# TECHNICAL REPORT ON THE THOMPSON CREEK MOLYBDENUM MINE

*Idaho, USA*

Technical Report Pursuant to National Instrument 43-101

Prepared for:

**Centerra Gold Inc.**

**Qualified Persons:**

Lars Weiershäuser, PhD, P. Geo.
Jean Francois St-Onge, P. Eng.
Robert Pratt, P.E.
Hank Wong, P. Eng.
Christopher Graves, P. Eng.
Justin Stockwell, P. Geo.
Jason Obermeyer, P.E.

**Date:** September 27, 2024

**Effective Date:** September 1, 2024

# CERTIFICATE OF QUALIFIED PERSON LARS WEIERSHÄUSER

I, Lars Weiershäuser state that:

I am Director, Geology at Centerra Gold Inc., Suite 1800, 1 University Ave, Toronto, ON M5J 2P1, Canada.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows: I am a graduate of the University of Toronto in 2005. I obtained a Doctor of Philosophy (Geology). I have practiced my profession continuously since January 2005. I have completed Mineral Resource Estimations for deposits in North and South America and Asia for numerous deposit types and commodities, including intrusion hosted porphyry deposits. I am the author or co-author of numerous Technical Reports for projects worldwide. I am a registered member of the Professional Geoscientists Ontario (P. Geo.), and my license number is 1504

My most recent personal inspection of the property that is the subject of the Technical Report occurred during May 2023 and was for a duration of three days.

I am responsible for Items 6, 7, 8, 9, 10, 11, and 14, and parts of Items 1, 12, 25, and 26 of the Technical Report.

I am not independent of the issuer as described in Section 1.5 of the Instrument.

I did not have prior involvement with the property that is the subject of the Technical Report.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Toronto, Ontario this 27th day of September 2024.

(*original signed*)

Lars *Weiershäuser*, PhD, P. Geo., APGO # 1504

## CERTIFICATE OF QUALIFIED PERSON JEAN-FRANCOIS ST-ONGE

I, Jean-Francois St-Onge state that:

I am a consultant acting as Senior Director Technical Services at Centerra Gold Inc.,1 University Avenue, Suite 1800, Toronto, ON M5J 2P1

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows: 30+ year Mining Engineer member of the Professional Engineers of Ontario, experience with base metal deposits and open pit mining, experience with studies, operation and costing of these projects, and the compliance to environmental and regulatory aspects.

My most recent personal inspection of the property that is the subject of the Technical Report occurred from November 6 to November 8, 2023.

I am responsible for Items 2, 3, 4, 5, 15, 16 (except 16.2), 18.1, 19, 20 and 22 and parts of Items 1, 12, 21, 25 and 26 of the Technical Report.

I am not independent of the issuer as described in Section 1.5 of the Instrument.

My prior involvement with the property has been limited to technical studies for its potential restart.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Brisbane, Queensland this 27th day of September 2024.

(*original signed*)

Jean-Francois St-Onge, P. Eng., License # 100215849

# CERTIFICATE OF QUALIFIED PERSON ROBERT W. PRATT

I, Robert W. Pratt state that:

I am President at Call & Nicholas, Inc., 2475 N Coyote Dr., Tucson, AZ. USA 85745.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows:

- I am a graduate of the University of Arizona Department of Mining & Geological Engineering with a bachelor's degree in Geological Engineering (1996)
- I am a Registered Professional Geological Engineer in the US states of Arizona (License No. 36557) and Idaho (License No. 15111)
- I am an SME Registered Member #4136115
- I have been in continual practice as a geological engineer in the mining industry for over 25 years. My experience includes geotechnical analysis and design of open pit mines and waste rock storage facilities

My most recent personal inspection of the property that is the subject of the Technical Report occurred on September 27, 2022, and was for 1 day.

I am responsible for Item 16.2 and parts of Items 1, 12, 25, and 26 of the Technical Report.

I am independent of the issuer as described in Section 1.5 of the Instrument.

I have had prior involvement with the property that is the subject of the Technical Report as a geotechnical engineering consultant.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Tucson, AZ. USA this 27th day of September 2024

*(original signed)*

Robert W. Pratt, P.E., Idaho Registered Geological Engineer, License #15111

## CERTIFICATE OF QUALIFIED PERSON HANK WONG

I, Hank Wong state that:

I am Communication Studies Manager at AtkinsRéalis, 745 Thurlow St., Suite 1100,
Vancouver, BC, V6E 0C5.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the “Technical Report”).

I am a “qualified person” for the purposes of National Instrument 43-101 (the “Instrument”). My qualifications as a qualified person are as follows:

- I am a graduate of the University of British Columbia in 2003 with a Bachelor of Applied Science in Chemical and Biological Engineering
- I am registered as a Professional Engineer in the Province of British Columbia (License #35353)
- I have worked as an engineer in the mineral process industry for a total of 20 years since my graduation

My relevant experience for the content I am responsible for preparing in the Technical Report is as follows:

- Studies and engineering for mineral process plants, including primary molybdenite concentrators
- Testwork and base metal plant operating data review
- Operations support and consulting in base metals concentration

My most recent personal inspection of the property that is the subject of the Technical Report occurred during December 2023 and was for a duration of 2 days.

I am responsible for Items 13 and 17 and parts of Items 1, 12, 21, 25 and 26 of the Technical Report.

I am independent of the issuer as described in Section 1.5 of the Instrument.

My prior involvement with the property that is the subject of the Technical Report is as follows: Studies in 2017, reviewing past operations data to assess concentrator throughput and costs.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Vancouver, British Columbia, this 27th day of September 2024

*(original signed)*

Hank Wong, P. Eng., License #35353

# CERTIFICATE OF QUALIFIED PERSON CHRISTOPHER GRAVES

I, Christopher Graves state that:

I am Hatch's Vancouver Office Engineering Manager at Hatch Ltd., 1066 West Hasting Street,
Suite 400, Vancouver, British Columbia, V6E 3X2, Canada.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows: Graduate of the University of Waterloo in Chemical Engineering and have 29 years of experience in mining and metallurgical plants, specializing the brownfield project related to improvements and refurbishment of existing plant infrastructure. I am a professional engineer in the province of British Columbia (EGBC).

My most recent personal inspection of the property that is the subject of the Technical Report occurred during July 17th to 19th and was for a duration of 2.5 days.

I am responsible for items related to the Capital Cost Estimate (Section 21) for the Processing Plant (primary crusher through to concentrate packaging and tailing discharge, excluding tailings pipeline and storage) of the Technical Report.

I am independent of the issuer as described in Section 1.5 of the Instrument.

My prior involvement with the property that is the subject of the Technical Report is as follows: Project Manager or the Thompson Creek Mining company's operations restart capital cost estimate and participant on the recent site visit to the operations site for verification of the scope required for the planned restart.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Vancouver, British Columbia, this 27th day of September 2024

*(original signed)*

Christopher Graves, P.Eng., EGBC, License # 187062

# CERTIFICATE OF QUALIFIED PERSON JUSTIN STOCKWELL

I, Justin Stockwell state that:

I am a Senior Hydrogeochemist at Lorax Environmental Services Ltd., 1770 W 7th Ave #305, Vancouver, BC, V6J 4Y6.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows: mine waste geochemistry and management, mine water balance and management, hydrogeology, surface water balance and water quality modelling, water quantity and water quality assessments. I have over 20 years of working experience as an environmental geoscientist in the mining sector. I am a Professional Geoscientist with Engineers and Geoscientists British Columbia.

My most recent personal inspection of the property that is the subject of the Technical Report occurred during October 2014 and was for a duration of three days.

I am responsible for Site Water Management (Section 18.3) of the Technical Report as well as water management sub-sections of Sections 1, 25 and 26.

I am independent of the issuer as described in Section 1.5 of the Instrument.

My prior involvement with the property that is the subject of the Technical Report is as follows: Technical lead and coordinator of technical studies pertaining to the water quality and water quantity assessments for the Thompson Creek Mine Phase 8 Environmental Impact Statement.

I have read the Instrument and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Vancouver, British Columbia, this 27th day of September 2024

*(original signed)*

Justin Stockwell, Professional Geoscientist with Engineers and Geoscientists British Columbia (P. Geo.), License# 59192

# CERTIFICATE OF QUALIFIED PERSON JASON OBERMEYER

I, Jason Obermeyer, state that:

I am a Vice President, Geotechnical Engineer at WSP USA Inc., 7245 West Alaska Drive, Suite 200, Lakewood, Colorado 80226.

This certificate applies to the technical report titled Technical Report on the Thompson Creek Molybdenum Mine with an effective date of September 1, 2024 (the "Technical Report").

I am a "qualified person" for the purposes of National Instrument 43-101 (the "Instrument"). My qualifications as a qualified person are as follows: I am a graduate of The University of Texas at Austin, having received a Bachelor of Science degree in civil engineering in 2001 and a Master of Science degree in geotechnical engineering in 2002. My relevant experience after graduation for the purpose of the Technical Report includes leading or assisting with engineering evaluations, design work, and operational support for tailings management at numerous mine sites. This work has included geotechnical characterization, seepage analysis, slope stability analysis, tailings deposition planning, reclamation cover evaluation and design, dam safety inspection, and other related work. I am a member of the Society for Mining, Metallurgy, and Exploration.

My most recent personal inspection of the property that is the subject of the Technical Report occurred during September 2024 and was for a duration of three days.

I am responsible for Item 18.2 and parts of Items 1, 12, 25, and 26 of the Technical Report.

I am independent of the issuer as described in Section 1.5 of the Instrument.

My prior involvement with the property that is the subject of the Technical Report is as follows: I began working on engineering analyses and operational support for the tailings storage facility at the property in 2011. Engineering analyses have included slope stability, seepage, mass balance, liquefaction, and seismic hazard. Operational support has included dam safety inspections, tailings deposition planning, monitoring data review and analysis, and regulatory support. I have conducted on-site visual inspections of the tailings storage facility at the property once or twice each year since 2011. I have served as the Engineer of Record firm's representative for the tailings storage facility at the property since November 29, 2018.

I have read the Instrument, and the Items of the Technical Report for which I am responsible have been prepared in compliance with the Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Items of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Lakewood, Colorado, this 27th day of September 2024.

*(original signed)*

Jason Obermeyer, P.E., Idaho Professional Engineer, License # 16652

**Cautionary Note Regarding Forward-Looking Information**

*Information contained in this Technical Report which is not a statement of historical fact, and the documents incorporated by reference herein, may be “forward-looking information” for the purposes of Canadian securities laws and within the meaning of the United States Private Securities Litigation Reform Act of 1995. Such forward-looking information involves risks, uncertainties and other factors that could cause actual results, performance, prospects and opportunities to differ materially from those expressed or implied by such forward looking information. The words "achieve", “advance”, “assume”, “anticipate”, “approach”, “assess”, “budget”, “contingency”, “could”, “decrease”, “develop”, “enhance”, “estimate”, “expect”, “explore”, “focus”, “forecast”, “future”, “generate”, “growth”, “in line”, “increase”, “improve”, “may”, “maximize”, “optimize”, “plan”, "potential", “remaining”, “restart”, “result”, “schedule”, “strategy”, “subject to”, “target”, “understand”, “update”, “will”, and similar expressions identify forward-looking information.*

*These forward-looking statements relate to, among other things: statements regarding Centerra’s strategic plan; any synergies which may arise from, or are expected to arise from, the vertical integration of TCM and Langeloth including the Company’s ability to source and blend the concentrate from TCM or third-parties at Langeloth; the proposed pit highwall layback; projections regarding cash flows, NPV, operating and capital costs, and other financial metrics; project spending at TCM related to capitalized stripping, plant refurbishment, mine mobile fleet upgrades and capital expenditures; the success of any pit optimization; fluctuation of, sensitivity to, and assumptions of molybdenum prices and the impact it may have on the future supply and demand of molybdenum and steel; the expected profile of future production, profitability and costs; updates to the life of mine plan for TCM; ongoing evaluations of a restart of TCM, including integrating Langeloth, its operating capacities and the use of the concentrate from TCM or third-parties; Centerra receiving all necessary permits and authorizations required during the restart and production at TCM; mineral reserve and mineral resource estimates; grades and recoveries; development plans; mining methods and metrics including strip ratio; recovery process; and the future exploration plans.*

*Forward-looking information is necessarily based upon a number of estimates and assumptions that, while considered reasonable by Centerra, are inherently subject to significant technical, political, business, economic and competitive uncertainties and contingencies. Known and unknown factors could cause actual results to differ materially from those projected in the forward- looking information. Factors and assumptions that could cause actual results or events to differ materially from current expectations include, among other things: (A) strategic, legal, planning and other risks associated with Centerra’s operations, including: the management of external stakeholder expectations; the impact of changes in, or to the more aggressive enforcement of, laws, regulations and government practices; risks that community activism may result in increased contributory demands or business interruptions; potential defects of title that are not known as of the date hereof; the imprecision of mineral reserves and resources estimates and the assumptions they rely on, including environmental, processing permitting, taxation, socioeconomic, infill and exploration drilling and other factors; key assumptions,* *parameters and methods used to estimate the mineral reserve and mineral resource estimates; Indigenous claims and consultative issues; and (B) risks related to operational matters and geotechnical issues and Centerra's continued ability to successfully manage such matters, including: the ability of Centerra to complete construction and waste stripping and produce ore as scheduled; the ability of the Centerra to achieve pit slope design angles at TCM, particularly in the North Wall, which will be based on future drilling and may be impacted by stronger/weaker rock characteristics, favorable/unfavorable geologic structure, and/or variations in pore pressures that could result in an increase or decrease in required depressurization to achieve these slope design angles; the ability of Centerra to achieve historical throughput rates at TCM; Centerra receiving the required authorizations and permits for the restart of TCM; the stability of the pit walls; the integrity of tailings storage facilities and the management thereof, including as to stability, seismic activity, compliance with laws, regulations, licenses and permits, controlling seepages and storage of water, where applicable and any future capital expenditures required for active reclamation and tailings storage facilities issues; changes to current remediation plans due to tailings storage facilities structures; changes to, or delays in Centerra's supply chain and transportation routes, including cessation or disruption in rail and shipping networks, whether caused by decisions of third-party providers or force majeure events (including, but not limited to: labour action, flooding, wildfires, earthquakes, pandemics, or other global events such as wars); risks related to future price of molybdenum, inflation, interest rates, discounted cash flows, working capital requirements and transportation and processing costs; the adequacy of Centerra's insurance to mitigate operational and corporate risks; mechanical breakdowns; the occurrence of any labour unrest or disturbance and the ability of Centerra to successfully renegotiate collective agreements when required; reliance on a limited number of suppliers for certain consumables, equipment and components; the ability of Centerra to address physical and transition risks from climate change; Centerra's ability to accurately predict decommissioning and reclamation costs and the assumptions they rely upon; and Centerra's ability to attract and retain qualified personnel. For additional risk factors, please see section titled "Risks Factors" in Centerra's most recently filed Annual Information Form available on SEDAR+ at www.sedarplus.com and EDGAR at* www.sec.gov/edgar *and the "Capital and Operating Costs – Material Assumptions", "Economic Analysis – Assumptions", "Interpretation and Conclusions - Risks and Opportunities" sections of the Technical Report.*

## Non-GAAP Measures

This document contains the non-GAAP financial measure of all-in sustaining costs per molybdenum pound sold. This financial measure does not have any standardized meaning prescribed by GAAP or NI 43-101, and is, therefore, might not be comparable to a similar measure presented by other issuers.

All-in sustaining costs per molybdenum pound sold include all operating costs, comprising of all stripping costs,capital costs and treatment costs. This measure incorporates costs incurred during the production phase.

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# 1 SUMMARY

This Technical Report summarizes the current and planned operations and the Mineral Reserves and Mineral Resources for the Thompson Creek Molybdenum Mine (TCM). The Technical Report was prepared by and for Centerra Gold Inc. (Centerra), the 100% owner of Thompson Creek Metals Company Inc. (TCMC) by the qualified persons as listed in Item 2. The purpose of this Technical Report is to review and document the current Mineral Resource and Mineral Reserve estimates, which have been updated since the filing of the previous technical report (Marek and Lechner, 2011).

The Technical Report has been prepared according to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) and following Form NI 43-101F1.

## 1.1 Property Description, Location, Conditions, History

The Thompson Creek Mine is an open pit molybdenum mine and concentrator located near Challis, Idaho, USA. The operation consists of an open pit mine, ore crusher, overland conveyer system, concentrator, and tailings storage facility (TSF) including the containment dam. Associated infrastructure includes water pumping systems, electrical transmission lines, support facilities (offices, maintenance shops and warehouse), and access roads.

Open pit mining commenced in 1983 and was conducted in several phases, culminating with Phase VII in 2014. The mine was placed on care and maintenance in December 2014, and the open pit was allowed to flood. Care and maintenance has been continuous until the present day.

The TCM is located in Custer County in central Idaho, approximately 22 miles southwest of the town of Challis and approximately 9 miles northwest of the town of Clayton. The property is easily accessible year-round either from Idaho Falls or Boise, both cities within driving distance to the project that are serviced by national and international flights.

Mining supplies and services, as well as skilled and unskilled labor are sourced primarily from within Idaho as well as regionally from Nevada and Utah.

The infrastructure at the TCM includes:

- A site access road
- Tailings pond and associated sands plant and containment dam
- Process and freshwater ponds
- A crushing plant, overland conveyor, mill, and concentrator
- Laboratory
- Core storage building
- An administrative building, warehouse, dry, infirmary, main garage, and repair shops.

Electric power is provided to the site by Bonneville Power Administration through a 24.7-mile, 230 kV power line. There is an ample supply of water to support mining processes.

## 1.2 Geology and Mineralization

The Thompson Creek porphyry molybdenum deposit occurs near the suture of the late Cretaceous Idaho Batholith in the west and complexly folded Paleozoic metasedimentary rocks interpreted to have accumulated in a back-arc environment in the east.

The primary host for the molybdenite mineralization at Thompson Creek is the Thompson Creek intrusive complex, which is composed of a granodiorite-quartz monzonite stock of Cretaceous age.

Alteration of the intrusive rocks is characterized by pyrite, quartz, and sericite, primarily in veins at shallow depths. This alteration style has been mostly mined out. The dominant alteration at depth comprises coarse biotite, in some places intergrown with molybdenite in quartz veins.

There are two major structural features associated with the Thompson Creek deposit:

- The Raise Fault strikes northwest, parallel to the trend of the mineralization
- The Unnamed Fault strikes 34° and dips steeply to the southeast.

The Unnamed Fault separates the deposit into northwest and southeast portions.

Mineralization is restricted almost exclusively to the granodiorite/quartz monzonite intrusion. The long axis plunges shallowly to the northwest; its shape is generally elliptical with approximate dimensions of 6,000 ft long by 2,500 ft wide by 2,500 ft high.

The molybdenum mineralization occurs as a series of crosscutting quartz-molybdenite-pyrite veinlets, stringer zones, and rare coarse disseminations. The dominant vein set strikes at 300–320° and dips at 30–85° northeast, parallel to the long dimension of the intrusive body.

Over the life of the mine to date, the molybdenum grade mined has averaged approximately 0.083% Mo.

## 1.3 Exploration Status

The property has been subjected to numerous exploration drilling campaigns by various owners since the 1970s. Of the total of 429,391 ft of drilling (436 holes), TCMC drilling programs have recovered 115,158 ft of core from 129 holes. In 2023, Centerra completed 18 core holes (14,600 ft) for geotechnical purposes – no current mineral exploration has been conducted by Centerra.

## 1.4 Development and Operation Status

A Modified Mining Plan of Operations (MMPO) was proposed in 2008 in support of Phase VIII expansion. An Environmental Impact Statement (EIS) per the National Environmental Policy Act (NEPA) was prepared to evaluate the potential environmental effects of the proposed MMPO. A positive Record of Decision (ROD) was issued by the Bureau of Land Management (BLM) in August 2016. TCM received approvals for a revised MMPO submitted in 2021, in February 2022 in line with the Phase VIII Mine Plan. In December 2023, TCM submitted a MMPO to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback subject to a minor update to the reclamation plan.

TCMC has evaluated an optimized mine plan to restart the mine and continue development of the open pit. Approximately 28,500 tons per day of ore would be processed through the existing, refurbished processing facilities.

Material mined from the Thompson Creek open pit will be processed on site using the existing crushing circuit, mill, and concentrator. Molybdenite concentrate and high-performance molybdenum (HPM) products will be produced and shipped by truck, either directly to customers or to the refinery owned by TCMC in Langeloth, Pennsylvania. In the event that molybdenite concentrate and/or HPM products are shipped to Langeloth, the molybdenite concentrate will be processed to make molybdenum trioxide ($MoO_3$) and other products for sale to various customers.

## 1.5 Mineral Resources Estimate

The TCM is an open pit operation that was active until 2014 when falling molybdenum prices made further exploitation of the deposit uneconomic. After approximately 10 years on care and maintenance, the mineral resource model used in the past required to be updated due to changes in the Company's software infrastructure and the understanding that grade differences exist between the two principal intrusive phases that host the molybdenum mineralization.

Limited reconciliation data suggest the previous model performed well; while some variability exists on a bench-by-bench basis, which is expected, larger volumes, such as mining phases, reconciled well.

Specific gravity (SG) data had been poorly documented in the past, and SG values, or more specifically, a ton-factor, had been assigned for each lithology. To address this shortcoming, Centerra, in the fall of 2023, submitted approximately 200 samples from various lithologies to Bureau Veritas (Reno) for SG determinations. The SGs of the primary mineral-bearing lithologies, monzonite (2.603) and granodiorite (2.621), exhibit values within 2% of each other. Test data are reported in Item 14.

The "reasonable prospects for eventual economic extraction" requirement laid out by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM, 2019) generally implies that quantity and grade estimates are high enough that when reasonable and transparent economic assumptions and parameters are applied and that Mineral Resources are reported at an appropriate cut-off grade taking into account extraction scenarios and processing recovery, the deposit may conceptually be economic. The resource cut-off grade was established based on an open pit mining scenario, excluding Mineral Reserve modifying factors, and a Mineral Resource molybdenum price derived from market analyses and a 2022 analysis of metal prices used by peer producers for Resource and Reserve estimations. The Mineral Resource metal price is 15% higher than the Mineral Reserve metal price used for the cost model.

The resource evaluation reported herein are reasonable representations of the global molybdenum Mineral Resources of the Project at the current level of sampling. The mineral resources have been estimated in conformity with the widely accepted CIM Estimation of Mineral Resource and Mineral

Reserves Best Practices Guidelines (CIM, Nov 2019) and are reported in accordance with the Canadian Securities Administrators' NI 43-101.

Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into Mineral Reserves.

The Mineral Resource Statement for the TCM is presented in Table 1-1. The statement was prepared by Dr Lars Weiershäuser, PGeo (APGO#1504).

**Table 1-1 Mineral Resource Statement, TCM – September 1, 2024**

| Class | Mass (Mst) | Mo grade (%) | Metal content (Mlb) |
|---|---|---|---|
| Measured | 5.5 | 0.059 | 6.6 |
| Indicated | 49.8 | 0.057 | 56.8 |
| **Measured + Indicated** | **55.3** | **0.057** | **63.4** |
| Inferred | 11.6 | 0.072 | 16.7 |

Notes:

- Mineral Resources are reported exclusive of Mineral Reserves; Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- Mineral Resources are considered for open pit extraction.
- Resources are reported using a 0.025% Mo cut-off grade within a conceptual pit shell and exclusive Mineral Reserves.
- Economic parameters for the determination of the resource cut-off grade include:
  - Molybdenum price of US$18.5/lb
  - Mining costs of $1.77-$2.17/ton, and a G&A and processing cost of $6.75/ton processed. Sustaining costs were not included in the resource cut-off grade calculation.
  - 82% mill recovery.
- Mineral Resources are classified and have been estimated in accordance with CIM Definition Standards.
- As required by reporting guidelines, rounding may result in apparent summation differences between tons, grade, and metal content.

## 1.6 Mineral Reserves Estimate

In accordance with the CIM classification system, only Measured and Indicated Mineral Resource categories can be converted to Mineral Reserves through the application of appropriate modifying factors. Inferred Mineral Resources are treated as waste for the purpose of Mineral Reserve estimates.

