activities.
- Prior to removal of any buildings or structures at the Facility, a survey may be required by a QEP to ensure the building or structure is not being utilized by a designated *Species at Risk*, such as the Little Brown Myotis, which are known to use anthropogenic structures for roosting and overwintering.

5.2.4 Amphibians and Reptiles

Amphibians and reptiles rely on aquatic and terrestrial habitat to carry out their necessary biological functions. However, Western Toads and Painted Turtles are particularly vulnerable to road mortality due to the distance the two species will travel between breeding and overwintering grounds in the spring and fall (PWTWG, 2014; BC MOE, 2017); both are a designated *Species at Risk* in Table 1 (Section 4.0). Large congregations of Western Toads adults or juveniles crossing roadways can be a common phenomenon where roads bisect crucial aquatic (breeding) habitat and suitable upland (overwintering) habitat (PWTWG, 2014). In contrast, Painted Turtles rely on suitable aquatic habitat for overwintering and move to terrestrial habitats in the spring to breed (BC MOE, 2017). Painted Turtles exist in significantly lower numbers in the Cariboo Region compared to other amphibian and reptile species and should be reported if observed (BC MOE, 2017). The Common and Wandering garter snake have the potential to occur at the Facility and in the Surrounding Areas, and both species den communally in hibernacula.

Aquatic habitat, particularly riparian and wetland, are present in the Surrounding Areas around the Facility and, therefore, personnel should be aware that amphibians and reptiles have the potential to be present on commute roads. The following measures will be implemented to reduce the risk to amphibians and reptiles:

- Mine activities will consider the reduced-risk window for amphibians and reptiles during project planning, as outlined in Section 5.1.3. Activities that occur outside the reduced-risk window should determine the level of risk to amphibians and reptiles at the project location prior to commencing.
- If mine activities are occurring outside the reduced risk window in an area that has been determined to be high-risk for the presence of amphibians and reptiles, the Accountable Facility Representative may request that additional mitigation is implemented at the site, such as temporary installation of exclusion fencing to keep amphibians and reptiles out of the area of disturbance.
- If amphibians and reptiles are occurring inside the boundaries of the work site, an amphibian and reptile salvage may be required by a QEP under the authorization of a Wildlife Permit through MFLNRORD. Handling of amphibians and reptiles by unauthorized personnel is prohibited due to the potential to transfer disease between individuals and incidentally cause harm.
- Observations of large aggregations of amphibians, including migrations across roadways, will be immediately reported to the Operations Supervisor or Accountable Facility Representative so that further mitigation can be implemented, as necessary. Mitigation may include ensuring all personnel are aware to avoid that location, posting signage, installing temporary exclusion fencing, or having a QEP conduct an authorized salvage. The same procedures apply for a single observation of a Painted Turtle, which occur in lower numbers. Aggregations of snakes may indicate the presence of a hibernacula, which should also be similarly reported.
- Mine activities must not disturb any wetlands, streams or water features, including small, ephemeral (temporary) pools and water-filled ditches, as such habitats can provide important breeding, foraging, and hydration sites for amphibians.
- Any activities near aquatic habitats should protect shallow water areas and their vegetation from trampling and other disturbance; these areas serve as breeding habitat and cover for many amphibians.

5.3 General Best Management Practices

5.3.1 General Restrictions

To ensure compliance with Section D-12 of the M-200 permit, the following provisions and restrictions apply:

- No hunting or shooting shall occur within any area encompassed by the mine permit,
- No fishing or hunting shall occur while on company business, or while commuting to and from the mine for all MPMC personnel and contractors,

- Any exclusion fencing (e.g., electric fencing) that is installed shall be regularly maintained to ensure it is effectively functioning at all times that people are present on site.

To ensure compliance with all relevant wildlife regulations (Section 3.0), the following general provisions and restrictions apply:

- Feeding wildlife is strictly prohibited and is a direct violation of the BC *Wildlife Act* (Section 3.1.1). Feeding wildlife may result in wildlife becoming attracted to human foods and habituated to human presence, which can result in the creation of 'conflict wildlife' and have serious consequences for the animal and other people.
- Cooking outside and using outdoor cooking appliances is prohibited.
- Littering is prohibited. All garbage, including organic wastes (e.g., banana peels, pear cores, etc.), should be stored in wildlife-proof temporary containers and removed and appropriately disposed of off-site (see Section 5.3.3).
- Harassment of wildlife is strictly prohibited and is also a direct violation of the BC *Wildlife Act*. Harassment of wildlife can lead to the abandonment of habitat or the disruption of critical activities (e.g., nesting), and may result in injury to wildlife and/or humans.
- All potentially sensitive wildlife features, including bird nests, dens, roosts, hibernacula, kill sites (e.g., carcass locations that will attract wildlife), and mineral licks (e.g., an area where ungulates regularly congregate to obtain mineral nutrients) will be reported to the Operations Supervisor or Accountable Facility Representative. The Accountable Facility Representative may implement measures to avoid or reduce adverse effects to known wildlife features from mine-related activities, which could include restricting the knowledge of the feature location to reduce traffic at the site and prevent vandalism.

5.3.2 Equipment and Vehicles

To reduce incidents of wildlife-vehicle collisions and near-misses at the Facility, the following general provisions and restrictions apply:

- The Accountable Facility Representative will be familiar with the BC Wildlife Collision Prevention Program (http://www.wildlifecollisions.ca/Default.aspx) and will be responsible for ensuring all mine personnel and visitors are orientated on best management practices for preventing wildlife collisions.
- When travelling to and from the mine, Facility personnel and visitors are required to report incidental wildlife observations. This information will be valuable in identifying areas where potential wildlife-vehicle collisions have a higher chance of occurring.
- Road signage that informs mine personnel (and other road users) to be attentive for wildlife will be established, as necessary. Signage will be placed where potential collisions are predicted (e.g., at known wildlife crossings, blind hills, blind corners, etc.) or have already occurred. All Facility personnel and visitors must obey traffics signs.
- On public gravel or forest service roads, the maximum speed limit is 60 km/hour or per posted signage. During poor road conditions when visibility and traction are reduced, personnel are encouraged to slow down and drive safely to the conditions.

- The maximum speed limit on the mine property is 40 km/hour in ideal driving conditions.
- Wildlife has the right-of-way, except in select circumstances when it is unsafe to apply the brake or come to a complete stop. When wildlife is present on a road, slow down or stop and allow the animal(s) to depart the roadway.
- Limit access to deactivated trails, seasonally or permanently, using signage and high visibility barricades.
- Report wildlife remains observed along access roads at the Facility, and in the Surrounding Areas, to the Operations Supervisor or Accountable Facility Representative. Wildlife carcasses have the potential to lure other wildlife onto the roadway, which may result in an increased likelihood of wildlife-vehicle collisions. MPMC will relay reports of wildlife remains along highways to the regional Conservation Officer Service.
- Wildlife-vehicle collisions that cause injury or death to wildlife must be reported immediately. If an animal is killed as a result of a vehicle collision, the Accountable Facility Representative will notify the regional Conservation Officer Service so the remains can be removed from the road in a timely fashion, suitably disposed of, and documented in an Incident Report. The RCMP must be notified if damage is greater than $1,000 or if there are human injuries. If an animal is injured as a result of a vehicle collision, the Accountable Facility Representative will contact the regional Conservation Officer Service to determine the best course of action (e.g., animal destruction). Some injured animals may present a safety hazard (e.g., bears, moose, deer, etc.); consequently, personnel should not approach injured animals.
- A near-miss animal-vehicle collision will be reported as an “incident” as this information will be important for determining high-risk collision areas that may require warning signage.

5.3.3 Waste Management

Garbage and food waste are wildlife attractants which may lure and create conflict wildlife, such as bears, foxes, and coyotes. In addition, wildlife attractants may include vegetation growing along the roadside (e.g., grasses), chemicals (e.g., gasoline), waste containers (e.g., empty fuel cannisters), and wildlife remains. Conflict wildlife can create unsafe working conditions for personnel and result in damage to facility structures and equipment.

The following waste management measures will be followed to reduce wildlife conflicts related to food waste and garbage:

- Adhere to the guidelines outlined in the General Restrictions (Section 5.3.1).
- Food waste, sewage, and mechanical maintenance waste (e.g., motor oil) will be handled and disposed of appropriately under the direction of the Accountable Facility Representative.
- Temporary recycling and garbage containers shall not be placed or stored outside.
- Wildlife incidents related to garbage or human food attractants will be promptly reported to the Accountable Facility Representative.
- Waste disposed of incorrectly will be reported promptly to the Accountable Facility Representative. The Accountable Facility Representative will affirm that any inappropriately disposed of waste, within and around the Facility, is correctly disposed of.

- Regular site inspections will be conducted of waste transfer areas to ensure site cleanliness, adequate bear-proofing features, and to document improper garbage storage.
- When seeding along road corridors is required at the Facility, the Accountable Facility Representative will select seed mixes that do not contain wildlife attractants (e.g., clover), as these can result in an increase in animal-vehicle collisions.

5.3.4 Reporting Wildlife Observations and Incidents

Observations of wildlife or wildlife incidents by mine personnel and visitors must be documented and reported to the Accountable Facility Representative. An observation is defined as physical observations of wildlife or identification of signs that wildlife may be present in the area (e.g., nests, scat, tracks, dens, etc.). An incident may include animal-vehicle collisions, strange behavior (e.g., the animal behaving aggressively or losing its fear of humans), close encounters on foot or within a vehicle, or witnessing deceased or wounded animals.

Reports of wildlife observations and incidents provide information that can help determine:

- Hazardous circumstances requiring intervention (e.g., conflict wildlife).
- Whether notification to the regional Conservation Officer Service is required (e.g., roadkill).
- If there are deficiencies in the conflict wildlife mitigation and waste management measures.
- Areas along roadways that are potential hotspots for animal-vehicle collisions and, thus, require warning signs.

5.3.4.1 Wildlife Observations

Observations of wildlife and wildlife habitat features (e.g., nests, dens, wildlife trees, cavities, etc.), provide important data on wildlife habitat usage and behavior patterns at the Facility and in the Surrounding Areas. Wildlife observations will be collected and documented by the Operations Supervisor who will forward the information to the Accountable Facility Representative. All observations will be reviewed to assess the potential for conflict wildlife and to ensure current guidelines are sufficient in protecting personnel and wildlife. Wildlife observations will be included in MPMC's annual reporting.

Most wildlife and wildlife habitat observations will be discussed at health and safety meetings. However, the location of sensitive wildlife habitat features (e.g., mineral licks) may be disclosed to a restricted number of mine personnel at the discretion of the Accountable Facility Representative.

5.3.4.2 Wildlife Incidents

Mine personnel and visitors are required to promptly notify wildlife incidents to the Operations Supervisor or Accountable Facility Representative, who may request the completion of an Incident Report. Incident Reports regarding wildlife will be reviewed for any evidence of conflict wildlife development, to ensure current guidelines are sufficient in protecting personnel and wildlife, and for annual reporting purposes.

5.4 WILDLIFE MONITORING

In accordance with the permit requirements outlined in Section 1.1, monitoring programs will be developed to evaluate the effects of mining-related activities on wildlife and wildlife habitat at the Facility and in the Surrounding Areas. Wildlife monitoring will also help determine the success of remediation works completed at Polley Flats and the Hazeltine Creek Corridor, as well as the success of any future remediation that is implemented to achieve long-term reclamation and closure objectives. All monitoring programs will incorporate adaptive management to optimize procedures and outcomes as new information becomes available. The design and development of specialized projects may be done in consultation with QEPs, as required.

An Ecological Risk Assessment was conducted for Polley Flats and the Hazeltine Creek Corridor in 2017 to determine the potential impact of heavy metals on biological receptors and to determine the direction of future remediation and monitoring efforts (Golder, 2016). The assessment determined that the risk of metal uptake was low in aquatic and terrestrial systems and was less likely to cause adverse impacts to wildlife than the effects of the physical disruption to functional habitat (Golder, 2016). For further details regarding wildlife monitoring requirements, refer to the CEMP (MPMC, 2019).

5.5 RECLAMATION PLANNING

MPMC has identified wildlife habitat as one of the primary land-use objectives during reclamation and closure planning, which will fulfill the requirements outlined in Section E-2 of the M-200 permit. Reclamation initiatives will utilize a variety of different strategies to achieve self-sustaining ecosystems that will create long-term habitat for wildlife, including soil amendments to improve soil conditions, revegetation of native species, enhanced landscape features that attract wildlife, and construction of habitat systems that provide ecosystem functions for many species. For further details on how wildlife habitat will be incorporated into long-term reclamation and closure planning, refer to the *Reclamation and Closure Plan Update* by MPMC (2017).

5.6 REPORTING REQUIREMENTS

A summary of the effectiveness of the Plan will be included in the annual reclamation report. In addition, summary reports of wildlife-related mitigation measures, incidents, and observations will be generated annually and will form the basis of adaptive management strategies to address compliance issues and conflict wildlife. These summary reports will be provided to MFLNRORD, First Nations, and community stakeholders upon request (Section 7.0).

6 RESPONSIBILITIES

The following sections summarize the responsibilities held by each of the employment levels at the Facility as they pertain to this Plan.

6.1 SENIOR MANAGEMENT REPRESENTATIVE: MINE MANAGER

The Senior Management Representative, or designate, is responsible for:

- Ensuring the required resources are in place to execute the Plan,
- Submitting the results of the Plan to all relevant Provincial agencies and First Nations groups.

6.2 ACCOUNTABLE FACILITY REPRESENTATIVE: ACTING GENERAL MANAGER

The Accountable Facility Representative, or designate, is responsible for:

- Reviewing the effectiveness of the current wildlife management measures at the Facility,
- Scheduling and coordinating the implementation of measures outlined in the Plan, and,
- Training site personnel and contractors on the Plan and ensuring best management practices are implemented,
- Ensuring additional in-house training is provided regarding protocols for wildlife encounters and sensitive wildlife features for personnel and contractors who may require it,
- Consolidating and reviewing all documentation and data regarding incidental wildlife observations, wildlife encounters, conflict-wildlife, sensitive wildlife features, and the presence of *Species at Risk* on site; this information will be reported to the Mine Manager,
- Communication of additional wildlife mitigation strategies that may be required prior to the initiation or continuation of mine activities.

6.3 OPERATIONS SUPERVISOR: GENERAL FOREMAN

The Operations Supervisor, or designate, is responsible for:

- Reviewing the effectiveness of the current Plan,
- Collecting all documentation and data from personnel regarding incidental wildlife observations, wildlife encounters, conflict-wildlife, sensitive wildlife features, and the presence of *Species at Risk*; this information will be forwarded to the Accountable Facility Representative,
- Implementation of additional wildlife mitigation strategies that may be required prior to the initiation or continuation of mine activities.

6.4 FACILITY PERSONNEL AND CONTRACTORS

All Facility Personnel and Contractors are responsible for:

- Following all the measures and guidelines outlined in this Plan and addressing any questions or concerns with the Operations Supervisor,
- Reporting all wildlife observations to the Operations Supervisor,
- Submitting a wildlife incident report in the event of a wildlife-collision or encounter with conflict-wildlife.

6.5 TECHNICAL SERVICES SUPERINTENDENT

The Technical Services Superintendent is responsible for:

- Providing feedback on the effectiveness of the current Plan at the Facility,
- Conducting internal audits of the guidelines and measures outlined in the Plan at the Facility,
- Coordinating external audits of the Plan at the Facility,
- Coordinating the wildlife monitoring programs, and,
- Reporting the results of the audits and monitoring programs to the regulatory authorities.

7 STAKEHOLDER CONSULTATION

In accordance with the MPMC Communication Plan as a condition of Permit 11678, environmental data will be shared with the Xatśūll First Nation, Williams Lake First Nation, Cariboo Regional District, and the Community of Likely. First Nation and community stakeholders will be provided avenues for discussing and communicating concerns regarding the Plan, including the implementation and results of the wildlife monitoring programs. For further details regarding First Nation and community stakeholder participation, refer to the *Communication Plan* by MPMC (2016).

8 ADAPTIVE MANAGEMENT

The Plan will be continually adapted based on the results of ongoing wildlife monitoring programs, reclamation planning, incident and summary reports, and employee education programs. The adaptive management framework recognizes that new information obtained from those sources of information should be used to inform future planning, decision-making, mitigation, and program design to help MPMC maintain compliance. An annual review of the Plan to determine the potential need for revisions will also be required to ensure adaptive management strategies can be successfully identified and integrated.

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Appendix A

Table of Wildlife Species with a Conservation Status in the BC Cariboo Region not legally Adopted under any Statute

Wildlife species documented in the BC Cariboo Region that have been given a conservation status by the BC Conservation Data Centre and/or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but have not been legally adopted under any statute[1]

Wildlife Species			Conservation Status	
English Name	**Scientific Name**	**Category**	**BC List[2]**	**COSEWIC[3]**
American Avocet	*Recurvirostra americana*	Bird	Blue	no status
American Bittern	*Botaurus lentiginosus*	Bird	Blue	no status
American Golden-Plover[4]	*Pluvialis dominica*	Bird	Blue	no status
Black-crowned Night-heron[4]	*Nycticorax nycticorax*	Bird	Blue	no status
Broad-winged Hawk[4]	*Buteo platypterus*	Bird	Blue	no status
California Gull[4]	*Larus californicus*	Bird	Blue	no status
Caspian Tern[4]	*Hydroprogne caspia*	Bird	Blue	NAR (1999)
Double-crested Cormorant[4]	Phalacrocorax auritus	Bird	Blue	NAR (1978)
Eared Grebe	*Podiceps nigricollis*	Bird	Blue	no status
Green Heron[4]	*Butorides virescens*	Bird	Blue	no status
Gyrfalcon[4]	*Falco rusticolus*	Bird	Blue	NAR (1987)
Horned Lark, *merrilli* subspecies[4]	*Eremophila alpestris merrilli*	Bird	Blue	no status
Northern Goshawk, *atricapillus* subspecies	*Accipiter gentilis atricapillus*	Bird	Blue	NAR (1995)
Rough-legged Hawk	*Buteo lagopus*	Bird	Blue	NAR (1995)
Short-billed Dowitcher[4]	*Limnodromus griseus*	Bird	Blue	no status
Surf Scoter[4]	*Melanitta perspicillata*	Bird	Blue	no status
Swainson's Hawk	*Buteo swainsoni*	Bird	Red	no status
Townsend's Big-eared Bat[4]	*Corynorhinus townsendii*	Mammal	Blue	no status
Tundra Swan	*Cygnus columbianus*	Bird	Blue	no status
Upland Sandpiper[4]	*Bartramia longicauda*	Bird	Red	no status
White-throated Swift[4]	*Aeronautes saxatalis*	Bird	Blue	no status

[1] BC CDC Search criteria: Vertebrates AND BC Conservation Status: Red (Extirpation, Endangered, or Threatened) OR Blue (Special Concern) AND Area of Interest: User Defined Polygon. The exported BC CDC list was further filtered by comparing the results to the CDC mapped locations, distribution maps, and Habitat Wizard wildlife observation points.

[2] Based on Status designated by the BC Conservation Data Centre: Blue = Special Concern, Red = Endangered/Threatened.

[3] Based on Status designated by the Committee on the Status of Endangered Wildlife in Canada: NAR = Not at Risk. The year the status was adopted is in brackets.

[4] These species are either at the northern extent of their range and occur infrequently in the region, or are more likely to occur while on migration or as vagrants.

APPENDIX 10-8: FUGITIVE DUST MANAGEMENT PLAN

Mount Polley Mining Corporation

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Fugitive Dust Management Plan

Submitted to:

BC Ministry of Environment and Climate Change Strategy
Environmental Protection Division
South Interior Region – Cariboo

Prepared by:

Mount Polley Mining Corporation
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Date: September 25, 2025

Document Review and Revision Control

Rev. No.	Revision	Date	Approved
0	Original	2016	CH
1	Care and Maintenance Update	2020	MO
2	Restart Operations Update – draft only	2022	GH
3	Operations, TARP, SOP, Appendix C	2025	GH

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1 INTRODUCTION

The following describes the Dust Management Plan (the Plan) for the Mount Polley Mine (the Facility), which is located approximately 100 km northeast of the city of Williams Lake, British Columbia (BC), near the town of Likely, BC.

The purpose of the Plan is to:

- identify the sources of fugitive dust emissions associated with the Mount Polley Mine;
- describe how fugitive dust can be controlled from each significant source and describe the best management practices in place and planned for at the Mount Polley Mine;
- describe how the Plan will be implemented, including the training of personnel;
- describe inspection and maintenance procedures; and,
- describe methods of monitoring and appropriate actions/response framework to feedback into refining management actions, as needed, based on monitoring and inspection results (i.e., Act component described below).

The Plan is structured as follows:

- Section 2 provides an overview of the Facility;
- Section 3 provides an overview of the existing meteorological conditions;
- Section 4 provides an overview of the dust monitoring programs;
- Section 5 identifies the responsibilities for each employment level as they relate to the Plan; and,
- Section 6 describes the fugitive dust control measures that are implemented at the Facility. This section follows the Plan, Do, Check, and Act (PDCA) cycle according to the International Standards Organization guidelines. The PDCA cycle is described below:
  - Section 6.1 **PLAN** - identifies the emission sources at the Facility;
  - Section 6.2 **DO** - documents the schedule for implementation of the management practices;
  - Section 6.3 **CHECK** - describes the monitoring procedures and a record keeping system; and
  - Section 6.4 **ACT** - describes the management practice review and update procedures to promote its continuous improvement.

According to Section 2.5 of the BC Ministry of Environment (ENV) Pollution Abatement Order PA-15087, the Permittee (Mount Polley Mine) shall supress fugitive dust created within the operations area. In response the *Fugitive Dust Management Plan Mount Polley* (Golder 2015a) was created for the tailings storage facility (TSF), and submitted by Golder Associates Ltd. (Golder) on May 26, 2015 to the BC ENV. The Pollution Abatement order was rescinded in 2019, but dust management implementation and planning has continued and previous efforts are considered in this plan.

Permit M-200 Section C.8 states the following:

8. Fugitive Dust Management

(a) No later than 30 days after issuance, the Permittee must update and implement the Fugitive Dust Management Plan to effectively control dust emissions from the Mine Facilities and access roads. The Permittee must ensure the plan includes:

(i) Identification of dust sources and specific measures to mitigate dust for each source;

(ii) A site-specific event- and activity-based effectiveness monitoring program;

(iii) A TARP that addresses specific environmental and site conditions that could result in generation of dust and includes proactive reporting out procedures in the event that dust control measures are ineffective or inoperable for any reason;

(iv) Contingency plans to address circumstances where prescribed dust control measures are ineffective or inoperable for any reason;

(v) Procedures to evaluate and mitigate potential effects of dust; and

(vi) Procedures to address and report on public complaints.

(b) With respect to the Fugitive Dust Management Plan, referred to in Condition C.8.(a), the Permittee must ensure:

(i) The plan is reviewed annually and updated as required; and
(ii) The review is documented in the Annual Reclamation Report.

As the Mount Polley Mine has returned to full operations with a plan extending to 2033, this 2025 update is intended to align the dust management plan with on-site operating conditions and includes the entire site of Mount Polley Mine.

2 FACILITY DESCRIPTION AND SETTING

As shown in Figure 1, the Mount Polley Mine can be separated into the following mine site facilities:

- Pit Areas
- Dump Areas
- Road Areas
- Stockpile Areas
- TSF Areas
- Misc. Areas

This plan identifies the following areas as critical to fugitive dust management:

- the TSF and surrounding areas.
- the crusher and mill processing site; and,
- operations areas (open pits, waste rock dumps, stockpiles, roads, etc.) and surrounding areas.

2.1 TSF AND SURROUNDING AREAS

The TSF at Mount Polley Mine consists of tailings material and a single embankment made up of three dams: the Main Embankment, the Perimeter Embankment, and the South Embankment. During the TSF dam failure which occurred on August 4, 2014, water (both supernatant and interstitial) was released from the TSF, resulting in much of the tailings within the TSF being exposed to the elements (i.e., no longer submerged). The TSF has since been repaired and is being managed according to Engineer of Record specifications. The most recent normal operation Quantitative Performance Objectives (QPOs) for TSF operations consist of a beach width > 100m, freeboard level of > 2m, and an upper operating reclaim pond volume limit of <1.5 Mm^3 (WSP, 2025). Embankment safety is ensured by personnel following strict QPO trigger levels and remediation actions, set out by the EoR, when beach width and freeboard levels are below these normal QPO levels and the previously mentioned reclaim pond volume is not exceeded. While these specifications are focused primarily on safe tailings storage and appropriate water management, they have the added benefit of preventing dust mobilization.

2.2 CRUSHER AND MILL PROCESSING SITE

The crusher and mill area includes the crusher and mill building, the coarse ore pile, the tertiary pile, the fine ore (mill feed) pile, and the pebble pile. Rock and ore drops contribute to airborne dust, with the extent of this contribution determined by particle size, drop height, number of times material is handled, and moisture content. Potential sources for fugitive dust include ore processing, material handling, and stockpiling.

2.3 PITS AND SURROUNDING AREAS

The active mining of pits includes two open pits (Cariboo and Springer), which are adjacent to one-another, and being expanded into a singular combined pit. Waste rock dumps include the Temporary NW PAG Stockpile, North East Zone (NEZ) Rock Dump and the South East Rock Dump (SERD). Potential sources for fugitive dust also include road dust and material handling.