The conversion of Mineral Resources to Mineral Reserves required cumulative knowledge achieved through Pseudoflow pit optimization, detailed pit design, and associated modifying parameters. For Thompson Creek, the Mineral Reserve estimation was completed using Datamine's NPV Scheduler software and applied to the entire TCM Mineral Resource. Detailed access, haulage, and operational cost criteria for the mine were applied in this process. TCM was built and is operated in imperial units, and molybdenum grades are expressed in percent (%) Mo metal content.

The orientation, proximity to the topographic surface, and geological controls of the TCM mineralization support mining of the Mineral Reserves with open pit mining techniques. To calculate the Mineral Reserves, pits were designed following an optimized Pseudoflow pit, which was selected based on an analysis of incremental pit shells using a $16.00/lb molybdenum sales price. The quantities of material within the designed pits were calculated using a base cut-off grade of 0.030% Mo, which is based on the assumed US$16.00/lb molybdenum sales price used for this study.

The Mineral Reserves for the TCM are presented in Table 1-2.

**Table 1-2 Thompson Creek Mineral Reserve estimate as of September 1, 2024**

| Classification | Ore (Mst) | Mo grade (%) | In situ Mo metal (Mlb) | Waste (Mst) | Strip ratio (waste/ore) |
|---|---|---|---|---|---|
| Proven | 49 | 0.076 | 75 | 386 | 3.1 |
| Probable | 75 | 0.057 | 86 | | |
| **Proven and Probable** | **125** | **0.065** | **161** | | |

Source: Centerra, 2024

Notes:

- Mineral Reserves stated in the table above are the economic portion of the Measured and Indicated Mineral Resource contained within the engineered pit design following the selected ultimate Pseudoflow pit shell.
- Mineral Reserves are stated in terms of in situ tons and grade before process recovery is applied.
- Modifying factors such as dilution and mining loss have been accounted for and are discussed in Section 15.2.1.
- The economic assumptions used for the Mineral Reserve estimate include: ore mining cost of $2.17/ton; waste mining cost of $1.77/ton; mining sustaining cost of $0.06/ton; G&A, processing, and sustaining costs of $7.33/ton ore; and selling cost of $1,460/ton metal in concentrate.
- Mineral Reserves are based upon a 0.030% Mo internal cut-off grade with some marginal material included, using a $16.00/lb Mo price with a variable molybdenum recovery as described in Section 15.2.
- Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.

## 1.7 Mining Methods

### 1.7.1 Geotechnical Evaluations

Stability of the majority of the north wall sectors is controlled by continuous wedge-forming faults, low-strength rock, daylighted structure, and pore pressure. These mechanisms resulted in major slope instabilities during mining of the Phase VI and VII pushbacks. Inter-ramp slope angles (ISAs) based on stability analyses considering this experience are 36.5° (lower) / 38° (upper) for the western portion of the north wall (sectors N2b and N2c) and 36.5° for the southern portion of the north wall.

The north wall must be effectively depressurized 300–400 ft behind the life-of-mine (LOM) slope. Horizontal drains installed to a length of approximately twice the depressurization target (800 ft) can be effective in mitigating pore pressure. The eastern portion of the north wall where the design is limited by daylighted structures is planned at a 40° ISA. Benches of 80–90-ft width, spaced approximately every 500 vertical feet, provide additional rockfall protection and will limit the size of potential inter-ramp instability.

Stability of the south (S1) and lower north wall sectors (N4) is limited by bench-scale design criteria. The east (E1) and west (W1) walls are sectors where ISAs transition from flatter north wall angles (39°–40° ISA) to the steeper south wall (47° ISA). These angles are based on technical analyses and an audit of the previously achieved slope configuration using high-precision drone photogrammetry data. Double benching and pre-split blasting are necessary to achieve the south wall 47° ISA.

### 1.7.2 Mining

The TCM is a conventional hard rock open pit mine currently in care and maintenance. The mine has historically self-performed all drill, blast, load, haul, and support operations and plans to self-perform major mining activities in the future. Mining is planned on 50-ft benches using two existing cable shovels, a Bucyrus 495HD and a P&H 2300, as the primary loading units. These loading units will be supported by a Bucyrus RH-340 hydraulic shovel and a Cat 993 front-end loader. A fleet of existing Cat 789C haul trucks will be re-conditioned and two new Cat 789 haul trucks will be purchased to achieve the mine production requirements. Blast-hole drilling will be performed with two existing and one new Atlas Copco Pit Viper 271 drills.

Ore will be mined at an average rate of 35,000 tons per day (st/d) (12.8 million short tons per year – Mst/y) with the majority direct tipped into the primary crusher to maintain the 28,500 st/d plant throughput rate. A low-grade stockpile will be maintained throughout the mine life to manage the grade being fed to the plant.

Waste rock will be mined with the same fleet as the ore and placed in one of two waste rock storage facilities (WRSFs): the Buckskin WRSF or the Pat Hughes WRSF. The Buckskin WRSF is located northwest of the TCM pit and contains a storage capacity for 131 million tons (Mst) of waste material. The Pat Hughes WRSF is located southeast of the TCM pit and contains a storage capacity for 266 Mst of waste material. Both WRSFs are topped by stockpiles containing volcanic Type I (non-acid generating – NAG) waste rock material, which will be used to cap the WRSFs and the TSF at the end of mine life. Volcanic Type I stockpile capacity is included in the total WRSF capacities indicated above, and additionally a 14 Mst operational stockpile for Type I waste will be utilized to facilitate closure needs. This stockpile will be emptied during the closure process.

## 1.8 Data Verification

### 1.8.1 Mining and Mineral Reserves

The Qualified Person (QP) has visually assessed the existing mining surfaces, existing dumps, and infrastructure at TCM. During the site visit, the QP observed that these infrastructure and surfaces were within the area as per surveyed topography and as shown by aerial photographs. Additionally, the QP observed that these surfaces aligned with the mineral resource model developed by the geology QP.

It was not possible to visually verify portions of the pit bottom surface that were beneath the pit lake or beneath backfill. Per TCM, the pit bottom surface underneath the pit lake was measured using a bathymetric survey conducted by Golder Associates Inc. (Golder) in 2018. Centerra and its predecessor owners maintained a series of surveys throughout mining operations that documented mined volumes and replacement backfill. The methods for measuring topographical surfaces beneath the pit lake and beneath backfill are considered acceptable by the QP.

## 1.9 Metallurgical Testwork and Mineral Processing

The TCM and mill operated from 1983 through to 2014, during which period metallurgical characteristics and operational processes of the ores were well established. The ore was processed through a gyratory crusher, a SAG-ball mill (SAB) circuit, and combined with rougher and cleaner flotation plant, to produce molybdenum-rich concentrates. The mine and concentrator were placed on care and maintenance in December 2014 when the mining and processing of Phase VII ore was completed.

### 1.9.1 Metallurgical Testwork

The ore to be processed upon mine restart will be from the same mineral deposit as previously mined, extracting ore from the existing pit (walls and floor). The mineral processing characteristics are principally defined by the existing operating data; a metallurgical test program was conducted to confirm that the planned LOM ores would be similar in processing characteristics as established historically. The QP is satisfied that the recovery of molybdenum in concentrate from the mined ores will be accomplished to the stated specifications.

A metallurgical testwork program was carried out at Base Metallurgical Laboratories Ltd (BaseMetLab), located in Kamloops, British Columbia, Canada, from October 2023 to February 2024. The program consisted of comminution and flotation tests to characterize future ores, and also to confirm the similarities and identify differences, if any, between the restart LOM ore and historical production ore.

Four composite samples, each representing a three-year mining period (Year 1-3, Year 4-6, Year 7-9, and Year 10-EOM) were submitted for analysis. The composite samples were made up of drill core intervals from the prospective mine plan locations, principally along the existing pit wall and floor.

Based on the testwork results, the calculated specific grinding energies required to achieve the target grind ($P_{80}$ 212 µm), shown in Table 1-3, for the LOM are within the operating Specific Energy range experienced previously by the mill, indicating test sample similarity to the historically processed ore from the perspective of hardness and comminution.

**Table 1-3 Calculated Specific Energy for LOM three-year composite samples**

| Test set | Composite sample | Specific Energy (kWh/st) |
|---|---|---|
| 1 | Year 1-3 | 11.17 |
| 2 | Year 4-6 | 10.23 |
| 3 | Year 7-9 | 10.43 |
| 4 | Year 10-EOM | 11.35 |

Rougher flotation tests were performed at a nominal primary grind size of 200 µm. All composite samples produced high rougher recoveries in the range of 94.3% to 97.0%.

Cleaner flotation tests were performed. High molybdenum recoveries were achieved in Sets 1 to 3, with a range of 88.9% to 94.8% and concentrate grades ranging from 52.3% to 59.3% Mo. Set 4, which corresponds to the previously noted high-sulfur metasediments lithology, exhibited weak metallurgical performance with much lower concentrate grades, ranging from 20.8% to 41.5% Mo.

The flotation testwork program also included a stage of rougher pyrite flotation to inform the design of a new pyrite removal circuit. The objective of the circuit was to produce a non-sulfide tailings grade not greater than 0.1% S. TCM's historical pyrite removal circuit had been removed but will be replaced with the new circuit prior to the restart of operations.

A separate sample, identified as High Sulfur and corresponding to the metasedimentary rock formations, produced the weakest flotation response. Metasediments constitute only a small fraction of the ore, and the low flotation results for this rock type will not impact overall recoveries.

No testwork specific to concentrate dewatering (thickening, filtration, or drying) and acid leaching was completed. It is expected and assumed that the LOM ore will not present any issues in these unit operations, given its similarity to historical feed, and the performance and ability of the existing circuits to produce a clean, saleable concentrate.

### 1.9.2 Mineral Recovery Methods

TCM has existing process plant facilities at the mine site which will be employed to treat remaining ores and produce high-grade molybdenum concentrate. Currently, most of the plant is on a care and maintenance basis with only leaching and high-grade circuits operating to treat custom feeds.

Upon restart, the TCM plant will process mineralized material from the same deposit as previously mined. Metallurgical testwork has confirmed recovery of molybdenum will be consistent with historical operations. Additional tests have defined the SG of the individual mineralized lithologies, enabling more accurate mass determinations and reconciliations.

A review of historical performance indicates the plant can run at a steady state throughput rate of 1,290 short tons per hour (st/h), an average daily rate of 28,500 st/d, and it has a demonstrated maximum capacity of 38,000 st/d.

The plant is expected to operate at 92% availability, recover between 85.3% and 92.5% of molybdenum contained in the ore and deliver concentrate at a molybdenum grade range of 52.3% to 59.3%.

Prior to full-scale production, a restart preparation period will be required to bring the concentrator from its current care and maintenance state to a fully operational state. Where necessary, new replacement equipment will be installed, or existing equipment and circuits will be refurbished prior to plant restart.

Processing operations at TCM began in 1983 and have since produced saleable high-grade molybdenum concentrates at recoveries of 90% Mo or better. TCM utilizes a conventional process flowsheet similar to other primary molybdenum producers.

Historical production of the TCM processing plant is shown in Table 1-4.

Table 1-4 TCM processing plant throughout statistics

| Year | Reported days | Annual (dry Mst/y) | Average (dry st/d) | Median (dry st/d) | Maximum (dry st/d) | Std dev (dry st/d) |
|---|---|---|---|---|---|---|
| 2008 | 362 | 10.1 | 27,855 | 29,135 | 35,103 | 4,917 |
| 2009 | 272 | 7.7 | 27,908 | 28,838 | 35,158 | 4,637 |
| 2010 | 359 | 10.3 | 28,123 | 30,039 | 38,897 | 6,946 |
| 2011 | 364 | 10.4 | 28,570 | 29,615 | 38,622 | 6,699 |
| 2012 | 366 | 10.3 | 28,090 | 29,442 | 38,356 | 6,145 |
| 2013 | 184 | 5.0 | 27,184 | 29,796 | 35,658 | 6,989 |
| 2014 | 212 | 5.6 | 26,451 | 28,264 | 32,846 | 5,228 |

Based on the maximum daily throughput values tabled above, the mill has processed up to 38,000 st/d. For more sustained daily throughput, the median daily values indicate approximately 29,000 st/d, adequate for the planned average throughput rate of 28,500 st/d or 10.4 Mst/y. Based on the 2012 availability records, and planned refurbishments, it is expected that the TCM concentrator will be able to achieve 92% availability.

A comprehensive inspection of the 60-inch x 89-inch, 600 hp gyratory crusher was completed in 2023, and a course of actions was recommended to upgrade the crusher for reliable and stable operation. These actions will be completed prior to restart. The gyratory crusher discharge apron feeder was visually inspected, and recommended actions for its refurbishment will also be taken during restart activities.

Crushed ore from the primary crusher is conveyed via two overland conveyors and deposited onto the coarse ore stockpile of five-day capacity upstream of the processing plant. Two process lines reclaim stockpiled ore into dedicated conveyors and SAG mills. Inspections in 2023 resulted in plans to replace idlers, scrapers, and the Conveyor 1 belt.

Each of the two grinding lines (of combined capacity of 1,290 st/h), comprise one 32-ft x 13-ft SAG mill with 8,000 hp installed power and one ball mill operating in closed circuit with two classifying hydrocyclone clusters. Inspections of the grinding circuit resulted in recommended refurbishment actions in advance of startup. New equipment installations include a cyclone pump-box, a particle size analyzer, and a new liner and lifter design for the SAG mills.

Two new banks of rougher flotation cells will be installed of the same specification previously employed. Molybdenum recovery of 94% is expected from the rougher circuit. Rougher tailings will pass through the pyrite removal flotation circuit prior to delivery to the TSF. Rougher concentrate will be reground in closed circuit with cyclones then routed through a first cleaner flotation circuit, then through a series of 60-inch diameter flotation columns for additional molybdenum recovery. The resultant concentrate is screened prior to thickening and delivery to the concentrate leaching process.

The leaching process further improves the grade and quality of the molybdenum concentrate by dissolving impurities such as copper and lead into the leachate at high temperature. The leached molybdenum concentrate is dewatered using filter presses. The filtered molybdenum concentrate cake is collected and conveyed to a Holoflite dryer to reduce the moisture content of the final product before packaging.

A high-performance molybdenum (HPM) circuit is currently in operation, treating custom feeds.

Plant services (such as compressed air, fire water, etc.) required for the restart of the process plant are all existing and are designed for the operation of the facilities at the nameplate production rate of 28,500 st/d. Further, certain plant facilities are certified and/or in current use, specifically around the HPM circuit. No significant changes are forecasted for the required capacities of existing utilities and services at site. Restart of the plant services will require servicing of existing equipment and/or replacement of damaged/inoperable equipment and wear parts.

## 1.10 Mine Infrastructure, including Tailings and Waste Rock Storage

### 1.10.1 Mine Infrastructure

Infrastructure to support the operation of the mine is in place and has been maintained during the care and maintenance period. Capital expenses are required for refurbishing components of the water management system, described in Item 18. A schematic of the water management system is shown in Figure 1-2 and explained fully in Item 18.

### 1.10.2 Waste Rock Storage

Two WRSFs exist at the mine. The Buckskin and Pat Hughes WRSFs are capable of accepting the expected 386 Mst of waste rock to be extracted in the Phase VIII Mine Plan. Plans are in place to cover the piles with non-acid generating (NAG) Type I rock to prevent acid rock drainage (ARD).

### 1.10.3 Tailings Storage

Mine tailings produced at the TCM are stored in the Bruno Creek Tailings Impoundment, which commenced operations in August 1983. Containment of impounded tailings is provided by a cyclone sand dam, which is raised sequentially as a centerline structure. The original TSF design accommodated tailings produced during Phase I through Phase VI of the Mine Plan. Expansion designs have since been completed for Phase VII and Phase VIII. The Phase VIII design received regulatory approval and is intended to accommodate tailings produced during the remaining LOM. Expansion beyond the Phase VIII design would be challenging due to topographic constraints, particularly at the left abutment and along the left groin. Dam crest elevations in units of feet above sea level (ft-asl) and TSF capacities (including both the sand dam and impounded tailings) for different phases in the mine life are provided in Table 1-5.

**Table 1-5 TSF information**

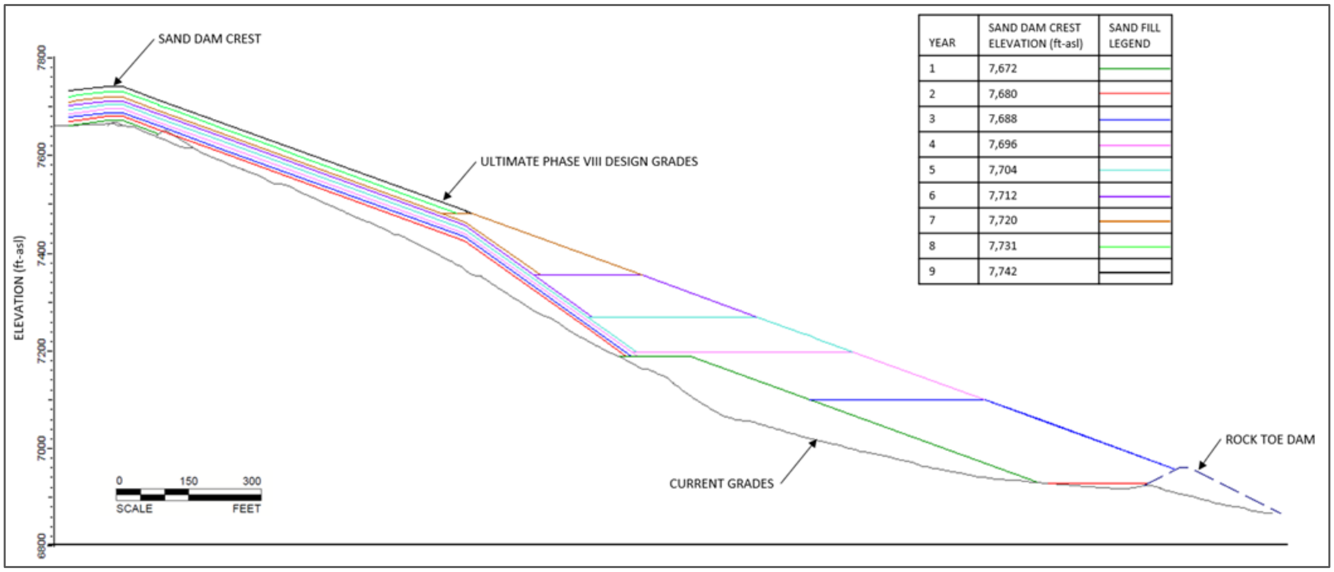
| Design timeframe | Date range | Dam crest elevation (ft-asl) | Incremental capacity (Mst) | Cumulative capacity (Mst) |
|---|---|---|---|---|
| Design for Phases I through VI | 1983 to 2009 | Up to 7,600 | 200 | 200 |
| Design for Phase VII | 2009 to 2013 | Up to 7,646 | 34 | 234 |
| Design for Phase VIII, to date | 2013 to 2014 | Up to 7,660 | 6 | 240 |
| Design for Phase VIII, remaining | Future | Up to 7,742 | 94 [1] | 334 [1] |

Note: [1] The capacity for the remainder of Phase VIII corresponds to pre-reclamation conditions. Additional tailings will be used to help reach closure grades across the impoundment surface. The amount of additional tailings needed to reach closure grades is subject to adjustment but is currently estimated at 30 Mst based on the conceptual closure plan.

Continued raising of the sand dam after mill restart will require increased on-specification sand recovery from tailings cyclone operations to produce sufficient volumes of dam construction material.

At the start of the current temporary shutdown, there existed a sand deficit from previous operations, totaling approximately 7.5 Mst (Golder, 2015b), which has left some areas lower in elevation and steeper than intended (Figure 1-1). To help recover from this shortfall, and to enable improved future operations, a fixed cyclone station was constructed above the right abutment of the sand dam in 2012. An assessment is currently underway to evaluate potential improvements to the existing cyclone and tailings distribution systems that would increase on-specification sand recovery and enable delivery of cyclone sand to locations downslope from the dam crest so that the existing deficit can be eliminated as quickly as feasible after mill restart.

**Figure 1-1 Cyclone sand placement sequence by year**

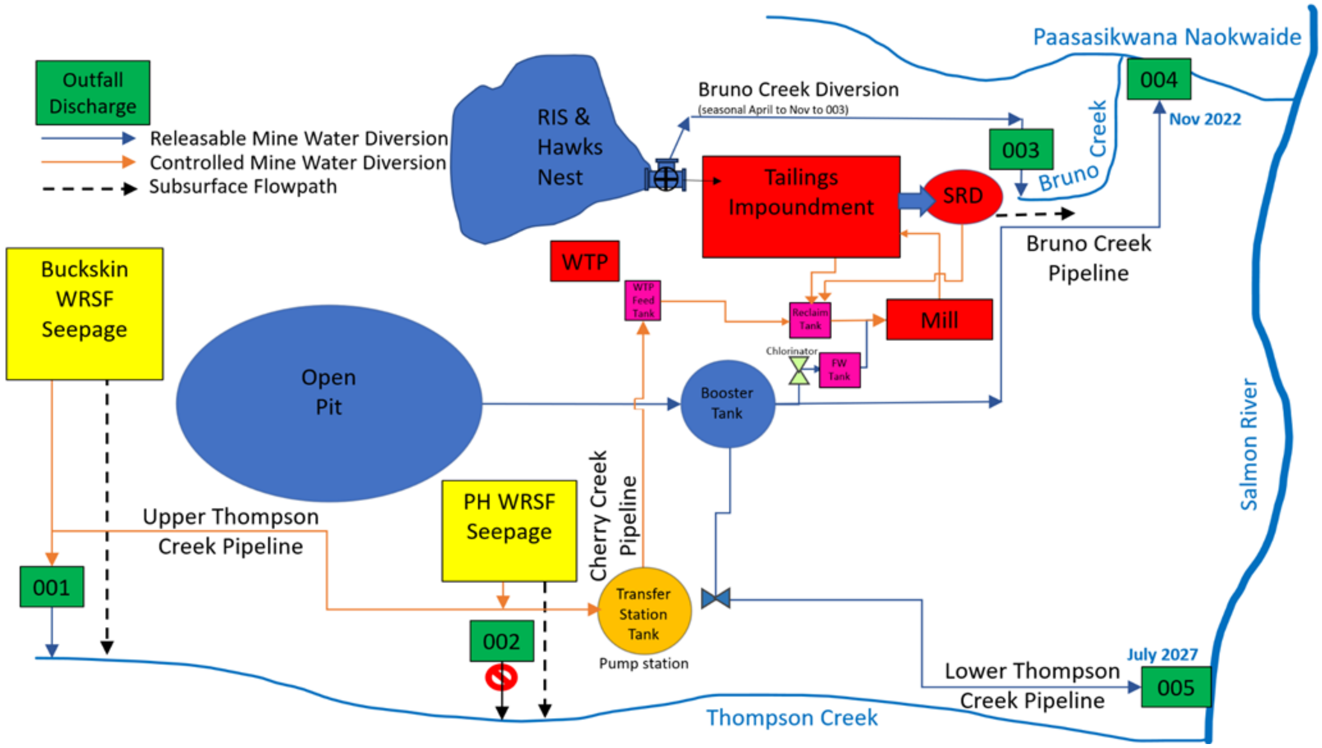


The TSF has sufficient capacity to accept the deposition of 94 Mt of tailings to reach the ultimate design grades, plus additional capacity for excess tailings to help reach closure grades across the impoundment surface.

### 1.10.4 Water Management

A site-wide water balance GoldSim model (WBM) was developed to inform LOM water management decision-making for specific phases of the project, including pit dewatering and operations. The WBM is informed by previous work conducted in support of the restart project (Lorax, 2022) and the Phase VIII Environmental Impact Statement (EIS) (Lorax, 2011a) and is calibrated to site-specific monitoring data from operations as well as long-term regional climate and hydrometric datasets. The WBM integrates physical and catchment-scale processes for all mine facilities, including an open pit, two mine rock storage facilities, a TSF, mill, and associated water management and conveyance infrastructure.

**Figure 1-2 Water management layout schematic – operations and milling phase**



Water discharges to receiving streams are constrained by site infrastructure capacity limitations and approved, flow-based, discharge permit limits specified by the Idaho Pollutant Discharge Elimination System (IPDES), which are built into the WBM logic. The WBM includes flow, precipitation, and evaporation inputs for a 23-year period of record and operates on a daily time step.

The WBM evaluated a range of project phases, including dewatering of the pit prior to milling and operations through the LOM once processing has commenced and after the pit has been dewatered. Following the end of mining operations, the time for the pit to flood was assessed.

The Base Case dewatering scenario demonstrated that the pit can be dewatered in approximately 3.3 years to 5.2 years (median result of 3.7 years) following the restart of milling. If the dewatering period coincides with successive wet years, additional discharge capacity may be required to dewater the pit to the current pit base (floor) ahead of advancing the south highwall below 6,360 ft-asl by 2032. The likelihood of this outcome is considered low because of the conservatism built into the WBM (i.e. overestimation of modelled pit inflows based on a comparison of simulated versus measured pit water levels [Lorax, 2024a]).

The Base Case operations scenario outcomes identified additional mill make-up water demands consistent with historical operations (e.g. from the Salmon River). Noted model sensitivities to climate and modelled groundwater inflow rates identified potential surge storage demand which can be accommodated in the pit, consistent with historical operations.

Post-closure model simulations suggest the pit will require on the order of 60 years to fill to the final managed water elevation of 7,030 ft-asl. Additional recommendations pertaining to water quantity and water quality management as the project advances through detailed design are provided.

## 1.11 Environmental, Social and Permitting

The TCM is located within the mountainous terrain of Custer County, south central Idaho, bounded by Thompson Creek to the west and south and Paasasikwana Naokwaide to the east. Steep mountainous terrain bounds the project area to the north and divides the Thompson and Paasasikwana Naokwaide drainages. Thompson and Paasasikwana Naokwaide flow into the Salmon River approximately 4 miles south of the project.

The site has undergone no significant change to the area of disturbance since 2015. A Modified Mine Plan of Operations consistent with the ROD (BLM, 2015) (MMPO), was accepted in early 2022 which detailed the Phase VIII operations: expansion of the open pit, and expansion of the WRSFs and TSF. The additional surface disturbance from Phase VIII will be on approximately 120 acres of TCM land, 200 acres of Bureau of Land Management (BLM) administered land, and 185 acres of United States Forest Service (USFS) land. The Phase VIII Reclamation Plan and Cost Estimate was accepted in May 2023, allowing initiation of Phase VIII early works activities in November 2023. In December 2023, TCM submitted a MMPO for the Thompson Creek Phase VIII Mine Plan of Operations to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback acreage subject to a minor update to the reclamation plan.

Site operations are overseen by four government agencies:

- Idaho Department of Lands (IDL)
- Idaho Department of Water Resources (IDWR)
- BLM
- USFS.

TCM operates under the following permits, licenses, and limits.

- Plan of Operation (POO) Permit
- Water Rights
- A Section 404 Permit under the Clean Water Act
- Idaho Pollutant Discharge Elimination System Discharge Permit

- Air Quality Permit

Impacted site water includes seepage from beneath the Pat Hughes and Buckskin WRSFs and tailings underdrain water. All the impacted water is pumped in existing pipelines to the existing water treatment plant via the Thompson Creek Pipeline/Cherry Creek pump station (for the Pat Hughes/Buckskin water) and the SRD pump station (for the tailings drain water). The treatment plant provides lime neutralization, clarification, and filtration at 8 µm prior to consumptive use at site (pump gland seal, heat exchange, milling/grinding, leach circuits, etc.). Impacted water in surplus to consumptive use is accumulated in the pit.

Solid waste is disposed at the TCM landfill, which is permitted through the District Seven Health Department as a private disposal facility for solid waste generated at the mine and mill.

Since 1997, the Consolidated Environmental Monitoring Program has been in continuous operation incorporating monitoring requirements to address various operational and regulatory changes, including potential for ARD, changes in status of threatened and endangered species protection, and new National Pollutants Discharge Elimination System (NDPES) discharge points. The current Consolidated Environmental Monitoring Program is composed of: Biological Monitoring, Air Emission Compliance Monitoring, Discharge Permit Monitoring, Structural and Dam Safety Monitoring, Water Quality Monitoring and Data Validation, Mine Waste Monitoring, Formal Reporting of Environmental Monitoring Program Data and Analyses, and Water Quantity Monitoring.

Water quality management and environmental monitoring are reported in seven annual monitoring reports issued by TCM:

- Best Management Practices Plan (to USEPA and IDEQ) – annually
- Environmental and Reclamation Activities Report (to IATF) – annually
- Water Quality Report (to IDEQ and IATF) – annually
- Aquatic Biological Conditions Report (to IATF) – annually
- Waste Rock Dump Report (to IATF) – annually
- Sediment Report (to IATF) – annually
- Tailings Impoundment Operation and Dam Safety Monitoring Report (to IDWR, Dam Safety and IATF) – annually.

The mine disturbance is not impacting private or tribal lands, nor would the Phase VIII expansion. Concern from conservation groups and the Nez Perce tribe have been focused on protection of water quality in the streams near the site that are tributary to the Salmon River. No other social or community requirements have been identified that will affect the implementation of the Phase VIII expansion, and TCM continues to work with the IATF and other stakeholders to address input and concerns on a regular basis.

## 1.12 Market Studies and Contracts

The Phase VIII mine plan is expected to produce a similar molybdenite concentrate to that produced by TCM in seven operating phases dating back to 1983.

Molybdenite concentrates are sold globally by producing mines under both contract and spot terms. Pricing for contract arrangements is typically determined by reference to specified published prices during the applicable quotation periods, less any discounts in line with industry standards depending on the quality of the concentrate. No contractual commercial or agency arrangements for TCM molybdenite concentrates are in place currently.

## 1.13 Capital and Operating Cost Estimates

The total LOM costs are estimated at $2.2 billion, including $0.5 billion in capital expenditures, which comprises upfront pre-stripping costs, equipment upgrades and replacements, and site facility equipment, and $1.7 billion in operating costs. Operating costs were developed from first principles, considering planned mine physicals, equipment hours, labor projections, consumables forecasts, other expected costs, and historical costs. Operating costs of $1.7 billion include all of stripping costs incurred during the production phase prior to the allocation of capital of $0.2 billion. The LOM production cost per molybdenum pound sold is estimated at $9.66 and all-in sustaining cost per molybdenum pound sold is estimated at $12.46. All-in sustaining cost per molybdenum pound sold is a non-GAAP mesure defined by the Company.

## 1.14 Economic Analysis

Total LOM undiscounted after-tax cash flows are estimated at $491 million. The after-tax net present value (NPV) of the LOM cash flows, at a discount rate of 8%, is $185 million. The project is most sensitive to the molybdenum ore head grade, with capital costs being the least sensitive parameter.

## 1.15 Interpretations and Conclusions

Exclusive of Mineral Reserves, the Mineral Resources at Thompson Creek are comprising 5.5 million short tons of Measured Resources grading 0.059% Mo, 49.8 million short tons of Indicated Resources grading 0.057% Mo, and 11.6 million short tons of Inferred Resources grading 0.072% Mo.

The QP is confident in the classifications of the Mineral Resources and the estimated metal contained in the defined mineral deposit.

The TCM is a viable open pit mining operation with a history of profitable mining and the Mineral Reserves can be profitably mined. The QP has included a Mineral Reserves statement in this report for the remaining mine life.

The existing mining fleet is appropriate for the planned mining rates for waste rock and ore. Some new equipment will augment refurbished vehicles to ensure production schedules can be met.

Upon restart, the TCM plant will process mineralized material from the same deposit as previously mined. Metallurgical testwork has confirmed recovery of molybdenum will be consistent with historical operations. Additional tests have defined the SG of the individual mineralized lithologies, enabling more accurate mass determinations and reconciliations.

A review of historical performance indicates the plant can run at a steady state throughput rate of 1,290 st/h, an average daily rate of 28,500 st/d and has a demonstrated maximum capacity of 38,000 st/d.

The plant is expected to operate at 92.0% availability, recover between 85.93% and 92.5% of molybdenum contained in the ore, and deliver concentrate at a molybdenum grade range of 52.3% to 59.3%.

The QP concludes that the TCM processing plant has shown it can handle throughput rates and mineral recovery effectively. However, certain equipment and components require refurbishment, as some had minimal to no use over the past decade. Assuming ore feed remains consistent with historical patterns, the plant is anticipated to meet its performance targets following refurbishment, recommissioning, and ramp-up.

The two WRSFs are engineered structures designed for stability and to prevent the development of acidic water and runoff. A plan is in place to cover the piles with NAG Type I volcanic rock as a preventive measure after the cessation of mining.

The Phase VIII design for the TSF has received regulatory approval and is intended to accommodate tailings produced during the remaining LOM. The TSF has sufficient capacity remaining for 94 million tons of tailings to reach the ultimate design grades, plus additional capacity for excess tailings to help reach closure grades across the impoundment surface.

Continued raising of the sand dam after mill restart will require increased on-specification sand recovery from tailings cyclone operations to produce sufficient volumes of dam construction material.

Modelling results indicate that the water elevation in the pit will require approximately 3.3 to 5.2 years following the start of processing to be drawn down to the current base (floor) of the pit. Approximately one million $ft^3$ (7.5 million US gallons) of residual pit water will be retained in the pit sump following dewatering.

Early in the mine operation, water balance model results indicate sensitivity to variable climate and uncertainty with respect to groundwater inflows to the pit (Lorax, 2024b). Under water surplus conditions, the water balance model indicates that water will accumulate in the pit during spring runoff, consistent with previous operations.

Later in the mine life, under water surplus conditions, excess water that cannot be managed through infrastructure limitations on permitted discharges (i.e. outfalls 004 and 005) may require temporary storage in the pit which could impact the timing for ore extraction from the base of the pit.

The post-closure pit flooding scenario assumes that the final managed water elevation in the pit will be 7,030 ft-asl to prevent water from discharging through the historical adit in the pit highwall at 7,040 ft-asl (Lorax, 2011h). Up to the managed water elevation, the storage volume in the EOM pit is estimated at ~3,570 million ft$^3$ (26.7 billion US gallons). Post-closure scenario model results indicate that the median duration for the pit to flood to the final managed elevation (7,030 ft-amsl) is on the order of 60 years.

A study has indicated that post-closure water treatment will require new water treatment equipment including a lime addition system, coagulant and flocculant equipment, reaction tank(s), a clarifier, a filter, and appurtenant process and control equipment.

The capital cost of post-closure water treatment infrastructure is estimated as follows:

- Pit Infilling Phase, Years 1–5 (existing infrastructure maintenance only) – $91,000
- Water Treatment Phase, Year 31 (new water treatment plant, piping, and pump station) – $7.02 million
- Water Treatment Phase – 50-year replacement of treatment plant – $6.48 million.

The estimated annual operational cost summary is estimated as follows:

- Pit flooding, Year 1: $427,000 per year
- Pit flooding, Years 2–15: $422,000 per year
- Pit flooding, Years 16–30: $953,000 per year
- Water treatment, Years 31 forward: $1.66 million per year.

Initial capital investment of $390 million has been estimated to return the TCM to operation. Total capital for the LOM is $464 million. Operating costs are estimated to average $13.98/st milled over the 16-year LOM.

The economic analysis based on the results of the feasibility study indicate a positive net cash flow and positive after-tax NPV$_{8\%}$ of $191 million. The mine is most sensitive to variations in molybdenum head grade and secondarily to fluctuations in the price of molybdenum.

## 1.16 Risks and Opportunities

A comprehensive discussion of risks and opportunities is provided in Item 25, the major risks and opportunities are:

- Mineral Resources may be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socioeconomic, and other factors. Further infill and exploration drilling may result in increases or decreases in subsequent Mineral Resource estimates.
- An opportunity may exist to utilize the SAG mill motors more fully with improvements in lifter, grate, or pulp discharge design.
- There is minimal risk to the operation of the plant according to its design, based on its prior performance. Past performance has been as much as 33% higher than the planned throughput rate, therefore there is the opportunity to increase the average annual processing rate.

- The new Pyrite Removal circuit design includes a newer unit operation type compared to the older technology used previously. The planned new unit operation is proven technology and presents minimal risk. There is opportunity for more stable operation of the Pyrite Removal Circuit.
- Portions of the downstream face of the TSF dam are steeper than stipulated in the design as a result of a deposition shortfall during previous operations. Regulatory authorities are aware of the situation and may demand faster mitigation.
- Also, the variation from the TSF design from historical operations results in reduced seismic stability for the structure, which increases instability risk in the event of a large earthquake and would not conform to dam design standards if left in its present state.
- There is an opportunity to operate the dam construction cyclone for longer periods of the year, increasing sand volumes and correcting the dam profile sooner.
- Discharging pit water via the permitted outfall 005 (Salmon River) will be required to dewater the pit and has been assumed to commence by July 2027 at rates up to 1,000 gal/min. Operation of the 005 outfall will require the twinning of the Cherry Creek Pipeline from the booster tank to the Thompson Creek Pipeline. Infrastructure design, construction, and commissioning requirements will need to be detailed prior to discharging water via outfall 005.
- Periodic (seasonal) operation of outfalls 004 and 005 may be necessary during mill operations to address excess water associated with active pit dewatering or adverse climate conditions which would result in higher volumes through the water treatment plant prior to discharge.
- Once dewatered, the pit provides a critical reservoir to manage surge storage of water during operations which may impact pit bench development in the later stages of mine life.
- The mine is constructed and therefore is exposed to minimal risk of variation in capital cost. Operating costs in the State of Idaho are largely known and predictable, with the largest risks being labor and energy cost escalations.
- Cash flow is most sensitive to head grade, indicating an opportunity to implement stringent grade control in the mine operations and optimize feedstock to the processing plant for maximum profitability.

## 1.17 Recommendations

The following recommendations are made with respect to mining and rock stability:

- Evaluate the site prior to closure for “design for closure” opportunities that may reduce the closure liability for the property.
- Conduct geotechnical core drilling in upper portions of the slope in design sectors N2c and N3 to support sub-domaining of the Challis Volcanics unit.
- Conduct geotechnical core drilling in the N4 design sector to verify structural and rock quality at the toe of the LOM slope.
- Conduct a hydrogeologic testing campaign to measure aquifer properties.

- Construct a pit-scale FEFLOW groundwater model to confirm if the slope depressurization targets can be met with horizontal drains.
- Incorporate budget contingency for slope monitoring and management. Monitoring equipment should include prisms, an automated total station, and a slope stability radar, at a minimum.

Recommendations pertaining to the Mill include:

- Additional work is recommended to advance the design of the new Pyrite Removal Circuit and integration with the existing layout.
- Additional work is recommended to plan and execute the refurbishment or replacement of equipment as identified, as well as identification and removal of legacy piping and systems no longer in use.

Recommendations pertaining to the TSF include:

- Upgrades to the sand distribution infrastructure and changes to historical practices are recommended to deliver sand to areas lower on the dam face and to deposit it in paddocks. Sand deposition near the dam toe should be prioritized in the first three years after mill restart to address the existing sand deficit and enhance dam stability as quickly as feasible.
- Replacement of the shore-mounted water reclaim pumps with barge-mounted pumps is recommended for improved operability.
- Installation of additional piezometers, slope inclinometers, and thermistor arrays is recommended to augment the current monitoring infrastructure in preparation for mill restart.
- TSF-related construction activities that should be completed prior to mill restart include installation of new subdrain systems, raising of the rock-toe dam, and construction of new tailings overflow ponds and a new sediment interceptor pond.
- Accumulated sediment should be removed from the seepage return pond prior to mill restart.

Uncertainties regarding water quality to be addressed prior to operations restart include the following:

- Periodic surveys and water sampling of the flooded pit profile are recommended to confirm water quality parameters are within discharge limits.
- Excess pit water sources should be managed through the water treatment plant prior to discharge.
- Seepage collection systems and associated groundwater cut-off walls and connections to seepage collection pipelines should be maintained in the Pat Hughes and Buckskin Creek drainages to minimize contaminant loadings to Thompson Creek via groundwater pathways.

# 2 INTRODUCTION

This Technical Report, which was prepared by and for Centerra Gold Inc. (Centerra), the 100% owner of Thompson Creek Metals Company Inc. (TCMC), summarizes the current and planned operations and the Mineral Reserves and Mineral Resources for the Thompson Creek Molybdenum Mine. The purpose of this report is to review and document the current Mineral Resource and Mineral Reserve estimates, which have been updated since the filing of the previous Technical Report (Marek and Lechner, 2011). This Technical Report has been prepared according to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) and following Form NI 43-101F1.

The Thompson Creek Mine (TCM) is an open pit molybdenum mine and concentrator located near Challis, Idaho, USA. The operation consists of an open pit mine, ore crusher, overland conveyer system, concentrator, and tailings storage facility (TSF) including the containment dam. Associated infrastructure includes water pumping systems, electrical transmission lines, support facilities (offices, maintenance shops and warehouse), and access roads.

Open pit mining commenced in 1983 and was conducted in several phases, culminating with Phase VII in 2014. The mine was placed on care and maintenance in December 2014, and the open pit was allowed to flood with meteoric inputs and runoff from the surrounding disturbed areas as well as collected seepage from the Buckskin and Pat Hughes Waste Rock Storage Facilities (WRSFs).

A Modified Mining Plan of Operations (MMPO) was proposed in 2008 in support of Phase VIII expansion. An Environmental Impact Statement (EIS) per the National Environmental Policy Act (NEPA) was conducted to evaluate the potential environmental effects of the proposed MMPO. A positive Record of Decision (ROD) was issued by the Bureau of Land Management (BLM) in August 2016. TCM received approvals for the submitted 2021 MMPO in March of 2022 in line with the Phase VIII Mine Plan. In December 2023, TCM submitted a MMPO for the Thompson Creek Phase VIII Mine Plan of Operations to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback subject to a minor update to the reclamation plan.

TCMC has evaluated an optimized mine plan to restart the mine and continue development of the open pit. Approximately 28,500 tons per day (25,855 tonnes per day) of ore would be processed through the existing, refurbished processing facilities.

Material mined from the Thompson Creek open pit will be processed on site using the existing crushing circuit, mill, and concentrator. Molybdenite concentrate and high-performance molybdenum (HPM) products will be produced and shipped by truck, either directly to customers or to the refinery owned by TCMC in Langeloth, Pennsylvania. At Langeloth, the molybdenite will be processed to make molybdenum trioxide ($MoO_3$) and other products for sale to various customers.

## 2.1 Sources of Information

This Technical Report is based on published material and data, professional opinions, and unpublished materials available to TCMC, or prepared by its employees, or consultants. In addition, certain information used to support this Technical Report was derived from previous technical reports on the

TCM and from reports and documents listed in Item 27 (References). Other sources of data include geologic and block model reports, drillhole assay data, the block model, mine plans, geotechnical assessments, cost estimates, and economic models that were prepared by consultants of TCMC.

## 2.2 Contributing Persons and Site Inspections

This Technical Report has been prepared by the persons listed in Table 2-1, each of whom is a Qualified Person (QP), as defined by NI 43-101, and has provided a QP certificate. All QPs have visited the TCM.

Other TCMC or Centerra employees compiled certain sections of this Technical Report under the supervision of those identified in Table 2-1. These employees are experienced technical and accounting/finance professionals in their respective areas of expertise.

**Table 2-1 Qualified Persons and Responsibilities**

| Qualified Person | Company | Primary area(s) of responsibility | Technical Report items authored |
|---|---|---|---|
| Lars Weiershäuser<br>(Geologist) | Centerra | Geology, exploration, drilling, and Mineral Resource estimate | • Items 6, 7, 8, 9, 10, 11, and 14<br>• Parts of Items 1, 12, 25, and 26 |
| Jean Francois St-Onge<br>(Mining Engineer) | Centerra | Property description, mining methods, mineral reserves, operating and capital costs | • Items 2, 3, 4, 5, 15, 16 (except 16.2), 18.1, 19, 20 and 22<br>• Parts of Items 1, 12, 21, 25, and 26 |
| Robert Pratt<br>(P.E) | Call & Nicholas, Inc. | Geotechnical pit slopes and WRSS | • Item 16.2<br>• Parts of Items 1, 12, 25, and 26 |
| Hank Wong<br>(Metallurgist) | AtkinsRéalis | Mineral processing and metallurgy; operating costs | • Items 13 and 17<br>• Parts of 1, 12, 21, 25, and 26 |
| Christopher Graves<br>(P.Eng) | Hatch | Capital costs for plant refurbishment | • Parts of 21 |
| Justin Stockwell<br>(Senior Hydrogeochemist) | Lorax Environmental Services | Hydrology, pit dewatering, and water quality assessment | • Item 18.3<br>• Parts of Items 1, 25, and 26 |
| Jason Obermeyer (P.E.) | WSP USA | TSF | • Item 18.2<br>• Parts of Items 1, 12, 25 and 26 |

Standard professional procedures have been followed in preparing the contents of this Technical Report. Data used in this Technical Report have been verified, where possible, and all data are considered to have been collected following industry best practices.

## 2.3 List of Abbreviations

Units of measurement used in this report conform to the Imperial system unless otherwise indicated. All currency in this report is US dollars (US$) unless otherwise noted.