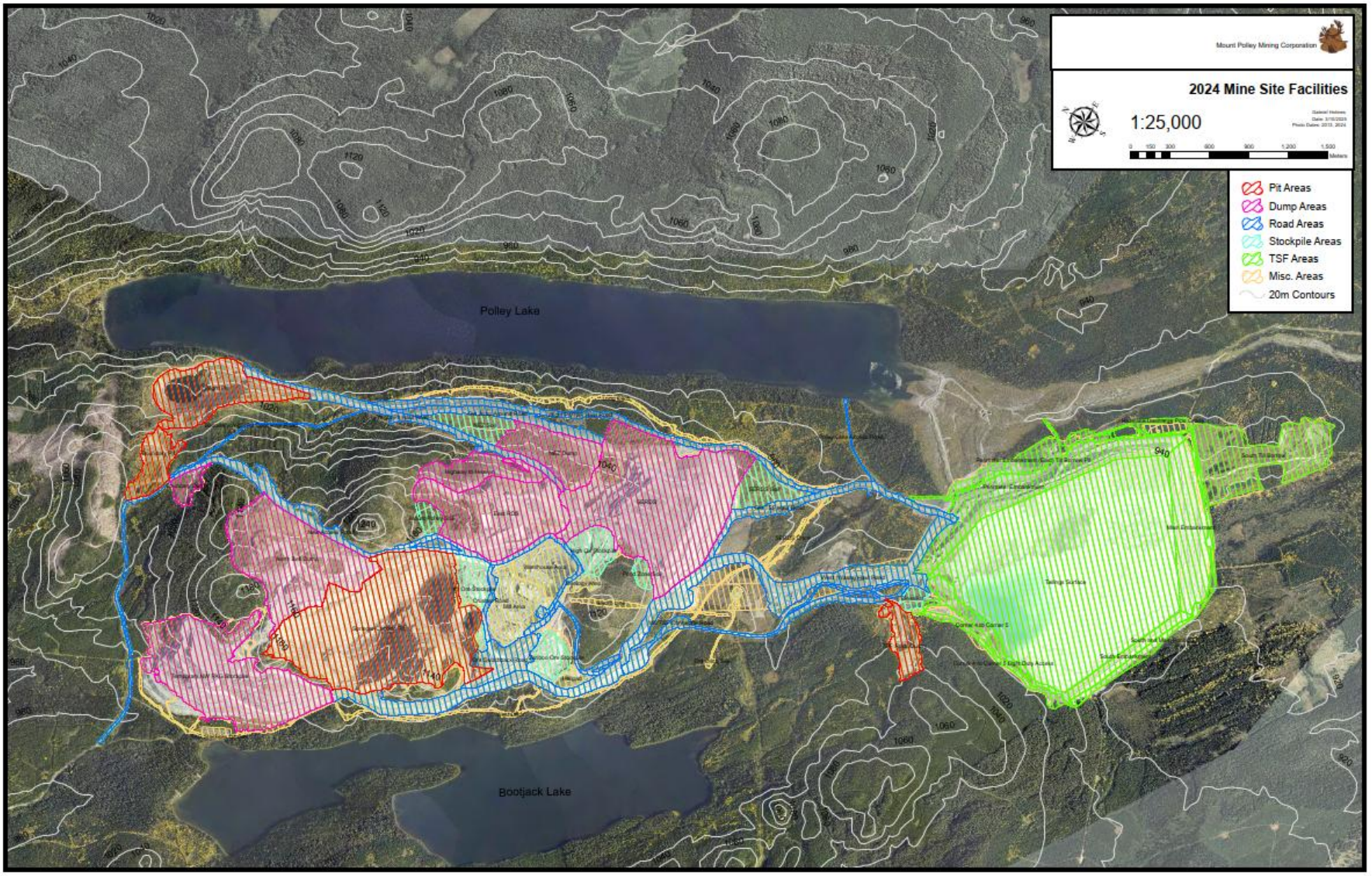


Figure 1 Mount Polley Mine Site Facilities

3 METEOROLOGY

Mount Polley Mine has two meteorological monitoring stations on site that have been operating since 2012. The first station (Station #1) is located southwest of the Polley Mountain summit, at an elevation of 1,171 metres above sea level (masl) near the Mill Site. The second station (Station #2) is located northwest of the TSF, along the access road to the old rock quarry. Station #2 is located atop a topographical rise at an elevation of 964 masl. The two stations are approximately 3.5 km apart, with an elevation difference of approximately 200 m. These stations continuously monitor and record rainfall, temperature, relative humidity, wind speed, wind direction, and solar radiation.

4 DUST MONITORING

4.1 DUSTFALL MONITORING

Five environmental airborne particulate stations monitored dustfall at the Mount Polley Mine from November 2011 to December 2019; one was added in 2013 and three were added in June 2015. The station A5 was discontinued in August 2014. Station names and locations are presented in Table 4.1. These air quality monitoring stations provided the fixed, volatile, and total dustfall measured in milligrams per decimetre squared per day (mg/dm^2/d) over a monthly period.

Table 4.1. Airborne Particulate Station Description

Station Name and Description	Easting (m)	Northing (m)	Years Active
A1 – by W12 (6km Creek water monitoring station)	588,221	5,826,043	2011-2019
A2 – at cabin on Bootjack Lake	589,906	5,823,978	2011-2019
A3 – near New Access Road	590,471	5,825,114	2011-2019
A4 – Polley Lake Boat Launch	595,241	5,821,259	2011-2019
A5 – by W7 (Hazeltine Creek water monitoring station)	597,010	5,819,075	2011-2014
A6 – Polley Lake Cabin	593,170	5,826,290	2013-2019
A7 – by Corner 3 (southwest) of TSF	592,969	5,818,320	2015-2019
A8 – southeast of TSF	596,911	5,817,991	2015-2019
A9 – Polley Flats (northeast of TSF)	596,020	5,821,407	2015-2019

The technical memorandum titled *Dustfall Monitoring and Pollution Control Objectives* written by the Air Quality Section of the ENV (2016), states that the Air Quality Section considers dustfall monitoring to be an outdated methodology and no longer recommends its use. For protection of human health, the Air Quality Section recommends particulate monitoring, specifically, monitoring of particulates with a diameter of 10 µm or less and 2.5 µm or less, be conducted instead of dustfall monitoring (ENV 2016; Appendix A). As such, dustfall monitoring will no longer be collected at the Mount Polley Mine. Particulate monitoring at the mine site in discussed in Section 4.2.

4.2 PARTICULATE MONITORING

Particulate matter is generally defined into three size fractions:

- Particulates of all size classes are referred to as total suspended particulate (TSP);
- Particulates with a diameter of 10 µm or less are referred to as PM_{10}; and
- Particulates with a diameter of 2.5 µm or less are referred to as $PM_{2.5}$.

Exposure to respirable (PM_{10}) and fine particulate matter ($PM_{2.5}$) may aggravate a number of respiratory illnesses. Smaller particles are generally thought to be of greater concern to human health than larger particles (US EPA 2016).

The deposition of TSP is generally considered dustfall. Deposition of PM_{10} and $PM_{2.5}$ are limited relative to TSP and these smaller particles can generally travel farther distances than TSP. Currently, there is no monitoring of TSP, PM_{10}, and $PM_{2.5}$ at the Facility, but these parameters were continuously monitored from July to October 2015 at four locations around the TSF and Polley Flats. The monitoring for TSP, PM_{10}, and $PM_{2.5}$ was discontinued based on favorable monitored results. Of the 82 days that were monitored, only three days had PM_{10} and $PM_{2.5}$ concentrations greater than the AAQO; however, these exceedances were most likely attributable to local and regional forest fires (Golder 2015b). Also, despite August 2015 being a dry month when compared to historical averages, particulate concentration data showed fugitive dust control measures were effective in the TSF area. For more information see *Continuous Particulate Monitoring at Mount Polley September 17 to 29, 2015: Summary of Particulate Monitoring July 7 to September 29, 2015* (Golder 2015b).

Additionally, MPMC has an ongoing Workplace Monitoring Program that was developed with an industrial hygienist that includes routine monitoring of dust and respirable crystalline silica in work areas of the mine that generate dust. The plan indicates that there are three types of locations that could potentially be sampled under then program:

- Workers' breathing zone (occupational/personal samples).
- General work area (area samples).
- In the proximity of specific processes or operations (worst-case samples).

Further details can be found in the Mount Polley Mine Workplace Monitoring Program.

4.3 RECEPTORS

Table 4.2 summarizes offsite sensitive receptors near the Facility, arranged by the least distance from the Facility, which may be affected by fugitive dust (Golder 2015a). There are a number of recreational areas within 10 km of the Facility and the nearest town site is the community of Likely located 12 km northeast of the TSF and 9.5 km northeast of the Mount Polley Mine mill site.

Table 4.2. Sensitive Receptor Locations

Receptor Description	Receptor Name	Easting (m)	Northing (m)	Direction from Facility
Recreation	Polley Lake Campsite	596,031	5,821,197	North
Recreation	Polley Lake	595,508	5821,029	North
Recreation	Bootjack Lake	592,240	5,820,738	Northwest
Recreation	Campsite at Bootjack Lake	590,183	5,823,874	Northwest
Recreation	Raft Creek Campsite	601,094	5,818,449	East
Recreation	Bootjack Mountain	589,454	5,820,753	West northwest
Recreation	Quesnel Lake	599,055	5,823,901	Northeast
Residence	Cedar Creek Rd Residences by Quesnel Lake	599,755	5,826,365	Northeast
Residence	Cabins at Polley Lake	593,105	5,826,547	North northwest
Residence	Residential Dwelling	592,076	5,826,365	North northwest
Recreation	Cedar Point Provincial Park	598,954	5,826,215	Northeast
Recreation	Gavin Lake	587,195	5,816,268	Southwest
Recreation	Mount Jacobie	586,318	5,821,558	Northwest
Residence	Likely Road Residences by Quesnel Lake	598,207	5,829,330	Northeast
Recreation	Jacobie Lake	584,757	5,822,835	Northwest
Town Site	Community of Likely	596,739	5,830,494	Northeast
Recreation	Morehead Lake	586,301	5,826,856	Northwest
Recreation	Prior Lake	589,673	5,829,819	North northwest
Recreation	Little Lake	586,936	5,830,106	Northwest
Residence	Dwelling by Little Lake	586,878	5,830,576	Northwest
Recreation	Morehead Lake Cabins and Campsite	586,824	5,828,888	Northwest

5 ROLLS AND RESPONSIBILITIES

The following sections detail the responsibilities held by each of the employment levels at the Facility as they pertain to this Plan.

5.1 SENIOR MANAGEMENT REPRESENTATIVE: MINE MANAGER

The Senior Management Representative, or designate, is responsible for:

- ensuring the required resources are in place to execute the Plan.

5.2 ACCOUNTABLE FACILITY REPRESENTATIVE: ACTING GENERAL MANAGER

The Accountable Facility Representative, or designate, is responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility;
- scheduling and coordinating the implementation of fugitive dust control measures; and,

- training of site personnel and contractors on the Plan and best management practices to be implemented.

5.3 OPERATIONS SUPERVISOR: GENERAL FOREMAN

The Operations Supervisor, or designate, are responsible for:

- reviewing the effectiveness of the current dust control measures at the Facility;
- maintaining documentation of schedules and logs;
- implementing fugitive dust control measures; and,
- forwarding dust observation reports from site personnel to the Accountable Facility Representative.

5.4 FACILITY PERSONNEL AND CONTRACTORS

All Facility Personnel and Contractors are responsible for:

- following the dust control procedures that are currently in place; and,
- reporting dust observations to appropriate supervisor.

5.5 TECHNICAL SERVICES SUPERINTENDENT

The Technical Services Superintendent is responsible for:

- providing feedback on the effectiveness of the current dust control measures at the Facility;
- conducting internal audits of the dust control measures at the Facility;
- coordinating external audits of the dust control measures at the Facility;
- coordinating dust sampling programs; and,
- reporting results to regulatory authorities.

6 FUGITIVE DUST EMISSIONS MANAGEMENT AND PLAN IMPLEMENTATION

This section describes the fugitive dust control measures that are implemented at the Facility. This section follows the PDCA cycle as described below:

- Section 6.1 **PLAN** - identifies the emission sources at the Facility.
- Section 6.2 **DO** - documents the schedule for implementation of the management practice(s).
- Section 6.3 **CHECK** - describes the monitoring procedures and a record keeping system.
- Section 6.4 **ACT** - describes the management practice review and updating procedures to promote its continuous improvement.

6.1 PLAN – IDENTIFICATION AND CLASSIFICATION OF FUGITIVE DUST EMISSIONS

6.1.1 Identification of the Sources of Fugitive Dust Emissions

Fugitive dust emissions occur due to mechanical disturbances of granular materials exposed to the air. Dust generated from these open sources is termed “fugitive” as it is not discharged to the atmosphere in a confined flow stream, such as through an exhaust pipe or stack (US EPA 1995).

Mechanical disturbances are often created from activities such as vehicle movement, crushing and material transfer activities, but can also be created from wind action, which promotes lifting of fine particles from sources such as open fields and stockpiles. Therefore, some fugitive dust emissions occur, or are intensified during, certain operations and/or by natural means (e.g., wind action).

Factors that would affect the quantity of fugitive dust emitted from a source include the material's particulate size distribution, moisture content, and frequency of the mechanical and natural disturbances. Precipitation and evaporation conditions can affect the moisture content of the material being disturbed and have an influence on the amount of fugitive dust emitted. Precipitation acts to prevent emissions through cohesive bonding of small particles, while evaporation elevates the potential for dust emissions.

Once dust is emitted (suspended in air), it will disperse from the source according to various factors such as wind speed and direction, precipitation rates, and particle size distribution (ENV 2005). Higher wind speeds increase the potential distance travelled by the particulates, while precipitation can facilitate particulate deposition (wet deposition). Particles that are less than 2.5 µm in diameter can travel further before settling and are of higher concern as they have the potential to present a health problem to humans if inhaled.

Main sources of activities which contribute to fugitive dust emissions from the Facility are summarized in Table 6.1.

Table 6.1: Main Sources and Factors Contributing to Fugitive Dust

Process/Activity	Causes	Factors that may Affect or Produce Fugitive Dust Emissions
TSF	• Wind erosion off of surface of TSF from dried material	• Fines content of tailings • Surface moisture content of tailings • Wind speed and direction • Precipitation and snow cover (natural control measures) • Vegetation cover – control measures • Sprinklers – control measures • Pond volume – control measure
Material Handling	• Disturbance of material (waste rock, ore and stockpiles) caused by loading/unloading (dumping into haul trucks and dumping onto stockpiles/dumps/gyratory crusher) • Wind erosion of material from material being handled	• Drop height of loading/unloading activities • Moisture content of material • Fines content of material • Wind speed
Ore Processing and Crushing	• Processing of material (waste rock and ore) through crusher • Wind erosion off of stockpiles	• Drop height of loading/unloading activities • Moisture content of material • Fines content of material • Wind speed
Dozing Activity	• Disturbance of material (waste rock, ore and stockpiles) caused by machinery • Wind erosion of material from material being dozed	• Height of material being dozed • Fines content in material handled • Moisture content in the material • Vehicle weight and speed • Wind speed
Grading	• Disturbance of surface material caused by grading machinery	• Surface fines content • Surface material moisture content • Vehicle weight and speed
Hauling/Access Road Traffic	• Disturbance of granular material on the road surface caused by motion of vehicles • Wind erosion on the road surface	• Surface fines content • Surface material moisture content • Wind speed • Vehicle weight and speed

6.1.2 Fugitive Dust Management Practices

Control measures to reduce fugitive dust emissions should consider the sources of the dust emission, the dispersion conditions and the location of sensitive areas in order to avoid significant impacts of dust emissions on receptors. Control measures tend to impact one or more factors affecting the generation and/or dispersion of fugitive dust emissions. These control measures can be classified as follows:

- **Preventative Procedure**: Measure pertaining to the design and installation of structures and the operating procedures which are implemented on a regular basis to prevent the generation of dust and/or the dispersion of dust generated from reaching sensitive areas.
- **Reactive Control Measures**: Measures which are implemented in the event of unexpected circumstances which can lead to the generation of dust and/or the dispersion of dust generated reaching sensitive areas.

Table 6.2 provides a description of the preventative procedures and control measures at the Facility.

Table 6.2: Description of Preventative Procedures and Control Measures for Fugitive Dust Emissions

Preventative Procedure/ Control Measure	Emission Source Effected	Description	Application Frequency
Visual Inspection	TSF	Daily visual inspections of the TSF	Daily during non-frozen periods. If inspection indicates potential for dust emissions another follow-up inspection will be conducted later that day
Wet Suppression	TSF and unpaved site roads	Fugitive dust generated from the TSF and unpaved site roads are controlled by using water	Daily observations (water management inspections, when wind speeds measured over 3.6 m/s are observed, and/or incidents)
Progressive Reclamation and Monitoring	Polley Flats	Growth media and vegetation applied progressively as either planting, seeding, or natural re-vegetation	Ongoing planting/seeding and annual monitoring
Use of Dedicated Routes/Areas	Unpaved Site Roads (excluding the Mine and Ore Stockpile Area)	Haul traffic has designated routes. Have a procedure that all vehicles comply with these routes. Regular application of appropriate dust suppression (e.g., water, flocc, CaCl)	When necessary
Controlled Loading and Unloading Techniques	Dust from Material Handling	Trucks are loaded/unloaded in a slow and controlled manner to minimize drop height and avoid spillage	When necessary, based on daily observations, inspections, and/or incidents

Fugitive dust may be emitted from the TSF under strong wind conditions (wind speeds >5.4 m/s) (Golder 2015a). If wind erosion from the TSF is observed, it can be controlled by stabilizing the affected surfaces by use of chemical suppressants or regular watering. Control measures that have been implemented to reduce wind erosion from the TSF include:

- Installation of water sprayers along the Main Embankment of the TSF. Each sprayer has a spray radius of 40-70 m and are adjacent to each other. Water is being pumped from the Main Embankment Seepage Collection Pond below the Main Embankment to a sprinkler line connected to all sprinklers. Water sprayers are removed during construction events to facilitate the necessary construction on the embankments.
- TSF EoR specifications including water elevation and beach width, keeping material submerged.
- Pond volume size parameters take into account dust management in regards to amount of surface area exposed.
- Reclamation, revegetation, and monitoring of any area deemed inactive for mining purposes can demonstrate successful outcomes and is believed to contribute positively to dust management in this area where applicable.

Winter temperatures, below freezing, will prohibit the use of water as a dust suppressant; however, snow cover will act as dust suppressant in the winter months. Based on weather data presented in Golder (2015a), the average temperature is below freezing from November to March, where there is snow cover present.

Table 6.3 summarizes the fugitives dust emission activities and processes along with the proactive and reactive mitigation practices that can be implemented to control fugitive dust.

Table 6.3: Summary Table of Mitigation

Source	Proactive Mitigation Practices	Reactive Mitigation Practices
TSF	• Sprinklers as a dust suppressant on TSF • Rain/snow cover as a natural dust suppressant during winter	• EoR specifications • Wet suppression
Crusher Building/Stockpiles (No or very limited activity during care and maintenance)	• Sprayers located on conveyers, transfer chutes, screens, and at the top of stockpiles • Dust control scrubber system for crusher building • Turbomister installed by crusher stockpiles	• Wet suppression • Removal of dust emissions from building
Road Dust	• Use of water trucks to wet roads	• Wet suppression

The effectiveness of watering practices for the TSF and other potential areas are expected to be the same as for stockpiles. From Environment Canada (2014), wet suppression effectiveness rates are a function of the amount of water applied and range between 50-95% efficiency (Table 6.4).

Table 6.4: Wet Suppression Efficiency (Environment Canada 2014)

Efficiency (%)	Application Rate (L/m^2)
50	1.591
60	2.232
70	3.172
80	4.748
85	6.077
90	8.306
95	13.337

It is expected that there are 151 days during the year where there are either subfreezing ground conditions, based on average monthly temperature in Golder (2015a), or days where there is at least 1 cm of snow on the ground (Horsefly Lake Gruhs Lake Environment Canada Climate normal) which would act as a natural dust control measure. Furthermore, it is expected that during the non-freezing period there are approximately 98 days where there is at least 0.254 mm of rainfall (Station #1 and Station #2). Therefore, using the precipitation adjustment factor published by Environment Canada (2014) for stockpiles, it is expected that precipitation and snow cover would have approximately 68% percent effectiveness at controlling fugitive dust on an annual basis.

The effectiveness of vegetation covers to control fugitive dust has been observed to vary with the type and amount of cover. In the southwest regions of the United States, vegetation cover, which were sparse, resulted in dust control effectiveness of 25%; whereas, dense vegetation cover can result in dust control effectiveness of up to 100% (US EPA 1984).

Dust suppression at the crusher includes the seasonal use of Dustlock during the winter months to prevent ore from freezing at various transfer points. The system, known as the Power Chemicals IPAC 6832 and 1256F Antifreeze and Dust Suppression Application System, automatically applies product to four conveyor transfer points in the crushing circuit: 1/2, 4/5, 7/8, and 8/9. It operates in Auto mode and is housed in the crusher building. The storage tank is however, located outside the crusher building.

The Dustlock product contains 30% by weight calcium chloride and is applied after being diluted with water, depending on operational needs. It is delivered through a VFD-controlled pump at flow rates ranging from 0.2 to 5.0 L/min, ensuring consistent coverage of the conveyed ore. During summer months, the system can be filled with water and used to suppress dust in the same areas, helping to reduce airborne particulate levels in the crusher zone and improve air quality for personnel and equipment.

6.2 DO – IMPLEMENTATION OF THE DUST MANAGEMENT PLAN

Dust generating activities performed on-site should meet the requirements of this Plan.

6.3 CHECK – INSPECTION, MAINTENANCE AND DOCUMENTATION

Routine inspections at the Facility should be performed to firstly check that the proactive and reactive mitigation measures are being implemented, and secondly, confirm that the mitigation practices are effectively reducing fugitive dust emissions. Daily inspections of the TSF and surrounding area are incorporated into MPMC's Water Management Inspection Manual checklist (Appendix B). Outstanding or overdue inspection findings are reviewed monthly by the Joint Occupational Health Safety and Environment Committee.

Routine reviews of results are also performed by MPMC's Environmental Department. This includes review of the documented observations to confirm that that mitigation (control) measures were implemented to reflect the observations recorded.

It is expected that all deficiencies identified in inspections will be addressed. Reasonable corrective action will be undertaken and documented. Reviews of the non-conformance should be done quarterly as a method for continual improvement. The Operations Supervisor should be responsible for recordkeeping the information listed above.

The annual and monthly wind roses for Station #2 (the station with representative winds at the TSF and Polley Flats) demonstrates that the predominant wind directions during the summer months are from the north and south (with more southerly winds).

6.4 ACT – DUST MANAGEMENT PLAN REVIEW AND CONTINUOUS IMPROVEMENT

Inspections and monitoring procedures will assist MPMC personnel with the maintenance of an effective Dust Management Plan. The Dust Management Plan should be monitored and updated, as follows:

- when there are significant changes in the fugitive dust emissions sources;
- annual review and update as necessary;
- when there are verified grievances associated with fugitive dust emissions from the Facility; and,
- when there are visible dust emissions occurring more frequently and/or at a higher rate (excluding seasonal conditions).

Review of the Plan is intended to evaluate the effectiveness of the proactive and reactive dust control practices and focus on the identification of improvement opportunities that can reduce the risk of complaints or health concerns related to fugitive dust emissions.

6.4.1 Contingency Measures

Possible contingency measures to be implemented, if required, include:

- Application of calcium chloride on Bootjack Forest Service Road and other high exposure roads.
- Installation of additional turbomisters, sprayers and sprinklers to periodically wet the TSF or other location, thereby increasing the moisture content of the surface material which will result in

greater surface cohesion and a reduction from fugitive windblown dust. These systems will not be installed during periods of construction at the TSF and may be utilized at other locations on the mine site.

- Maximize water truck usage for dust suppression on road surfaces in the dry months of the year.
- Utilize the IPAC dust suppression system on the crusher conveyors during non-freezing conditions.

6.5 TRIGGER ACTION RESPONSE PLAN

Activity / Location	Normal (Baseline)	Level 1 Alert	Level 2 Alert	Level 3 Alert
Haul Roads	**Trigger:** No visible dust leaving road surface. **Action:** Maintain watering roads	**Trigger:** Visible dust plumes <20 m; wind >20 km/h. **Action:** Increase watering; reduce speed limits.	**Trigger:** Dust visible at site boundary; wind >25 km/h sustained. **Action:** Cease non-essential traffic; continuous watering; apply dust suppressant where aplicable.	**Trigger:** Complaints from receptors. **Action:** Suspend haulage until conditions improve; notify regulator/residents;
Excavation / Soil Handling	**Trigger:** Dust controlled at source. **Action:** Minimize drop heights.	**Trigger:** Visible dust plumes; dry conditions. **Action:** Consider water application; cover loads where applicable.	**Trigger:** Dust crosses boundary; wind >25 km/h sustained. **Action:** Pause excavation during high winds; apply water.	**Trigger:** Complaints from receptors. **Action:** Stop excavation; escalate reporting; notify stakeholders.
Blasting	**Trigger:** Calm conditions, blast dust dissipates onsite. **Action:** Blast only under approved conditions.	**Trigger:** Forecast wind >20 km/h at time of blast. **Action:** Consider delaying blast or increase water coverage on blast site.	**Trigger:** Wind >25 km/h or visible dust migration off-site. **Action:** Consider suspending blasting or reschedule under favorable conditions.	**Trigger:** Complaints from receptors. **Action:** Cancel blast; report to regulator; implement alternative blasting plan.
Stockpiles	**Trigger:** No dust lift-off. **Action:** None	**Trigger:** Dry surface, minor dust lift-off. **Action:** Consider applying water or crusting agent; restrict handling.	**Trigger:** Sustained wind >25 km/h; visible dust movement. **Action:** Apply water as necessary; suspend handling.	**Trigger:** Complaints from receptors. **Action:** Fully cover; cease activity; notify regulators/residents.
Processing Plant / Crushers	**Trigger:** No visible emissions from crushers/transfer points. **Action:** Maintain enclosures, sprays, and filters.	**Trigger:** Visible dust near plant area. **Action:** Increase water sprays; check scrubbers and filters.	**Trigger:** Dust observed beyond plant area or wind >25 km/h. **Action:** Reduce throughput; shut down non-essential crushing.	**Trigger:** Complaints from receptors. **Action:** Suspend operations; repair controls as required; escalate reporting.
Tailings / Reclamation Areas	**Trigger:** Surface stabilized (moist cover or vegetated). **Action:** Maintain cover.	**Trigger:** Dry patches visible; minor lift-off. **Action:** Consider additional watering	**Trigger:** Sustained wind >25 km/h; dust leaving area. **Action:** Apply water as necessary where practical	**Trigger:** Complaints from receptors. **Action:** Halt earthworks; notify regulator/residents.

6.6 PROCEDURE TO ADRESS PUBLIC COMPLAINTS

The following procedure will be followed upon receipt of a public complaint regarding dust:

6.6.1 Purpose

To ensure all public complaints related to dust emissions are managed promptly, consistently, and transparently, in order to minimize impacts and maintain regulatory and community trust.

6.6.2 Scope

This procedure applies to all site activities that could generate fugitive dust, including general operations, earthworks, haulage, material handling, blasting, and stockpile management.

6.6.3 Responsibilities

Site Supervisor: First point of contact, initiates investigation, and implements immediate controls.

Environmental Superintendent: Oversees response, ensures communication and reporting, maintains complaint log, and liaises with regulators if required.

Project Manager: Ensures adequate resources, authorizes corrective actions, and escalates to senior management if needed.

6.6.4 Procedure

Step 1: Receipt of Complaint

- Record complaint details (time, date, complainant name/contact, location, description of issue).
- Acknowledge receipt of complaint within **24 hours** (or sooner if possible).

Step 2: Verification and Investigation

- Dispatch supervisor or environmental staff to investigate within **2 hours** of receiving the complaint (sooner during active dust events).
- Confirm if dust is originating from site operations, noting:
    - Weather conditions
    - Activities occurring at time of complaint
    - Effectiveness of existing dust controls

Step 3: Immediate Corrective Action

- If site-related dust confirmed:
    - Increase dust suppression (water trucks, misting, suppressants).
    - Halt or limit dust-generating activities if controls are insufficient.
    - Implement temporary barriers or covers for stockpiles/materials.
- Record actions taken.

Step 4: Communication and Feedback

- Contact complainant within **24 hours** of investigation to:
    - Confirm receipt and investigation of complaint.
    - Explain findings and corrective measures implemented.
- If dust was not site-related, provide explanation with supporting evidence.

Step 5: Documentation and Reporting

- Log complaint and actions in **Dust Complaint Register** (date, time, source, actions, follow-up).
- Report significant complaints (e.g., off-site impacts, multiple complaints in a short timeframe) to regulators within required reporting period.

Step 6: Follow-up and Continuous Improvement

- Review recurring complaints to identify systemic issues.
- Update Dust Management Plan or Trigger Action Response Plan as needed.
- Share lessons learned with crews during toolbox talks.

6.6.5 Records

- Complaint Log (with unique ID number for each complaint)
- Investigation Notes (weather data, site conditions, activities at time)
- Corrective Action Reports
- Communication Records with complainant and regulators

7 REFERENCES

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Appendix A

Dustfall Monitoring and Pollution Control Objectives Technical Memorandum

BRITISH COLUMBIA

Memorandum

Air Quality Section

Monitoring, Assessment and Stewardship

Date: January 21, 2016 **File: 21610-00\Dustfall**

To: Robyn Roome, Director, Monitoring, Assessment & Stewardship

Re: Dustfall Monitoring and Pollution Control Objectives

The Air Quality Section has recently reviewed the use of dustfall monitoring in mining assessments and EMA authorizations/permits. Based on the review, the Air Quality Section considers dustfall monitoring and the dustfall Pollution Control Objectives as outdated methodology/criteria and, with the exception of specific limited circumstances, is no longer recommending or supporting their use based on the following reasons:

- The BC dustfall objectives were originally developed under the old BC Pollution Control Objectives (PCOs) back in 1979 as a 'soiling index' or method of assessing the "dustiness" of an area from an aesthetic or nuisance perspective. Their effectiveness for determining impacts on human or environmental health (soil, water, vegetation) is extremely limited.
- The PCOs were rescinded in 2006, although the dustfall objectives were retained on the BC air quality website "for reference purposes".
- Dustfall sampling methodology (passive open canister exposure) does not perform well (severely underestimates) during high wind events (often associated with fugitive dust).
- Dustfall monitoring is often used around mining projects with the stated intention of tracking metals impacts associated with fugitive dust. However, results are poor indicators for metals effects monitoring as there is no indication of the bioavailability of any metal contained in the samples and no established relationship between deposition rates and protection of soil, water or vegetation health.
- Dustfall results cannot be used for dust episode management actions as the 30-day sample periods (and subsequent laboratory analyses) are too long to be of any use for this purpose.
- While dispersion modelling may assist with determining the possible affected areas from fugitive dust generated during mining operations, the modelled concentrations are highly uncertain due to the poor quality of the model inputs, namely simplistic emission factors, added to the inherent uncertainties and limitations in modelling dust dispersion and deposition. This is particularly the case with road dust.

Based on the rationale above, it is suggested that before requiring dustfall as a component of any assessment process or inclusion within a regulatory authorization, that the objectives of the monitoring and/or dust management plans be clearly defined. Some possible considerations:

- If the concern is simply one of an aesthetic or nuisance nature, the use of dustfall monitoring and the objectives may be justified, with careful selection of the appropriate criteria, e.g.
    - 'residential/parkland' PCO (1.75mg/dm^2/day),
    - 'industrial/other' PCO (2.90mg/dm^2/day), or
    - facility/site specific deposition rate.
- If the objective is to protect of human health (i.e. nearby human receptors), monitoring of $PM_{2.5}$/PM_{10} would be more appropriate, including compliance with associated Ambient Air Quality Objectives.
- If the objective is to the protect the soil/water/vegetation and/or tracking accumulation of metals or other contaminants in the environment, including impacts to 'country foods', sampling of the specific media of concern would be more appropriate and specialists from the related disciplines should be involved in the development of baseline and on-going monitoring programs and determination of protective criteria.
- For episode management of fugitive dust, continuous monitoring of TSP or PM_{10} would provide more timely information for triggering actions under a dust mitigation plan.
- If there are concerns regarding other emission sources and possible impacts to ambient air quality and the environment, the emissions/impacts should be characterized, assessed and the appropriate monitoring determined.

When dispersion modelling is used in an assessment, the BC modelling guidelines recommend that a modelling plan be developed with input and subsequent sign-off from an Air Quality Meteorologist; it is recommended that a similar approach be used when developing baseline monitoring plans used to support assessments, compliance monitoring programs, or permit monitoring clauses. Proponents and permitting staff should consult with Air Quality Meteorologists to determine the contaminant(s) of concern, the monitoring methods, sampling locations and air quality criteria to be used.

Sincerely,



Arvind Saraswat, P.Eng.
Air Quality Section Head (Assessments)

Appendix B

The Daily Water Management Inspection Checklist

Page ____ of____

Daily Water Management Inspection Checklist

*(Controlled Document – **DO NOT COPY**: please ask Environment Department for print out)*

inspector: _____ Date: _____

Shift: (Crew, D or N) _____ Weather Conditions: (ex. hot, windy, sunny): _____

Is the TSF Generating Dust? Must circle one

No Minor Moderate Major | Corner 1 Corner 2 Corner 3 Corner 4 Corner 5

	Pumps/Pipes/Sumps	Time Checked	Inspection Gauge Readings / Inspection Findings	Pump Notes / Comments
1	Junction Zone Seepage Sump		GOOD / ISSUE	
2	9K Sump		RED YELLOW BLACK	
3	NW PAG Sump		RED YELLOW BLACK	
4	Mine Drainage Creek Sump		RED YELLOW BLACK	
5	West Ditch Culverts (light vehicle TAR)		GOOD / ISSUE	
6	Booster Station – ☐ mark if overflowing		GOOD / ISSUE	
7	Springer Dewatering		GOOD / ISSUE	
8	Cariboo Pit Pumps ☐ To West Ditch ☐ To Mill			Flow meter ____ gpm
9	Magnetite Sump		RED YELLOW BLACK	
10	Bootjack Creek Sump – Upstream side		GOOD / ISSUE	
11	TSF Barge		GOOD / ISSUE	
12	South Seepage Collection Pond		RED YELLOW BLACK	
13	Main Seepage Collection Pond		RED YELLOW BLACK	Percent Full _____%
14	WTP Slurry Line/Sumps		GOOD / ISSUE	
15	Perimeter Embankment Till Borrow Pond		RED YELLOW BLACK	
16	PETBP to TSF		GOOD / ISSUE	Flow meter ____ m^3/hr
17	Breach Sump/COW Drain/Upstream Drain		GOOD / ISSUE	
18	Corner 1 Buttress Culverts/Ditch		GOOD / ISSUE	
19	CCS		GOOD / ISSUE	
20	Long Ditch Outflow Pipes		GOOD / ISSUE	
21	Long Ditch Sump (Lower)		RED YELLOW BLACK	
22	Long Ditch Sump (Upper)		RED YELLOW BLACK	
23	SERDS Sump		RED YELLOW BLACK	
24	SERDS to WP Diesel		GOOD / ISSUE	
25	Bootjack Creek Fish Fence		GOOD / ISSUE	Cleaned? Y / N
26	NEZ Seep Sump 1 (intake and discharge)		GOOD / ISSUE	
27	NEZ Seep Sump 2 (intake and discharge)		GOOD / ISSUE	
28	Wight Pit Water Level		GOOD / ISSUE	_____ (m)
29	Wight Pit Barge		GOOD / ISSUE	
30	Wight Pit Deep Well		Pump Hours	
31	Wight Pit Booster		GOOD / ISSUE	Flow meter ____ m^3/hr
32	NEZ #1 Booster		GOOD / ISSUE	Flow meter ____ m^3/hr
33	NEZ #2 Booster		GOOD / ISSUE	Flow meter ____ m^3/hr
34	Joe's Creek Pipe		GOOD / ISSUE	
35	Leach pad LCRS		(ft)	Pumped? Y / N
36	West Ditch Culverts (heavy duty TAR)		GOOD / ISSUE	
37	Bootjack Creek Sump		RED YELLOW BLACK	
38	Wight Pit Deep Well		Pump Hours	

Indicate times pumps are turned on or turned off

REMEMBER TO DRAIN BACK UP DIESEL PUMPS AFTER TESTING IN FREEZING CONDITIONS

Updated April 21, 2024

ADDITIONAL COMMENTS/OBSERVATIONS (EX. EROSION):

NOTE* - Please clean up and report all spills of hydrocarbons or chemicals

WILDLIFE OBSERVATIONS (include locations):

Appendix C

Continuous Particulate Monitoring at Mount Polley September 17 to 29, 2015: Summary of Particulate Monitoring July 7 to September 29, 2015

APPENDIX 10-9: CHANCE FIND MANAGEMENT PLAN

REPORT

Chance Find Management Plan

Living Document

Submitted to:

Mount Polley Mining Corporation

PO Box 12
Likely BC V0L 1N0

Submitted by:

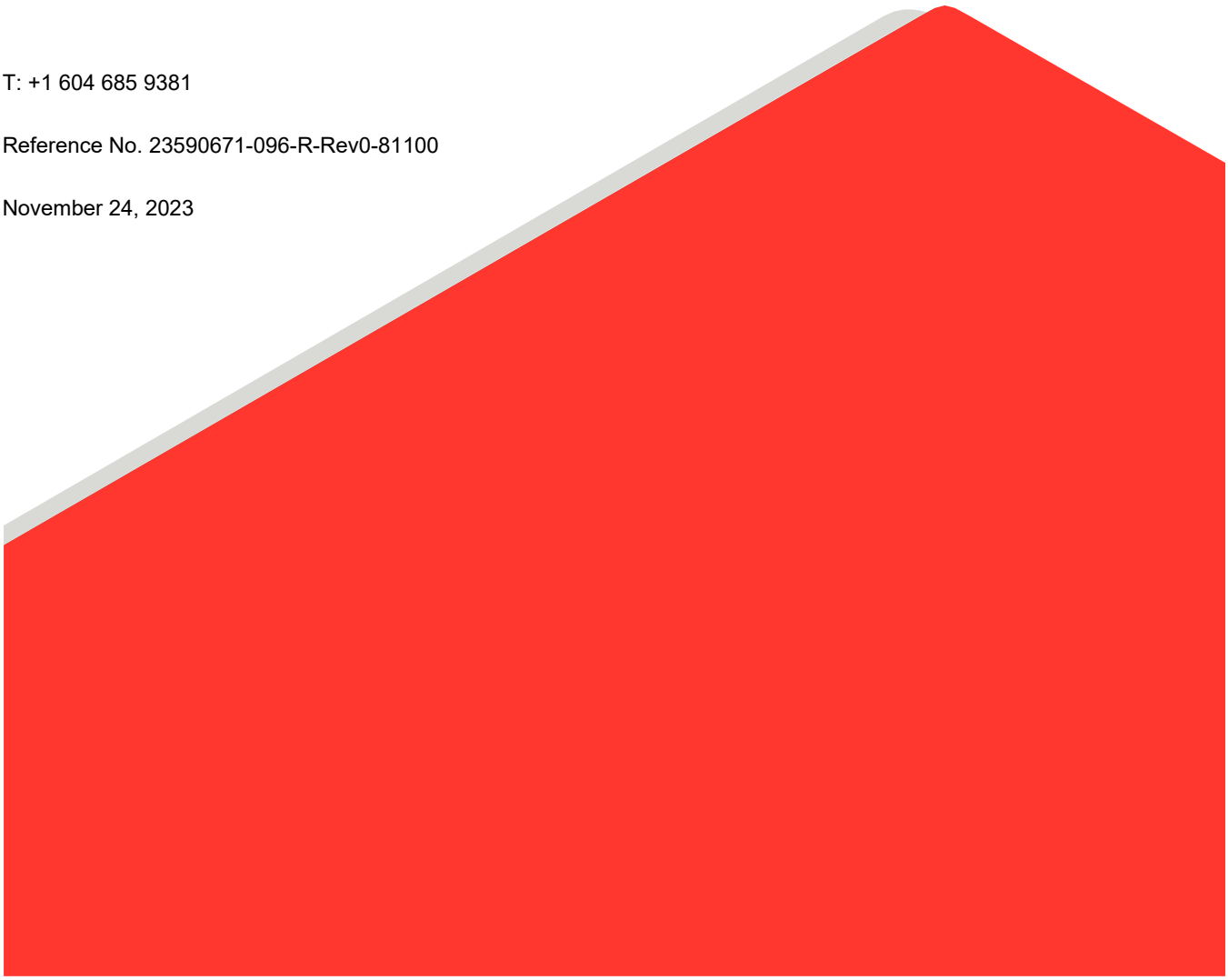
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November 24, 2023



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Archaeological Chance Find Documentation Form

1.0 INTRODUCTION

This document provides guidance and a communication plan in the event that Mount Polley Mining Corporation (Mount Polley) project activities inadvertently disturb or uncover archaeological deposits, human remains, or objects of historical importance.

Legislative protection for British Columbia's archaeological and heritage resources is provided by the *Heritage Conservation Act* (HCA) (R.S.B.C. 1996, Chapter 187). Under the HCA, a permit is required to search for or alter heritage sites or objects that represent physical evidence of human habitation or use before 1846. Certain site types, including burial places and rock art that have heritage value, are protected regardless of age, and heritage wrecks are protected if two or more years have passed from the date that the vessel or aircraft sank, was washed ashore or crashed. Sites that post-date 1846 are not automatically protected but may be afforded protection by an Order-In-Council, based on the site's heritage value to British Columbia, a community, or an aboriginal people.

Mount Polley engages in a variety of activities that require ground disturbance. Activities that may result in disturbance to a known heritage site require an Alteration Permit pursuant to Section 12.4 of the HCA. The permit will outline procedures for archaeological work during Project activities, if required. Such permits currently take approximately 32 weeks to procure and therefore planning for the management of such sites should take place well in advance of the commencement of disturbance. In most cases, disturbance would result from ground altering activities, but above-ground works could impact heritage sites such as structures, rock cairns, culturally modified trees, or other features.

Mount Polley projects also have the potential to disturb currently unrecorded heritage sites. The following step-by-step procedure is intended to guide Mount Polley in case heritage resources are unexpectedly encountered during project activities. The procedure includes basic archaeological site recognition criteria and reporting procedures. If archaeological assessment or monitoring is required as the result of a chance find, a Heritage Inspection Permit will be required under Section 12.2 of the HCA. A Heritage Inspection Permit will be obtained for the Mount Polley to facilitate chance find responses without delay.

2.0 DEFINITIONS

The following definitions apply to the content of this management plan:

Table 1: Definition of Terms

Term	Definition
Archaeology	The science concerned with the discovery and interpretation of the human past through the study of physical remains.
Archaeological Site	Any place where physical evidence of past human activity is found.
Artifact	Any object that has been modified or manufactured by humans. Artifacts can include tools, weapons, ornaments, utensils, and sculptures.
Cache Pit	Circular depressions, usually less than 3 metres in diameter, used for storing goods or food.
Chance Find	Heritage material that is unexpectedly encountered, typically during project-related activities.
Culturally Modified Tree	A tree that has been intentionally altered by Indigenous people through their traditional use of forest resources (for food, manufacture, or medicinal purposes) or in order to mark a trail
Heritage Site	Land, including land covered by water, that has heritage value to British Columbia, a community or an aboriginal people.
Heritage Value	The historical, cultural, aesthetic, scientific or educational worth or usefulness of a site or object.
Historical	Refers to a time period during which there are written records. This period of time is also referred to as post-contact. “Post Contact” refers to the time after the arrival of Europeans.
Petroglyph	An image that has been carved, incised, engraved, pecked, or ground into the surface of a rock.
Pictograph	An image that has been painted on a rock using organic and mineral pigments.
Rock cairn	A deliberately constructed pile of stones forming a mound, often marking a burial place.

3.0 SITE RECOGNITION CRITERIA

The following lists some criteria that may signal the presence of an archaeological or burial site. The list is not exhaustive, but it includes site indicators that may be expected within the Mount Polley mine site area. The Basic Archaeological Site Identification Guide (Appendix A) provides more detailed descriptions and photographs.

Archaeological Site Indicators

- Artifacts such as stone, bone, or antler tools. Artifacts may be formed implements, such as arrowheads or spear points (also known as projectile points), or simply scatters of chipped/flaked stone. Be aware of concentrations of chipped stone materials that are not otherwise present in the project area (e.g., dacite, tourmalinite, argillite, chert, chalcedony, obsidian).
- Rock art, specifically pictographs (paintings on stone) or petroglyphs (images pecked in stone).
- Small circular depressions (about 1 m to 4 m across) representing pit ovens, cache pits etc. – particularly if associated with trails, or if found in clusters.
- Large circular or oval depressions, representing house-pits.
- Buried or exposed hearths, represented by localized dense concentrations of charcoal and/or ash sometimes associated with fire broken rock, burnt bone, or soil.
- Caves or rock overhangs.
- Trails of possible heritage significance.
- Culturally modified trees, such as blazes and bark removal scars.

Burial Places

- Human remains.
- Stone cairns.
- Earthen mounds.
- Shallow depressions or low mounds at the base of talus slopes.
- Rectangular or oval depressions.

4.0 CHANCE FIND PROCEDURES FOR HERITAGE RESOURCES

4.1 Archaeological Sites or Objects

Step 1: If known or suspected archaeological deposits or objects are encountered, stop work immediately. Secure the find location.

Step 2: Contact the Chief Compliance Officer and the Environmental Coordinator. The Environmental Coordinator will contact a professional archaeologist for further guidance (see Sections 5.0 and 6.0). Do not move or otherwise disturb the artifacts or site deposits. Do not resume work until directed by the Environmental Coordinator. Be prepared to transmit detailed location information and images of the find/location (see form in Appendix C).

Step 3: The archaeologist will advise on further action.

Initial Action

Depending on the nature of the situation, one of the following responses is likely:

- Based on information provided by the on-site representative, it may be decided that there are no further concerns, allowing project activities to continue as planned.
- A field visit by an archaeologist may be recommended. If the find is confirmed to be of archaeological concern, the archaeologist will provide direction about the interim management of impacts at the location, including the staking or flagging off the affected location.
- The archaeologist will notify the Archaeology Branch and the appropriate Indigenous communities of the find. The Archaeology Branch will recommend follow-up actions, primarily through discussions with Mount Polley, Indigenous communities, and the archaeologist. The archaeologist will advise the Environmental Coordinator regarding the resumption of project activities at the location.

Follow-up Action

- The archaeologist will implement any follow-up actions recommended by the Archaeology Branch, including but not limited to, the filing of a British Columbia Archaeological Site Registration Form for entry to the Provincial Heritage Register and archaeological investigations or monitoring.
- Findings or incidents involving heritage resources will be reported to the Environmental Coordinator and documented in Mount Polley's Environmental Management System.

4.2 Human Remains

Should suspected human remains be identified during project activities, the following responses are required. See Appendix B for Archaeology Branch Found Human Remains Policy.

Step 1: If known or suspected human remains are encountered, **stop work immediately**. Immediately notify the Environmental Coordinator and the Chief Compliance Officer. Do not move or otherwise disturb the remains or artifacts present. Take notes of the incident and be prepared to transmit detailed information and a description of the find.

Step 2: Secure the site. If the site is in a busy location or has high public visibility, assign an employee to stand watch until the local policing authority or archaeologist arrives to prevent additional disturbance or removal of evidence. Ensure that the remains are treated with dignity and respect by all those at the scene, including limiting photography to that required by the local policing authority and the archaeologist. Cover any exposed remains with plastic sheeting, plain paper, or other clean and appropriate covering to protect them. Do not backfill.

Step 3: The Environmental Coordinator will contact the Project Archaeologist (see Sections 5.0 and 6.0). Do not move or otherwise disturb the remains or associated artifacts or sediments. Do not resume work until directed by the Project Archaeologist. If some remains may have been placed in a spoil pile, do not move the pile or continue to use it. If material thought to contain remains has been removed from site, try to isolate the spoil at its new location and discontinue further disturbance of the spoil until it can be more thoroughly examined by an archaeologist or forensic specialist. The archaeologist will contact the local policing authority, if necessary, as described below.

Step 4: A qualified archaeologist will advise on further action if the remains are archaeological in nature.

Initial Action

Depending on the nature of the situation, one of the following responses is likely:

- Based on a telephone description of the encounter and review of available images, it may be determined that the remains are not human, and project activities may continue as planned.
- Based on a telephone description of the encounter and review of available images, it may be determined that the remains are likely human, and the archaeologist will contact the local policing authority and the Coroner's Office. The Coroner will determine whether the remains are human, and, if human, whether they are of forensic concern.
- If forensic, the local policing authority will assume management of the scene and liaise directly with the Environmental Coordinator and Chief Compliance Officer.

If archaeological, the archaeologist will notify the Environmental Coordinator and the Chief Compliance Officer, the Archaeology Branch, and all Indigenous communities with an interest in the area. Consultations will follow to establish an appropriate procedure for handling the remains according to cultural protocols. The Archaeology Branch Policy for Found Human Remains (Appendix A) may be used to guide the discussions.

- If the remains are not of Indigenous ancestry, the archaeologist will notify cultural groups identified by the Archaeology Branch and will attempt to identify and contact an organization representing that cultural group.
- The Archaeology Branch, in consultation with the Environmental Coordinator, the Indigenous community or other cultural group (if applicable) and the archaeologist, will determine follow-up procedures, including:
  - Interim management of project impacts and activities at the location, including the staking or flagging-off of the affected location.
  - The need for complete documentation of the burial site.
  - Appropriate treatment of the human remains.
  - Management of future project activities.

Follow-up Action

- Report findings or incidents involving heritage resources to Mount Polley's Environmental Management System.
- The archaeologist will implement any follow-up actions recommended by the Archaeology Branch, including but not limited to, the filing of a British Columbia Archaeological Site Registration Form for entry to the Provincial Heritage Register.

5.0 COMMUNICATIONS PROTOCOL

- All communications should be made using email or telephone and should be documented, with written follow-up to concerned parties.
- All face-to-face meetings are to be documented, with minutes prepared for review and finalization by all parties.
- The proceedings of all meetings are confidential among the parties to the meeting and are not to be distributed.
- All media queries will be directed to the Environmental Coordinator who will notify the Company spokesman.
- All queries from Indigenous community members with an identified interest at the site will be directed to their Chief and Council or other designated organization. All other queries from Indigenous community members will be directed to the Environmental Coordinator.
- Site safety and security is the responsibility of Mount Polley; when implementing safety or security measures, input from the Archaeology Branch and the Project Archaeologist should be sought to help ensure additional impacts to the burial place do not inadvertently occur.

6.0 CONTACT NAMES AND NUMBERS

Table 2: Contact Name and Numbers – Current October 2023

Organization	Name	Title	Contact Information
Mount Polley	Gabriel Holmes	Environmental Coordinator	gholmes@mountpolley.com Mobile: +1 250-364-4939 Mine Site: +1 250-790-2215
Mount Polley	Don Parsons	Chief Compliance Officer	don.parsons@imperialmetals.com Direct: +1 604-488-2652 Mobile: +1 778-836-2652
Archaeology Branch	TBD	Project Officer (HCA Permit TBD)	TBD (update when known)
Williams Lake RCMP	n/a	n/a	575 Borland St Non-emergency Direct: +1 250 392-8707
WSP Canada Inc.	Chris Dodd	Senior Archaeologist	Chris.Dodd@wsp.com Mobile: +1 604-315-1351
WSP Canada Inc.	Andrew Mason	Senior Principal Archaeologist	Andrew.Mason2@wsp.com Mobile: +1 604-417-4259

7.0 LIMITATIONS AND USE OF CHANCE FIND MANAGEMENT PLAN

This document was prepared by WSP Canada Inc. for the exclusive use of Mount Polley and their contractors. Consistent with the intent of the *Heritage Conservation Act*, Mount Polley is advised that if unanticipated cultural materials or features are encountered during construction, all work in the immediate area should cease, and the guidelines for archaeological chance find management, as presented above, should be implemented.

Any use, reliance, or decisions made by third parties on the basis of this report are the sole responsibility of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions based on this report.

8.0 CLOSURE

The reader is referred to the Study Limitations section, which precedes the text and forms an integral part of this report.

We trust that the information contained in this report meets your present requirements. Please contact us if you have any questions or concerns regarding the above.

WSP Canada Inc.





Chris Dodd, BA, RPCA
Senior Archaeologist

Andrew Mason, MA, RPCA
Senior Principal Archaeologist

CD/ARM/lih/hp/sw

https://golderassociates.sharepoint.com/sites/10023g/23590671 deliverables/002_issued/096-r-81131-chance find management plan/rev0/23590671-096-r-rev0-81100-mount polley cfmp 24nov_23.docx

APPENDIX A

Basic Archaeological Site Identification

BASIC ARCHAEOLOGICAL SITE IDENTIFICATION GUIDE

Common criteria that may signal the presence of an archaeological site are noted below. The examples are not exhaustive but includes common site indicators that may be encountered within the Mount Polley Mining Corporation area of operations.