**Table 2-2 Abbreviations and units of measurement**

| Abbreviation/Unit | Description |
|---|---|
| ° | degrees |
| °C | degrees Celsius |
| °F | degrees Fahrenheit |
| µg | micrograms |
| µm | micrometers |
| 1D, 2D, 3D | one-dimensional, two-dimensional, three-dimensional |
| a | annum |
| A | ampere |
| ABA | acid base accounting |
| AL | Atterberg Limits |
| ANFO | ammonium nitrate and fuel oil |
| ARD | acid rock drainage |
| BaseMetLab | Base Metallurgical Laboratories Ltd |
| BDT | Brazilian Disk Tension |
| BLM | Bureau of Land Management |
| Centerra | Centerra Gold Inc. |
| cfs | cubic feet per second |
| CIM | Canadian Institute of Mining, Metallurgy and Petroleum |
| cm | centimeters |
| $cm^2$ | square centimeters |
| CMS | Chemical and Mineralogical Services |
| CNI | Call & Nicholas, Inc. |
| Cu | copper |
| CV | coefficient of variation |
| CYMET | Cyprus Metallurgical Processes Corp. |
| Cyprus | Cyprus Minerals Corporation |
| d | day |
| DAC | design acceptance criterion |
| DST | direct shear testing |
| EIS | Environmental Impact Statement |
| EOM | end of mine |
| EPA | Environment Protection Agency |
| $FeCl_3$ | ferric chloride |
| FLAC3D | Fast Lagrangrian Analysis of Continuum in Three Dimensions |
| ft | foot |
| ft/s | feet per second |
| $ft^2$ | square foot |

| Abbreviation/Unit | Description |
|---|---|
| $ft^3$ | cubic foot |
| ft-amsl | feet above mean sea level |
| ft-asl | feet above sea level |
| FS | factor(s) of safety |
| G | Giga (billion) |
| G&A | general and administrative |
| gal/min | US gallons per minute |
| Golder | Golder Associates Inc. |
| GPS | global positioning system |
| h | hour |
| ha | hectare(s) |
| Hazen | Hazen Research, Inc. |
| HCl | hydrochloric acid |
| hp | horsepower |
| HPM | high-performance molybdenum |
| IATF | Interagency Task Force |
| ICP-MS | inductively coupled plasma mass spectrometry |
| $ID^2$ | inverse distance squared |
| IDEQ | Idaho Department of Environmental Quality |
| IDF | inflow design flood |
| IDL | Idaho Department of Lands |
| IDWR | Idaho Department of Water Resources |
| IMOA | International Molybdenum Association |
| in | inch(es) |
| $in^2$ | square inch(es) |
| IPDES | Idaho Pollutant Discharge Elimination System |
| ISA | inter-ramp slope angle |
| J | Joule(s) |
| k | kilo (thousand) |
| kg | kilogram(s) |
| km | kilometer(s) |
| $km^2$ | square kilometer(s) |
| kPa | kilopascal |
| kV | kilovolt(s) |
| kVA | kilovolt-amperes |
| kW | kilowatt |
| kWh | kilowatt-hour |
| kWh/st | kilowatt hours per short ton |
| L | liters |
| L/s | liters per second |
| lb | pound(s) |
| LiDAR | light detection and ranging (survey) |
| LIMS | Laboratory Information Management System |

| Abbreviation/Unit | Description |
|---|---|
| LOM | life of mine |
| Lorax | Lorax Environmental Services |
| m | meters |
| M | mega (millions) |
| $m^3/h$ | cubic meters per hour |
| m-asl | meters above sea level |
| Ma | million years |
| MCE | maximum credible earthquake |
| min | minute(s) |
| mm | millimeters |
| MMPO | Modified Mining Plan of Operations |
| Mo | molybdenum |
| $MoS_2$ | molybdenite |
| MPSO | Mine Plan Schedule Optimizer |
| Mst | million short tons |
| Mst/a | million short tons per annum |
| Mst/y | million short tons per year |
| NaCl | salt |
| NAG | non-acid generating |
| NEPA | National Environment Policy Act |
| NI 43-101 | National Instrument 43-101 Standards of Disclosure for Mineral Projects |
| NPDES | National Pollutants Discharge Elimination System |
| NPV | net present value |
| OK | ordinary kriging |
| $P_{80}$ | 80% passing, in association with defined screen size |
| PAG | potentially acid generating |
| PAX | potassium amyl xanthate |
| PMF | probable maximum flood |
| PMP | probable maximum precipitation |
| ppb | parts per billion |
| ppm | parts per million |
| QAQC | quality assurance and quality control |
| QP | Qualified Person |
| QQ | quantile-quantile |
| RF | revenue factor |
| RIS | Runoff Interceptor System |
| RL | relative elevation |
| RMGC | Rocky Mountain Geochemical |
| RMI | Resource Modeling Inc. |
| ROD | Record of Decision |
| ROM | run of mine |
| RPD | relative percent difference |
| RQD | rock quality data |

| Abbreviation/Unit | Description |
|---|---|
| S | sulfur |
| SAB | sag-ball mill (circuit) |
| SAG | semi-autogenous grinding |
| SE | specific energy |
| sec | second |
| SG | specific gravity |
| SHA | seismic hazard assessment |
| Skyline | Skyline Labs |
| SRD | seepage return dam |
| SRF | strength reduction factor |
| SRM | standard reference material |
| st | short ton(s) |
| st/d | short tons per day |
| st/h | short tons per hour |
| std dev | standard deviation |
| TCM | Thompson Creek Mine |
| TCMC | Thompson Creek Metals Company Inc. |
| TCS | triaxial compression strength |
| TSF | tailings storage facility |
| TSS | total suspended solids |
| UCS | unconfined compressive strength |
| US | United States |
| US$ | United States dollar |
| USFS | United States Forest Service |
| USGS | United States Geological Survey |
| VWP | vibrating wire piezometer |
| WBM | water balance model |
| WRSF | waste rock storage facility |
| y | year |
| yd | yard(s) |
| $yd^3$ | cubic yard(s) |

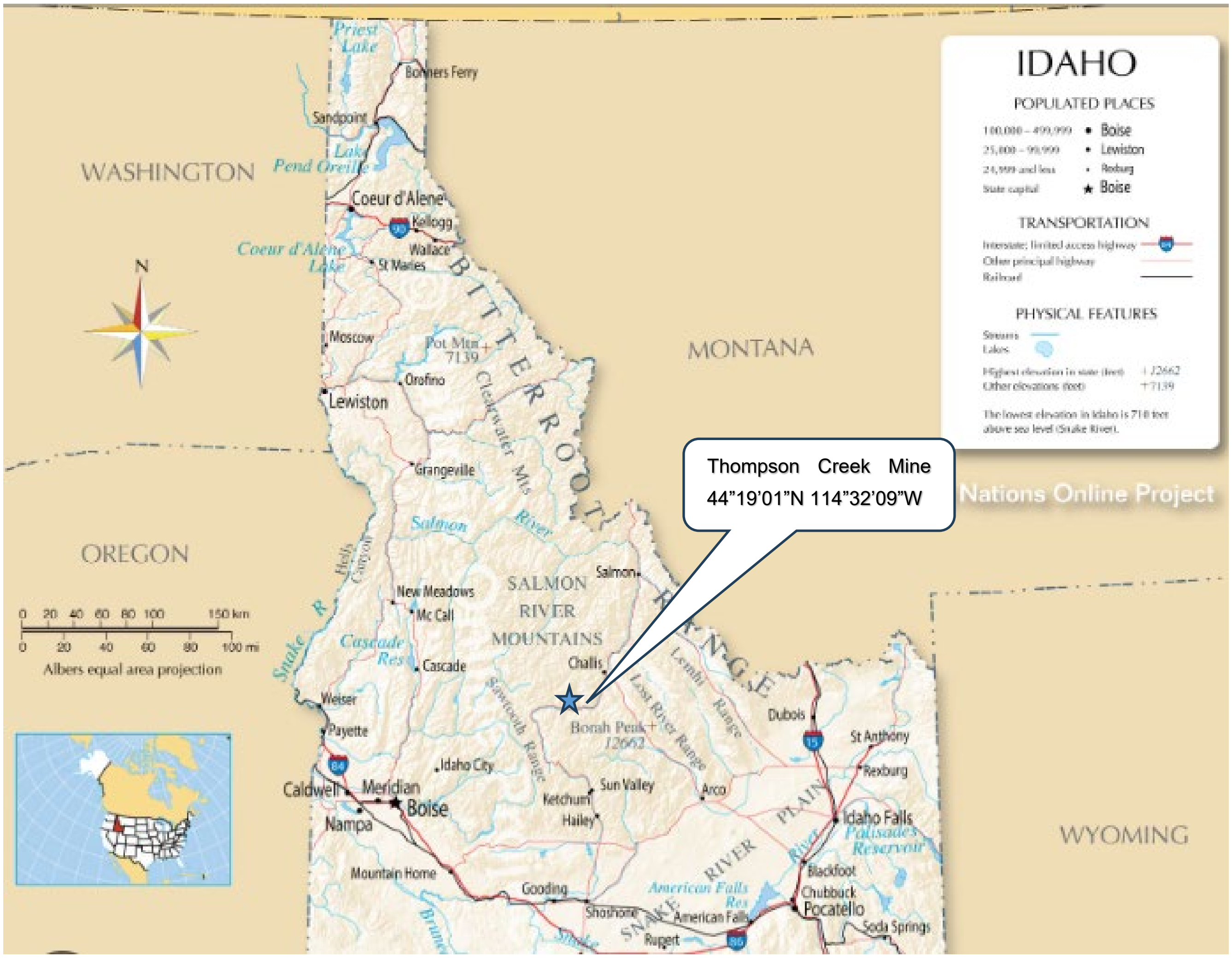
# 3 RELIANCE ON OTHER EXPERTS

The information, conclusions, opinions, and estimates contained herein are based on the work of qualified Centerra employees and consultants. Experts were relied upon to provide advice on many aspects of the mine, operation, and support services.

# 4 PROPERTY DESCRIPTION AND LOCATION

The TCM is located in Custer County in central Idaho, approximately 22 miles southwest of the town of Challis and approximately 9 miles northwest of the town of Clayton (Figure 4-1).

**Figure 4-1 Location map for TCM**



Thompson Creek Mine
44"19'01"N 114"32'09"W

Image: © Nations Online Project

## 4.1 Land Tenure

TCM presently controls a block of contiguous mineral claims that include patented lode claims, placer claims, and mill site claims comprising about 35 square miles of land, or about 22,500 acres. Specifically, the tenement consists of 1,631 patented and unpatented mineral and mill site claims including placer and lode claims. A summary of these claims is shown in Table 4-1; all titles are current and up to date and all claims are in good standing. Ongoing obligations are made to maintain these titles. Local taxes levied on the mine and mill site are also current. TCM reports that each mineral claim has a survey description with it, and that each patented claim is surveyed by a registered surveyor.

**Table 4-1 Thompson Creek Metals Mineral Property Claim List**

| TCM no. | Cyprus no. | Property name | No. of claims |
|---|---|---|---|
| **Patented Lode Mining Claims** | | | |
| II A 1 | 100144 | CM | 11 |
| II A 2 | 100339 | Debit | 2 |
| **Patented Mill Sites** | | | |
| II B 1 | 100239 | MS | 53 |
| II B 2 | 100341 | MS | 426 |
| **Unpatented Lode Mining Claims** | | | |
| II C 1 | 100101 | Buckskin Group | 6 |
| II C 4 | 100104 | NN Claims | 135 |
| II C 5 | 100105 | SW Claims | 104 |
| II C 6 | 100106 | NE Claims | 99 |
| II C 7 | 100107 | TA Claims | 16 |
| II C 8 | 100108 | BK Claims | 10 |
| II C 9 | 100110 | PH Claims | 19 |
| II C 10 | 100111 | NW Claims | 61 |
| II C 11 | 100112 | EE Claims | 86 |
| II C 12 | 100113 | EER Claims | 7 |
| II C 13 | 100114 | BC Claims | 76 |
| II C 14 | 100115 | TS Claims | 59 |
| II C 15 | 100116 | CH Claims | 33 |
| II C 16 | 100117 | CM Claims | 55 |
| II C 17 | 100123 | Peach Claims | 127 |
| II C 18 | | Cinnabar Claims | 5 |
| II C 19 | | EXT Claims | 107 |
| **Unpatented Placer Claims** | | | |
| II D 1 | 100109 | BB Placer Claims | 12 |
| **Unpatented Mill Sites** | | | |
| II E 1 | 100120 | Twin Apex | 3 |
| II E 2 | 100180 | MS | 117 |
| II E 3 | | MS | 2 |

Figure 4-2 and Figure 4-3 show the relationship of the mine to the boundaries of the mineral claims. The open pit, processing plant, and ancillary facilities are included in this area, along with the tailings and waste dumps.

Under United States law, title to these mineral claims does not expire as long as an annual payment is made for each mineral claim. TCM reports that all fees for mineral claims are current. Maintenance buildings are located on private land. Approximately 40% of the claims are on lands of the Challis National Forest, with the remaining 60% are located on lands of the BLM.

**Figure 4-2 Claim map**

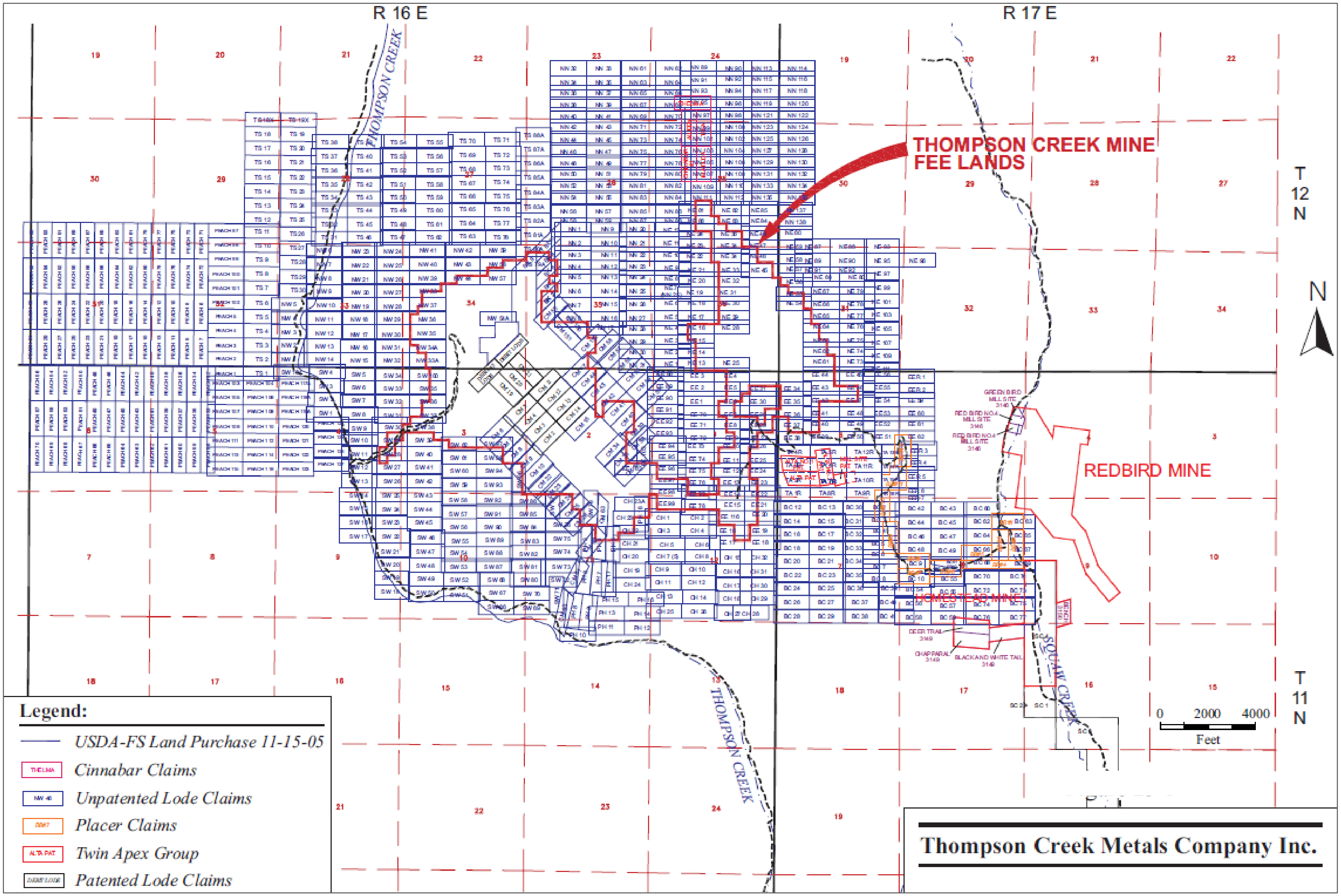
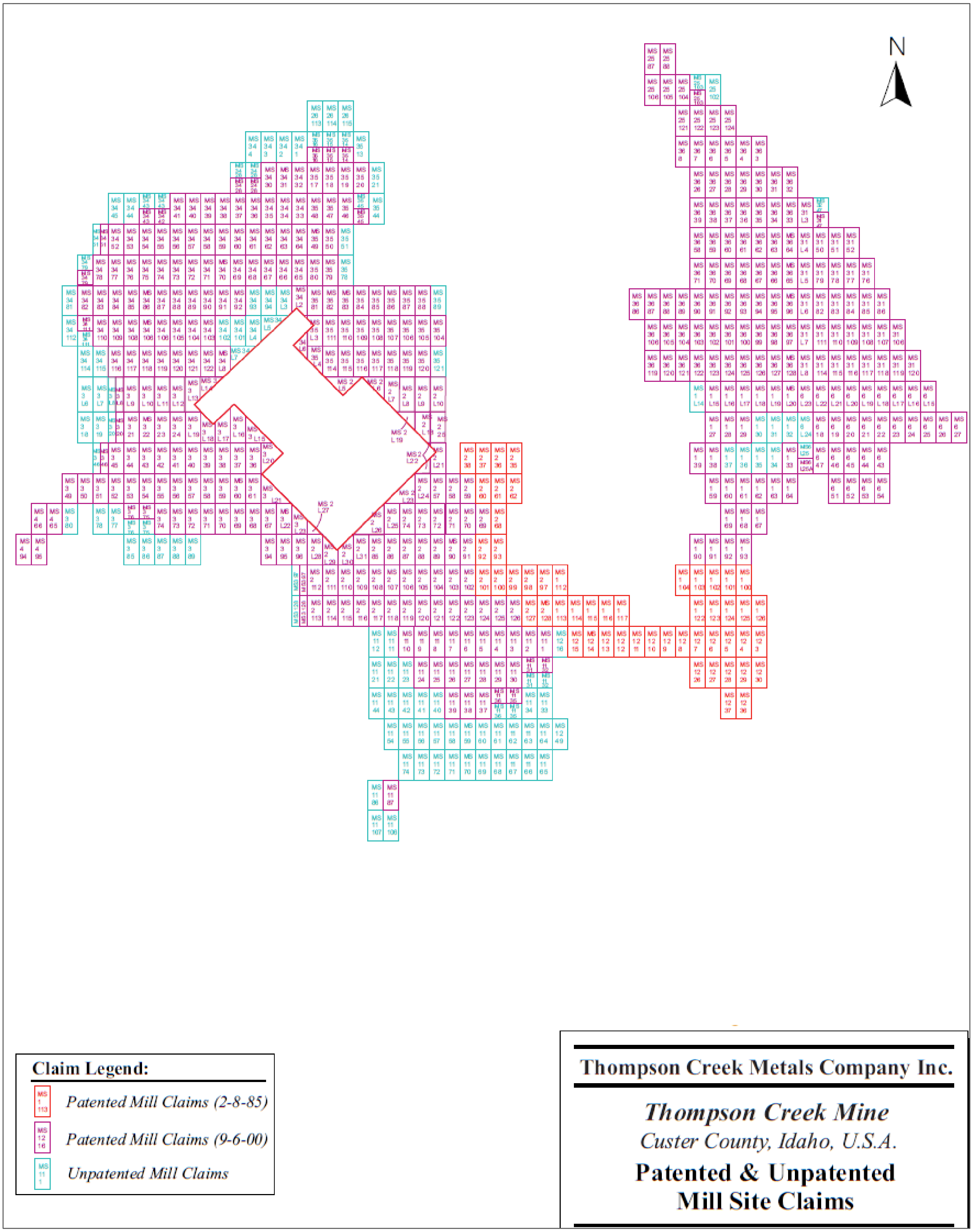


Figure 4-3 Patented and unpatented mill claim sites



## 4.2 Royalties and Streaming Agreements

There are no royalties or streaming agreements.

## 4.3 Permits and Authorization

All required permits and authorization for the TCM are currently in place to mine the Phase VIII Mine Plan, including closure plans and all necessary environmental compliance approvals. Since the receipt of approval for a MMPO in 2024, permits and authorizations include an additional pit highwall layback.

Further details on permits can be found in section 20.

# 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

## 5.1 Access

The property is easily accessible year-round either from Idaho Falls or Boise, both cities within driving distance to the project are serviced by national and international flights. The town of Challis is the closest community to the mine and is most easily reached from Idaho Falls via Highway 20 (Medal of Honor Highway) and from Argo on Highway 93. The drive time is approximately 2.5 hours. Alternatively, Challis can be reached from Boise in approximately 4.5 hours via Interstate 84, Highway 20 to Argo, followed by Highway 93 North towards Challis. A shorter, but slower route (5.5 hours) through the Boise National Forest follows State Route 55 North to Garden Valley and then Idaho State Routes 21 North and 75 North.

From Challis the mine is accessible via Idaho State Route 75 for 30 miles and Saw Creek Road for 9 miles. Both are paved roadways. The mine access road is a well-maintained gravel road, which is accessible year-round.

Figure 4-1 shows the location of the TCM in the State of Idaho.

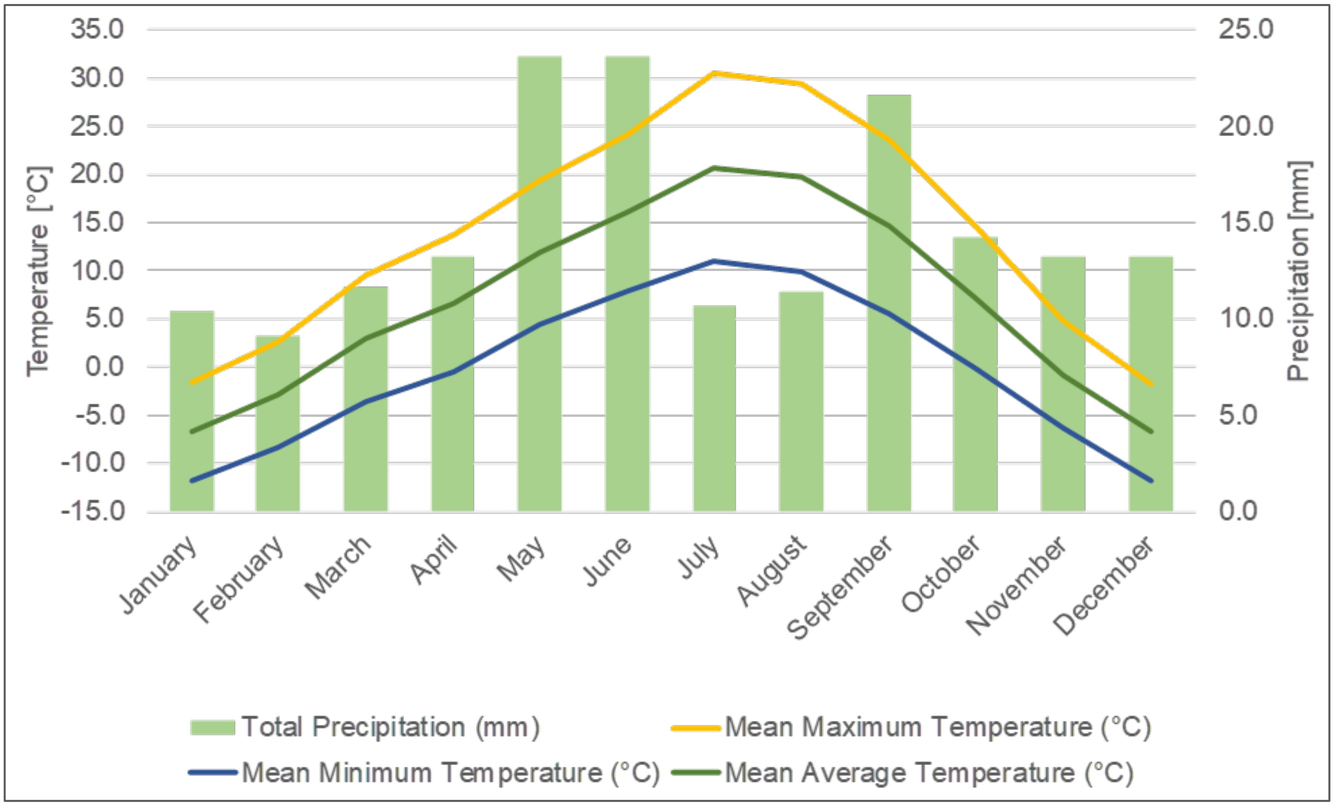
## 5.2 Climate

The climate in Challis is semi-arid (Köppen climate classification BSk) with cold winters, hot summers, and low precipitation throughout the year. Table 5-1 and Figure 5-1 show average monthly temperatures and precipitation for the Challis area.

**Table 5-1 Monthly average climate data from 1991 to 2020 for Challis ID area**

| Month | Precipitation | | Temperature | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total (inches) | Total (mm) | Mean maximum (°F) | Mean maximum (°C) | Mean minimum (°F) | Mean minimum (°C) | Mean average (°F) | Mean average (°C) |
| Jan | 0.41 | 10.4 | 29.2 | -1.6 | 10.7 | -11.8 | 20 | -6.7 |
| Feb | 0.36 | 9.1 | 36.7 | 2.6 | 17.0 | -8.3 | 26.8 | -2.9 |
| Mar | 0.46 | 11.7 | 49.2 | 9.6 | 25.5 | -3.6 | 37.3 | 2.9 |
| Apr | 0.52 | 13.2 | 56.8 | 13.8 | 31.2 | -0.4 | 44.0 | 6.7 |
| May | 0.93 | 23.6 | 66.8 | 19.3 | 40.0 | 4.4 | 53.4 | 11.9 |
| Jun | 0.93 | 23.6 | 75.5 | 24.2 | 46.3 | 7.9 | 60.9 | 16.1 |
| Jul | 0.42 | 10.7 | 86.9 | 30.5 | 51.7 | 10.9 | 69.3 | 20.7 |
| Aug | 0.45 | 11.4 | 84.9 | 29.4 | 49.9 | 9.9 | 67.4 | 19.7 |
| Sep | 0.85 | 21.6 | 74.5 | 23.6 | 42.0 | 5.6 | 58.2 | 14.6 |
| Oct | 0.56 | 14.2 | 58.5 | 14.7 | 31.6 | -0.2 | 45.0 | 7.2 |
| Nov | 0.52 | 13.2 | 40.5 | 4.7 | 20.6 | -6.3 | 30.5 | -0.8 |
| Dec | 0.52 | 13.2 | 28.8 | -1.8 | 10.8 | -11.8 | 19.8 | -6.8 |
| **Annual** | **6.93** | **176.0** | **57.4** | **14.1** | **31.4** | **-0.3** | **44.4** | **6.9** |

**Figure 5-1** **Monthly climate normal (1991 to 2020) – Challis area ID**



With increasing impact from climate change, Idaho is experiencing decreasing winter snowpack and earlier and less plentiful runoff in the spring. This change decreases water availability over the long term and increases the risk of forest and brush fires.