Artifact or Artifact Scatter

Portable object(s) manufactured or modified by human beings. These items may include chipped or ground stone objects or implements made from bone or antler (Photos 1 to 6).

Look for: Obviously formed stone objects or pieces of stone that have been chipped and/or ground in a non-natural way. Bone and antler artifacts will exhibit obvious modification (i.e., cutting, shaping, incision, etc.).

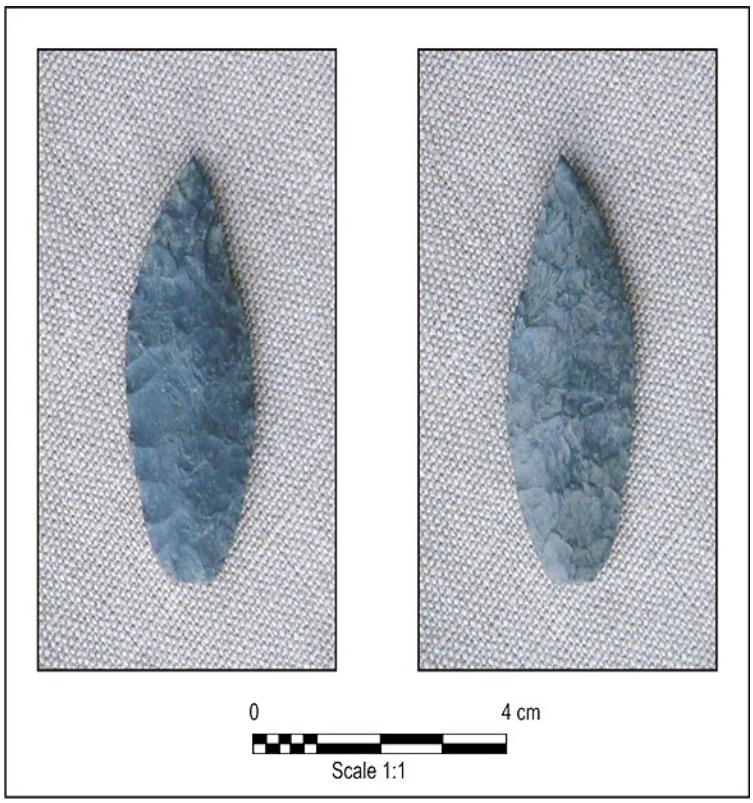


Photo 1: Projectile Point (© WSP Canada Inc.)



Photo 2: Scraper, Projectile Point, Key-shaped Drill (© WSP Canada Inc.)



Photo 3: Obsidian Knife. Obsidian is Volcanic Glass and is Extremely Sharp (© WSP Canada Inc.)



Photo 4: Bone and Antler Artifacts (© WSP Canada Inc.)



Photo 5: Pecked Stone Hand Maul (hammer) (© WSP Canada Inc.)



Photo 6: Chipped Stone Artifacts (flakes) (© WSP Canada Inc.)

Rock Art

Pictographs are paintings on rock and are the most common form of rock art in the region. The paint is often a mixture of ochre and rendered animal fat and is applied using a finger or stylus (Photo 7).



Photo 7: Pictograph (© WSP Canada Inc.)

Cultural Depressions

Cultural depressions range in size and function and may include: small circular depressions (about 1 m to 4 m across) representing pit ovens or food caches – particularly if associated with trails, or if found in clusters; and, large circular depressions (about 5 m to 20 m across) representing house-pits (Photos 8 to 10).



Photo 8: House-pit Depression (© WSP Canada Inc.)



Photo 9: Roasting or Cache Pit (© WSP Canada Inc.)



Photo 10: Roasting Pit in Profile (© Adam Gray)

Fire Cracked Rock (FCR) and Hearth Features

Fire cracked rock (FCR) is heat fractured stone resulting from rapid or alternate heating and cooling in campfires, or when using heated rocks to boil water in boiling pits. FCR is often associated with resource processing and/or food preparation (Photo 11). Hearth features are the remains of camp fires, indicates by dark stained soil, often with charcoal and ash (Photo 12).

Look for: concentrations of fractured rock, either in a hearth formation or dispersed with signs of being burnt in a fire, such as heavily oxidized surfaces sometimes reddish in color.



Photo 11: Fire Cracked Rock (© Andrew Mason)



Photo 12: Buried Fire Hearth (© WSP Canada Inc.)

Aboriginal Trails

Trails are often located in creek valleys and over saddles and ridges. Trails are often in association with other heritage sites such as campsites containing stone or bone artifacts, FCR, hearth features or cache pits (Photo 13).



Photo 13: Aboriginal Trail (© WSP Canada Inc.)

Burial Places

Burials take numerous forms which may include rock cairns, mound burials, and rectangular or oval depressions; however, many burial sites have no surface expression (Photos 14 and 15).



Photo 14: Burial Mounds (© WSP Canada Inc.)



Photo 15: Burial Cairn (© Andrew Mason)

APPENDIX B

Archaeology Branch Found Human Remains Policy

FOUND HUMAN REMAINS

Issued: September 22, 1999

Purpose

The purpose of this directive on found human remains is to provide guidelines to Archaeology Branch staff, archaeologists, other agencies and the public as to branch procedures for handling human remains that may be protected under the *Heritage Conservation Act* (1996, RSBC, Chap. 187), and to facilitate the respectful treatment of these remains.

Mandate

Pursuant to section 13(2)(b) of the *Heritage Conservation Act* (HCA), a permit is required under section 12 or 14 before a person can undertake any actions affecting a burial place of historical or archaeological value, human remains or associated heritage objects.

Authority

The Director of the Archaeology Branch and the Manager, Permitting and Assessment Section, have been authorized to exercise the powers of the Minister to issue permits under sections 12(2) and 14(2), as well as ministerial orders under section 14(4) where necessary for emergency conservation purposes.

Policy Statement

Upon notification of the discovery of human remains that are not of forensic concern, the Archaeology Branch will take steps to facilitate the respectful handling and disposition of those remains within the limits of existing funds and program priorities.

Procedures

The following procedures will normally apply in cases where human remains are discovered fortuitously through various land altering activities such as house renovations, road construction or natural erosion; or during archaeological studies conducted under an *HCA* permit:

1) Fortuitous Discoveries

In cases where the branch has been notified that human remains have been discovered by chance, the following procedures should normally apply:

- The Coroner's Office and local policing authority should be notified as soon as possible.
- The Coroner's Office should determine whether the matter is of contemporary forensic concern. The branch may provide information and advice that may assist in this determination.
- If the Coroner's Office determines the reported remains are not of forensic concern, the branch will attempt to facilitate disposition of the remain.
- If a cultural affiliation for the remains can be reasonably determined, the branch will attempt to contact an organization representing that cultural group.
- If remains are determined to be of aboriginal ancestry, the branch will attempt to contact the relevant First Nation(s).
- Generally, if remains are still interred and are under no immediate threat of further disturbance, they will not be excavated or removed.
- If the remains have been partially or completely removed, the branch will facilitate disposition.
- If removal of the remains is determined to be appropriate, they will be removed under authority of a permit issued pursuant to section 12 or 14, or an order under section 14 of the *HCA*, respecting the expressed wishes of the cultural group(s) represented to the extent this may be known or feasible.
- If circumstances warrant, the branch may arrange for a qualified physical anthropologist or an archaeologist with training in human osteology to provide an assessment of the reported remains in order to implement appropriate conservation measures.
- Analysis should be limited to basic recording and in-field observations until consultation between the branch and appropriate cultural group(s) has been concluded.

2) Permitted Archaeological Projects

In cases where human remains are encountered in the course of a permitted project, the Archaeology Branch should be contacted as soon as possible.

- The remains are to be handled in accordance with the methods specified in the permit, respecting the expressed wishes of the cultural group(s) represented, to the extent that these may be known or feasible.
- If the permit does not specify how remains are to be handled and if the cultural affiliation of the remains can be reasonably determined, the field director or permit-holder should attempt to contact an organization representing that group. The permit-holder or field director should advise the branch of the organization contacted, and any wishes expressed by that organization.
- The branch, in consultation with the appropriate cultural group(s), will determine disposition of the remains.
- Analysis should be limited to basic recording and in-field observations, until consultation between the branch and appropriate cultural group(s) has been concluded.

APPENDIX C

Archaeological Chance Find Documentation Form

Archaeological Chance Find Documentation	
Date and Time:	Location:
Time Work Stopped (if applicable):	UTM:
Recorder's Name:	Project Site:
Department/Company:	Find Surveyed (Y/N):
Position:	Depth Below Surface:
Incident Number/Site Number (if applicable):	
Archaeological Site Type:	
Disturbance Information:	Sketch Map:
Stratigraphic Information:	
Photographs Attached (Y/N): Site Map Attached (Y/N):	(include dimensions)
Name and Signature of Supervisor(s)/Manager(s):	
Follow-up Actions (if required):	
Communication Documentation (record: name, date, time, contact information, and details of conversation): (attach separate sheet if necessary)	



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APPENDIX 10-10: MINE EMERGENCY RESPONSE PLAN

Mount Polley Mining Corporation

an Imperial Metals company

Emergency Response Plan

This is a CONTROLLED Document.

Copies should not be made without the consent of the Safety department.

Revision August 2021

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1 OVERVIEW

1.1 Scope

Being prepared for a mine site emergency is critical in order to effectively respond and control any unexpected occurrence.

The following Mine Emergency Response Plan has been designed and developed for Mount Polley mine to coordinate and effectively respond to any and all mine emergencies.

This is a requirement of the Health, Safety and Reclamation Code for Mines in British Columbia (HSRC) 3.7.1

1.2 Definition of an Emergency

A current or imminent situation that requires prompt coordination of actions of trained personnel to protect health, safety, or welfare of people and to limit damage to property and to the environment.

1.3 Goals

- To identify and ensure adequate resources are available on site and off site in order to facilitate effective emergency response.
- To introduce and train management in the roles of the "Control Group"
- To introduce and train workers in the relevance of the Mine Emergency Response Plan.
- To ensure and maintain a high standard of emergency response training for mine personnel.

1.4 Training

For the ERP Training Program to be successful, with adequate revision of this Plan, it is necessary to establish a Drill Program. The Health and Safety, Environmental and any other operational areas will take part in the drills.

All personnel assigned specific duties within this plan shall review pertinent sections of the plan

All personnel in positions of leadership shall be trained in the Incident Command System

Emergency Response Drill Schedule

- LEVEL 1 Once every 6 months - Area specific evacuation practice
- LEVEL 2 Once every year / Mine Site wide Involving the Mine Rescue Team (ERT)
- LEVEL 3 Once every two years / Involving the ERT and Activating the Emergency Operation Centre

2 EMERGENCY RESPONSE PLAN MANAGEMENT

Mount Polley Mining Corporation shall designate an Emergency Response Plan Coordinator and Emergency Response Planning Committee who shall oversee the development, review and implementation of the Emergency Response Plan.

2.1 Emergency Response Plan Coordinator

The Emergency Response Plan Coordinator shall normally be the Senior Safety Coordinator or his designate.

2.2 Plan Audits and Revisions

The emergency response planning group will be comprised of the Mount Polley Occupational Health, Safety and Environment Committee members.

The ERP Planning Committee shall review the emergency response plan annually. The Emergency Response Plan shall also be reviewed following any incident, to determine if the planned response procedures were adequate or require revision. The planning committee shall be chaired by the Emergency Response Plan Coordinator.

Date	Rev.#	Revision	Originator
July 2019	#0	N/A	M Dyment
July 2020	#1		M Dyment
Aug 2020	#2		M Dyment
Dec 2020	#3	E2 Propane plan	M Dyment
Aug 2021	#4	Contact info	M Dyment

2.3 Emergency Response Plan Distribution

The Emergency Response Plan will be maintained as a secure document with limited printed copies. Digital copies will be stored on the Mount Polley Microsoft Teams network at General\Emergency Response Plans\Surface. Printed copies will be maintained in the following locations:

Copy	**Location**
1	Emergency Operations Center – 2nd Floor Boardroom
2	On-call Binder – Reception Desk
3	Mine Manager

3 COMMUNICATIONS

3.1 Level of Emergency

Mount Polley Mine Incident Reporting Policy requires that all levels of emergencies be reported immediately. Based on the level of emergency the Incident Commander and Safety Representative shall be notified as required.

EMERGENCY RESPONSE LEVELS
Level 1 "Low": Green
A "Low Level" emergency can be controlled by area personnel from the affected area.
Level 2 "Medium": Yellow
A "Medium Level" emergency cannot be handled by the personnel of the affected area. The Mine Rescue Team is required. It does not exceed the resources of the site. The Emergency Operations Group should be activated.
Level 3 "High": Red
A "High Level" incident is one which exceeds the resources available at the site and outside help, such as government, industry and or corporate, is required.

The highest severity rating for any individual risk factor determines the overall severity rating of the emergency.

3.2 Emergency Communications

EMERGENCY COMMUNICATION / INCIDENT NOTIFICATION

EMPLOYEE / BYSTANDER

Emergency Communications

1. By Radio on area radio frequency EMERGENCY – EMERGENCY –EMERGENCY - I have an Emergency
2. Report significant details of the incident

Provide the following information:

1. Your name, area and company
2. Location of the Emergency
3. Description of the Emergency
4. Number of injured persons if any and their health condition
5. Telephone number or radio frequency you will be monitoring
6. **Notify your Supervisor immediately**
    - DO NOT CALL the local media to report the emergency
    - DO NOT CALL the family or friends of the persons involved in the emergency (Management will take charge of making such calls)
    - DO NOT CALL the government agencies (Management will take charge of making such calls)

SUPERVISOR

On Scene Commander (OSC), Senior Area Supervisor present at the scene:

1. Confirms/Determines the Level or Emergency: Level 1 GREEN / 2 YELLOW / 3 RED
2. Informs Safety of the resources needed at the scene
3. Directs the on-scene activities
4. Initiates the dispatch of site based resources for the appropriate response:
    - Site Mine Rescue Personnel
    - First Aid
    - The on-call Health and Safety representative.
5. Contacts the Mine Manager or designate senior on call or the next higher level to report the Level of Emergency and response needs.

MANAGER

Manager
Incident Commander (IC), Mine Manager or Designate:

1. Confirms or Determines the Level of Emergency & assumes command at pre-designated Emergency Operations Center (2nd floor Boardroom).
2. Responsible for the overall management of an emergency.
3. Evaluates the emergency and determines the required level of response.
4. Confirms or initiates the dispatch of the resources for the appropriate response:
    - Site Mine Rescue personnel
    - First Aid
    - Ministry of Energy, Mines and Low Carbon Innovation
        - Senior Inspector of Mines, Health and Safety
    - RCMP - 911
    - BC Ambulance - 911
    - Forestry Fire Service etc.- 1-800-663-5555
    - Emergency Management BC – 1-800-663-3456
    - Williams Lake First Nation, Xatśūll First Nation

INITIAL RADIO AND TASK PROCEDURES WHEN AN EMERGENCY IS DECLARED
When an Emergency is called:
• **Radio Silence -** All non-essential radio communication are immediately ceased. Radio silence will remain in effect until lifted by the Incident Commander
• **Pit Operations 1 – Channel 5 -** is reserved for Emergency Incident Reporting, Management & High Priority Communications only
• **All Employees Monitor Pit Ops 1** to stay informed of the incident and listen for updates & instructions. Maintain radio silence unless you have a Priority Message
• **Cease High Risk Activities** in the initial stages of any reported emergency until a status can be determined by Management
• **Wait For Instruction -** Communications may be done with briefness on regular assigned channels to ask or receive instructions from your immediate Supervisor &/or Management
• **Prolonged Work Interruptions** will be at the discretion of the Incident Commander or his designate
• **Evacuation Ordered -** Proceed to designated Muster Points and report to your supervisor

3.3 Mount Polley Mine Radio Frequencies

Mount Polley Radio Communications				
Radio Channel	Area	Receive Mhz	Transmit Mhz	Full Private Line Mhz
Channel 5	Emergency/First-Aid	167.910	170.430	114.8
Channel 1	Tailings	170.670	170.670	
Channel 2	Mill	170.790	170.790	
Channel 3	Not Used			
Channel 4	Old Bootjack FSR	153.635	153.635	
Channel 5	Pit Ops 1 - Repeater	167.910	170.430	114.8
Channel 6	Pit Ops 2 – Repeater	162.075	167.055	131.8
Channel 7	Pit Talk Around	167.910	167.910	
Channel 8	Maintenance	166.020	166.020	
RR 25	Bootjack FSR	151.310	151.310	

3.4 Critical Personnel Contact Phone Numbers

Title	Name	Contact Information			
Interim General Manager	Don Parsons	Home:		Cell:	(778) 836-2652
		Office:	(604) 488-2652	Radio:	Channel 5
		E-mail:	Don.Parsons@ImperialMetals.com		
Technical Services Superintendent	Matt O'Leary	Home:		Cell:	(250) 274-0658
		Office:	(236) 317-4938	Radio:	Channel 5
		E-mail:	Mathieu.OLeary@MountPolley.com		
Mine Operations Superintendent	Joe Grant	Home:	(250) 296-4447	Cell:	(250) 644-0975
		Office:	(236) 317 4936	Radio:	Channel 5
		E-mail:	Joe.Grant@MountPolley.com		
Environmental Supervisor	Matt O'Leary	Home:		Cell:	(250) 274-0658
		Office:	(236) 317-4938	Radio:	Channel 5
		E-mail:	Mathieu.OLeary@MountPolley.com		
Mill Manager	Doug Ablett	Home:		Cell:	(250) 303-1479
		Office:	(236)317 4949	Radio:	Channel 5
		E-mail:	Doug.Ablett@MountPolley.com		
Safety Officer	Murray Dyment	Home:		Cell:	
		Office:	(236) 317-4940	Radio:	Channel 5
		E-mail:	Murray.Dyment@MountPolley.com		
Corporate President and CEO	Brian Kynoch	Home:		Cell:	(778) 836-7441
		Office:	(604) 488 2654	Radio:	
		E-mail:	Brian.Kynoch@ImperialMetals.com		
Corporate COO	Don Parsons	Home:		Cell:	(778) 836-2652
		Office:	(604) 488-2652	Radio:	
		E-mail:	Don.Parsons@ImperialMetals.com		

3.5 Outside Agency Critical Contact Numbers

Phone Numbers		
Agency Name	Primary Contact	Contact Information
Ministry of Energy, Mines and Low Carbon Innovation	*Phone: 1-888-348-0299*	*Email: MineIncidents@gov.bc.ca*
	Chris LeClair	778-220-2076 (Cell) 250-312-6728 (Office)
	Rory Cumming	250- 371- 7328 (Cell)
	Allan Chan	250-320-2948 (Cell) 250-312-6710 (Office)
Emergency Management BC	24 Hour Contact	1-800-663-3456
CANUTEC	**24 Hour Contact**	1-613-996-6666
BC Ministry of Environment	**Email**	EnvironmentalCompliance@gov.bc.ca
RCMP Williams Lake	**Emergency Contact** Non-Emergency Contact	**911** 250- 392-6211
BC Ambulance	**Emergency Contact**	911
Cariboo Memorial Hospital	**Emergency Department**	**250-392-4411 Ext 4000**
BC Wildfire Service	**Emergency Contact**	**1-800-663-5555**
Cariboo Regional District	**24 Hour EOC Emergency Contact**	**1-800-665-1636 and press 5**
T'exelc First Nation (Williams Lake First Nation)	Chief	250-302-1883 (Cell) 778-417-0194 (Office)
	Natural Resource Manager	250-305-8025 (Cell) 778-417-0191 (Office)
Xatśūll First Nation (Soda Creek Indian Band)	Chief	250-267-7464 (Cell) 250-989-2323 ext 125 (Office)
	Natural Resource Manager	250-267-7185 (Cell) 250-989-2323 ext 121 (Office) nrmanager@xatsull.com
Highland Helicopters Ltd	Williams Lake Base Quesnel Base	250-398-7142 250-249-9660

3.6 Media and Public Relations

During an emergency it is critical that all media and public communication be managed so that only accurate and required information is communicated to outside groups. All media and public communications will be handled by the Mine Manager or Designate. All requests for information shall be directed to Mine Manager or Designate. In the event of an emergency involving personal injury, specific focus should be given to notification of family members prior to public release.

The Shut Down of site external communications shall be determined by Mine Manager or Designate

4 PERSONNEL DUTIES AND RESPONSIBILITIES

4.1 General Responsibilities of Personnel

Anyone first finding or recognizing an emergency situation that would be cause for evacuation shall;

- Immediately report the emergency, pull the fire alarm and evacuate the building.
- Notify the supervisor of the emergency situation.
- Provide help until the appropriate response personnel arrive.
- Never place yourself or others in danger, especially during fires, electrical or chemical emergencies.
- If an alarm is sounded or you are instructed to do so, evacuate the area to designated assembly points and stay there until the "**All Clear**" signal is given.
- If an evacuation takes place, make sure you and any visitors you are responsible for are accounted for.
- If safe to do so, ensure that shutdown procedures for your area are completed prior to evacuation.

General Procedure G50 Evacuation Procedure shall be followed.

4.2 First aid Attendant

In the event of an emergency, the first aid attendant shall take over primary care of any injured workers. If Mine Rescue trained personnel are in command of an incident scene, the first aid attendant will take over care of the injured workers once the Mine Rescue personnel confirms the area is safe to approach.

4.3 Mine Rescue

4.3.1 Emergency Response Coordinator

The Emergency Response Coordinator or his designate must be contactable at all times, both during office hours and after hours. During office hours, the coordinator must be in close proximity to a radio or telephone.

The Emergency Response Coordinator will liaise with Incident Commander, Mine Rescue Personnel and Coordinate assistance for the incident and disseminates warnings and information as required.

Upon notification of an emergency The Emergency Response Coordinator will:

- Immediately report to the Emergency Operations Center
- Proceed to the mine rescue station and organize the emergency response personnel

- Coordinate the gathering of all required equipment and vehicles
- Ensure all required personal protective equipment is identified and utilized
- Brief the Mine Rescue personnel regarding the nature of the emergency and assigned duties
- Ensure that proper communication is established and maintained with all active Mine Rescue personnel throughout operation
- Ensure that a complete record is kept regarding assignments, communications and de-briefing

The Mine Rescue Personnel will seek the Emergency Response Coordinators approval prior to commencing any interventions that could endanger either Mine Rescue Team Members or other personnel.

4.3.2 Mine Rescue Team Captain

The Mine Rescue Team Captain reports directly to the Emergency Response Coordinator in an emergency. The Mine Rescue Team Captain directs the actions of the mine rescue team to rescue trapped or injured workers, protect the mine property from further damage, and rehab the affected area and equipment. The Captain has the right to refuse any task he considers an unacceptable risk to the team. The Mine Rescue Team Captain will be responsible for:

- knowing the Mine Recue Team Members available on site;
- knowing the locations and status of rescue vehicles;
- the direction and safety of team members during emergency situations.

4.3.3 Mine Rescue Personnel

In the event of an emergency all Mine Rescue Team Members report directly to the Mine Rescue Team Captain in the mine rescue training center for briefing. Once assessment of the incident has been completed by the Team Captain any team members not required will be returned to their duties and shall remain on call until needed or the incident has been controlled.

> **3.7.5 HSRC** The manager of an open pit mine employing more than 25 persons per shift shall ensure that
> (1) there is one fully trained and equipped mine rescue team, and
> (2) on every shift where more than 10 persons are working, there are four persons trained in mine rescue procedures.

4.3.4 Mine Rescue Equipment

An updated copy of the mine rescue equipment inventory shall be maintained in the mine rescue training center and on the mine rescue truck. These mine rescue inventories shall be inspected on a monthly basis with any changes to the inventory list being completed as soon as discrepancies are found. The Safety Officer will maintain these lists.

4.3.5 Mutual Aid

Mount Polley Mining Corporation does not currently have a Mutual Aid agreement.

All costs pertaining to rendering assistance from other mines or jurisdictions are the responsibility of the mine seeking assistance.

5 EMERGENCY INCIDENT COMMAND

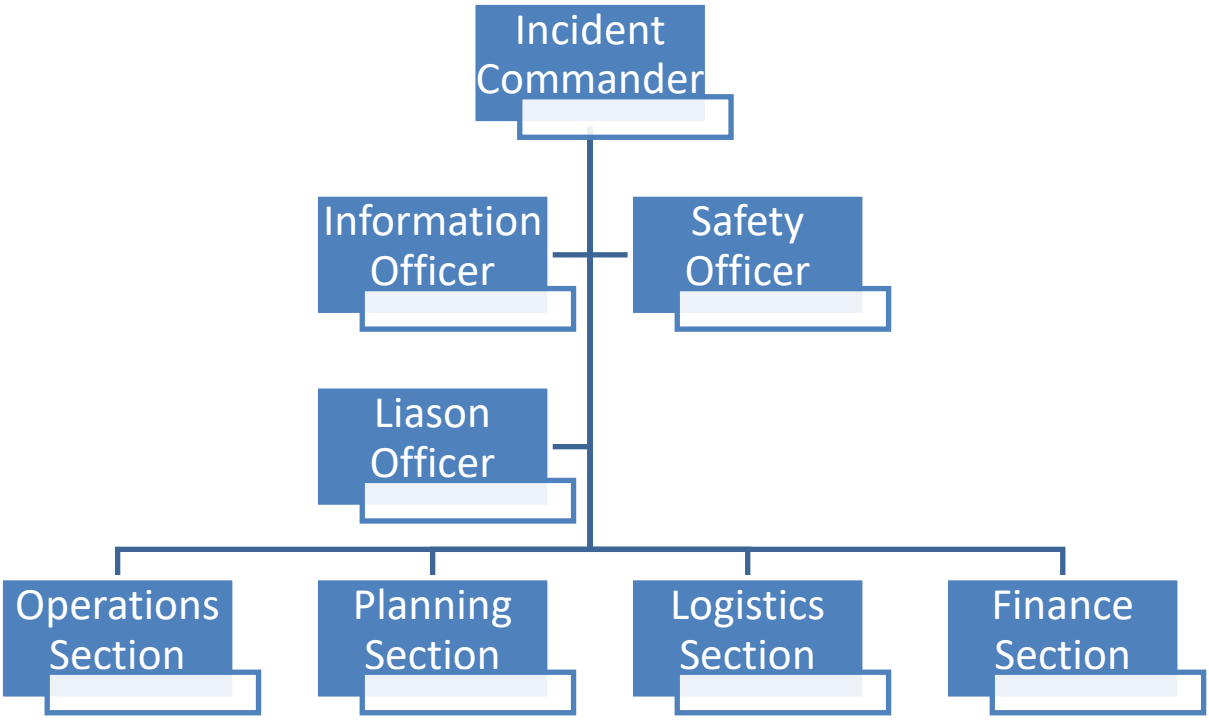
5.1 Incident Command Roles "Control Group"

Incident Command System (ICS)

- In charge of all aspects of emergency management
- Performing command activities, such as establishing commander and the Incident Command Post
- Protecting life and property
- Setting objectives, strategies and incident action plan
- Controlling and accounting for personnel and equipment resources
- Establishing and maintaining an effective liaison with outside agencies and organizations

With the exception of the Incident Commander (IC), who shall always be designated, the following positions may be implemented by the Incident Commander based on the scope and requirements of the emergency. In smaller incidents the roles may be performed by the IC, but larger incidents may require the IC to establish Sections whose activities are to support the IC.

5.2 ICS - Chain of Command Flow Chart



The Incident Commander will assign personnel to these positions.

6 EMERGENCY IDENTIFICATION, PREVENTION AND PROTECTION

6.1 General Evacuation

When an emergency occurs that is significant enough to affect the health and safety of employees in any work area, an evacuation of all areas may be required.

6.1.1 Responsibilities of Personnel

- Know the location of all the emergency exits in your work area, particularly the nearest one to you.
- When the alarm for the evacuation of your area is sounded and/or the notification is given by your supervisor, immediately stop what you are doing and go, in an orderly manner, directly to the areas designated Muster Point.
- When you leave your work site, CLOSE ALL DOORS AND WINDOWS. If you have enough time, close valves, shut off equipment, computers, office equipment and lights; safeguard confidential information by locking desks and file cabinets.
- If you are the last person to leave the area, check that all work areas are emptied of personnel, provided that circumstances and time allow you to do so.
- Personnel that work in critical areas of the process must perform the emergency shutdown procedures established for these areas.
- **WALK, DON'T RUN**. In an emergency, move fast but don't run. Remain in control, do not panic.
- Avoid smoke-filled environments. If a space that is full of smoke is the only exit route, crawl, escape through a window or if safe to do so remain in position and notify your supervisor of your location.
- Go to the muster Point assigned to your **work area**. Make sure that you establish contact with your supervisor (or the designated person) as soon as possible.
- Those people who know of lost personnel should immediately inform their supervisor.
- Do not re-enter the evacuated area or return to the scene of emergency to offer aid, unless the Incident Commander specifically requests your presence.

6.1.2 Muster Points

The Muster Points are designed to be used by personnel during an evacuation due to an emergency. Accommodations will be made to avoid exposure of the evacuees to the inclemency of the weather.

The following areas are designated Muster Points in the event of an emergency:

- **Outside Mine Rescue Training Center**
  All workers assigned to duties in the mill building, warehouse, admin
  Back-up Location: Employee parking lot
- **Outside the Crusher Maintenance shop**
  All workers assigned to duties in the Crusher building, Crusher Maintenance shop
  Back-up Location: Employee parking lot
- **South East Rock Dump (SERD)**
  All workers assigned to duties in the Pit and around the Tailings Storage Facility including The Water Treatment Plant
  Back-up Location: In-Pit Washrooms

In the event that an identified muster point cannot be used due to safety concerns the Incident Commander will designate alternate locations.
Generally a Muster Point is defined as an area that is:

- A minimum of 15 meters distance from the affected facility
- Located against the wind and uphill

6.1.3 Accounting for Personnel

All personnel working onsite shall sign in and out at the Mine Access Gate House.

The supervisor or most senior employee will be responsible for accounting for the personnel under their charge. This is done by performing the following steps:

- Ensuring that all the personnel leave their work area during the evacuation.
- When they have reached the designated Muster Point, perform a headcount of all personnel (employees, contractors, visitors, etc.) who were within the work area at the time of the emergency.
- The Daily Sign-In Sheet will be used for accounting of personnel during emergency situations. Once the head count has been completed, the supervisor must report any discrepancies in personnel, including any missing personnel and/or any individuals that normally work elsewhere.
- In turn, each supervisor will report to their next level of management until personnel information reaches the senior management person for each department at the assembly area.
- The senior management person for each department will account for all departmental personnel. This accounting should include all employees, contractors, delivery personnel, temporaries, and visitors under their supervision.

- Once all personnel have been accounted for the senior department representative shall communicate this information with Incident Command and Emergency Response Coordinator
- Departmental management at each assembly area should communicate with each other to determine the location of any missing personnel.
- If personnel are deemed to be missing, the Incident Commander and Emergency Response Coordinator should be contacted immediately.
- All supervisors shall keep their groups together at their respective assembly areas until the Incident Commander gives further instructions.

6.1.4 Search and Rescue

If a building has been evacuated, personnel shall not re-enter the building until the all clear signal is given, or directed to do so by the Incident Commander.

Mine Rescue trained personnel are permitted to enter an area that has been evacuated to perform search and rescue before the all-clear signal is given. Search and rescue is the responsibilities of the Mine Rescue personnel and will be conducted in accordance with their standard operating guidelines. The Mine Rescue Team Captain may enlist support from the Area Supervisor or their designate for knowledge of the area.

Note: There will be no search and rescue undertaken unless an adequate backup personnel are ready and standing by.

6.1.5 Pit Evacuation

Notification to evacuate the pit will be made through radios and may only be authorized by the supervisor. Instructions will be given for the operations personnel in charge of vehicles to move to the Assembly Points that have been determined to pose no danger.

The personnel who do not have any vehicle or do not have access to one (such as operators of drills, blasting equipment, etc.) will be picked up by light vehicles. It is very important that these workers wait at the designated Muster Point safely outside the emergency area.

6.1.6 Site Evacuation

The decision to conduct a full site evacuation will be made by the Incident Commander. The Incident Command Team will be responsible for arranging transportation off of the property.

- The Incident Commander must determine the final location of the evacuees.
- Transportation for the personnel must be coordinated.
- The headcount should be confirmed to ensure all personnel are accounted for.

Access and Egress to the Mine site

In the event that mine access road prevents any entry or egress of the mine site, the Incident Commander will refer to Appendix A – Site Evacuation Routes for alternate site evacuation routes. If all of these routes are compromised then other options, such as helicopter evacuation shall be considered.

6.1.7 End of the Emergency and Return to Work

The evacuated area must be left free of dangers. The Mine Rescue trained personnel will conduct a thorough inspection of the evacuated facilities. If there was a fire or if damage is found in the structures, the area must be inspected by Maintenance and Health and Safety personnel to determine if the area is safe to be occupied.

Once the area has been declared to be safe, the On Scene Commander will notify the Incident Commander of this circumstance so that he proceeds to stop the emergency signal. The Incident Commander will transmit the order to stop the emergency signal through all channels. Transmission will include a description of the evacuated areas with the key phrase:

"All clear"/you can return to the area".

This message must be repeated three consecutive times.

The employees may return to their work once the transmission of the end of the emergency has concluded.

A debriefing will be completed at the end of all emergencies. The debriefing session will be documented to address what was completed correctly and what improvements are needed. The Emergency Response Plan will be reviewed and, if necessary, revision made.

6.2 Medical Emergencies

6.2.1 Responsibilities

First on Scene Persons Duties

- Prior to accessing the scene ensure the area is safe. If unsafe to approach, immediate contact the supervisor to report the conditions.
- Quickly assess the situation determining the number of injured persons, the severity of injuries and what resources may be required to deal with the emergency situation.
- Immediately inform the area supervisor of the incident, including required resources.
- Give the supervisor the following information:
  - Your name
  - The location of the accident
  - The number of injured persons
  - The nature of the injuries
  - The best route to be used to approach the accident location
- The supervisor will contact the Incident Commander in order to dispatch the Mine Rescue Team.
- Do not move the injured unless they are in imminent danger.

- Restrict access to the scene by any unauthorized individuals and ensure security of any evidence.

On-Scene Commanders Duties

- At all times ensure the safety of personnel and emergency responders.
- Assess the accident scene.
- Contact the Incident Commander to apprise them of the situation, notify them of what additional resources may be required, and update the information whenever the situation changes or additional information becomes available.
- Have someone present assist you with the communications and recording of information & times. (Assign a Log Keeper)
- Control access to and preserve the emergency scene

- Note and record all details of the incident as soon as possible
- Prepare a report of the incident
- Get the names of eyewitnesses and others who may have relevant information.

Emergency Response Team Duties

- Respond to the scene as directed by the on scene or Incident Commander
- Apply appropriate care following protocols outline in training
- Initiate the request for any off-site resources as required (BC Ambulance, Fire Department)
- The Emergency Response Team Captain or Medic will keep the Emergency Response Coordinator or Incident Commander informed of any required resources
- Provide medical assistance and/or evacuate the patients(s) safely and quickly
- Preserve evidence and scene security

6.2.2 Transportation

MPMC procedure G03 Medical Evacuation shall be followed when any injured worker requires medical evacuation, either to meet BC Ambulance Service or to a medical facility.

6.2.3 Fatality

Personal injuries that result in fatalities require special action due to local law and conditions. If the injured party is clearly and definitely deceased, the remains are not to be moved until authorization is received from the RCMP, or the Coroner. Mount Polley Mine Manager or Designate is responsible for notifying the RCMP, Coroner and Ministry of Energy, Mines and Low Carbon Innovation (EMLI).

Due to the nature of fatalities, special emphasis shall be placed on securing the incident scene and all evidence. This shall be done to support investigating the accident, determining the causes and taking the necessary steps to prevent any reoccurrence.

All fatalities will be investigated by a Special Investigation Team made up of:

- The General Manager or his designate.
- The Superintendent of the Area Affected.
- The Senior Safety Coordinator
- The employee's supervisor
- JOHSEC Co-Chairs (Joint Occupation, Health, Safety and Environment Committee)
- Others, as determined by the General Manager / Health & Safety and as circumstances require, e.g. technical advisors

Work Related Fatality – Supervisors Duties

- The Supervisor ensures the barricading of the area surrounding the accident scene to guarantee evidence is preserved.
- The Supervisor ensures that the Health & Safety personnel are notified immediately.
- The Supervisor shall notify promptly the following people:
  - His immediate Supervisor
  - The Area Superintendent
  - Incident Commander
- The supervisor will confine the information to the facts of the accident, having made positive identification of the deceased. Radio discussions of the accident will be minimized and names will not be broadcast.
- The supervisor will preserve the accident scene and all physical information until relieved of this responsibility by the Health & Safety Representative, or employee he designated, or the Area Superintendent. Accident site visits will be limited to only necessary emergency response personnel, managers, and regulatory officials as required.
- The supervisor is responsible for completing a preliminary report of the accident. The Investigation Team will complete and distribute the final report as appropriate.

Work Related Fatality- Health and Safety Duties

- Ensure that the scene is properly preserved, documented and evidence collected.
- Health & Safety will initiate legal reporting, to all agencies that have authorization in the case. The Senior Safety Coordinator or his designate will follow up to ensure that appropriate notifications have taken place.
- The Senior Safety Coordinator will inform Mount Polley Mining Corporation's Senior Management.
- The Senior Safety Coordinator and other necessary management personnel will conduct a briefing session, if possible, with representatives from the local authorities prior to their inspection of the accident scene.
- The Senior Safety Coordinator will serve as a member of the Special Investigation Team.

- After all investigations have been completed, the Senior Safety Coordinator will prepare a final report of the accident in writing to the General Manager, and area Superintendents. He will also include copies to be sent to the local authorities after approval.
- No information will be given to any other source or agency without authorization from the General Manager.

Work Related Fatality – Department Superintendent Duties

- Ensure that the scene of the accident is secured and that no evidence can be tampered with
- Advise promptly the facts of the fatality to the Incident Commander.
- Stand ready to act as required or directed by the Incident Commander.
- Serve as a member of the Special Investigation Team.

Work Related Fatality – General Manager Duties

- Inform Mount Polley senior management and executive team of the occurrence.
- Ensure notification of the appropriate authorities is underway:
    - RCMP
    - Coroner
    - Ministry of Energy, Mines and Low Carbon Innovation
        - Local Inspector
        - Chief Inspector
    - Local JOHSEC (Joint Occupation, Health, Safety and Environment Committee)
- Ensure notification of next of kin occurs as soon as authorities allow
- Once the emergency is under control, the General Manager or his designate will visit the accident scene to assist in the investigation.
- The Incident Commander will return the accident site to its operational condition as soon as possible, being consistent with the requirements of Health, Safety and Reclamation Code.

6.3 Fire Emergencies

At all times be familiar with the evacuation routes of your work area. The best way to protect yourself is to be able to quickly evacuate a work area in the event of a fire or other emergency. Prior to fighting any fire, ensure that it is within the scope of your training and that you maintain a suitable exit route at all times. Large fire will be managed by the site Mine Rescue/Emergency Response Teams.

6.3.1 Fire Prevention

Automatic Fire Alarm: Site buildings are monitored through a fire alarm system. This system will activate and signal through audible bells and sirens for area evacuation.

Monthly fire suppression systems and handheld fire extinguisher inspections are essential to ensure the integrity of all systems.

Scheduled maintenance and repairs are imperative in order to maintain the integrity of fire suppression systems. Particular attention to housekeeping and observing the National Fire Code will ensure that fire protection remains effective at all times.
Combustibles shall not be stored inside buildings unless they are part of a work process.
Flammable materials such as paints and aerosols shall be stored in approved and appropriate storage cabinets.
Fire Extinguisher training: personnel shall be trained and familiar with safe use and application of Hand Held Fire Extinguishers.

6.3.2 Reporting and Extinguishing Small Fires

The site is equipped with hand-held fire extinguishers and fire hydrants for occupant first-response use on small fires. The initial response should be as follows:

- Warn occupants in the immediate fire area.
- Activate a fire alarm if one is nearby
- Activate any fire suppression systems that may be available.
- Attempt to extinguish the fire with a handheld fire extinguisher or fire hydrant if safe to do so.
- Notify the area supervisor via the appropriate radio channel.

Other Actions

- Relevant Supervisor is responsible for making sure that their area is evacuated.
- Regardless of the size of the fire, building occupants must assemble immediately at a designated Muster Point.
- All supervisors shall keep their groups together at their respective assembly areas until the Incident Commander gives further instructions.

6.3.3 Uncontrolled Fires

The following procedures apply to small fires that cannot be extinguished or fires that pose danger to human life/property or production.

- Warn occupants in the immediate fire area.
- Activate a fire alarm if one is nearby
- Activate any fire suppression systems that may be available.
- Notify area supervisor.
- Notify Mine Rescue trained personnel of the location and extent of the fire.

Mine Rescue Team (ERT)

- Responds to the emergency with the relevant equipment.
- Isolate the area and evacuate as many people as possible.
- Ensure rescue of trapped or injured workers.
- Provide firefighter measures within scope of training and request outside resources if required.

Isolating Utilities

The Incident Commander shall instruct the Mill Maintenance and Electrical department to Shut off and isolate power and other utilities to the fire area that could hinder emergency response.

Water Sources

- One of the most important factors to consider when fighting fire shall be maintaining an adequate supply of water and ensuring that alternate sources are readily available.

6.3.4 Wild Land Fires

Any range fire on mine property should be immediately reported to the area Supervisor. The area supervisor shall be responsible for summoning the help needed to extinguish the fire if necessary.

All responses to the fire will be coordinated by the Area Supervisor & Incident Commander. Response should be limited to extinguishing a small fire in its early stages. If the fire cannot be contained with the resources of the mine, response will be limited to protection of mine property.

The Site Manager should be notified of any major fire, or a fire that threatens life or mine property.

The main aim in responding to a Rangeland Fire is to:

- Report it to the area supervisor and Incident Command
- Evaluate the danger to personnel and infrastructure.
- Continual monitoring of the fire for direction, speed, size, smoke, etc.
- Allocation of resources as needed.
- Evacuate to a safe place accounting for all persons on site.
- Help with fire in area as situation warrants and as directed by Incident Command

BC Wildfire Service (BCFS) Wildfire Management Branch

The Wildfire Management Branch has the resources and personnel that are specially training to deal with wildfires. If required, the Incident Commander should initiate contact with the BC Wildfire Service as soon as possible during a wildfire event.

BC Wildfire Service contact line - 1-800-663-5555 or *5555 from a cellular phone

6.4 Hazardous Materials and Chemicals

6.4.1 Spill

For detailed information on Hazardous Materials and Chemical spills see the Spill Response Manual Appendix D

6.4.2 Training

Personnel assigned spill clean up duties must be trained in Hazardous Materials Spill Cleanup

6.4.3 Main Response Elements

Any reportable leak, spill, or release outside containment areas must be reported to the Environmental Department immediately. All external notification and reporting shall be conducted by the Environmental Superintendent or their designate. Containment and cleanup activities shall only be performed as directed by Environmental personnel.

6.4.4 Find and identify

- Mitigate the source of the spill
- Establish communications system
- Collect information
- Isolate the Emergency Scene

6.4.5 Notify

Hazardous Materials spills must be reported to the Environmental Department immediately.

6.4.6 Spill Assessment

See; Spill Response Manual 2019 Appendix D

6.5 Vehicle Incidents

There is a potential for vehicle accidents involving multiple casualties on the Mine-Access road. There would be a reasonably high risk of multiple casualties taking into consideration the volume of traffic and the mode of transportation, that being buses and multi-passenger vehicles.

Access control

One of the early priorities would be to prevent access to the scene by assigning 2 persons as guards, one at each end of the mine access road.
Travel into and out of the mine can then be restricted to essential and key personnel.

Emergency Response Personnel

If indeed there are multiple casualties it may be necessary for additional outside medical help. It would take a minimum of 1 hour for help to arrive from Williams Lake and if available, 30 minutes response from Likely; therefore, it is of the utmost importance that a “Triage station” be established so that casualties can be transported in the order of emergency medical importance.

Transportation

Consideration must be given to the situation where there are multiple casualties needing transportation to medical facilities in Williams Lake. If this is the case it may be necessary to facilitate the use of crew cabs or other multi-passenger vehicles as long as they can provide the necessary comfort for the casualties
The Designated First Aid Attendant is to respond to Medical Emergencies.
Where injuries require Medical Treatment follow procedure G03 Medical Evacuation
Where there are multiple casualties it may be necessary to establish a "Triage station" so that casualties can be transported in the order of emergency medical importance.

6.6 Land Movement

6.6.1 Prevention of Burial

Either a shift boss or a qualified person will examine dumps or stockpiles prior to any work being performed. Dumps, Stockpiles and Pit Walls will be monitored at intervals not to exceed four hours while in use.

The conditions noted shall be recorded in the daily logbook. Items of concern include:

6.6.1.1 Dumps and Stockpiles:

- Cracks appearing on the dump floor or face.
- Subsidence of the dump floor.
- Material hanging up on the face of the dump.
- Water flows or pooling

6.6.1.2 Pit Walls:

- Cracks developing along or near the edge.
- Cracks in the face.
- Overhangs developing on the bench face.
- Water flowing into the rock

If any of the above items are observed contact the Shift boss who will inspect the site and determine what actions are to be taken. In the event that the area appears unsafe do not enter and contact the Shift boss immediately for direction.

If cracks are observed on the rock dump floor the area shall be blocked off and monitored to determine if additional movement is occurring. Dumping in the area shall not recommence until the Shift Boss gives approval.

Overburden and soils piles will slough and compact as they are being built. Dumping shall take place back from the edge and dozed over. If bulging of the face or curved cracks are observed dumping shall cease in the area and the area shall be monitored for additional movement. Dumping in the area shall not recommence until the Shift Boss gives approval.

6.7 Tailings Storage Facility

6.7.1 Potential Emergencies

For detailed information on potential Tailings Storage Facility Emergencies see: MOUNT POLLEY MINE TAILINGS STORAGE FACILITY EMERGENCY PREPAREDNESS AND RESPONSE PLAN.

Located at the Mount Polley Microsoft Teams network at General \ Emergency Response Plans \ Tailings Storage Facility

6.8 Weather Related Emergencies and Natural Disasters

In severe weather, seismic, or other natural disaster situations personnel will keep away from high risk areas created by the condition.

Examples are:

- High winds or earth movement/permafrost subsidence - Stay away from power lines, high walls, and embankments that may be affected.
- Extreme precipitation (heavy snow or rain fall) - Keep personnel and equipment out of possible voids & high drift zones or flood areas in the case of heavy rain
- Heavy snow - Maintain accessibility for personnel and emergency equipment
- Lightning - Keep personnel out of non-protected elevated areas and other high-risk situations.

In the event of any severe weather conditions or other natural disaster situations the Mine Manager or Designate shall be notified.

6.9 Unplanned Explosions

Unscheduled Explosion – First on Scene Duties

- Call the relevant supervisor, report the situation, and follow their instructions.
- Assess the situation. Evacuate the affected area. Move to a safe vantage position. Do not endanger yourself or other rescuers.
- Stop all operations in the area until it is safe to resume.
- If there is anyone injured, follow the procedures herein for Injuries / Medical Accidents.
- If there is anyone in need of rescue, identify the need for the Mine Rescue team.
- Remain at the safe vantage position until relieved by the Supervisor and authorized to leave.
- Ensure that the Department Manager is informed of the emergency via radio or telephone.

Unscheduled Explosion - Supervisors Duties

- In the event of an unplanned detonation, ensure that the area is evacuated and secured. DO NOT ENTER the area except to rescue an injured person and then only if safe to re-enter (If possible, efforts should be made to get the Mine Rescue Team to the scene.)

- Proceed to a safe vantage position. Confirm the assessment of the situation with the First on Scene Person.
- Co-ordinate the immediate emergency response from the safe vantage position.
- Together with the Area Manager, decide on the Level of Emergency (LOE) warranted by the situation. Be prepared to change this if the situation escalates or diminishes in severity.
- Establish controls on all roads leading to the area.
- Prepare access to the scene for emergency services vehicles when it is safe for them to enter the area, and direct them to the scene.
- Ensure that the following personnel have been notified: Mine Operations Manager, Mine Operations Assistant Superintendent, Senior Safety Coordinator.
- See that the Mine Rescue Team is supported in their immediate response requirements.
- With the On Scene Commander, decide if additional off-site emergency services are required.
- When the situation is stabilized, assist the Manager with the investigation of the emergency.
- Ensure the area is secured.

Unscheduled Explosion – Area Superintendent Responsibilities

- Proceed to the scene of the emergency, if it is safe to do so, for an initial assessment.
- Consider secondary explosions, toxic gases, and structural collapses.
- Co-ordinate the response of various on-site specialists such as medical, fire, environmental, Mine Rescue Team, etc.
- Advise the Emergency Operations Group with details of the emergency, the immediate response taken, and if any risks remain.
- When the situation has stabilized, conduct an investigation of the causes, effects and response to the explosion, and prepare a written report.
- Security shall be assigned to control access to the affected area.

6.10 Bomb Threat

6.10.1 Bomb Threat - General Guidelines Procedures

Threat recipient:

- Make every effort to remain calm and relaxed.
- Record the call, if recording equipment is available.
- If a recording cannot be made, try to transfer the caller to the emergency number where a recording can be made.
- If unsuccessful, follow the guidelines in the Bomb/Threatening Call Record sheet to obtain as much information as possible from the person making the threat. **Attached at Appendix A**
- If the threat is in written form, put the letter and envelope in a plastic cover and refrain from unnecessary handling.

- Inform the Senior Safety Coordinator and Area Manager immediately after receiving the threat and wait for further instructions.
- If the caller indicates that the bomb is in the building that you are occupying, immediately start the evacuation process, taking the notes made during the threat call with you.

Observer of item suspected as a Bomb:

- Do not touch the device.
- Inform the Area manager as well as the Senior Safety Coordinator
- Start the orderly evacuation of the immediate area.

6.10.2 Responsibilities

On-Scene Commander's Duties

- Notify Internal Security and consider advice from the RCMP.
- Assess the situation and decide the following:
  - If a full or partial evacuation, or none at all, is warranted.
  - If a search is warranted and can be safely done.
  - When it is safe to reoccupy the site or office.
- Make sure everyone is accounted for at the designated assembly point for that area.

Mine Rescue Team Duties

- The Mine Rescue Team will respond with an ambulance, (if available) and appropriate rescue and firefighting equipment. These units will stand-by at the Incident Staging area where the On-Scene Commander (OSC) is located, at least 300 meters from the suspect device or location of threat.
- In the event of a detonation, when deemed safe to do so, normal Emergency Response procedures will be carried out.
- The Mine Rescue Team will provide the required fire/rescue/medical/search and recovery services and any other services as needed.
- The Mine Rescue Team does not participate in securing the bomb.

7 MINE WATER SUPPLY SYSTEM

- Mine site tap water is untreated and is not considered drinkable, bottled drinking water is provided and all sink tap locations are signed with “DO NOT DRINK TAP WATER”.
- Bottled Drinking water provided to site by Cool Clear Water, Williams Lake.
- All Mount Polley’s water samples are tested by ALS CANADA LTD.
- When maintenance tasks are required and unable to be completed by onsite personnel, then resources will be drawn from outside contractors.
- Interior health can be contacted in any emergency scenario to help with health risk assessments.