## 5.3 Local Resources and Infrastructure

Mining supplies and services as well as skilled labor are sourced primarily from within Idaho and Nevada. Unskilled labor is available locally; however, the remoteness and low population numbers present some recruitment and retainment challenges.

The infrastructure at the TCM includes:

- A site access road
- Tailings pond and associated sands plant and containment dam
- Process and freshwater ponds
- A crushing plant, overland conveyor, mill, and concentrator
- Laboratory
- Core storage building
- An administrative building, warehouse, dry, infirmary, main garage, and repair shops.

Electric power is provided to the site by Bonneville Power Administration through a 24.7-mile, 230 kV power line to the South Butte substation. A 2.6-mile 69 kV line runs from the South Butte substation to the mill site. Both lines are owned by TCM. Fresh water for the Thompson Creek operations is pumped from the Salmon River or, alternatively, pumped from the existing pit.

Figure 5-2 provides a photographic plan view of the mine.

**Figure 5-2 Satellite view of TCM**

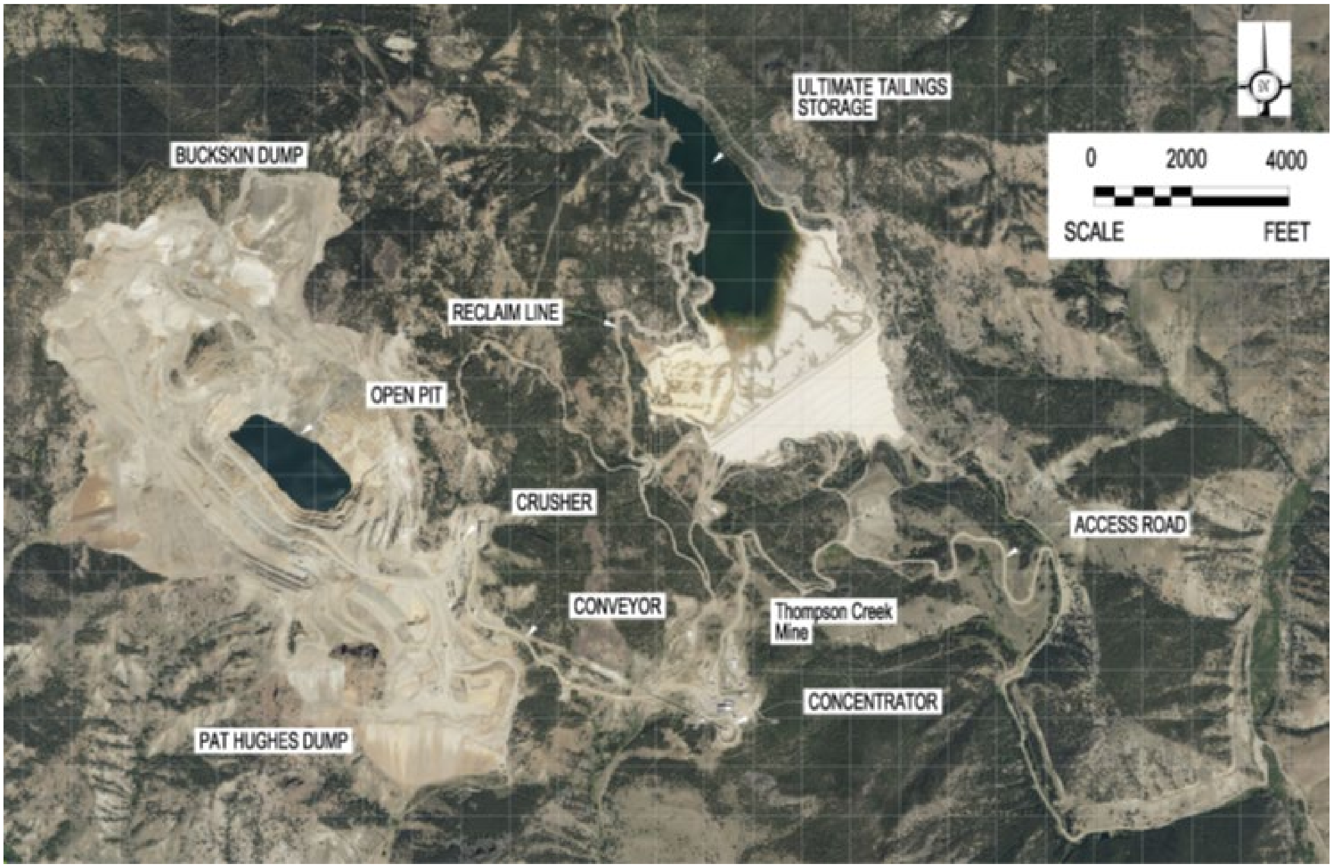
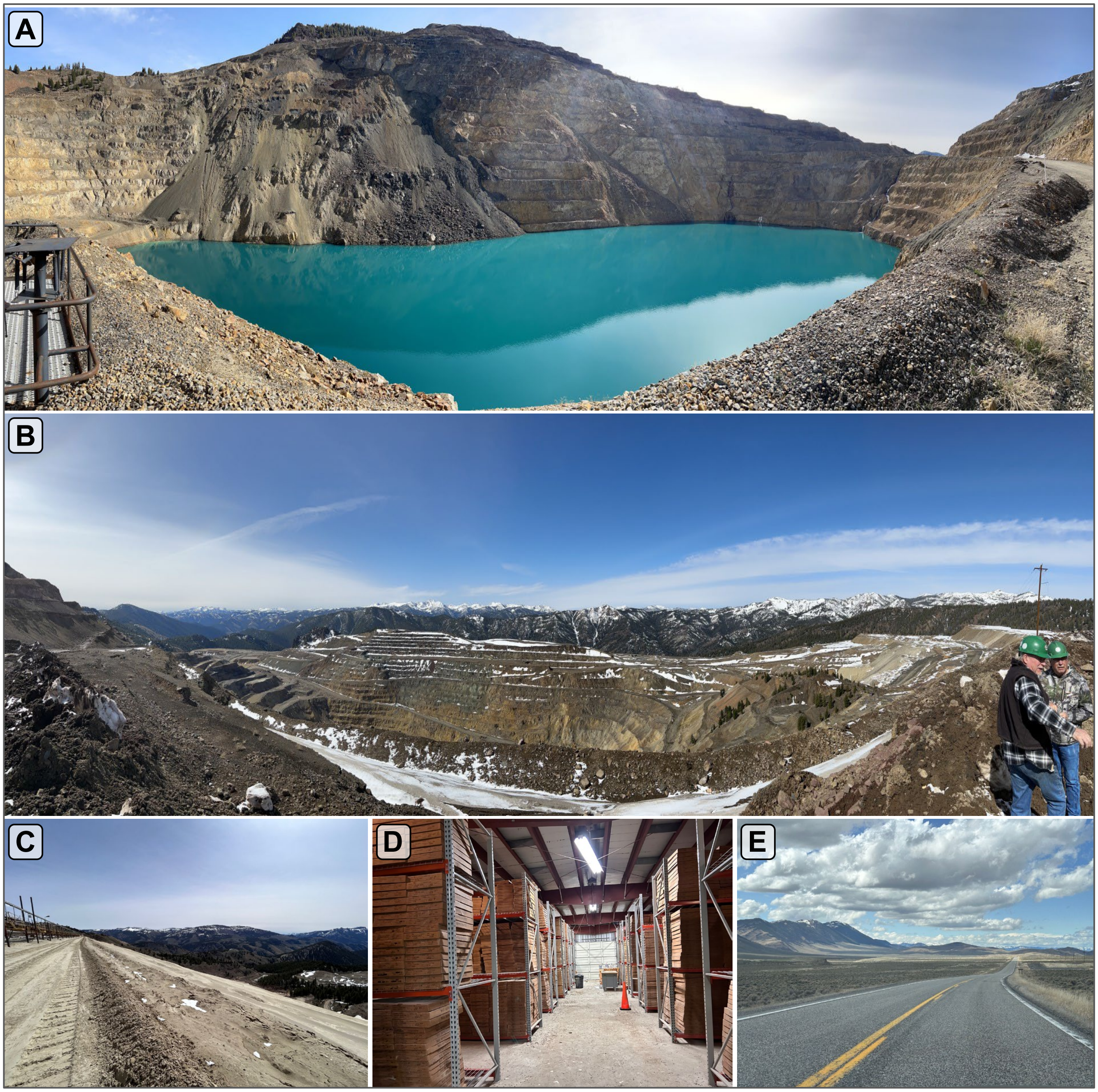


**Image from Google Earth™, 2024**

## 5.4 Physiography

The TCM is located in rugged mountainous terrain at elevations ranging from approximately 6,000 ft to 8,500 ft (1,800 m to 2,600 m) above sea level. Various species of soft wood trees are found in the area along with scrub-brush and sparse grassland. Figure 5-3 provides examples of typical physiography of the area and select mine infrastructure.

**Figure 5-3 Landscape and infrastructure in the project area**



A: View across the current pit lake towards the northeast. B: View across the pit area towards the southwest. Sawtooth Mountains in the far distance. C: View towards the northeast from the crest of the tailings dam. D: Core storage facility. E: Typical basin and range landscape on Highway 93 on the drive towards Challis.

# 6 HISTORY

Early prospecting and exploration activity in the general deposit area dates to the 1860s and 1870s; however, details are lacking until Cyprus Minerals Corporation (Cyprus) discovered the Thompson Creek deposit in 1968. Subsequent surface exploration, core and reverse circulation drilling, underground drifting for bulk sampling, and underground core drilling defined a mineable portion of the deposit. Drilling is discussed in detail in Item 10.

After successful exploration, Cyprus began construction at the site in 1981, commenced operations in 1983, and continued until December 1992 when operations were suspended due to declining metal prices. The decision to construct the mine starting in 1981 was based on open pit reserves of 174 Mt averaging 0.115% Mo at a 0.05% Mo cut-off grade and a US$3.15/lb molybdenum price and considering a 3.05:1 waste to ore strip ratio (Schmidt et al., 1982). The reader is cautioned that this historical estimate predates the implementation of NI 43-101 and that it is unknown whether estimation and economic parameters used in this estimate would meet modern standards of mineral resource qualification and estimation. The estimation results are given for historical reference only and should not be relied upon.

In 1993, Cyprus merged with Amax Inc., and the company decided to sell the property that had been on care and maintenance since 1992. In late 1993, the newly formed Thompson Creek Metals Company LLC acquired the Thompson Creek operation and deposit from Cyprus and restarted operations in April 1994, operating the mine until its sale in 2006.

Blue Pearl Mining Ltd, at the time a publicly listed Canadian company, acquired Thompson Creek Metals Company LLC on October 26, 2006. Blue Pearl Mining Ltd changed its name to Thompson Creek Metals Company Inc. (TCMC) in May 2007.

Due to a softening in demand for molybdenum in 2008 and 2009, the mill was placed on a reduced production schedule and production was suspended for a number of weeks in July 2009 prior to restarting at full production.

Open pit mining continued until 2014 when molybdenum prices dropped again, and mining became uneconomic. The mine and mill were placed on care and maintenance in December 2014 at the completion of Phase VII, which constituted a general pit expansion along the northeastern highwall. Subsequently, the open pit was allowed to flood. Pit water comprised water collected from seepage from the Buckskin and Pat Hughes WRSFs, meteoric inputs, and runoff from the surrounding disturbed areas.

Production history for the mine since 2005 is shown in Table 6-1. From 2005 to December 2014, Thompson Creek produced 180.0 million pounds of molybdenum from 89.6 million tons of ore at an average grade of 0.112% Mo. Average mill recovery was 89.6% through that period. Production data prior to 2005 have been lost or were never recorded.

**Table 6-1 TCM production, 2005 to 2014**

| | Total | Calendar year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| **Mine production** | | | | | | | | | | | |
| Ore from pit (‘000 tons) | **39,651** | 6,116 | 5,165 | 7,145 | 14,631 | 7,269 | 10,343 | 7,609 | 16,194 | 5,369 | 910 |
| Waste (‘000 tons) | **119,051** | 12,042 | 22,418 | 40,937 | 28,195 | 17,040 | 31,029 | 32,769 | 13,698 | 10,208 | 3,100 |
| **Mill production** | | | | | | | | | | | |
| Tons (‘000) | **89,626** | 7,757 | 5,114 | 8,870 | 10,083 | 7,592 | 10,128 | 10,398 | 10,258 | 10,099 | 9,328 |
| Grade (% Mo) | **0.112** | 0.137 | 0.173 | 0.064 | 0.096 | 0.131 | 0.139 | 0.116 | 0.088 | 0.110 | 0.103 |
| Recovery (%) | **89.6** | 90.7 | 91.2 | 82.2 | 87.4 | 90.4 | 89.9 | 84.6 | 90.5 | 93.0 | 91.3 |
| **Molybdenum production** | | | | | | | | | | | |
| Total molybdenum production (tons) | **90,189** | 9,569 | 8,158 | 4,649 | 8,423 | 8,907 | 12,535 | 10,693 | 8,126 | 10,444 | 8,685 |
| Total molybdenum production (‘000 lb) | **180,377** | 19,137 | 16,316 | 9,297 | 16,846 | 17,813 | 25,070 | 21,387 | 16,252 | 20,889 | 17,370 |

Notes:

- Tons milled are higher or lower than ore mined because of stockpile activity.
- The numbers may not add precisely due to rounding.

In 2016, Centerra acquired TCMC, becoming 100% owner of the TCM in addition to other assets. The site continues to be in a care and maintenance state; however, the processing facility is providing services to third parties for leaching and the production of HPM products.

A MMPO was proposed in 2008 in support of the Phase VIII expansion. This expansion constitutes further pushbacks of the north, west, and east pit walls. An EIS per NEPA was conducted to evaluate the potential environmental effects of the proposed MMPO. A positive ROD was issued by the BLM in August 2016. The long decisions process was due to land access issues related to pit wall expansions onto previously public land that needed to be resolved and the generally slow decision process inherent with official bodies.

In December 2023, TCM submitted a MMPO for the Thompson Creek Phase VIII Mine Plan of Operations to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback subject to a minor update to the reclamation plan.

# 7 GEOLOGICAL SETTING AND MINERALIZATION

## 7.1 Regional Geology

The following description of the regional geological setting is modified from Schmidt et al. (1982).

The Thompson Creek porphyry molybdenum deposit occurs near the suture of the late Cretaceous Idaho Batholith in the west and complexly folded Paleozoic metasedimentary rocks interpreted to have accumulated in a back-arc environment in the east.

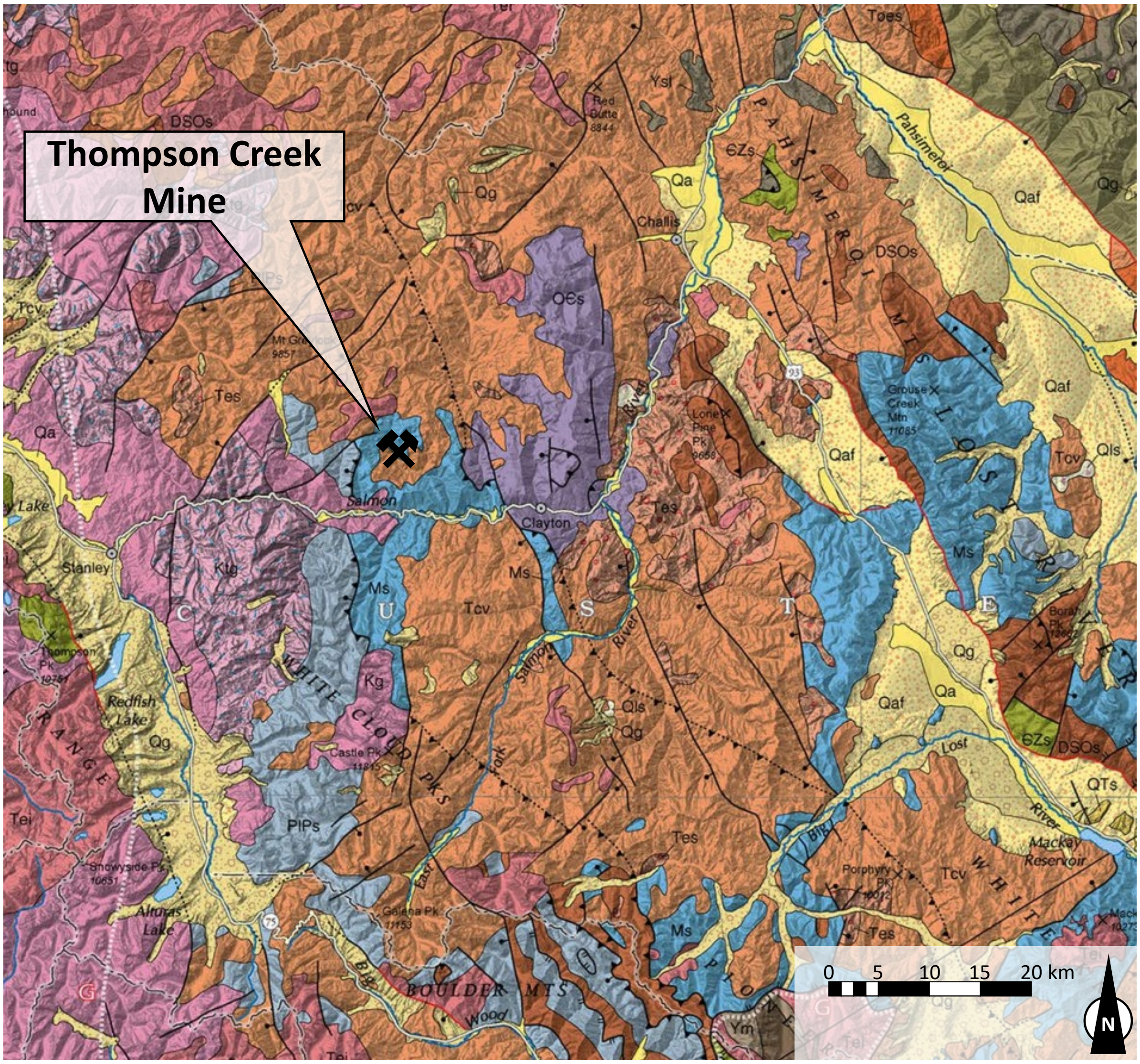
The Idaho Batholith is a multi-phase granitic to granodioritic intrusion with an age range of 65 to 100 million years (Ma). The intrusive phases are thought to have been generated by the subduction of the Pacific Farallon plate under the North American plate. In western Idaho, the batholith is separated by outcrops of older metasedimentary rocks.

East of the mine area, the terrain is dominated by a complexly deformed back-arc sequence of Paleozoic metasedimentary rocks. Although these rocks are poorly mapped, they may represent transitional and allochthonous portions of a Palaeozoic miogeosynclinal-eugeosynclinal wedge.

Large areas of both geologic provinces are unconformably overlain by thick Eocene volcanic rocks of the Challis Formation that has been dated to 41–51 Ma. The hot spring waters that flow into the Salmon River in the district are relics of these volcanic events. The Challis Formation was emplaced post mineralization and can reach thicknesses of approximately 1,000 ft locally.

Figure 7-1 is a geological map of the region around the TCM.

Figure 7-1 Regional geological setting (extracted from Lewis et al., 2012)



| | | | |
|---|---|---|---|
| Qa | Alluvial Deposits (Quaternary) | Ktg | Tonalite, granodiorite, and quarts diorite (Cretaceous) |
| Qaf | Alluvial-fan deposits (Quaternary) | Kg | Granodiorite and two-mica granite (Cretaceous) |
| Qls | Landslide deposits (Quaternary) | PIPs | Sedimentary rocks (Permian and Pennsylvanian) |
| Qg | Glacial deposits (Pleistocene) | Ms | Sedimentary rocks (Mississippian) |
| QTs | Sediments and sedimentary rocks (Pleistocene and Pliocene) | DSOs | Sedimentary rocks (Devonian to Cambrian) |
| Tes | Sedimentary rocks (Eocene) | O€s | Sedimentary rocks (Ordovician and Cambrian) |
| Tcv | Challis Volcanic Group (Eocene) | €Zs | Windermere Supergroup (Cambrian and Neoproterozoic) |
| Toes | Sedimentary rocks and sediments (Oligocene and Eocene) | Ysl | Swauger and Lawson Creek formations (Mesoproterozoic) |
| Tei | Challis Intrusive rocks (Eocene) | Ym | Gneissig and schistose metasedimentary rocks (Mesoproterozoic) |

## 7.2 Local Geology

The following description of the local geology is taken from The Winters Company (2000).

The primary host for the molybdenite mineralization at Thompson Creek is the Thompson Creek intrusive complex, composed of a granodiorite-quartz monzonite stock of Cretaceous age that has been dated at 88 Ma (Marvin et al., 1973). The stock was intruded into carbonaceous argillite of the Mississippian Copper Basin Formation. Both the intrusive rocks and metasedimentary units are overlain by the Eocene-age Challis Volcanics. The volcanic composition ranges from andesite to rhyodacite tuffs, flows, and agglomerates. The volcanic rocks filled paleo-valleys in the area and can be up to 1,000 ft (305 m) thick.

The quartz monzonite is equigranular with no obvious porphyritic phase or other direct evidence of a highly differentiated system. However, Schmidt et al. (1982) describe a multi-phase intrusive system with an outer zone of biotite granodiorite enclosing an inner zone of biotite quartz monzonite. The inner, deeper, and presumably younger quartz monzonite phase is lower in biotite but higher in potassic feldspar and contains monazite. The molybdenum mineralization has been interpreted to be related to this phase. Schmidt et al. (1982) also mention granite porphyry dikes lower in the system. At the contact of the intrusion, the argillite has been metamorphosed to hornfels and tactites. The metasedimentary host unit is locally mineralized.

Alteration of the intrusive rocks is characterized by pyrite, quartz, and sericite, primarily in veins at shallow depths. This alteration style has been mostly mined out. The dominant alteration at depth comprises coarse biotite, locally intergrown with molybdenite in quartz veins. Potassic feldspar is common in the biotitic veins, and disseminated potassic feldspar occurs in the younger intrusive at depth.