7.1 Potential Emergencies

7.1.1 Mechanical / Electrical water system failure

- Contact the General Manager or his designate (On Call Manager)
- Limit water usage on mine site
- Arrange for potable water to be trucked to site until the water well supply system is returned to operational condition
- Arrange for Sanitary stations
- Affect repairs

7.1.2 Water sampling test results outside acceptable parameters.

- Shut down water supply system
- Contact the General Manager or his designate (On Call Manager)
- Arrange for potable water to be trucked to site until the water well supply system is returned to operational condition
- Arrange for Sanitary stations
- Identify source of contamination
- Disinfect well system if applicable

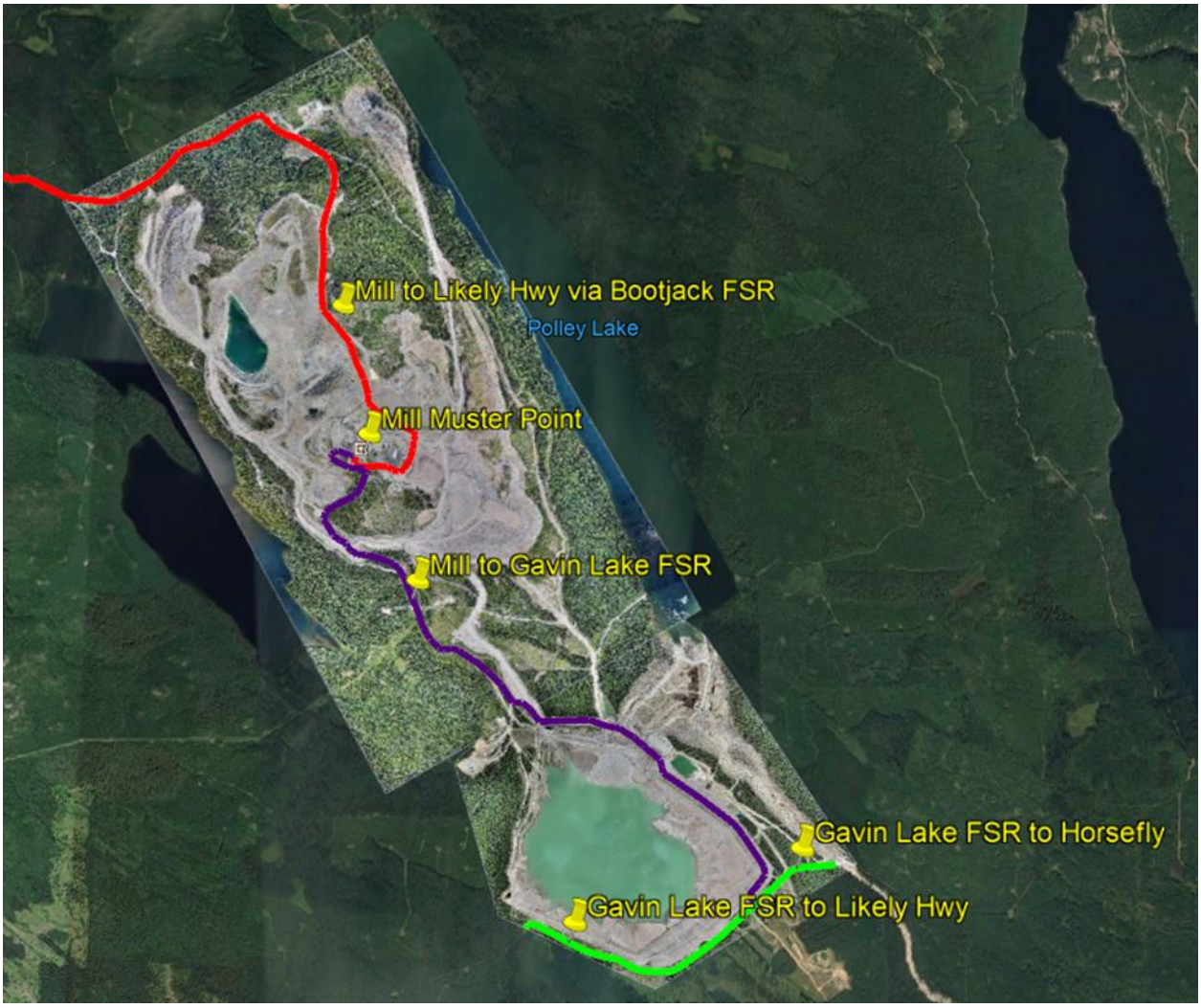
8 MINE SITE ACCESS CONTROL DURING EMERGENCY OPERATIONS

During an emergency, access to the mine site shall be limited to persons and equipment necessary for support of the management of the incident. In order to facilitate site access control a guard will be positioned at a location on the Bootjack FSR that allows for traffic control. This position will normally be at KM 8 of the Bootjack FSR.

The following materials will be needed when deploying site access control:

- A log book to record all personnel being granted access to the site. This log shall record date, check-in/out time, name and company name
- Reliable communication with mine site
- Lighting for night operation
- Traffic control devices, reflective cones, flagging tape and/or barricades
- Warning signage for vehicle operators

Appendix A – Site Evacuation Routes - A



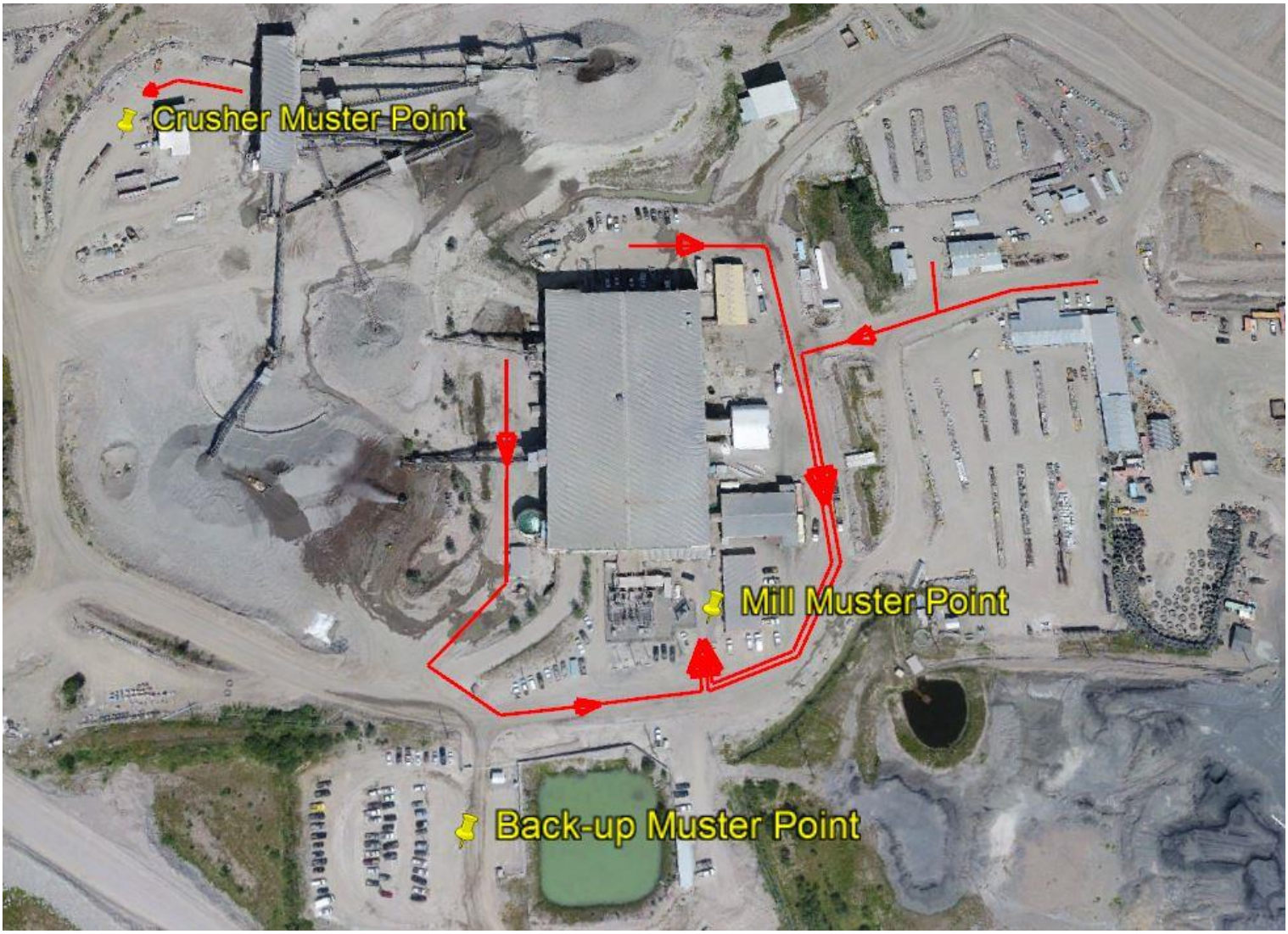
Appendix A – Site Evacuation Routes - B



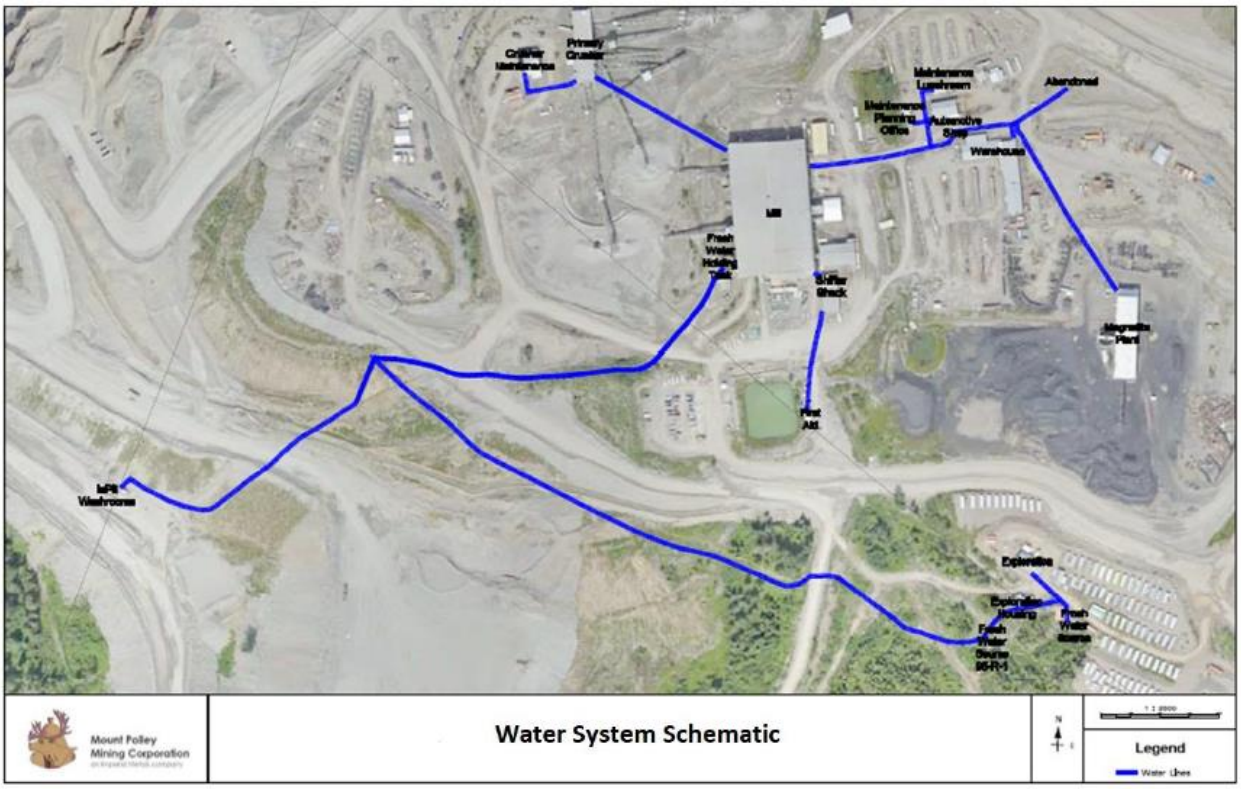
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Appendix B - Mill Building Evacuation Routes



Appendix C – Water System Site Schematic



Appendix D – Emergency Spill Response Contingency Plan

Mount Polley

Mining Corporation



Emergency Spill Response Contingency Plan

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Mount Polley Mining Corporation
EMERGENCY RESPONSE PLAN

EFFECTIVE DATE: February 2005

REVISION DATE: March 2013, April 2014, March 2016, July 2019 , Aug 2020

1. Overview

1.1. Policy:

To ensure preparedness and to maximize valuable time in case of an emergency.

To confirm Mount Polley Mining Corporation commitment to operating its business at the highest standards to protect the health and safety of workers, the public, and the environment.

1.2. Definition of an Emergency

A current or imminent situation that requires prompt coordination of actions of trained persons to protect health, safety, or welfare of people and to limit damage to property and to the environment.

1.3. Definition of a Reportable Spill

- A release or discharge into the environment, not authorized under the BC *Environmental Management Act* of a substance in an amount equal to or greater than the amount listed in Appendix E.
- A release of mine influenced water of any volume (outside of permitted effluent discharge volumes) is reportable.
- A release or deposit any deleterious substance in any water.

1.4. Legal Definition:

A spill means any polluting substance whether gaseous, liquid or solid that, in the opinion of the minister, is capable of causing pollution if it were to:

- Escape into the air
- Be spilled onto any land or into any body of water, or
- Escape onto any land or into any body of water.

1.5. Objectives:

1. Ensure compliance with B.C. Environmental Management Act: Part 7
2. Ensure compliance with the Federal Metal Mining Effluent Regulation.
3. Ensure compliance with the Federal Transportation of Dangerous Goods Act.
4. Ensure compliance with the Federal Fisheries Act.
5. Outlines response strategies to spills of potentially hazardous substances at or near the mine-site.
6. Facilitate the rapid deployment of trained personnel to deal with spills so that the environmental impact and risk are minimized.
7. Provides Guidelines for Communicating environmental incidents and issues to corporate management
8. Ensure that responsible personnel are:

- Familiar with the Emergency Spill Response Contingency Plan.
- Aware and are trained in the potential hazards associated with the Plan.
- Understand and are trained in the responsibilities of Team Members.
- Locations of spill containment materials.
- Action Plan for respective substances.
- Reporting procedures.

1.6. Plan Audits and Revisions:

The Environmental Superintendent is responsible for conducting an annual review of this plan and revising it when necessary.

1.7. Training:

It is the responsibility of the Mine Manger or Designate, with the assistance of the Safety Department, to organize, coordinate and conduct training sessions of the mine-site Emergency Response Team Members.

2. Contact Numbers

2.1. Critical Personnel Contact Phone Numbers

For Critical Personnel Contact Phone Numbers see Critical Personnel Contact Phone Numbers Section 3.4 Mount Polley Mining Corporation Emergency Response Plan

2.2. Agency Critical Contact Phone Numbers

For Agency Critical Contact Phone Numbers see Outside Agency Critical Contact Numbers Section 3.5 Mount Polley Mining Corporation Emergency Response Plan

Government Agencies:

Emergency Management BC: 24 hour service:	**1-800-663-3456**
BC Ministry of Environment	
EnvironmentalCompliance@gov.bc.ca	
Ministry of Health (non-emergency health information)	811
Spill Response Advice:	
Canutec (Canadian Transport Emergency Centre)	1-613-996-6666
Canwest Propane	1 800-943-7678
Orica (Williams Lake)	1-250-398-2611
Quadra Chemical Reagent	1-604-940-2830
	1-888-940-2830
Anachemia Science	1-800-361-0209
Brenntag Canada Inc.	1-800-661-1830
	1-604-685-5036
Commercial Clean-Up Services:	
Triple P Sanitation:	1-250-392-4414
Gord's Septic Services	1-250-392-4647

Orville's Septic Service	1-250-395-4638
Arrow Transport	1-250-571-7764

2.3. Regulatory Reporting Numbers

The Emergency Contingency Plan Control Officer/Designate must contact Emergency Management BC.

1-800-663-3456

This is a 24-hour toll free number.

The Emergency Management BC Program staff will notify all concerned agencies, including the following, as appropriate:

BC Ministry of Environment	EnvironmentalCompliance@gov.bc.ca
Ministry of Health.	1-800-663-7867
Environment Canada (24hEmergency – report to BC Ministry of Justice)	1-800-663-3456
Environment Canada (Vancouver Office)	1-604-664-9100
Soda Creek Indian Band	1-250-989-2323
Williams Lake Indian Band	1-250-296-3507
BC Mines Inspector	1778-220-5852

3. Spills

3.1. Potential Spill Materials:

1. Gasoline
2. Diesel Fuel
3. Waste Oil
4. Coolant
5. Hydraulic Fluid
6. Mill Tailings
7. Propane
8. Lime
9. Mill Reagent NaHS
10. Acids
11. MIBC (W22)
12. Concentrate
13. Mine Influenced Water
14. Till/mud/soil/rock
15. IPAC

3.2. Potential Spill Types:

1. Minor spills from equipment due to leaks.
2. Minor spills from containers being damaged or knocked over.
3. Minor/Major spills from fueling stations.
4. Major spills from storage tanks outside the Mill.
5. Major spills from storage tanks inside the Mill.
6. Major spills form transportation and delivery vehicles.
7. Spills from slurry tailings line.
8. Releases of mine influenced water from water collection or transportation facilities.

3.3. Potential Spill Locations:

1. General Mine-site grounds.
2. Mill Building and surrounding areas.
3. Fueling station.
4. Access road to mine site.
5. Access road around mine site.
6. Open Pits.
7. Ditches and pipeline routes.
8. Water storage sumps and ponds.
9. Creeks, lakes and surface water bodies in and around the mine site, including the Hazeltine Creek effluent discharge site.

3.4. Spill Response Materials Locations

1. Light vehicle fuel island (Warehouse).
2. Fuel Island (beside the Crusher).
3. Maintenance areas (Pit Shop, Finning/Shovel Crew Laydown)
4. Springer Pit.(MDG)
5. Warehouse (Entrance and in yard, with spare materials in stock).
6. Lower Hazeltine
7. Reach 3 Creek Construction
8. Cold-Water Pump location (Weir)
9. 9K Sump
10. Mine Drainage Sump
11. CCS Sump
12. South Seepage Sump

3.5. Spill Assessment Potential

Transportation:

The area of greatest vulnerability for spills is transport related incidents resulting from road conditions, and mechanical failures. Contingency plans are filed by the Shipper of the transport company with Transport Canada and drivers are required to be in possession of these files in order to address these types of incidents.
Ensure that Shipping Paper is carried in the cabin of the transport vehicle.

The Company:

Undertakes to provide information to the Shipper on avoidance of poor road conditions and rescheduling of deliveries, if necessary.
Ensures to maintain the mine road conditions in as favourable condition as possible.
Provides the manpower and equipment required to control and minimize the effects on the environment.

Fuels:
Standard procedures are in effect for the safe unloading of fuels to storage tanks and safety berms are provided to contain spills at the storage facilities.
Emergency Contingency Plans for effective response to spills are addressed in this document.

Lime:
Unloading of granular quicklime from bulk tank trucks can result in spillage. These spillages, if any, will be cleaned up with a front-end loader and disposed of.

Explosives:
Transport, handling and transfer of explosives are addressed within the Emergency Contingency plan of this document. Explosive materials storage is in separate containers and conform to the Ministry of Mines and Transport Canada standards.

Tailings:
The tailings lines are protected by against vehicle collision. The pipeline is also contained in a ditch along the access road to the tailings pond.

Mine Influenced Water:
Site water collection sumps, ponds, and ditches, water transport pipes, and the Hazeltine Creek Discharge System, all have the potential to release water into the environment, possibly entering surface water bodies. Breaches may occur due extreme runoff events, physical damage to pipes or other facilities, or pump failure.

Hazeltine Creek Effluent Discharge System

The installation of continuous monitoring for conductivity, temperature, and flow provides employees with immediate notification of changes in the discharge. As well, the emergency “shut down” system will prevent the discharge of water which exceeds the set limits for continuous monitoring as defined by Mount Polley Mining Corp. the Metal Mines Effluent Permit, and Ministry of Environment PE-11678.

Pump failure triggers emergency "shut down" and all storage tanks are designed to overflow into existing effluent storage facilities.

Other Consumables:
All consumables are contained within their original shipment containers prior to transfer to end user containers. End user spillage Emergency Contingency Plans are addressed in this document.

4. Response

4.1. Contact Group

Spills of chemicals, fuels and other substances may occur as isolated events or they may occur with other emergencies such as fire, explosion, natural causes or accident.

A number of response personnel may be involved to protect mine property and the health and safety of mine personnel and the public.

The key persons involved during a spill occurrence would be as follows:

- The person discovering the spill, and his/her Supervisor.
- The General Manager or his designate (who may be the On-Call Supervisor if the General Manger cannot be reached outside of regular hours).
- The Area Superintendent.
- The Safety Department.
- Mine Rescue trained personnel
- The clean-up crews.

The responsibilities of key personnel are outlined in the Personnel Responsibilities section.

Applicable telephone numbers are kept current and posted at the mine-site.

4.2. First-On-The-Scene Personnel Responsibilities

4.2.1. Person discovering the spill:

- Assess the hazard to one's own health and safety and to others in the vicinity.

- If the risk of gas poisoning exists ensure to conduct atmospheric testing with the appropriate equipment prior to entry.

- If fire or explosion hazards are perceived immediately retreat to safe distance.

4.2.2. In both these situations:

- Barricade/Flag the area.
- Place physical guards at a safe distance.
- Warn others in the immediate vicinity of the situation.
- Notify the Area Supervisor IMMEDIATELY following initial response action.
- Arrange for appropriate operating equipment to be shut down, if applicable, to minimize the extent of the spill.
- If warranted, notify designated First Aid Attendant for first aid.
- Firefighting response will be trained site personnel backed up by Mine Rescue trained personnel.
- The Supervisor or the person discovering the spill with the following information must contact the General Manager or his designate IMMEDIATELY following initial response action:

  - Name of person discovering the spill.
  - The time of the spill.
  - The location of the spill.
  - The type of substance spilled.
  - The quantity of material been spilled.
  - The cause of the spill.
  - The weather conditions.
  - Perceived potential for hazard, and any injury to aquatic systems, wildlife or people.
  - Actions already taken.
  - Whether a fire or explosion hazard is deemed to exist.
  - Personnel already notified.
  - If the spill is contained.
  - Any environmental effects that have or could occur.
  - Any injuries.

Note:

Ensure every remedial action is taken safely and efficiently to stop and/or minimize the extent of the spill.

The Supervisor must remain in place to direct personnel and equipment upon instructions from the Command Post.

4.3. Levels of Emergency

Level 1- A spill that is **below the external reportable quantity** or an emergency where the **potential health and safety risks are low** (no employees are injured). Incidents that can be cleaned up or resolved with little impact on the mine and or environment. No command post is necessary in such an incident.

Level 2- A spill that is **above the external reportable quantity** or an emergency whereby the **health and safety of staff member(s) may be jeopardized**. It is a spill that requires the initiation of the emergency measures. No external help is needed in this situation but a command post may need to be established.

Level 3- A spill that is **above the external reportable quantity** or an emergency where there is **great potential health and safety risks**. There may be casualties. This type of emergency requires internal and (may require) external intervention. A command post may be set up both onsite and offsite.

	Is the spill above external report quantity?	**Potential Health and Safety Risk**	**Emergency Operations Center**	**External Support**
Level 1	**No**	**Low**	**No**	**No**
Level 2	**Yes**	**Maybe**	**Maybe**	**No**
Level 3	**Yes**	**Yes**	**Yes**	**Maybe / yes**

4.4. Main Response Elements

Find and Identify

Mitigate the source of the spill
Establish Communication System
Collect Information
Isolate the Emergency Scene

Notify

Site supervisors, managers, and employees (according to procedures outlined in this document)
Regulatory bodies and agencies as required (Ministry of Environment, Environment Canada, Provincial Emergency Program), if required.
Soda Creek Indian Band and Williams Lake Indian Band, if required.
Notification to public and media, if required.

Ensure Public Health and Safety Protection

Work with appropriate first responders
- Mine Rescue Team and site First Aid attendants
- Ambulance
- Fire Department
- Police
- Search and Rescue

Environmental Protection

Establish Spill Plan
Manage spill response equipment and resources
Conduct spill material clean up

Terminate the Incident

Complete an incident report

4.5. Personnel Responsibilities

General Manager/Designate:

Deploy response crews and equipment operators to undertake the actual clean-up and supervise their work. Notifies Corporate, Emergency Management BC, First Nations groups, and Media.

Maintain responsibility for the activities at the site of the spill.

Maintain contact with and co-ordinate work with the Environmental Superintendent, Terminates the Incident, conducts brief**.**

- Notifies Government Agencies.
- Monitors Environmental Impact.
- Establishes decontamination measures with safety coordinator.
- Update the Spill Contingency Plan as required, for all potentially hazardous materials, accurate names of personnel and phone numbers.
- Plan and co-ordinate required skills.
- Be responsible for assessing new spill hazards as they develop and take preventative actions, whether covered in the manual or not.
- Check and maintain the operating status of required response equipment, which may be required at a spill.
- Train emergency response personnel with respect to their duties, or work with the Safety Department to do so.

Superintendent of Affected Area:

- Has authority to direct response operations.
- Needs to clear incident action plan with the General Manager (or designate).
- Determines level of Incident.
- Assigns Command Post if necessary.
- Executes the incident action plan.
- Enforces worker safety and environmental protection.
- Briefs team on specific assignment.

Communications

Responsible for the communication and emergency assistance

Notifies emergency response personnel by telephone or radio in the event of an emergency

- Assigns scribe
- Records incident details and subsequent developments as they occur.
- Responsible for establishing communication and emergency assistance.
- Establishes external support system (if required)
- Assisting Safety Supervisor.
- Maintains communication contact with the work parties via walkie-talkies, signal horns, or other means

Health and Safety:

- Advises the incident commander on all aspects of health and safety on the site.
- Recommends stopping the work if any of the work operations threaten worker or public safety.
- Ensure proper PPE is used and maintained.
- Controls entry and exit at the access control points.
- Monitors onsite hazards and conditions.
- Enforces the Buddy system.
- Control the decontamination of all equipment, personnel and samples from the contaminated areas.
- Assist In the disposal of contaminated clothing and materials.
- Advise medical personnel of potential exposures and consequences.

4.6. Emergency Response Team Members:

- Consult the Mine Emergency Response Plan to review the site plan relative to building location of the spilled material and specific location of the material within the building/site.
- Consult the appropriate ACTION PLAN contained in this document, to review the properties of the spilled material and recommended response actions.
- If further information is required, contact one of the resource services listed in Heading 2 of this document.
- Assess the spill requirements for manpower, equipment, materials, tools and protective gear to contain the spill, in consideration of the resources available.
- Mobilize these resources and take responsibility for implementation of the response actions in the spill site.
- If the spill is too large or complex to be handled entirely by the Company's resources, call an appropriate group or agency listed on page 3 of this document.
- Contact the Area Superintendent to determine what, if any, sampling should be done and to discuss the spill and any environmental implications.

- Once the initial response action is underway, contact the General Manager or designate to review the situation and strategy.

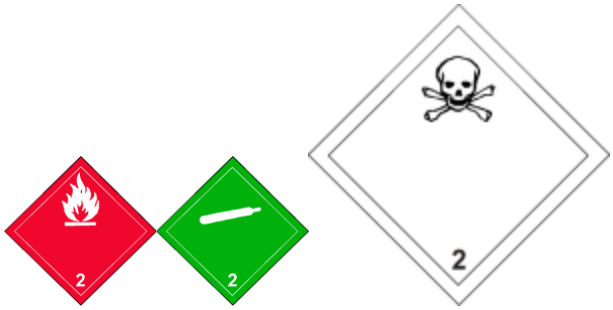
Appendix A

Federal and provincial legislation provide for the regulation of an extensive list of products, substances or organisms classified as dangerous. The products fall into one of nine classes:

- Class 1 explosives



- Class 2 gases



- Class 3 flammable liquids



- Class 4 flammable solids, spontaneously combustibles and substances that, on contact with water, emit flammable gases



- Class 5 oxidizing substances and organic peroxides



- Class 6 poisonous (toxic) and infectious substances





- Class 7 radioactive materials



- Class 8 corrosives



- Class 9 miscellaneous products or substances
  - miscellaneous identified dangerous goods
  - certain specified goods considered dangerous to the environment
  - dangerous

Appendix B

Hazardous Material Response Plan

H**azardous Material Response Plan**

Hazardous Materials Checklist

1. Isolate the Area and Deny Entry
   - ❑ Determine the Hazard Area Involved
   - ❑ Establish Control of the Hazard Area
   - ❑ Determine Incident Control Zones (Hot, Warm, Cold)
   - ❑ Advise All Units of Area to be Isolated

2. Identify and Verify the Materials Involved
   - ❑ Obtain Shipping Papers or Facility Documents (*only if safely possible*)
   - ❑ Write Down All Information Obtained
   - ❑ Verify the Source and Accuracy of all Information

3. Hazard and Risk Assessment
   - ❑ Evaluate the Following Concerns

     Health Physical Properties

     Flammability Chemical Properties

     Reactivity

   - ❑ Assess Container Integrity (Stress, Breach, Release, etc.)
   - ❑ Determine all Exposures
   - ❑ Estimate Likely Harm Without Intervention

4. Evaluate Protective Clothing and Equipment
    - ❑ Determine Proper Type and Level of Protective Clothing Required

Note: Structural Fire-Fighting Clothing Will Not Provide Protection

5. Coordinate Information and Resources

- ❑ Coordinate Information Between All Branches/Divisions/Groups
- ❑ Conduct Briefing of All Division/Group Officers to Develop Tactical Options
- ❑ Advise Incident Commander of Tactical Options and Recommendations

6. Control, Containment and Confinement

- ❑ Review Tactical Options With Entry Personnel
- ❑ Coordinated All Operations With the Safety Officer
    - ❑ Will Decontamination be Required After Entry Operations?
        - ❑ Yes Implement **Decontamination Procedures Prior to Entry**
        - ❑ No Continue

7. Decontamination Procedures
    - ❑ Decontamination Procedures Determined and Verified
    - ❑ Decon Area In Place and Fully Staffed

8. Entry Team Procedures

    (SOP's of the department supplying the hazardous materials technicians shall be used for all entries)

9. Termination Procedures

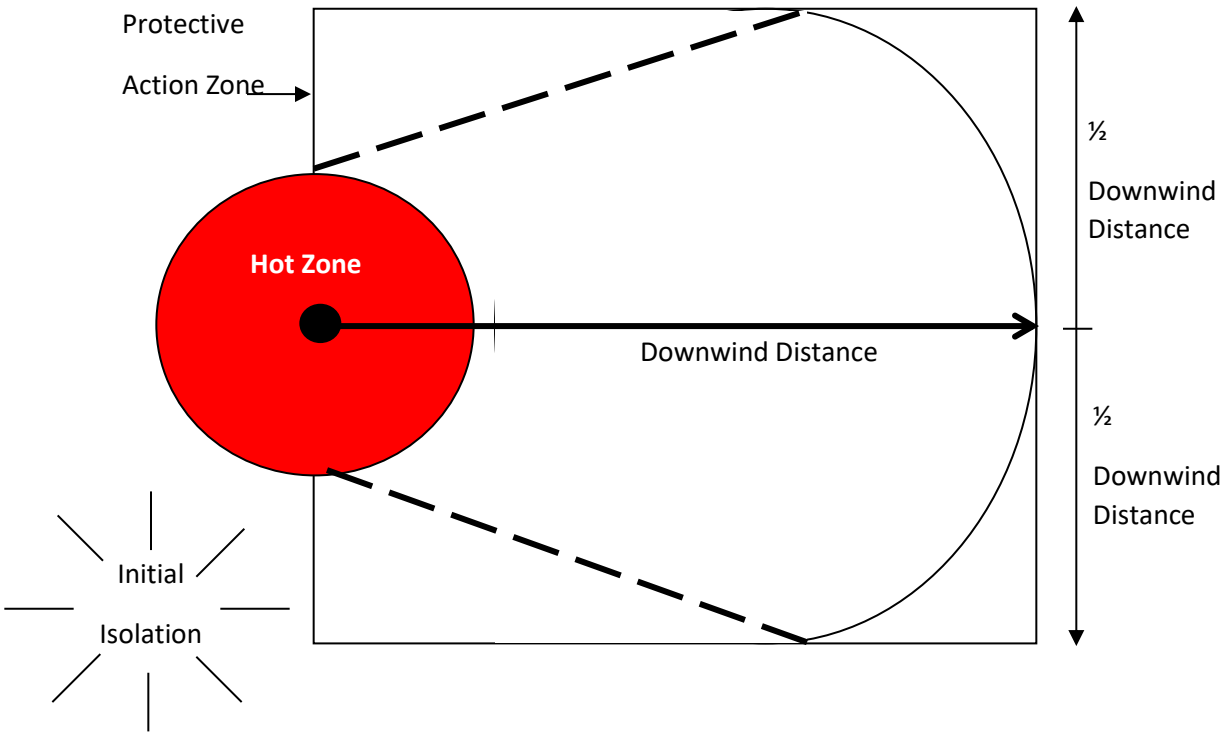
- ❑ Ensure All Personnel Are Briefed as Necessary
- ❑ Signs and Symptoms of Exposure Provided
- ❑ Personnel Exposures Documented

Initial Isolation/Protective Action

Hot- Exclusion Zone. Entry Team only

Warm- Decontamination, Properly trained & equipped personnel only

Cold- Staging & Operations





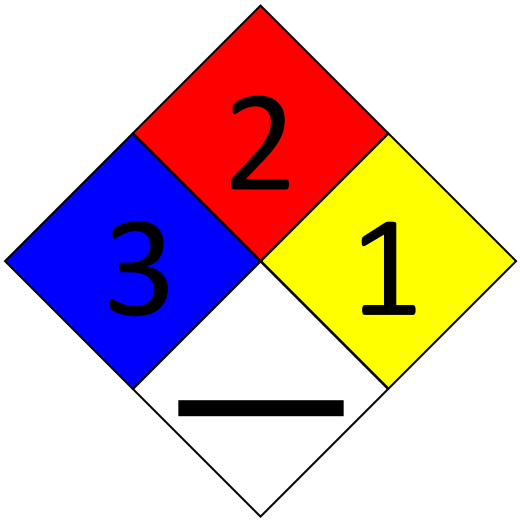
NFPA 704 HazMat*

Classification

Health Hazard
4-Deadlly
3-Extreme danger
2-Hazardous
1-Slightly hazardous
0-Normal material

Flammability
0-4

Fire Hazard
Flash Points
4-Below 73 F
3-Below 100 F
2-Below 200 F
1-Above 200 F
0-Will not burn



Health
0-4

Reactivity
0-4

(*Not intended to identify non-emergency health hazards)

Specific Hazard
Oxidizer OXY
Acid ACID
Alkali ALK
Corrosive COR
Simple Asphyxiant SA
Use NO WATER W
Radiation Hazard

Reactivity
4-May detonate
3-Shock and heat
may detonate
2-Violent Chemical change
1-Unstable if heated
0-Stable

Mount Polley Mining Corporation
EMERGENCY RESPONSE PLAN

Hazardous Materials Response Plan

Response Guide by TDG Hazardous Classification

Environmental Canada's Transportation of Dangerous Goods Act divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes include:

Class 1-Explosives

Class 2-Compressed Gases

Class 3-Flammable Liquids

Class 4-Flammable Solids

Class 5-Oxidizers

Class 6-Poisonous and Infectious Substances

Class 7-Radioactive Materials

Class 8-Corrosives

Class 9-Miscellaneous Hazardous Materials

Notes:

- In some emergency response procedures for TDG hazard classes, a distinction is made between bulk or package quantities. Packing Groups indicate the degree of danger of a product or substance, and are always shown in Roman Numerals: **I great danger, II moderate danger, III minor danger**

- Class 9, "Miscellaneous Hazardous Materials," refers to those materials that are hazardous but do not meet criteria for inclusion in the aforementioned classes.

Note: The material presented in this Response Guide has been written in accordance with industry standards. However, this guide cannot anticipate all possible emergency events or situations and emergency responses and therefore cannot be used without the competent review of the emergency response team and plant management. Conditions may develop in operations where standard methods will not suffice and nothing in this guide shall be interpreted as an obstacle to the experience, initiative, and ingenuity of the responders in overcoming the complexities that exist under actual emergency conditions. Responders should use all available resources to determine the appropriate strategies and tactics.

Class 1: Explosives

Definition

An explosive is any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, e.g., with a substantial instantaneous release of gas and heat.

General Emergency Response Procedures

1. Identify the material involved.
2. Keep non-essential people away (includes non-essential emergency service personnel).
3. Establish control zones (isolate area and deny entry).
4. Extinguish all sources of ignition in the vicinity. Do not allow vehicles or other sources of ignition in the area.
5. Wear positive pressure SCBA and full protective clothing.
6. Avoid exposure to smoke, fumes, vapors, dust, or direct contact. The combustion products of some propellant explosives are poisonous.

7. Do not allow personnel to touch or move explosives. Explosives should be moved only under the advice and supervision of trained explosive personnel.

8. Contact local police or military bomb units.

9. When a hazmat team is requested to respond to a bomb threat involving hazardous materials, under no circumstances will the hazmat team conduct building or area searches even when hazardous materials are involved. The hazmat team will stage in a safe area, but not less than 200 meters feet from the incident scene.

10. The hazmat team will act as a technical resource for the bomb unit. This may involve the loaning of chemical protective clothing to bomb unit personnel, assistance in dressing, researching chemical data, etc.

Emergency Response Procedures-Fire

1. Do not fight fire in cargo or storage area containing explosives. Withdraw from the area and let the fire burn.

2. If a fire is near explosives, efforts should be taken to prevent the fire from reaching the explosives. For fires involving the motor, cab, or tires of vehicles transporting explosives, flood the area with water.

3. The application of water to burning Class A or B explosives may cause an explosion.

4. Evacuate the area:

    - Class A Explosives – 800 m in all directions.
    - Class B Explosives – 800 m in all directions.
    - Class C Explosives – 450 m in all directions.
    - Blasting Agents- 800 m in all directions.

5. Do not overhaul areas where explosives have burned or exploded.

6. Explosives that have been exposed to heat may be very shock sensitive. Keep all personnel away and do not move these containers.

7. When explosives are involved in fire or serious accidents on the roadways, Canutec (613) 996-6666 should be notified.

Class 2: Flammable Compressed Gases

Definition

A flammable material or mixture having a vapor pressure exceeding 40 psi absolute at 100° F.

General Emergency Response Procedures

1. Identify the material involved.
2. Keep non-essential people away (includes non-essential emergency service personnel.)
3. Establish control zones (isolate area and deny entry).
4. Stay upwind and keep out of low areas.
5. Ventilate confined areas before entering.
6. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for all incidents. In some cases, chemical protective clothing carried by the hazmat team will be required for the safe handling of the incident.
7. Avoid exposure to gas.
8. Since the application of water to pools of liquefied gas will increase the vaporization rate, this is not usually a recommended practice.
9. If a tank truck or tank car is involved in fire, isolate 800 m in all directions.
10. Determine and implement appropriate decontamination procedures for personnel and equipment.
11. Consult CANUTEC (1-613-996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. Do not extinguish the fire unless the flow of gas can be stopped. The recommended means of extinguishing is to stop the flow.

2. If a leaking tank is involved in fire, cooling the tank with water may reduce the internal pressure and the rate of leakage. If sufficient water is available, use water spray to cool the tanks and adjacent combustibles affected by the heat of the fire. For massive fires, use unmanned monitors. If this is not possible, withdraw from the area and let the fire burn.

3. Un-insulated pressure tanks may rupture violently if there is flame impingement on the vapor space at the top of the tank. If it can be done safely, remove all vehicles or containers not already burning.

4. Let tank, car, tank truck or storage tanks burn unless leak can be stopped.

5. Stay away from the ends of the tank exposed to heat or flame impingement.

6. Observe tanks for evidence of bulging or red hot spots in the metal, and listen for a rising sound from venting safety devices. These indicate that the tank may fail.

Emergency Response Procedures-Spill or Leak

1. Extinguish all sources of ignition in the vicinity (vehicles, traffic light control boxes, machinery, tar pots, etc.).

2. Flammable gases may be heavier or lighter than air. Determine the vapor density of the material from reference sources and use combustible gas detectors to determine the boundary of the gases. Survey the area where the gases are likely to accumulate. Common lighter-than-air flammable gases include:

    - Hydrogen
    - Acetylene
    - Hydrogen cyanide
    - Ammonia

- Methane
- Natural Gas
- Carbon Monoxide
- Ethylene (ethane)
- Propane is heaver and will tend to migrate to low laying areas. (Density 1.5)

3. Flammable gases may ignite and flash back to the opening from which the gas originated.

4. Do not allow vehicles or other sources of ignition in the area as long as the combustible gas detector indicates the presence of flammable gases.

5. Do not enter the gas cloud. Be aware that the flammable gases extend beyond any visible cloud.

6. Water spray can be used to absorb water miscible gases, and water spray or explosion proof fans can be used to disperse gas clouds. Do not get water inside containers. Runoff must be contained for later analysis and possible disposal. Do not permit the runoff to enter storm, sewer, or water systems.

7. If it can be done safely, locate all leaks and close valves or otherwise reduce the amount of leakage.

8. If it can be done safely, move undamaged containers to a safe area, being careful to avoid sparks or friction.

9. Post guards and keep spectators at least 800 m away from leaks from tank cars, tank trucks, or large storage tanks containing compressed gas, liquefied gas, and cryogenics.

10. Wrecking operations or transfer of product should not begin until all the gas is dispersed. Confirmation of gas dispersal should be done with a combustible gas detector.

11. To prevent the build-up of static electricity, bond and ground the containers and equipment before product transfer.

12. Cutting torches or spark generating saws must not be used on the shell of empty or loaded cars or containers.

13. Empty tanks or tanks containing residue should be regarded as containing an ignitable gas-air mixture.

Class 3: Flammable Liquids

Definition

A liquid having a flash point below 140° F.

General Emergency Response Procedures

1. Identify the materials involved.

2. Keep non-essential people away (this includes non-essential emergency service personnel).

3. Establish control zones (isolate area and deny entry).

4. Stay upwind and keep out of low areas.

5. Eliminate ignition sources.

6. Ventilate confined areas before entering.

7. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for all flammable liquid incidents. In some cases, chemical protective clothing carried by the hazmat team will be required for the safe handling of the incident.
8. Avoid exposure to smoke, fumes, vapors, or direct contact.

9. If spilled material has entered storm, sewer, or water systems, notify the proper authority.

    - Maps should be used to determine the direction of flow and destination (outflow) of the system. Consideration should be given to dyking the storm, sewer, or water system ahead of the flow.

    - It may be appropriate to apply foam not only at the spill site, but also into the storm, sewer, or water system.

- To lessen the chances of ignition, it may be advisable to apply foam ahead of the flowing spill, either into storm drains or manholes down flow from the spill or down flow on the surface of open storm, sewer, or water systems.

10. If a tank truck or tank car is involved in fire, isolate 800 m in all directions.

11. Most flammable liquids float on water. Therefore, the application of water to a spill area may enable the flammable liquid to spread beyond the boundaries of the original incident.

12. The vapors of all flammable liquids are heavier than air. Therefore, in addition to eliminating ignition sources in the immediate spill area, the downwind area and adjacent low areas should be checked for sources of ignition and accumulations of flammable vapors.

13. Consider the need for additional resources and equipment (dyking material, absorbents, foam, over pack, containers, transfer equipment, private cleanup contractors, etc.).

14. Request sufficient foam supplies.

15. Determine and implement appropriate decontamination procedures for personnel and equipment.

16. Consult CANUTEC (1-613 996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. For small fires, use dry chemical, CO2, the appropriate foam or water spray.

2. For large fires use the appropriate foam or water spray. Water may be ineffective on low flash point flammable liquids.

3. If sufficient water is available, use water spray to cool tanks and adjacent combustibles affected by the heat of the fire. For massive fire, use unmanned monitors. If this is not possible, withdraw from the area and let the fire burn.

4. If it can be done safely, remove any vehicles or containers not already burning.

5. Dig trenches or build dikes in the path of the burning liquids to confine the fire and protect exposures.

6. If vapors are burning at the valves, do not extinguish the fire unless re-ignition can be prevented.

7. Observe tanks for evidence of bulging or red hot spots in the metal. Listen for pinging sounds or loud noises from the tank that increases in intensity. Withdraw immediately in case or rising sound from venting safety device or discoloration of tank. These indicate that the tank may fail.

8. Do not puncture or rupture the shell of a transport vehicle involved in a fire as this may liberate more flammable liquid and extend the fire.

9. If safety relief valves are obstructed, try to reposition the tank to allow the valves to function properly, but only if this can be done safely.

Emergency Response Procedures-Spill or Leak

1. Extinguish or eliminate all sources of ignition in the vicinity (traffic light control boxes, machinery, vehicles, tar pots, etc.). Use combustible gas detectors to determine the boundaries of the vapors.

2. Do not allow vehicles or other sources of ignition in the area as long as the combustible gas detector indicated the presence or flammable vapors.

3. Keep oxidizing materials away from spilled flammable liquids.

4. Post guards and keep spectators at least 800 m away for leaks from tank cars, tank trucks or large storage containers.

5. Dig trenches or build dikes ahead of the flow to confine the spill for later disposal or recovery.

6. Do not allow flammable liquids to enter storm, sewer, or water systems.

7. Cover flammable liquids with appropriate foam to blanket the surface and reduce the rate of evaporation. When ambient temperatures are less than 100° F, combustible liquids will usually

not require blanketing to reduce vapors. Do not permit the runoff to enter storm, sewer, or water systems.

8. Water spray can be used to absorb water miscible vapors, and water spray or explosion-proof fans can be used to disperse vapors. Do not get water inside containers. Runoff must be contained for later analysis and possible disposal. Do not permit the runoff to enter storm, sewer, or water systems.

9. If it can be done safely, attempt to close valves or otherwise reduce the amount of leakage.

10. Since most flammable liquids float, for leaks near the bottom of the tank, water may be added to the tank to float the flammable liquid if the leak cannot be controlled or stopped. The water flow can be adjusted so that only water leaks out and the flammable liquid does not overflow the tank. This will provide time to offload the remaining flammable liquid.

11. Wrecking operations or transfer of product should not begin until the area is determined safe. A combustible gas detector should be used to check the area continually during the entire operation.

12. To prevent the buildup of static electricity, bond and ground containers and equipment before product transfer.

13. Empty tanks and tanks containing residue should be regarded as containing an ignitable vapor-air mixture.

14. Cutting torches or spark generating saws must not be used on the shell of empty or loaded cars or containers.

15. If it can be done safely, move undamaged containers to a safe area, being careful to avoid sparks or friction.

16. Do not separate tractor units from their trailer, as the support gear on the trailer may fail.

Class 4: Flammable Solids

Definition

Any solid material, other an explosive, which under conditions normally incident to transportation is likely to cause fires through friction or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently it creates a serious transportation hazard.

Included in this class are spontaneously combustible and water reactive materials. Two materials shipped in bulk that can cause major problems for responders are phosphorous and sodium.

General Emergency Response Procedures

1. Identify the materials involved.

2. Keep non-essential people away (this includes non-essential emergency service personnel).

3. Establish control zones (isolate area and deny entry).

4. Stay upwind and keep out of low areas.

5. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for all incidents. In some cases, chemical protective clothing carried by the hazmat team will be required for the safe handling of the incident.

6. Avoid exposure to smoke, fumes, vapors, or direct contact. Toxic products may be produced from contact with water, heat, and other substances.

7. Consider the need for additional resources and equipment (dyking material, absorbents, foam, over pack containers, transfer equipment, private cleanup contractors, etc.).

8. If spilled material has entered storm or sewer systems, notify the proper authority.

9. Determine and implement appropriate decontamination procedures for personnel and equipment.

10. Consult CANUTEC (1-613 996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. Do not use water or foam on water-reactive materials.

2. If it can be done safely, remove containers from fire area.

3. Chemical reference sources will indicate appropriate extinguishing agents. Agents such as dry chemical, soda ash, lime, or sand may be appropriate for use on water-reactive materials, but they must be moisture-free.

4. Water may be used to cool containers exposed to fire, but if the water contacts water-reactive materials, the incident could escalate rapidly.

Emergency Response Procedures-Spill or Leak

1. Keep ignition sources away.

2. Extinguish all sources of ignition in the vicinity. Do not allow vehicles or other sources of ignition in the area.

3. If it can be done safely, attempt to close valves, plug, reposition containers, or otherwise reduce the amount of leakage.

4. Keep water-reactive materials dry and do not get water inside containers containing water-reactive materials.

5. Keep material out of storm, sewer, and water systems.

6. Dig trenches or build dikes around spills of water-reactive or environmentally damaging materials to prevent water from reaching them.

7. Powder spills can be covered with a plastic sheet or tarp to minimize spreading and prevent water/moisture contact.
   Warning: If the sun is shining directly on the plastic sheeting, moisture may collect on the underside of the sheeting, producing a reaction with water reactive materials.

Class 5: Oxidizers and Organic Peroxides

Definition

An oxidizer is a substance that yields oxygen readily to stimulate the combustion of other material.

Organic peroxide is an organic derivative of the inorganic compound hydrogen peroxide where organic radicals have replaced one or more of the hydrogen atoms. Organic peroxides readily release oxygen to stimulate the combustion of other materials.

General Emergency Response Procedures

1. Identify the materials involved.

2. Keep non-essential people away (this includes non-essential emergency service personnel).

3. Establish control zones (isolate area and deny entry).

4. Stay upwind and keep out of low areas.

5. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for all incidents. In some cases, chemical protective clothing carried by the hazmat team will be required for the safe handling of the incident.

6. Ventilate confined areas before entering.

7. Avoid exposure to smoke, fumes, dust, vapors, or direct contact. Burning oxidizers frequently produces toxic products.

8. Caution should be exercised when water is used on oxidizers, as most oxidizers are water-soluble and will produce solutions that can impregnate wood and other organic combustibles. Upon drying, these materials can spontaneously ignite and burn vigorously.

9. In accidents involving chlorates and other oxidizing materials, care is necessary to prevent ignition by friction or contact with acids.

10. When chlorates are mixed with organic matter, or even dust, a flammable mixture is formed.

11. Chlorates mixed with finely divided combustible material may burn with explosive violence.

12. Leaking of nitric acid, perchloric acid, or hydrogen peroxide may cause fire. These materials are also corrosive.

13. Organic peroxides generally have the special property that if they are heated beyond their transportation temperatures; they are likely to detonate.

14. Consider the need for additional resources and equipment (dyking materials, absorbents, foam, over pack containers, transfer equipment, private cleanup contractors, etc.)

15. If spilled material has entered storm or sewer systems, notify the proper authority.

16. Determine and implement appropriate decontamination procedures for personnel and equipment.

17. Consult CANUTEC (1-613-996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. If it can be done safely, remove any containers not already burning.

2. Cool affected containers with flooding quantities of water. For massive fires, use unmanned monitors. If this is not possible, withdraw and let the fire burn. Runoff water must be contained for later analysis and proper disposal.

Emergency Response Procedures-Spill or Leak

1. Keep flammables, combustibles and organic materials away from spilled material.
2. Avoid contact with spilled material.

3. Extinguish all sources of ignition in the vicinity. Do not allow vehicles or other sources of ignition in the area.

4. If it can be done safely, attempt to close valves, plug, or otherwise reduce the amount of leakage.

5. Water spray can be used to absorb water miscible vapors, and water spray or explosion-proof fans can be used to disperse vapors. Do not get water inside containers. Runoff must be contained for later analysis and possible disposal. Do not permit the runoff to enter storm, sewer, or water systems.

6. Keep material out of storm, sewer, and water systems.

7. Dig trenches or build dikes ahead of the flow to contain the spill for later disposal.

8. Powder spills can be covered with a plastic sheet or tarp to minimize spreading.

Class 6: Pesticides and Poisons

Definition

Pesticides are chemical agents used to destroy pests.

Poisons are substances that, through chemical action, usually kill, injure, or impair an organism.

General Emergency Response Procedures

1. Identify the materials involved.

2. Keep non-essential people away (this includes non-essential emergency personnel).

3. Establish control zones (isolate area and deny entry).

4. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for all incidents.

- Due to the construction and materials used for firefighter turnout clothing, the clothing may actually absorb and hold the pesticide or poison if contact with the smoke, fumes, dust, vapors, or material occurs. The firefighter would be re-exposed each time the clothing were worn if proper decontamination operations were not performed.

- In most incidents involving pesticides or poisons, the chemical protective clothing carried on the hazmat team will be required for safe handling of the incident.