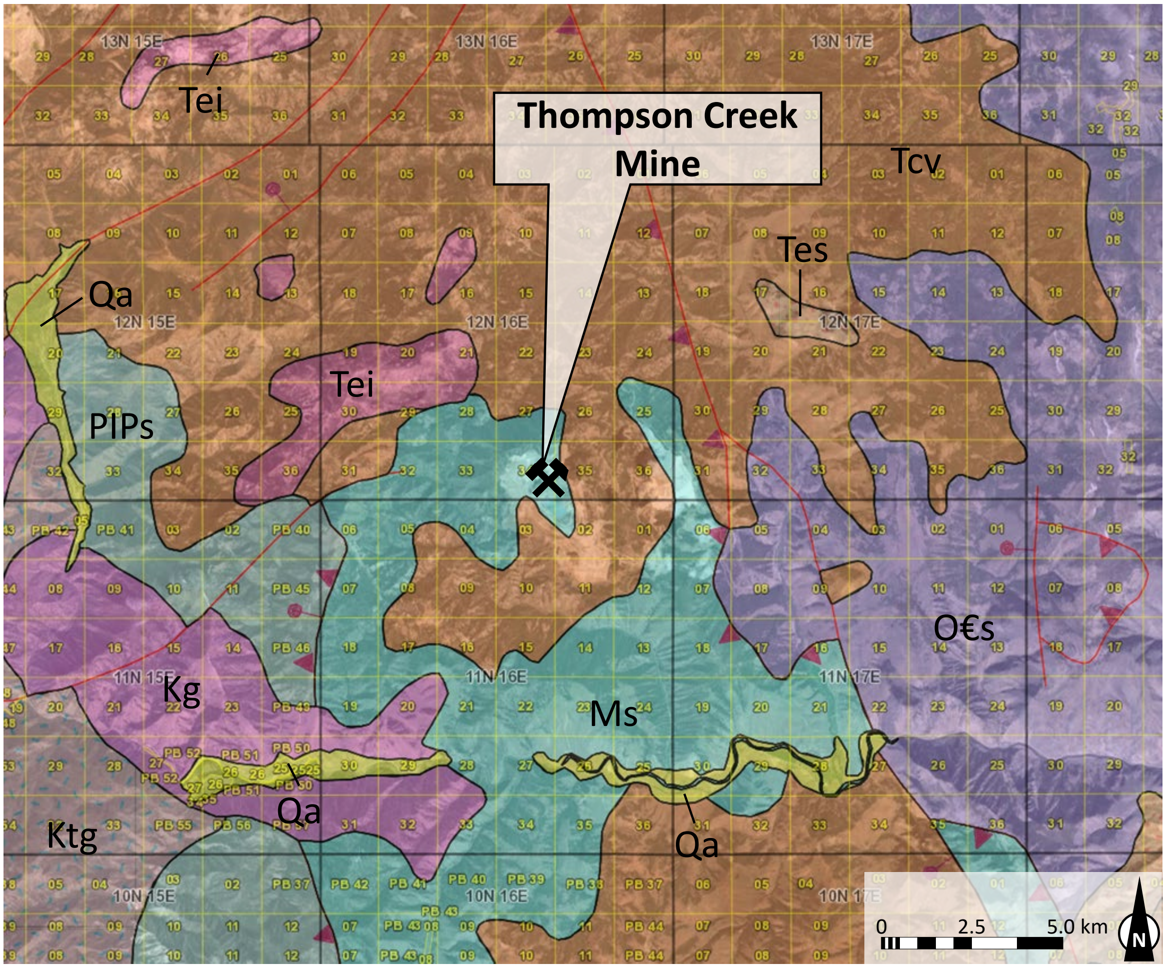
There are two major structural features associated with the Thompson Creek deposit:

- The Raise Fault, which strikes northwest, parallel to the trend of the mineralization
- The Unnamed Fault, which strikes 34° and dips steeply to the southeast.

The Unnamed Fault separates the deposit into northwest and southeast portions. There is evidence that the southeast portion may be down-dropped relative to the northwest portions.

Figure 7-2 is a geological map of the local area around the TCM.

**Figure 7-2 Local geology**



| Code | Description |
|---|---|
| Qa | Alluvial Deposits (Quaternary) |
| Qaf | Alluvial-fan deposits (Quaternary) |
| Qls | Landslide deposits (Quaternary) |
| Qg | Glacial deposits (Pleistocene) |
| QTs | Sediments and sedimentary rocks (Pleistocene and Pliocene) |
| Tes | Sedimentary rocks (Eocene) |
| Tcv | Challis Volcanic Group (Eocene) |
| Toes | Sedimentary rocks and sediments (Oligocene and Eocene) |
| Tei | Challis Intrusive rocks (Eocene) |
| Ktg | Tonalite, granodiorite, and quarts diorite (Cretaceous) |
| Kg | Granodiorite and two-mica granite (Cretaceous) |
| PIPs | Sedimentary rocks (Permian and Pennsylvanian) |
| Ms | Sedimentary rocks (Mississippian) |
| DSOs | Sedimentary rocks (Devonian to Cambrian) |
| O€s | Sedimentary rocks (Ordovician and Cambrian) |
| €Zs | Windermere Supergroup (Cambrian and Neoproterozoic) |
| Ysl | Swauger and Lawson Creek formations (Mesoproterozoic) |
| Ym | Gneissig and schistose metasedimentary rocks (Mesoproterozoic) |

Recent fault: active within last 15,000 years; ball and bar on downthrown side

Fault

Normal fault: active within last 15,000 years; ball and bar on downthrown side

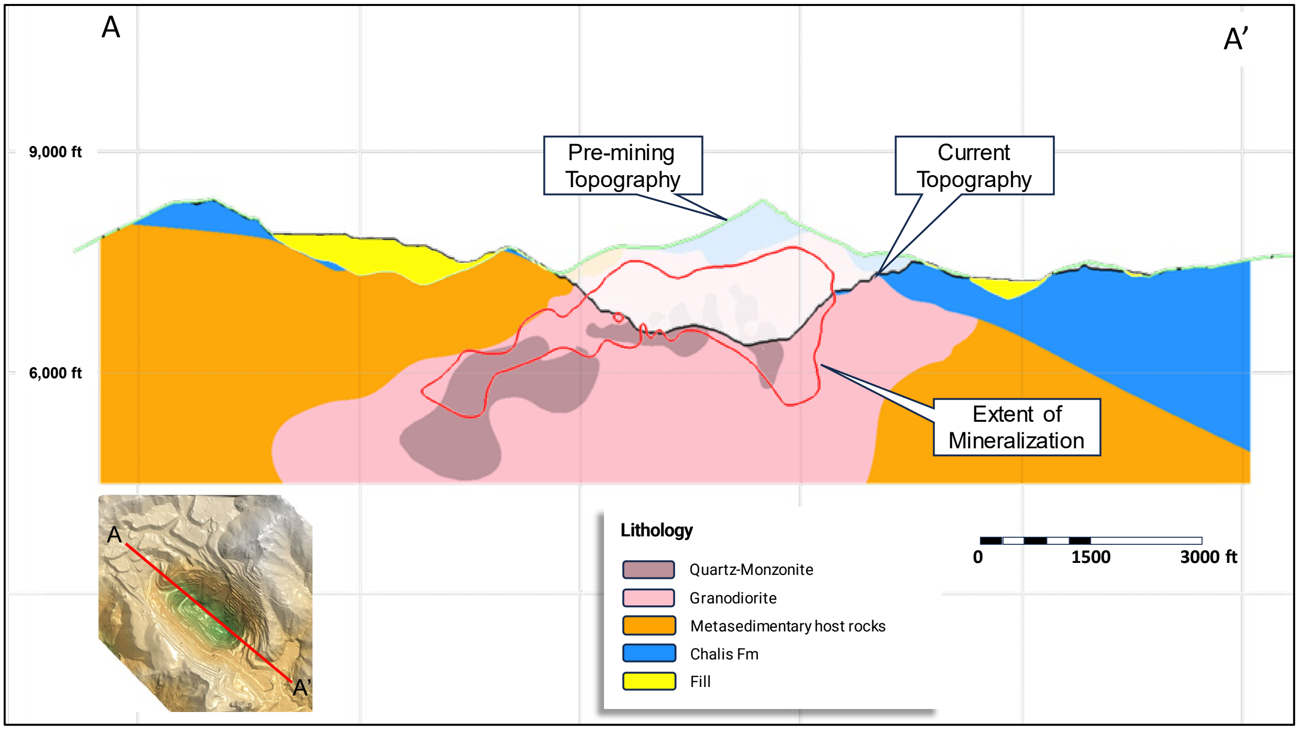
Reactivated thrust fault: teeth on upper late; bar and ball on downthrown side on reactivated fault segment

Note: Extracted from https://www.idahogeology.org/WebMap4/; grid is the Public Land Survey System (PLSS).

## 7.3 Mineralization

Mineralization is restricted almost exclusively to the granodiorite/quartz monzonite intrusion discussed above. The long axis of the largely eliptical deposit is oriented in a northwesterly direction with a plunge of about 30 degrees. The approximate dimensions of the deposit are 6,000 ft long by 2,500 ft wide by 2,500 ft deep. Figure 7-3 shows a longitudinal section of the mine running northwest-southeast, depicting the original topography, present day topography and the extent of mineralization.

**Figure 7-3 Section through the TCM, looking northeast**



The molybdenum mineralization occurs as a series of crosscutting quartz-molybdenite-pyrite veinlets, stringer zones, and rare coarse disseminations. The dominant vein set strikes at 120° to 140° and dips at 30° to 85° northeast, parallel to the long dimension of the intrusive body, implying that the same or a similar stress field played a role in controlling both the intrusion of the igneous rocks and opening the space occupied by the veining (Schmidt et al., 1983). Molybdenite occurs primarily as coarse, ~$^{1}/_{8}$-inch rosettes within vein selvages abutting the potassic minerals or in the center of quartz veins. Vein thicknesses average between approximately $^{3}/_{8}$-inch and $^{5}/_{4}$-inch with a vein density that is highly variable, depending upon the location within the deposit (Schmidt et al., 1982). The mineralizing event has been dated at 86 Ma (versus 88 Ma of the intrusion itself) (Marvin et al., 1973).

The deposit averages less than 100 ppm Cu and produces no saleable copper.

Limited assay data from blast holes were analyzed in 1999 that suggest a vertical volume of rock within the southern part of the pit that can be interpreted as a high-grade zone with molybdenum values consistently above 0.2% Mo (Worthington, 2007).

Over the life of the mine to date, the molybdenum grade has averaged approximately 0.083% Mo.

# 8 DEPOSIT TYPES

The Thompson Creek deposit is a porphyry molybdenum deposit. These deposits are a substantial resource for molybdenum metal. The deposits contain low-grade mineralization (typically 0.03–0.22% Mo) as molybdenite, but are large, which makes them amenable to bulk mining open-pit techniques (Taylor et al., 2010).

Porphyry molybdenum deposits are broadly categorized into two types: 1) alkali-feldspar rhyolite-granite (Climax-type) porphyry molybdenum deposits; and 2) arc-related (Endako-type) porphyry molybdenum deposits. The Thompson Creek deposit is of the Endako-type.

The Endako-type deposits are associated with subduction related processes, whereas the Climax-type deposits are generally rift-related. Other Endako-type deposits proximal to Thompson Creek include White Cloud, Idaho and Cannivan Gulch, Montana. Of the more than 50 molybdenum occurrences in Idaho and Montana, only the Thompson Creek deposit has had substantial production (Worthington, 2007). Other productive deposits are spread across the western cordillera of Canada, notably the Endako, Kitsault, and Boss Mountain deposits in British Columbia (Taylor et al., 2010).

The formation of porphyry molybdenum deposits typically occurs within a continental arc environment related to arc-continent or continent-continent collision and subduction. These arc-related porphyry molybdenum deposits are generally hosted by granodiorite to quartz monzonite intrusions. Secondary potassic alteration (biotite-feldspar) is common. Alteration is usually zoned from a core of potassic plus/minus silicic alteration outwards through phyllic to propylitic alteration (Taylor et al., 2010).

The mineralization is generally associated with molybdenite-bearing quartz veinlets in the form of stockwork. Molybdenum is the sole product of the Thompson Creek deposit, with the mineralization generally accompanied by less than 100 ppm Cu. Compared to other types of porphyry deposits, there is a distinctive overall lack of copper and tin enrichment in the mineralized system; hence, these are not considered to be economically recoverable metals (Taylor et al., 2010).

# 9 EXPLORATION

No current mineral exploration has been conducted by Centerra. Refer to Item 6 for historical exploration activity and Item 10 for exploration drilling information.

# 10 DRILLING

## 10.1 Historical Drilling

Exploration drilling at the Thompson Creek deposit was initiated by Cyprus in 1968. Until 1983, when the deposit went into production, Cyprus completed various surface and underground core drilling programs in delineating the deposit, including an underground bulk sampling and drilling program. Significant drilling by Cyprus occurred between 1978 and 1981 in the ramp-up period to production; approximately 100,000 ft (30,480 m) of relatively shallow rotary drillholes were completed. In the ensuing years, each of the subsequent operators of the deposit completed various infill drilling programs for mine planning purposes.

Table 10-1 summarizes drilling at Thompson Creek over time and by general purpose. Figure 10-1 illustrates the drill density and location of drilling campaigns.

**Table 10-1 Drillhole tabulation**

| Company | Purpose | No. of holes | Footage | Meters |
|---|---|---|---|---|
| Cyprus | Resource definition | 307 | 314,133 | 95,748 |
| Thompson Creek Metals Company LLC | 1998–1998 infill | 11 | 7,444 | 2,269 |
| | 2000 infill | 5 | 3,322 | 1,013 |
| | 2002 infill | 4 | 1,952 | 595 |
| TCMC | 2007 infill | 15 | 16,361 | 4,987 |
| | 2008 infill | 32 | 41,939 | 12,783 |
| | 2009 infill | 6 | 9,196 | 2,803 |
| | Geotechnical | 30 | 9,964 | 3,037 |
| | Dewatering | 16 | 6,457 | 1,968 |
| | Post 2010 infill | 10 | 18,624 | 5,676 |
| **Total** | | **436** | **429,391** | **130,878** |

Cyprus assayed for molybdenum during their drill programs, along with assays for uranium, lead, zinc, and tungsten. Drilling of the Thompson Creek deposit during the 1990s produced core that was assayed for molybdenum, lead, copper, and sulfur. Sample intervals were generally 10 ft in length.

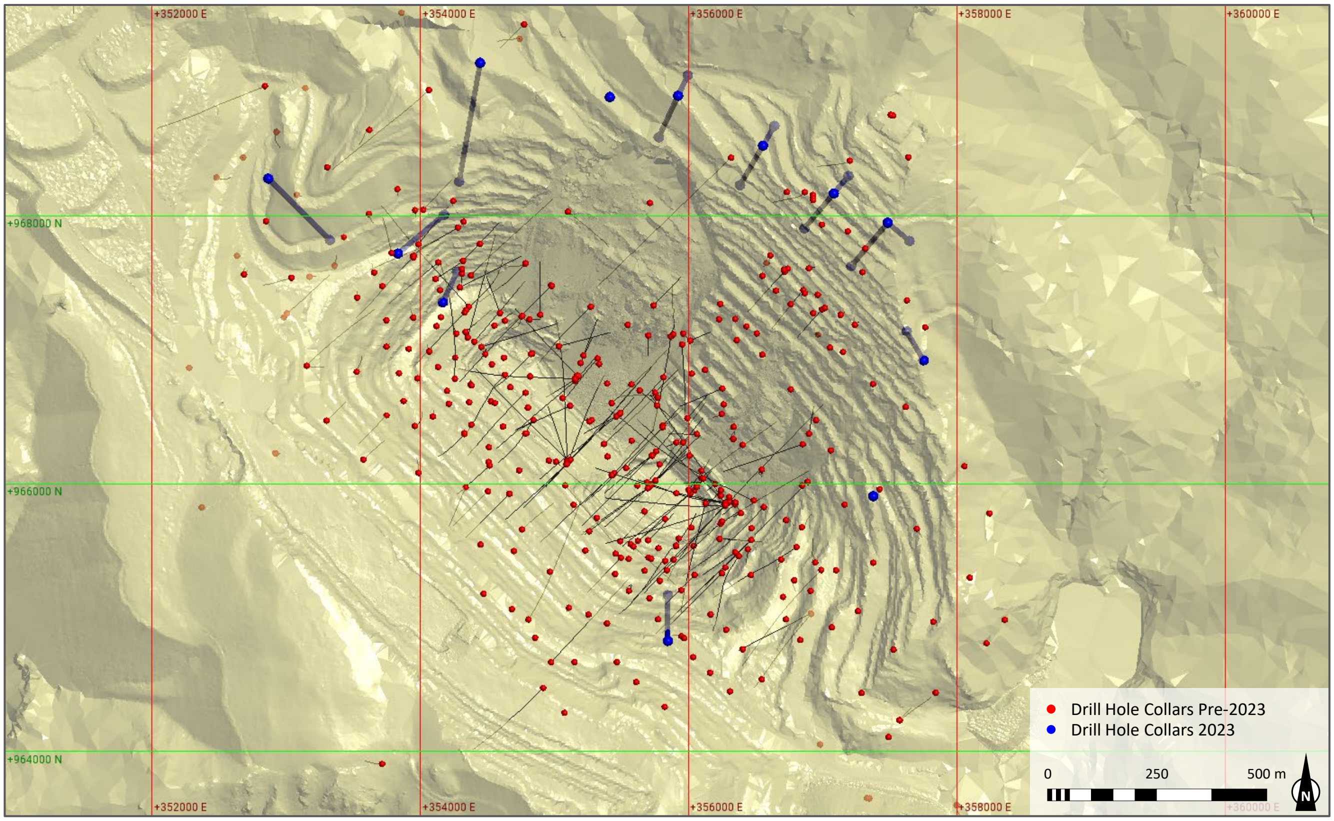
After acquisition of the property in 2007, TCMC initiated a drill program with the purpose of adding mineralized inventory at depth and along the perimeter of the deposit. Geotechnical drilling was also completed during this time to inform slope stability analyses.

Little else is known about the drilling procedures in place during this period. The generally high competency of the rock suggests that core recovery was good. Assay data obtained from these historical holes have been used in all subsequent mineral resource models. Generally accepted reconciliation information suggests that the data from core and rotary drilling are generally reliable and do not pose risks to the reliability of interpretation of geology and metal content of the Thompson Creek deposit.

## 10.2 Drilling by Centerra

Early in 2023, Centerra commenced a geotechnical drill program in support of a study to restart mining activities, which would entail additional pushbacks of the pit walls. The drill program comprised 18 core holes (14,600 ft/4,450 m) (Figure 10-1). Most of the holes targeted the north and northeast pit walls close to the crest. Holes were drilled using HQ-sized equipment with the possibility of reducing to NQ in case of challenging ground conditions. Select holes penetrated the known mineralization at depth prompting the logging and select sampling of the core in question.

**Figure 10-1 Drilling campaigns**



Collar locations were determined by mine staff using handheld Trimble global positioning system (GPS) receivers, and fore- or backside stakes were used to orient the drill. The dips of holes were determined using an inclinometer mounted directly on the drill equipment.

Core was collected by the drilling contractors, washed, and placed in wax-coated cardboard core boxes. Hole depth (footage) markers in the form of wooden blocks were placed in the core boxes. Core was delivered to the core logging facility in the technical area of the mine where it was logged by a Company geologist. Logging information, including basic geotechnical data, such as Rock Quality Data (RQD), mineralization, lithology, and alteration was recorded directly into a digital geological database, following well-established nomenclature. Each box of core was photographed using a fixed setup. Mineralized intervals were split lengthwise using a hydraulic splitter. Half of the core remains in the core boxes for reference, while the other half was collected in sample bags for shipment to the laboratory.

Sample length was typically 5 ft (1.5 m) but honored lithological boundaries. Sample tags were affixed in the core box as well as placed in sample bags. Centerra uses a Laboratory Information Management System (LIMS); bar code labels are used starting at the sampling stage. Once approximately 50 samples had accumulated in the core logging facility, the samples were transported to the mine laboratory.

Concerns with the validity of the data prompted Centerra to discount these data in the current mineral resource and reserve estimation.

All aspects of past and current drilling and sampling campaigns occurred within the gated confines of the mine area; hence, sample security on site is of little concern. Logging information is stored locally in databases on company-owned computers and backed up regularly to cloud storage services and local devices.

The drilling, logging, and sampling procedures followed generally accepted industry best practices. There are no known drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results. DGI Geoscience Inc. was tasked to perform final collar location and downhole surveys, performed once holes are completed. Collars were surveyed using a Trimble DA2 GPS receiver with accuracy within one half inch. Downhole surveys were completed using an Axis Mining Technology (Axis) Champ Navigator continuous gyroscopic survey tool. Survey data were shared with Centerra through a local Axis data hub, which eliminated data transcription errors.

# 11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Knowledge regarding sample preparation, assaying, and sample security during the exploration and development phases of the Thompson Creek deposit by Cyprus (1968 through 1981) is based on historical reports from Cyprus and The Winters Company. The Winters Company completed numerous checks and reviews of the pre-2000 drillhole database as part of contracted work for TCMC in 2000.

The following presents a summary of the procedures that were utilized by Cyprus for most of their exploration programs (Marek and Lechner, 2011):

- Drill core was split with a hydraulic splitter usually as 10-ft long (3.05 m) samples. One half of the split core was kept as reference material in waxed cardboard core boxes and the other half core was transported to a Cyprus preparation facility located in Philipsburg, Montana.
- The split core was crushed and pulverized, and the pulps sent to one of several labs for analysis.
- Assay labs that were used by Cyprus included: Chemical and Mineralogical Services (CMS) in Salt Lake City, Utah; Skyline Labs (Skyline) in Denver Colorado; Cyprus Metallurgical Processes Corp. (CYMET) in Tucson, Arizona; Rocky Mountain Geochemical (RMGC) in Salt Lake City; and Hazen Research, Inc. (Hazen) in Denver. There is no information about any certifications those labs may have possessed during those years; however, each laboratory was regularly used by many major mining companies.
- A subset of pulps was retained in Philipsburg for reference.
- Samples from surface drilling were generally assayed at Skyline with a duplicate at CMS. Several triplicate analyses were run at Cyprus in-house laboratories or at RMGC. Centerra was not able to assess the analytical quality control data from that period.
- Drillholes that were collared underground were generally assayed at Hazen.
- Rotary drillhole cuttings were collected and split in a Jones splitter at the drill site. Sampling was conducted on 10-ft intervals. The rotary cuttings were prepared in Philipsburg, MT and then assayed at one of several labs mentioned above.

In addition to molybdenum, some of the drillhole samples were also assayed for copper, lead, zinc, tungsten, sulfur, and uranium. These elements were not used in this Mineral Resource estimate.

The Cyprus data were collected prior to the more rigorous quality assurance and quality control (QAQC) practices of today. Cyprus did a certain amount of check assaying between different laboratories and was able to make various comparisons between drillhole samples and bulk samples collected from underground developments driven into the orebody. Despite the lack of robust analytical quality control data support of assay data, the mine has produced a significant amount of molybdenum. Since 1998, the mill processed approximately 123 million tons (111.8 million tonnes) of ore, producing approximately 247 million pounds (112,000 tonnes) of molybdenum. Throughout most of the mine life, the long-range geological model was based primarily on the Cyprus drillhole data, and it correlated adequately within the expected variance from production data for tons and grade. This fact suggests that the historical data are generally reliable, and that they can be used for mineral resource estimation purposes.

For most of the post-Cyprus drilling campaigns completed during the years 1997 to 1999 and 2007 to 2009, sample preparation and assaying was completed at the TCM laboratory. That lab did not obtain ISO certification. However, the laboratory operates to industry standards and serves several third-party clients that trust the laboratory's data quality. Assays from drill programs since 1997 include molybdenum, lead, iron, uranium, and sulfur. Analyses for the latter elements were obtained to ensure the quality of the molybdenum concentrate and not for potential metal recovery.

The sample protocols at the TCM laboratory were:

- Samples were dried and homogenized and then split with a riffle splitter.
- 200–300 g were pulverized to -200 mesh.
- 2 g samples were digested using a three-acid solute and analysis by atomic absorption. The acid solute comprised an initial decomposition with nitric acid, followed by chlorate, and final hydrochloric acid digestion.

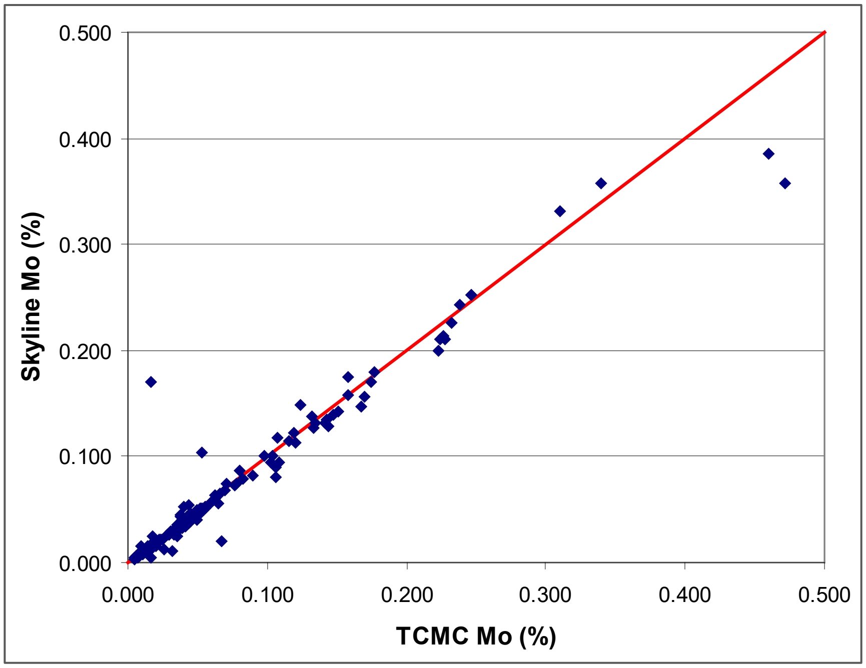
The blast-hole data were also assayed onsite at the TCM laboratory. Samples were assayed for molybdenum and lead, and every fifth sample was analyzed for iron if the molybdenum grade was above the cut-off of 0.030% Mo. Waste samples were assayed for sulfur, and every fifth sample was assayed for molybdenum. Blast-hole data have been lost and thus were not available for review.

According to TCM staff, the core and reverse circulation samples were assayed for molybdenum, copper, lead, and iron at the TCM laboratory. The TCM geologic staff did not submit standard reference materials (SRMs) at source; however, the TCM lab introduced their own SRMs according to their standard protocols. The TCM laboratory also inserted blank material in assay batches as part of their internal QAQC.

After the assays for the 2007 drilling program were completed, TCM sent 138 pulps to the Skyline laboratory located in Tucson, Arizona, to be assayed for molybdenum. The samples were selected based on initial waste, low-grade, and high-grade molybdenum values. These samples represented a frequency rate of about one check assay per 12 original samples.

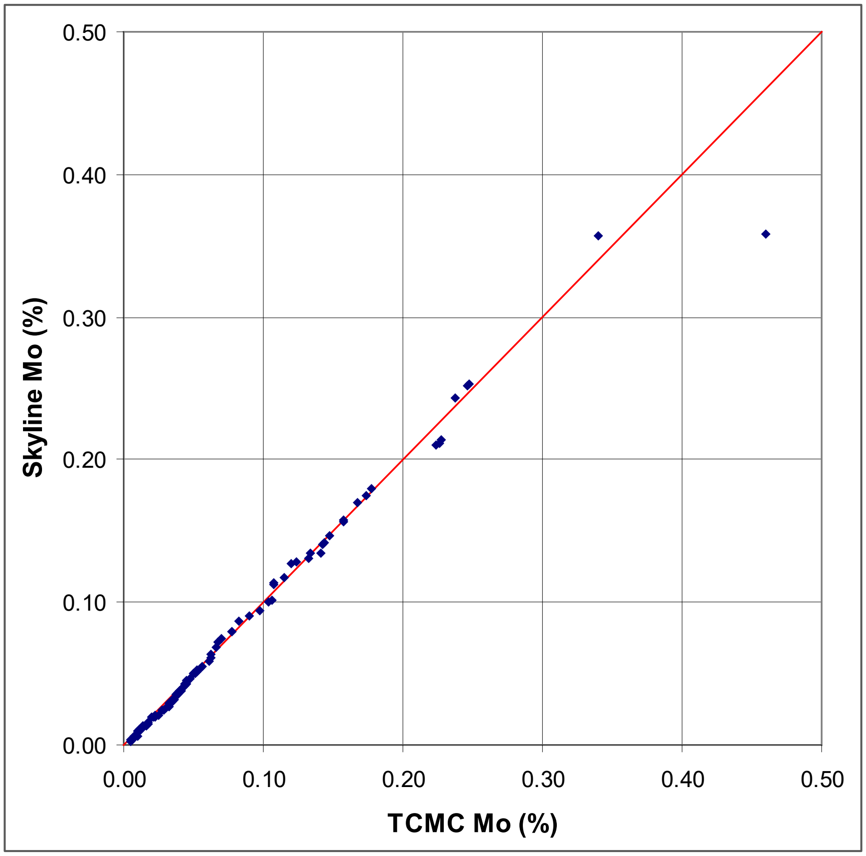
Figure 11-1 is an XY scatter graph which compares the molybdenum grades that were obtained from the TCM laboratory (X-axis) and the Skyline laboratory (Y-axis). The same data are shown in a quantile-quantile (QQ) plot in Figure 11-2. These two graphs show a reasonably close comparison with a slight bias towards the Skyline laboratory for samples below 0.1% Mo. The mean grades between the paired assay data are similar (0.085% for TCM and 0.084% for Skyline). The slight bias near the detection limit is considered immaterial, especially since it does not extend into higher grades. Some differences are expected in the mid-grade and high-grade range because the Skyline laboratory used multi-element inductively coupled plasma mass spectrometry (ICP-MS), while the mine laboratory used atomic absorption analysis.

Figure 11-1 XY scatter graph – 2007 TCM lab vs Skyline assays



Source: Marek and Lechner, 2011

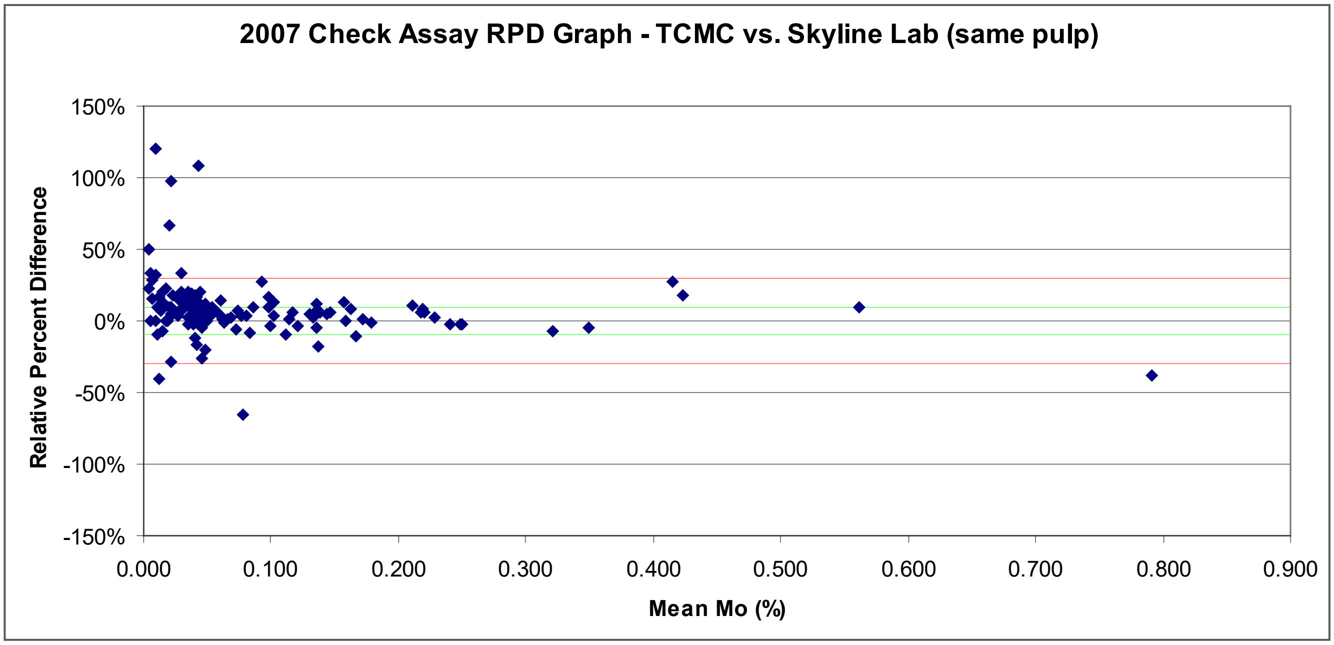
Figure 11-2 QQ plot – 2007 TCM lab vs Skyline assays



Source: Marek and Lechner, 2011

Figure 11-3 is a relative percent difference (RPD) graph that compares the TCM and Skyline lab results. The graph shows the individual sample pair differences with most of the higher percentage differences at low cut-off grades. For the 138 “check” assays, 90% of the data pairs were found to be within ±29% of one another, which is a variance above generally accepted limits (i.e. 90% of the pairs should be within ±10% of one another for same pulp comparisons).

**Figure 11-3 RPD plot – 2007 TCM vs Skyline assays**



In addition to the external laboratory checks discussed above, TCM collected duplicate samples from their 2007 core and reverse circulation drilling campaigns. Basic statistics for the initial and duplicate sample are summarized in Table 11-1. The mean grades for the first and second duplicates vary between +3% and -8% from the original or initial sample grades.

**Table 11-1 Duplicate sample results – 2007 drill campaign**

| Parameter | First Duplicate | | Second Duplicate | |
|---|---|---|---|---|
| | Initial | Duplicate | Initial | Duplicate |
| Count | 213 | 213 | 97 | 97 |
| Minimum molybdenum | 0.000 | 0.001 | 0.002 | 0.002 |
| Maximum molybdenum | 0.340 | 0.390 | 0.126 | 0.129 |
| Mean molybdenum | 0.300 | 0.029 | 0.026 | 0.028 |
| % Difference – mean molybdenum | 3.1% | | -8.4% | |
| Standard deviation | 0.047 | 0.045 | 0.025 | 0.027 |
| Coefficient of variation | 1.551 | 1.549 | 0.958 | 0.946 |

Analytical QAQC procedures for the 2008, 2009, and 2010 drilling campaigns were restricted to TCM onsite lab protocols. The mine prepared SRMs from blast-hole cuttings. These SRMs have an expected grade of approximately 0.074% Mo with two standard deviations ranging between 0.068% and 0.080% Mo. The most recent standard, known as “QC#9”, was routinely inserted into the atomic absorption instrument at a frequency of one standard for every five samples after the machine was calibrated with a blank. In-house SRM is considered acceptable in this case, considering the lack of commercially available material.

No assay certificates are available for post-2009 drilling.

Based on the above discussion, the Thompson Creek drillhole data are considered representative of the molybdenum mineralization at Thompson Creek and thus are suitable for the purpose of Mineral Resource estimation. The TCM has had extended periods of production with favorable reconciliation history of prior resource models and production results.

# 12 DATA VERIFICATION

## 12.1 Mineral Exploration, Geology, Sampling, Assays

The prior QPs, Marek and Lechner (2011), had a long working relationship with the TCM. In 1997 and 2000, numerous checks were made between the electronic drillhole database and the Cyprus drillhole assay logs, downhole survey logs and lithologic logs. In general, the electronic database was accurate with few errors. The QP responsible for this Item of this Technical Report notes that the TCM had been operating for over 15 years at the time those data verifications were made and that the TCM typically experienced excellent reconciliation results.

Since acquiring the property in late 1993, Thompson Creek Mining Company LLC and later Thompson Creek Metals Company Inc. (2006) have drilled approximately 129 drillholes totaling around 115,258 ft (35,130 m). Most of this footage was drilled as infill data for mine planning purposes and the rest was for geotechnical and dewatering purposes (Table 10-1).

The QP responsible for this Item of this Technical Report did perform basic data validation on the 10 holes completed in the post-2009 drillhole campaigns. Those validations were based on comparing the new drillhole results to surrounding holes and where available, reviewing various QAQC results.

The same drillhole database (with the inclusion of the post-2009 drillhole data) and long-range block model that were the basis of the last Technical Report (Marek and Lechner, 2011) have been used for this Technical Report. The TCM used the June 2010 block model until the mine closed in late 2014 due to low metal prices.

It is the opinion of the QP responsible for this Item of this Technical Report that the drillhole assays, and geologic interpretation, are adequate for the Mineral Resource estimate. This assertion is based on a long-standing history of mine and mill production and favorable reconciliation results.

## 12.2 Mining Data Verification

The mining engineer QP has visually assessed the presence of the existing mining surfaces, existing dumps, and infrastructure at TCM. During the site visit, the QP observed that the mining infrastructure and surfaces were within the area as per surveyed topography and aerial photographs. Additionally, the QP observed that these surfaces aligned with the resource model developed by the geology QP.

It was not possible to visually verify portions of the pit bottom surface which lie beneath the pit lake or beneath backfill. Per TCM, the pit bottom topography underneath the pit lake was measured using a bathymetric survey conducted by Golder in 2018. Centerra and its predecessor owners maintained a series of surveys throughout mining at TCM that kept a record of material mined-out and replaced with backfill. The methodologies for constructing topographical surfaces beneath the pit lake and beneath backfill are considered acceptable by the QP.

## 12.3 Mineral Processing Data Verification

Mr Hank Wong and QP for Mineral Processing visited the plant site in December 2023. The plant equipment and infrastructure described in Item 17 were verified by the QP.

Historical process data were obtained from site. Assays of % Mo were generated from composite samples collected by automated samplers every 12-hour shift. The samples were processed by the onsite assay laboratory. The daily recovery data were calculated using the two-product formula, reviewed by the QP, and used to project future production. Throughput values were generated by totalized weightometer readings. Month-end reconciliation of production was in place, and monthly adjustments to head grades were made to match the sum of the change in concentrate inventory and products shipped and sold offsite.

In the QP's opinion, the sampling system was typical of the era during which the process plant was built. The system could be improved for future production years. The process for which production is calculated is typical and accepted in the industry. Month-end reconciliation should include mined ore and could improve in future production years.

Composite samples representing the to-be-processed ore were collected and subjected to metallurgical testing at Base Metallurgical to confirm alignment of this ore to the previously processed ore. In the QP's opinion, the to-be-processed ore has similar processing and production characteristics as the historical ore.

# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

## 13.1 Introduction

The TCM and mill operated from 1983 through to 2014, during which period metallurgical characteristics and operational processes of the ore were well established. The ore is processed through a gyratory crusher, a SAG-ball mill (SAB) circuit, and combined with rougher and cleaner flotation plant, to produce molybdenum-rich concentrates. The mine and concentrator were placed on care and maintenance in December 2014 when the mining and processing of Phase VII ore was completed. As the molybdenum price has increased in recent years, Centerra is considering a restart of the TCM operation (“TCM Restart Project”).

The ore to be processed for TCM’s restart is from the previously mined orebody and is mined from the existing pit (walls and floor). The mineral processing characteristics are principally defined by the existing operating data, and a metallurgical test program was conducted to confirm that the planned LOM ores would be similar in processing characteristics as established historically.

All data analysis discussed in the following paragraphs was completed by AtkinsRéalis (formerly SNC Lavalin), reviewed and approved by Centerra.

## 13.2 Metallurgical Testwork

### 13.2.1 Historical Testwork

No historical testwork reports were available for review. Metallurgical review for the TCM Restart Project was conducted using historical TCM production reports and process data.

## 13.3 Historical Operations Data

Operations data from 2008 to 2014 were available for review. These data provide an indication of the ore’s processing characteristics, with respect to the Thompson Creek Concentrator.

Records for each operating year are not entirely complete, with occasional gaps throughout the period. The years 2008, 2010, and 2011 are almost complete, missing only three, six and one day of data, respectively. In 2009, the plant operated at a reduced capacity, due to low molybdenum prices, with only 272 operating days reported. The year 2012 is a complete operating year. For 2013 and 2014, records were only available for the period from July 2013 to July 2014. Years 2013 and 2014 were impacted by lack of ore, and the constraints imposed by the low price of molybdenum and pending transition to care and maintenance.

Operations data for the period 2008 to 2012 are sourced from concentrate production records and provide throughputs and concentrate recoveries, but do not contain grinding circuit power consumption. Data for the period 2012 to 2014 are sourced from the milling circuit, so contain grinding specific information, but do not include recovery information. Year 2012 data includes throughputs, concentrate recoveries and grinding specific information.

## 13.4 Throughput Capacity

An indication of the throughput capacity of the TCM concentrator is given by the daily maximum, median, and average daily production values achieved historically. The annual throughputs, based on the reported number of operating days, do not completely represent the plant's true throughput capacity due to various factors. These include factors such as limited ore availability and constraints due to low molybdenum prices. Table 13-1 summarizes the plant throughput statistics for years 2008 to 2014.

**Table 13-1 Plant throughput statistics**

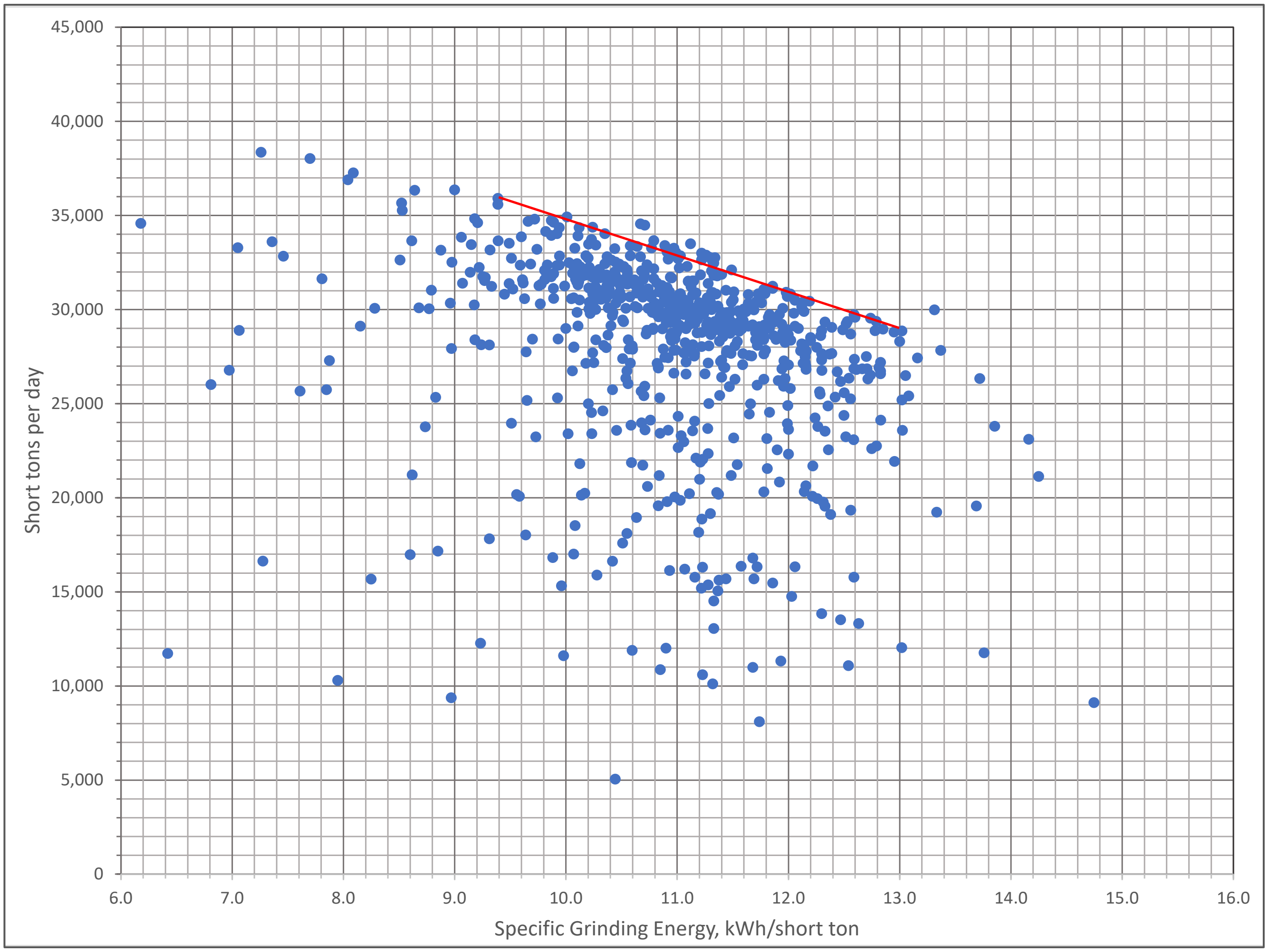
| Year | Annual operating days | Production rates | | | | Std dev (dry st/d) |
|---|---|---|---|---|---|---|
| | | Annual (M dry st/y) | Daily average (dry st/d) | Daily median (dry st/d) | Daily maximum (dry st/d) | |
| 2008 | 362 | 10.1 | 27,855 | 29,135 | 35,103 | 4,917 |
| 2009 | 272 | 7.7 | 27,908 | 28,838 | 35,158 | 4,637 |
| **2010** | **359** | **10.3** | **28,123** | **30,039** | **38,897** | **6,946** |
| **2011** | **364** | **10.4** | **28,570** | **29,615** | **38,622** | **6,699** |
| **2012** | **366** | **10.3** | **28,090** | **29,442** | **38,356** | **6,145** |
| 2013 | 184 | 5.0 | 27,184 | 29,796 | 35,658 | 6,989 |
| 2014 | 212 | 5.6 | 26,451 | 28,264 | 32,846 | 5,228 |

Based on the maximum daily throughput values reported above, the mill processed up to 38,000 short tons per day. For more sustained daily throughput, the median daily values indicate approximately 29,000 tons per day. The most complete data period, from 2010 to 2012, indicates the annual daily average achievable on a long-term basis, if the historical ore and Phase VIII ore have similar grinding characteristics. Data for 2011 indicate that 28,500 short tons per day average per year was achievable.

## 13.5 Grinding Characteristics

Aside from volumetric capacity, concentrators are typically constrained by their grinding capacity, which is related to their grinding equipment size and power available, and the grinding characteristics of the ore, such as hardness. TCM's grinding circuit is a relatively standard SAB circuit (SAG milling followed by ball milling, in closed circuit with hydrocyclones). Data for 2012 to 2014 are used to provide an indication of the Operating Grind Circuit Specific Energy (Operating SE) of the ore with respect to Thompson Creek. The Operating SE is calculated as the total SAG and ball mill power draw divided by ore throughput Figure 13-1 shows the grinding circuit throughput versus Operating SE. No corresponding grind size records were available for the data. Though it is expected that grinding will produce a $P_{80}$ of 212 µm (80% passing) and the size will be allowed to vary. For 2012, mill power draw records were not available for August. Instead, throughput and availability are sourced from the metallurgy department reports. For 2013 and 2014, only the period from July 2013 to July 2014 (inclusive, i.e. one year and one month) were available.

**Figure 13-1 Throughput vs Operating SE**



The maximum grinding circuit capacity is generally defined by the line of Operating SE ranging between 9 kWh/st and 13 kWh/st which corresponds to processing rates ranging between 36,000 st/d and 29,000 st/d.

Analysis of the power utilization (Table 13-2) suggested that the grinding circuit power was not fully utilized, with lower utilization than typical. The circuit operating availability for the two grinding trains combined was lower than typically observed at similar operations. These findings indicate that the existing grinding circuit had more power capacity than utilized in 2012 to 2014. Mill availability and ability to draw power are further discussed in Item 17.

**Table 13-2 Historical TCM grinding circuit power utilization**

| Year | Average productivity (st/h) | Operating availability (%) | Operating grind circuit SE (kWh/st) | Average power utilization (%) |
|---|---|---|---|---|
| 2012 | 1,248 | 91.7 | 10.9 | 77.3 |
| 2013 | 1,222 | 89.4 | 10.1 | 70.3 |
| 2014 | 1,180 | 90.4 | 11.1 | 73.5 |

## 13.6 Flotation Performance

### 13.6.1 Flotation Recovery of Molybdenum

Figure 13-2 shows 12-hour shift data from 2011 to 2012. Only valid datapoints are shown where feed, final concentrate, and final tailings Mo grades are available for calculating Mo recovery (i.e. invalid datapoints are either 100% recovery or divide by zero errors). Table 13-3 shows the summary statistics of flotation performance for the period. The data indicate that molybdenite floats well for a wide range of feed grades and is able to achieve recoveries as high as 98%. The data show that the original flotation circuit design had the flexibility necessary to maintain high recoveries (>95%) at relatively high feed grades (>0.2% Mo). Figure 13-3 shows the recovery versus throughput relationship, which does not show a clear correlation between the two variables; therefore, the evidence confirms that the flotation equipment sizing was appropriate for the throughput and feed grade combinations experienced at TCM so far.