5. Stay upwind and keep out of low area. If you can smell pesticide, you are too close and not sufficiently protected.

6. Avoid exposure to smoke, fumes, vapors, dust or direct contact.

7. Determine signs and symptoms of exposure and advise all personnel operating at the site. Some symptoms may not become present for up to 48 hours following exposure.

8. Ventilate confined areas before entering. It is not advisable for fire personnel to enter tanks or other confined spaces that contain or have contained pesticides and/or poisons.

9. If spilled material has entered storm, sewer, or water systems, notify the proper authority. Maps should be used to determine the direction of flow and destination (outflow) of the system. Consideration should be given to dyking ahead of the flow.

10. Determine and implement appropriate decontamination procedures for personnel and equipment.

11. Flush any contacted material from skin or clothing immediately.

12. Remove and isolate any contaminated clothing at the site and avoid spreading contamination to non-contaminated areas.

13. Consult CANUTEC (1-416-996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. Consider protecting exposures and allow the fire to burn. This may create less of a hazard to people and the environment, especially if runoff cannot be confined.

2. For small fires, use dry chemical, CO2, water spray or the appropriate foam.

3. For large fires use the appropriate foam or water spray.

4. Do not extinguish fire unless the flow can be stopped.

5. If sufficient water is available, use water spray to cool containers exposed to the fire.

6. Dike fire control water for later analysis and/or disposal.

Emergency Response Procedures-Spill or Leak

1. For a liquid pesticide spill, extinguish or eliminate all sources of ignition in the vicinity as many pesticides have flammable liquids as the carrier of the poison. Use combustible gas detectors to determine the boundary of the vapors if the pesticide is a flammable.
2. Do not allow vehicles or other sources of ignition in the area as long as the combustible gas detector indicates the presence of flammable vapors.

3. If it can be done safely, attempt to close valves, plug, or otherwise reduce the amount of leakage.

4. Water spray can be used to absorb water miscible vapors, and water spray or explosion-proof fans can be used to disperse vapors. Do not get water inside containers. Runoff must be contained for later analysis and possible disposal. Do not permit the runoff to enter storm, sewer or water systems.

5. Keep material out of storm, sewer, and water systems.

6. Dig trenches or build dikes ahead of the flow to confine the spill for later disposal or recovery.

7. Powder spills can be covered with a plastic sheet or tarp to minimize spreading.

Class 6: Infectious Substances

Definition

Substances or materials hosting or contaminated by communicable pathogens. Examples include medical waste, laboratory samples, etc.

General Emergency Response Procedures

1. Identify the materials involved. Infectious substances include the red infectious waste bags and "sharps" containers from hospitals (sharps containers are used for the disposal of needles and other sharp instruments). Caution should be used if these containers are encountered.

2. Keep non-essential people away (this includes non-essential emergency service personnel).

3. Establish control zones (isolate area and deny entry).

4. Wear positive pressure SCBA and chemical protective clothing. Firefighter protective clothing will not provide adequate protection for all incidents involving infectious substances. The chemical protective clothing carried on the hazmat team may be required for safe handling of the incident.

5. Stay upwind and keep out of low areas.

6. Avoid exposure to smoke, fumes, vapors, or dust. Do not contact damaged containers or spilled material. Virus and disease-bearing substances are often present.

7. If leakage is discovered in transit, the vehicle must not be moved and the area must be isolated.

8. If spilled material has entered storm or sewer systems, notify the proper authority.

9. Implement appropriate decontamination procedures. A freshly mixed 10% or stronger bleach/water solution is an effective decontamination solution for most infectious substance exposures.

Emergency Response Procedures-Fire

1. If it can be done safely, remove containers from the fire area. Do not touch or move damaged containers.

2. Use dry chemical, soda ash, or lime for small fires.

Emergency Response Procedures-Spill or Leak

1. Cover damaged containers or spill area with dampened towel or rag, and keep wet with liquid bleach.

    - To decontaminate the area and equipment, a garden sprayer with a 10% bleach/water solution can used to spray exposed surfaces.

    - Recently mixed bleach/water solutions should be used, as premixed solutions lose their strength after a few days.

2. Dike spills for later disposal.

3. Keep material out of storm, sewer and water systems.

Class 7: Radioactive Materials

Definition

Radioactive materials contain charged particles (ions) and have a specific gravity greater than 0.002 microcuries per gram. These charged particles may cause damage to molecules, cells, or tissues. Atoms that emit ionizing radiation are said to be radioactive; radioactivity is the process whereby atomic changes, known as decay or disintegration, occur through the emission of ionizing radiation.

General Emergency Response Procedures

1. Identify the materials involved. Radioactive materials are often shipped in lead containers.

2. Keep people as far away as practical, at least 50 m upwind.

3. Establish control zones (isolate area and deny entry). Use radiation-monitoring devices to determine control zones and assess areas for contamination.

4. Wear positive pressure SCBA and full protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for radioactive incidents.

5. Avoid exposure to smoke, fumes, vapors, dusts or direct contact.

6. All personnel should utilize dosimeters. Zero dosimeters prior to use.

7. Entry should not be made until appropriate radiological personnel are on scene and the degree of radiation is known.

8. Enter Exclusion Zone only to save a life, and limit entry into the Exclusion Zone to the shortest possible time.

9. If spilled material has entered storm, sewer, or water systems, notify the proper authority.

10. Implement appropriate decontamination procedures for personnel and equipment.

11. Delay clean up until arrival or instructions of qualified radiation personnel.

12. Equipment used in the Exclusion Zone shall not be removed until appropriate decontamination procedures have been performed and the equipment has been monitored and declared clean.

13. Contact a radiological team for assistance and equipment.

14. Consult CANUTEC (1-613-996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. Do not move-damaged containers, but undamaged containers should be moved to a safe area if it can be done safely.

2. Assume the fire involves radioactive materials.

3. Avoid exposure to smoke, fumes, or dust. Airborne contamination is a great cause of concern for emergency responders. Stay upwind from the fire area.

4. Evacuate downwind area.
5. The fire should be extinguished as quickly as possible, with a minimum amount of water. Try not to disturb the radioactive containers.

6. Fight fire from a maximum distance. Do not allow personnel into the area after fire knockdown.

7. For massive fires, use unmanned monitors.

8. Dig trenches or build dikes ahead of the flow to contain the spill for later disposal.

9. The fire area should not be overhead.

Emergency Response Procedures-Spill or Leak

1. Do not touch damaged containers or contact the spilled material.

2. Prevent spread of spilled material and keep it out of water systems and sewers. Dike far ahead of large spills to confine the material for later disposal.

Class 8: Corrosives

Definition

Any liquid or solid, including powders, that can destroy tissue, or a liquid that has a severe corrosion rate on steel or aluminum.

General Emergency Response Procedures

1. Identify the materials involved.

2. Keep non-essential people away (this includes non-essential emergency service personnel).

3. Establish control zones (isolate area and deny entry).

4. Wear positive pressure SCBA and chemical protective clothing. This is a minimum level of protective clothing and will not provide adequate protection for corrosive incidents. The chemical protective clothing carried by the hazmat team may be required for the safe handling of most incidents involving corrosives.

5. Stay upwind and keep out of low areas.

6. Avoid exposure to smoke, fumes, vapors, dusts, or direct contact. Highly toxic fumes are often present.

7. Ventilate confined areas before entering.
8. Consider the need for additional resources and equipment (dyking material, absorbents, over pack containers, transfer equipment, private cleanup contractors, etc.).

9. If spilled material has entered storm or sewer systems, notify the proper authority.

10. Determine and implement appropriate decontamination procedures for personnel and equipment.

11. Consult CANUTEC (1-613-996-6666) for product information and assistance.

Emergency Response Procedures-Fire

1. Many corrosive chemicals react violently with water, liberating heat and toxic gases.

2. If it can be done safely, remove undamaged containers from the fire area.

3. Do not get water inside the container.

4. Use water to cool containers that are exposed to flame until well after the fire is out. Do not allow water to get inside container.

Emergency Response Procedures-Spill or Leak

1. Avoid contact with spilled material.

2. Extinguish all sources of ignition in the vicinity. Do not allow vehicles or other sources of ignition into the area.

3. Do not apply water unless directed to do so. Contact with water may cause the generation of large quantities of vapors and heat.

4. Do not get water inside the container.

5. Water spray can be used to absorb water miscible vapors, and water spray or explosion-proof fans can be used to disperse vapors. Do not get water inside containers and do not put water on leak or spill area. Runoff must be contained for later analysis and possible disposal. Do not permit the runoff to enter storm, sewer, or water systems.

6. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

7. If it can be done safely, attempt to close valves, plug, or otherwise reduce the amount of leakage.

8. Dig trenches or build dikes ahead of the flow to contain the spill for later disposal or recovery.

9. Powder spills can be covered with a plastic sheet or tarp to minimize spreading.

10. Keep material out of storm, sewer, or water systems.

11. Do not attempt neutralization. Neutralization may cause the production of vapors and heat, creating additional problems.

12. Do not attempt dilution. The quantity of water required to dilute one gallon of concentrated acid to a neutral pH of 7 is in the hundreds of thousands of gallons.

Specific Action Plan

Propane (UN1978)

Regulated by Environment and Climate Change Canada (ECCC) for the E2 regulations.

Uses

Fuel source for heating mine buildings such as mill, pit shop, warehouse and water treatment plant. Also used as fuel for forklift trucks

Location

Main Storage tank on east side of Mill building (Max storage capacity is 110,000 litres)

Water Treatment Plant Tank (Max storage capacity is 60,000 litres)

Properties

EXTREMELY FLAMMABLE.

Will be easily ignited by heat, sparks or flames.

Will form explosive mixtures with air.

Vapors from Propane are initially heavier than air and spread along ground.

Vapors may travel to source of ignition and flash back.

GASES UNDER PRESSURE- COMPRESSED GAS

Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.

Containers may explode when heated.

Ruptured cylinders may rocket.

HEALTH

Vapors may cause dizziness or asphyxiation without warning.

Some may be irritating if inhaled at high concentrations.

Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.

Fire may produce irritating and/or toxic gases.

SAFETY

Keep away from heat, sparks, open flames, and hot surfaces.

No smoking.

Stay upwind, uphill and/or upstream.

Propane gas is heavier than air and will spread along the ground and collect in low or confined areas

DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

PROTECTIVE CLOTHING

Wear positive pressure self-contained breathing apparatus (SCBA).

Structural firefighters' protective clothing provides limited thermal protection.

Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

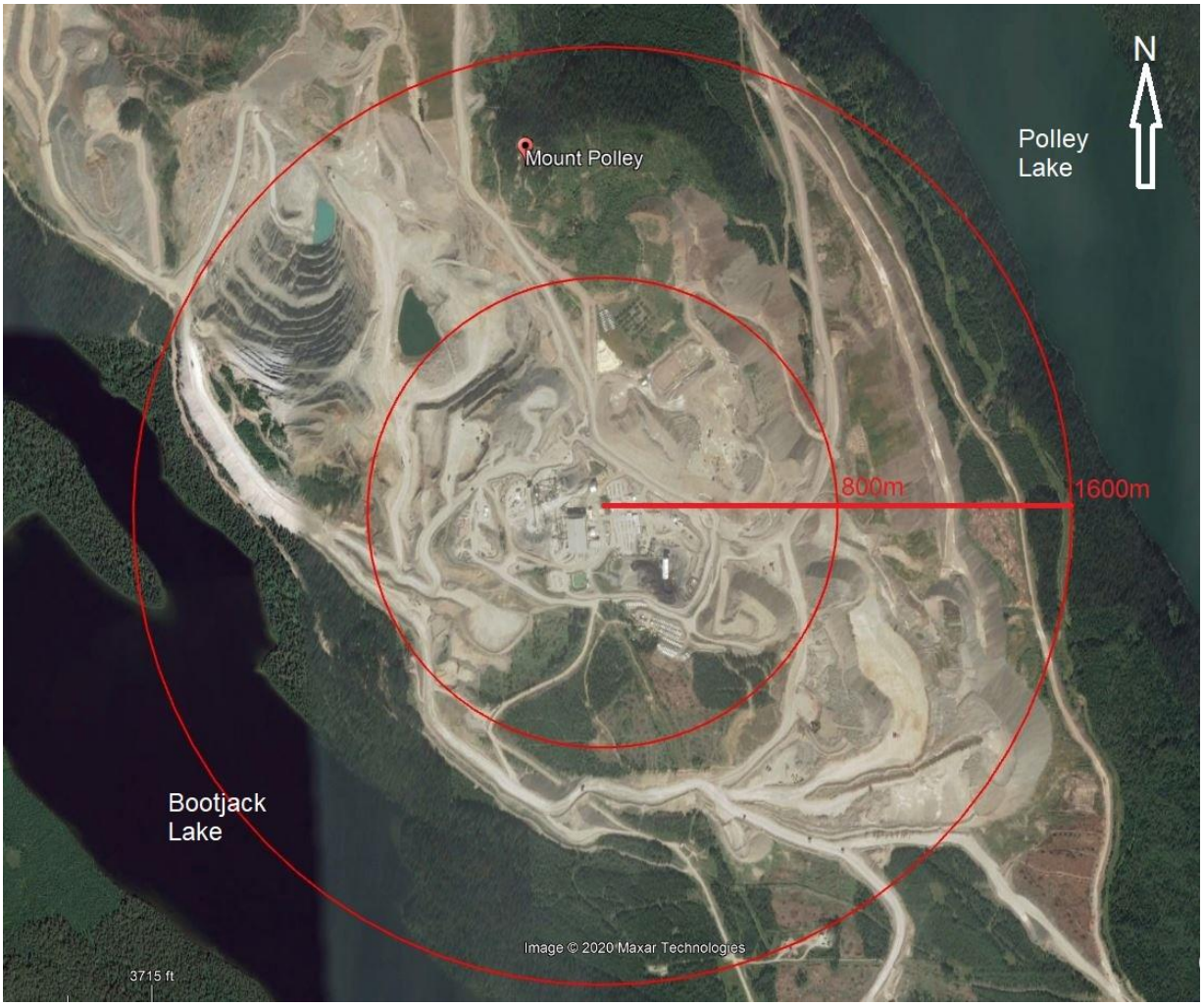
EVACUATION

Small Spill

Spill or leak- Evacuate area for at least 100 meters (330 feet) in all directions.

Large Spill

Consider initial downwind evacuation for at least 800 meters (1/2 mile).



Evacuation map – Propane

FIRE

If tank or tank truck is involved in a fire, consider initial evacuation for 1600 meters in all directions.

ALWAYS stay away from tanks engulfed in fire.

SMALL FIRE

Dry chemical or CO2.

LARGE FIRE

For massive fire Evacuate from area and let fire burn.

Fight fire from maximum distance.

Water spray or fog.

If it can be done safely, move undamaged containers away from the area around the fire.

Cool containers with flooding quantities of water until well after fire is out.

Do not direct water at source of leak or safety devices; icing may occur.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

BLEVE (BOILING LIQUID EXPANDING VAPOR EXPLOSION)

A BLEVE occurs when a fire impinged or damaged tank fails to contain its internal pressure and explodes with a sudden product release.

The main hazards from a BLEVE are:

Fire: If the released substance is ignited, there is an immediate fireball.

Thermal radiation: At a distance of about 4 times the radius of a fireball, the heat radiated from a fireball is enough to burn exposed skin in 2 seconds. Wearing protective clothing limits the thermal radiation dose.

Blast: A concussive force caused by the sudden release of the pressurized substance. For a BLEVE occurring out in the open, the blast strength at a distance of 4 times the radius of a fireball can break window glass and may cause minor damage to buildings.

Projectiles: Tank failure can throw metal fragments over large distances. These fragments can and have been deadly.

The danger decreases as you move away from the BLEVE centre. The furthest-reaching hazard is projectiles

For additional information on Propane Hazards refer to Transport Canada Emergency Response Guidebook and Propane Safety Data Sheet (SDS)

Consult CANUTEC (1-613-996-6666) for product information and assistance.

SPILL OR LEAK

ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

All equipment used when handling the product must be grounded.

Do not touch or walk through spilled material.

Stop leak if you can do it without risk.

If possible, turn leaking containers so that gas escapes rather than liquid.

Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

Do not direct water at spill or source of leak.

Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Isolate area until gas has dispersed.

FIRST AID

Call 911 or emergency medical service.

Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Move victim to fresh air if it can be done safely.

Give artificial respiration if victim is not breathing.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

Clothing frozen to the skin should be thawed before being removed.

In case of contact with liquefied gas, thaw frosted parts with lukewarm water.

In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

Keep victim calm and warm.

Specific Action Plan

LIME

PROPERTIES:

White powder to granular.

Very alkaline; very corrosive to eye surfaces.

Effects of acute exposure - corrosive.

Effects of chronic exposure are burns, ulceration, and blindness.

ACTION STEPS:

Report spill.

Stop source if possible.

Contain spill materials.

Protect area.

Remove material.

Reclaim area.

Complete spill report.

NOTIFICATION:

Immediately notify the Area Supervisor.

INITIAL SPILL RESPONSE:

Stop spill at source, if possible.

Avoid dusting.

Keep spilled lime dry.

Prevent from entering watercourses.

If mixed with water, dyke and contain the milk of lime.

HAZARDS and ENVIRONMENTAL THREATS:

Heat generated when mixed with water.

Strong alkaline - protect self from exposure, especially eyes.

No environmental hazard.

ACTION FOR FIRE:

Shovel and contain dry material in containers.

Dyke and contain milk of lime and pump into proper mill circuit.

DISPOSAL:

Dispose of recovered solids by recycling material through the crushing circuit to the mill process.

Specific Action Plan

TAILINGS OR CONCENTRATES

PROPERTIES:

Maybe toxic when ingested and or the fumes, if any, are inhaled from residual milling components.

HAZARDS and ENVIRONMENTAL THREATS:

Will cover and kill vegetation.

May exhibit ARD properties overtime.

ACTION STEPS:

Report spill.

Stop source, if possible.

Contain spill, if possible.

Protect area.

NOTIFICATION:

Immediately notify your Area Supervisor.

INITIAL SPILL RESPONSE:

Stop the flow, if possible.

Prevent spills from entering watercourses

Contain spilled liquid using sand, straw, or commercial absorbents.

If raining cover with tarps

ACTION FOR FIRE:

Slightly flammable

RECOVERY:

Pump or scoop up material.

If necessary, contaminated soil should be excavated.

DISPOSAL:

Recovered spilled materials and contaminated soils should be disposed of in the tailing storage facility

Specific Action Plan

MINE INFLUENCED WATER
(NOT RELATED TO HAZELTINE CREEK DISCHARGE SYSTEM)

PROPERTIES:

Water that has been affected by mining or mineral processing and may contain elevated levels of metals, suspended solids, reagents, and other parameters, or a pH outside of the natural range.

HAZARDS and ENVIRONMENTAL THREATS:

May have a detrimental effect on aquatic or terrestrial environments and organisms. May cause erosion and deposition of sediment (on land or in creeks).

ACTION STEPS:

Report spill.

Stop source, if possible.

Contain spill, if possible.

Protect area.

NOTIFICATION:

Immediately notify your Area Superintendent.

INITIAL SPILL RESPONSE:

Stop the release using water diversions or pumps, or contain water using berms or sumps.

Prevent spills from entering watercourses.

If watercourses are affected, conduct full suite and in situ sampling upstream and downstream of the release point.

Use sediment and erosion control methods including, but not limited to, straw, sediment fence, and geotextiles and retention ponds to minimize erosion and limit sediment transport by water.

RECOVERY:

Pump any water out of emergency sumps or water storage facilities.

Re-vegetate any eroded areas.

Review root causes of the release, and implement changes to prevent a re-occurrence.

Specific Action Plan

MINE INFLUENCED WATER
(RELATED TO WTP Discharge System)

PROPERTIES:

Water that has been affected by mining or mineral processing and may contain elevated levels of metals, suspended solids, reagents, and other parameters, or a pH outside of the natural range.

HAZARDS and ENVIRONMENTAL THREATS:

May have a detrimental effect on aquatic or terrestrial environments and organisms. May cause erosion and deposition of sediment in the creek and alter creek morphology.

SYSTEM SPILL PREVENTION MECHANISMS:

In the event that trigger thresholds for conductivity, temperature or flow are exceeded in continuous monitoring of the discharge effluent, a warning will be issued to the Mill Control Room immediately through the Man Machine Interface. These trigger levels (set below permitted allowable levels) allow for the discharge system to be shut off or discharge rates reduced before any guidelines are exceeded.

Pump failure triggers an automatic “shut off”, and water storage tanks have automatic (and manual) overflow systems that drain water into existing effluent storage facilities.

NOTIFICATION:

Immediately notify the Area Superintendent.

In addition to regulatory notifications required for releases of mine influenced water, the Ministry of Environment must be notified of discharge guideline exceedances and Environment Canada must be notified (as outlined in Mount Polley Mining Corp.’s *Annual Discharge Plan,* PE-11678, and the Metal Mining Effluent Regulations).

INITIAL SPILL RESPONSE:

Immediately stop effluent discharge using the manual shut off valves (and tank drains if necessary).

If the release is due to physical damage to the discharge line, if possible, stop the release using water diversions, berms, sumps or pumps to prevent water from entering watercourses, and use sediment and erosion control materials and methods, such as straw, sediment fence, geotextiles, and retention ponds to minimize erosion and limit sediment transport by water.

If watercourses are affected, conduct full suite and in situ sampling upstream and downstream of the release point.

RECOVERY:

Pump any water out of emergency sumps or water storage facilities.

Re-vegetate any eroded areas.

Review root causes of the release, and implement changes to prevent a re-occurrence.

Specific Action Plan

RELEASE OF TILL/MUD/SOIL/ROCK

PROPERTIES:

Any form of rock, soil, or till, including mud and suspended till.

HAZARDS and ENVIRONMENTAL THREATS:

May cause deposition or morphological changes to watercourses and increase turbidity. May disturb vegetated areas and promote erosion. May have a detrimental effect on terrestrial or aquatic environments and organisms. Large transfers of material may be hazardous for humans.

ACTION STEPS:

Report incident.

Stop source, if possible and if area is safe.

Contain material, if possible and if area is safe.

Protect area.

NOTIFICATION:

Immediately notify your Area Superintendent.

INITIAL RESPONSE:

Stop the release using methods including berms or containment sumps.

Take action to protect any infrastructure or prevent further incidents (example: shut off water in dewatering pipelines that may be affected).

Prevent material from entering watercourses.

If watercourses are affected, conduct full suite and in situ sampling upstream and downstream of the release point.

Use sediment and erosion control methods including, but not limited to, straw, sediment fence, and geotextiles and retention ponds to minimize erosion and limit sediment transport by water.

RECOVERY:

Move material, as possible and as required (example: away from infrastructure).

Install long-term sediment and erosion control works, including re-vegetation of any eroded areas.

Restore aquatic habitats, as required.

Review root causes of the release, and implement changes to prevent a re-occurrence

Appendix C Protocol for Corporate Reporting of an Environmental Incident

A) Protocol for Corporate Reporting of an Environmental Incident:

1) Corporate reporting of an "environmental incident" is required when:

(a) Any environmental incident occurs that:

- Poses a serious or imminent threat to human health or to the environment.
- Precipitates an immediate, external reporting requirement to regulatory authorities.
- Requires a minimum expenditure of $Cdn25, 000 in materials and/or offsite technical or legal support.
- Is subject of an inquiry from the media.

(b) Any environmental event occurs when:

- An administrative or judicial enforcement action is taken.
- A notice of a citizen suit or other significant complaint from the public is received.
- A private lawsuit premised on personal injury or property damage is filed.
- A civil or criminal action is taken against any Mount Polley Mining Corp. employee, manager, officer or Director.

2) Protocol for Report

(a) The Area Superintendent will immediately notify the General Manager (or his designate).

(b) The general manager will notify the Company President. (CP)

(c) Consultation with the general manager will determine the extent of legal counsel involvement.

(d) The Area Superintendent will prepare a " Preliminary Draft Incident Report for the General Manager to authorize and fax as soon as possible to the CP. The "Final Incident Report" will be submitted once the investigation of the incident is complete.

B) Protocol for Communicating Environmental Issue

1) Corporate communication of an "environmental issue" is required when:

(a) A situation arises or an event occurs that has, in the opinion of the Area Superintendent, the potential to become an Environmental Incident as defined above.

2) Protocol for Communicating and Environmental Issue.

(a) When an issue becomes apparent, the Area Superintendent will inform the General Manager.

(b) Actions plans to mitigate a possible incident will be developed and approved by the General Manager.

(c) The General Manager will keep the CP informed of any issues with the potential to become " Incidents".

Appendix D Preliminary Incident Report

PRELIMINARY INCIDENT REPORT

Mount Polley Mining Corporation
Environmental Incident Report

Date of Incident:	**Date Incident Reported:**
Incident:	
Department:	**Supervisor:**

DESCRIPTION OF INCIDENT: (include detailed timeline of events)	
Date	
Time	
Time	
Time	
Time	

Include figures as required.
Maps
photos

NEXT STEPS:
Internal Root Cause Analysis

Environmental Assessment and Monitoring
Review of required monitoring
Long Term Mitigation
If required.
Signature of Area Supervisor: _____
Copies: Include names of all recipients of report

Appendix E Reportable Levels for Certain Substances

Item	Column 1	Column 2
	Substance spilled	**Specified amount**
1 **Ammonium Nitrate**	Class 1, Explosives as defined in section 2.9 of the Federal Regulations	Any quantity that could pose a danger to public safety or 50 kg
2	PCB Wastes as defined in section 1 of the Hazardous Waste Regulation	10 kg
4 **Propane**	Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations	10 kg
4	Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations	5 kg
5 **Gasoline, MIBC, Diesel**	Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations	100 L
6	Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations	25 kg
7 **NaHS**	Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regulations	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regulations	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regulations	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment

11	Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the "Packaging and Transport of Nuclear Substances Regulations"
12 **Acids**	Class 8, Corrosives as defined in section 2.40 of the Federal Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations	25 kg or 25 L
14	waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the hazardous Waste Regulation	5 kg or 5 L
17	waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18 **Waste Oil**	waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB Wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23 **Concentrate, Tailings, Lime**	A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22	25 kg or 25 L

24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

APPENDIX 11-1: RLCE SUMMARY REPORT

Due to the financial nature, the RLCE was submitted seperately to the Major Mines Office.