**Figure 13-2 Historical flotation performance – recovery vs feed grade, 2011–2012**

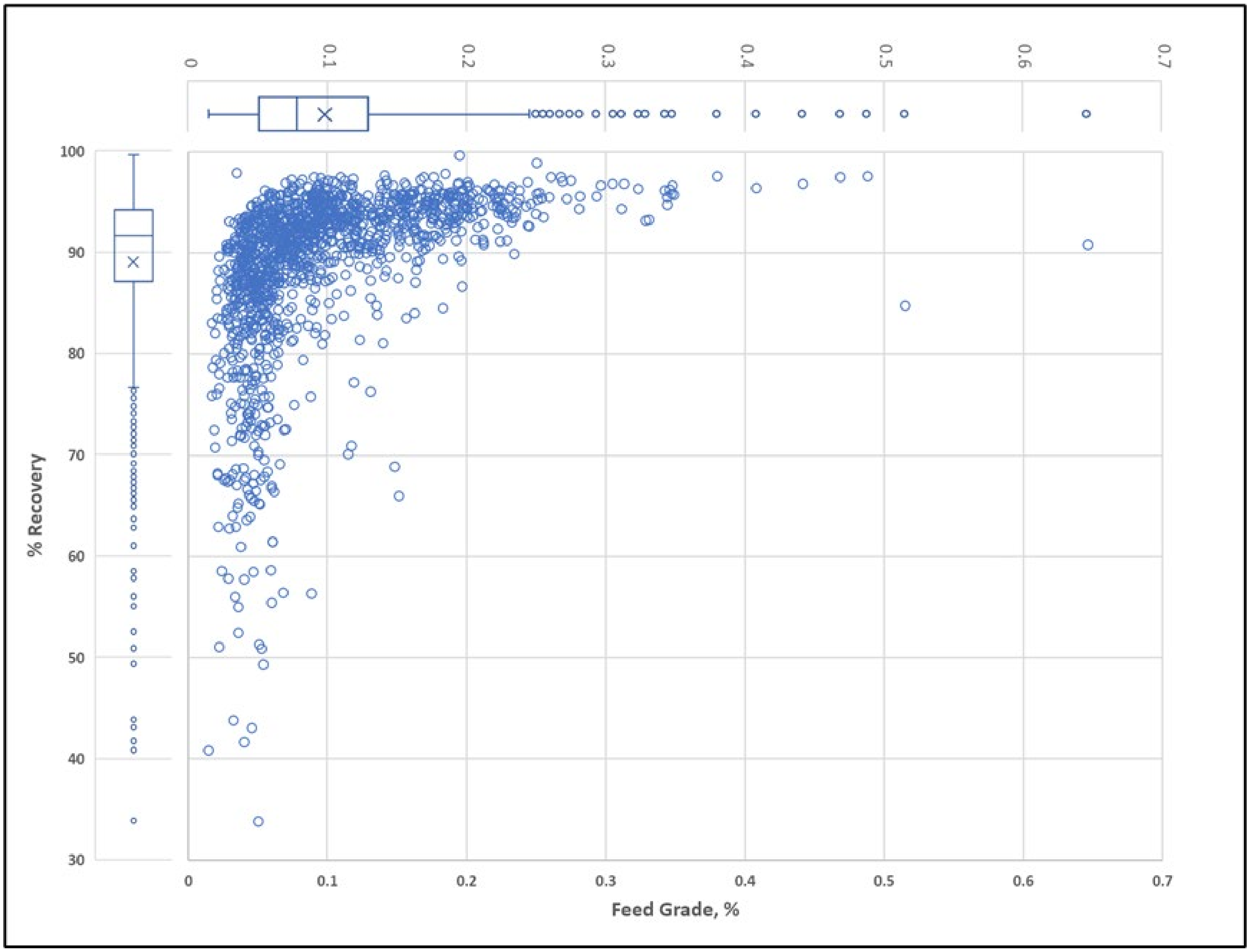
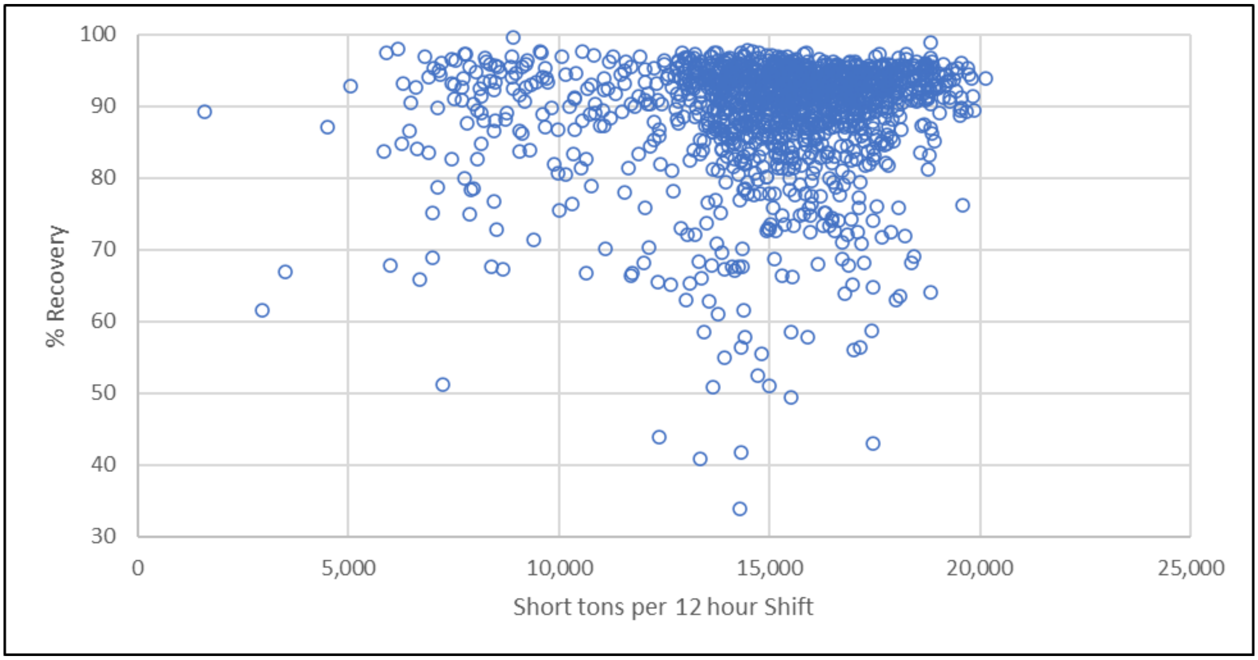


**Table 13-3 Summary statistics of flotation performance from 2011–2012**

| Description | Units | Average | Minimum | Maximum | Std dev |
|---|---|---|---|---|---|
| Molybdenum grade | % | 0.097 | 0.0166 | 0.246 | 0.06 |
| Molybdenum recovery | % | 89.5 | 77.3 | 98.0 | 6.9 |

**Figure 13-3 Flotation performance – recovery vs throughput, 2011–2012**



## 13.6.2 Recovery Model

A molybdenum recovery model based on feed grade was established with filtered shift data set from 2011 to 2012. Shifts with lower-than-average mill operating hours and statistical outliers are taken as proxies for upset conditions and abnormal performance due to poor equipment condition at the time. These abnormal shifts with recoveries unrelated to metallurgical performance are removed to better represent the full metallurgical potential of the Thompson Creek ore. Table 13-4 shows the summary statistics for the filtered dataset.

**Table 13-4 Summary of flotation performance from 2011 - 2012 for recovery model**

| Description | Units | Average | Minimum | Maximum | Std dev |
|---|---|---|---|---|---|
| Molybdenum grade | % | 0.10 | 0.0166 | 0.349 | 0.06 |
| Molybdenum recovery | % | 91.2 | 77.7 | 99.0 | 4.3 |

Five recovery models were explored:

- Classic first order kinetics (FOK)
- Klimpel kinetics (Klimpel)

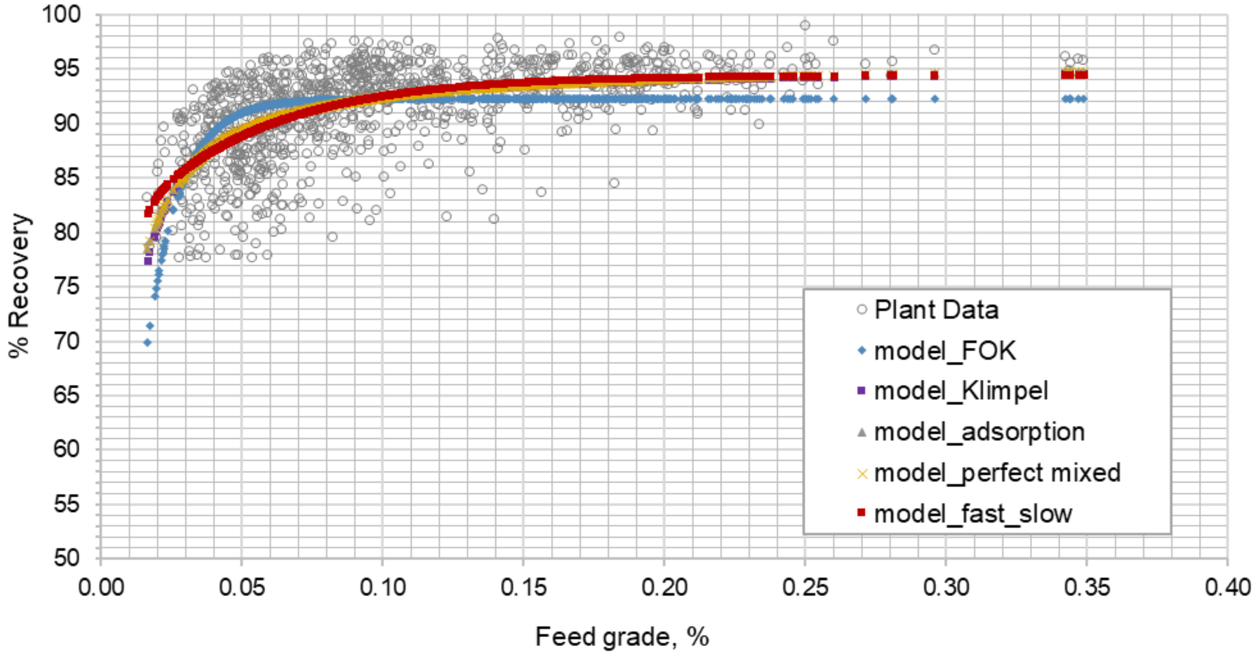
- Improved adsorption model (adsorption)
- Perfect mixed reactor (mixed)
- Fast/slow kinetics (fast/slow).

As shown in Figure 13-4 below, all five models fit reasonably well, with the fast/slow kinetic model scoring the best fit based on Least Square Error method, followed by the improved adsorption and perfect mixed reactor model. Therefore, the recovery was described as a function of the feed grade by the fast/slow kinetic equation:

$$R = \vartheta_f\left(1 - e^{-K_f \cdot t}\right) + \vartheta_s\left(1 - e^{K_s \cdot t}\right)$$

$$R = 78.1\left(1 - e^{-245.6 \cdot x}\right) + 16.3\left(1 - e^{-21.4 \cdot x}\right)$$

**Figure 13-4 Fitted models for molybdenum recovery projection**



## 13.7 Concentrate Production

Following comminution and flotation, the concentrate is further processed through thickening, leaching, filtering, drying, and packaging circuits before being ready for shipment offsite as final concentrate. Each circuit is of sufficient capacity to handle the historical range of ore fed and molybdenum grade as discussed previously, and capable of producing a clean saleable concentrate.

The historical molybdenum concentrate grade data are summarized in Table 13-. Typical deleterious elements including lead, iron, bismuth, and gamma emitters, were monitored and removed from the concentrate products via depression (iron, bismuth, gamma emitters) in the flotation process and acid leaching (lead) or blended as required to meet sales targets.

**Table 13-5 Concentrate production statistics in 2011–2012**

| Description | Units | Average | Minimum | Maximum | Std dev |
|---|---|---|---|---|---|
| Molybdenum concentrate grade | % | 53.9 | 47.3 | 58.6 | 3.5 |

## 13.8 Metallurgical Testwork Program (2023–2024)

A metallurgical testwork program was carried out at Base Metallurgical Laboratories Ltd (BaseMetLab), located in Kamloops, British Columbia, Canada, from October 2023 to February 2024. The program consisted of comminution and flotation tests to characterize future ores, and also to confirm the similarities and to identify differences, if any, between the restart LOM ore and historical production.

### 13.8.1 Composites

Four composite samples, each representing a three-year mining period (Year 1-3, Year 4-6, Year 7-9, and Year 10-EOM) were submitted for analysis. The composite samples were made up of drill core intervals from the prospective mine plan locations, principally along the existing pit wall and floor. Figure 13-5 and Figure 13-6 shows the locations of the samples used to generate the composites. The plan view shows the drillhole locations overlaid on the existing pit. On the section view, the tan line shows the current pit extent, while the red line shows the pit line for the feasibility study. The Year 1-3, Year 4-6, Year 7-9 and 10-EOM samples are indicated as red, green, yellow, and blue, and correspond to the mine plan sequence.

**Figure 13-5 Metallurgical and comminution composites spatial location – plan view**

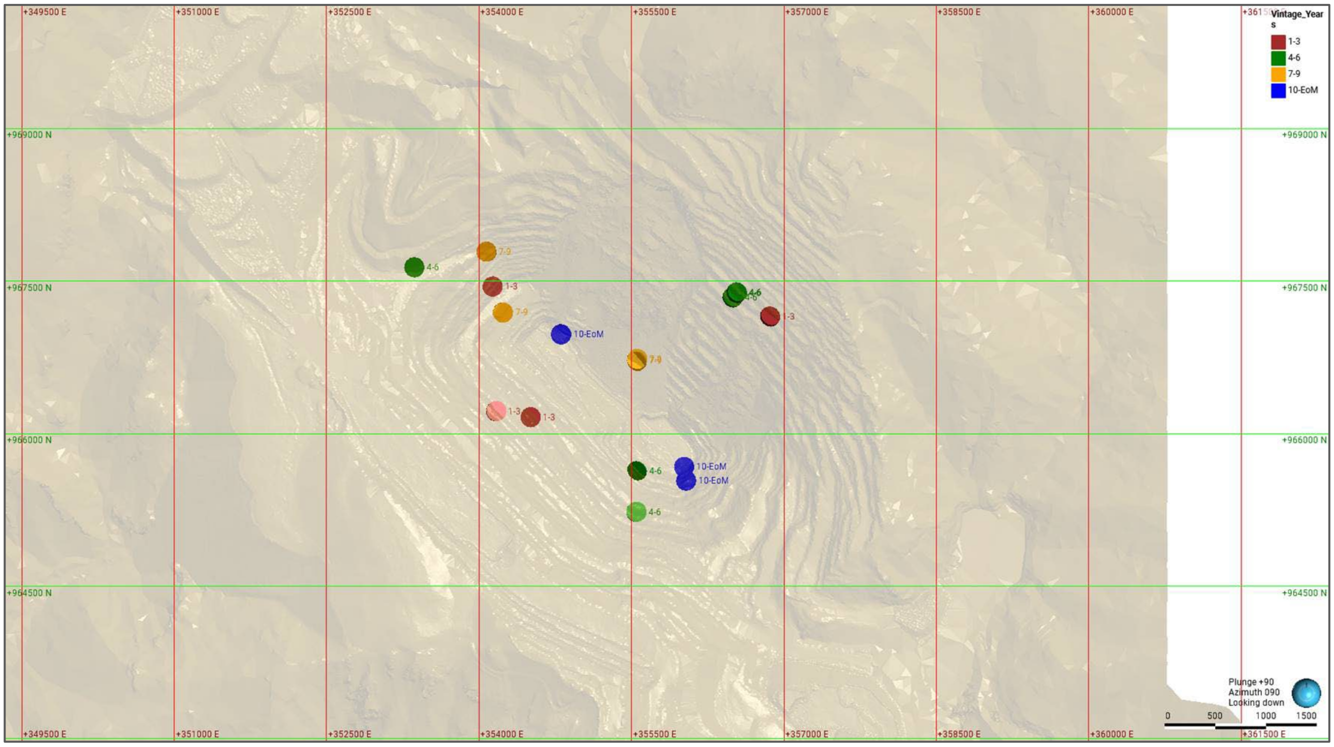
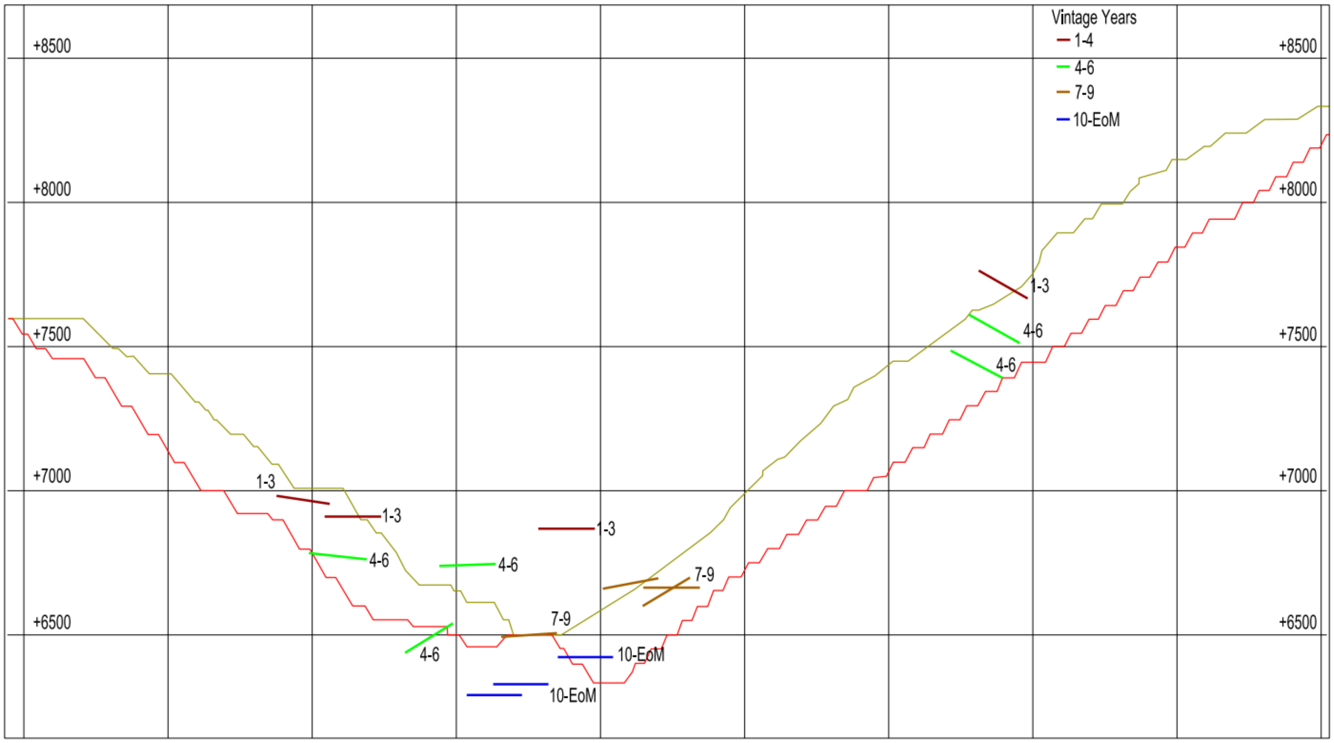


**Figure 13-6 Metallurgical and comminution composites spatial location – section view**



## 13.8.2 Mineralogy

The mineral content of the composites was determined using the PMA (Particle Mineral Analysis) function in QEMSCAN. Table 13- shows the mineralogical make-up of the four composites. The four time periods show similar molybdenite content, except for Year 1-3, which is lower, but does show similar non-sulfide gangue content. Composite Year 4-6 shows higher pyrite content which will have an impact on the metallurgical performance in the molybdenum flotation circuit and pyrite removal circuit, respectively.

**Table 13-6 Composite mineralogy**

| Mineral | Mineral abundance (%) | | | |
|---|---|---|---|---|
| | Year 1-3 | Year 4-6 | Year 7-9 | Year 10-EOM |
| Pyrite | 0.51 | 1.13 | 0.52 | 0.39 |
| Molybdenite | 0.12 | 0.18 | 0.17 | 0.21 |
| Other sulfides | 0.02 | 0.03 | 0.02 | 0.03 |
| Quartz | 34.8 | 37.0 | 39.4 | 35.7 |
| Plagioclase | 30.1 | 23.9 | 22.0 | 27.7 |
| K-Feldspar | 20.6 | 19.6 | 26.8 | 24.4 |
| Sericite/Muscovite | 2.91 | 6.58 | 2.26 | 2.98 |
| Biotite | 4.83 | 3.70 | 3.26 | 3.45 |
| Chlorite | 1.53 | 2.14 | 1.65 | 1.19 |
| Clays | 3.25 | 3.19 | 2.51 | 2.54 |
| Carbonates | 0.46 | 1.56 | 0.58 | 0.61 |
| Apatite | 0.29 | 0.48 | 0.35 | 0.29 |
| Other | 0.59 | 0.48 | 0.48 | 0.49 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** |

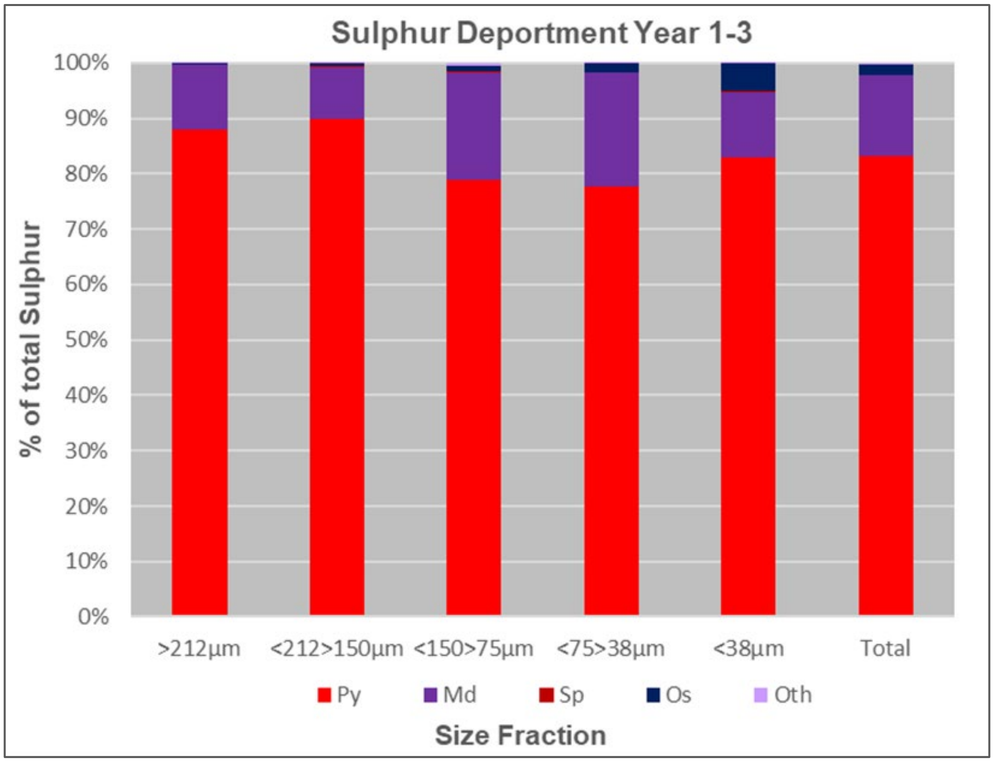
Table 13- shows the total sulfur deportment in each composite. Figure 13-7 to Figure 13-10 show the sulfur deportment by size fraction. The sulfur deportment is dominated by pyrite, particularly in the Year 4-6 composite. The relative amount of molybdenite is lower in the first six years and increases towards the end of mine life. There is a small presence of sphalerite that will become more prevalent towards the end of mine life when it will reach 2.4% of total sulfides. There is also the presence of other sulfides most noticeably in Year 1-3. This category includes galena, which is predominantly in the smaller size fractions with most of its content 38 µm and smaller.

**Table 13-7 Composite sulfur deportment**

| Composite | Mineral distribution of sulfur (% of total sulfur) | | | | |
|---|---|---|---|---|---|
| | Py | Md | Sp | Os | Other |
| Year 1-3 | 83.1 | 14.6 | 0.2 | 1.9 | 0.2 |
| Year 4-6 | 88.3 | 10.3 | 0.6 | 0.7 | 0.0 |
| Year 7-9 | 78.8 | 18.9 | 1.2 | 1.0 | 0.0 |
| Year 10-EOM | 69.3 | 27.7 | 2.4 | 0.6 | 0.0 |

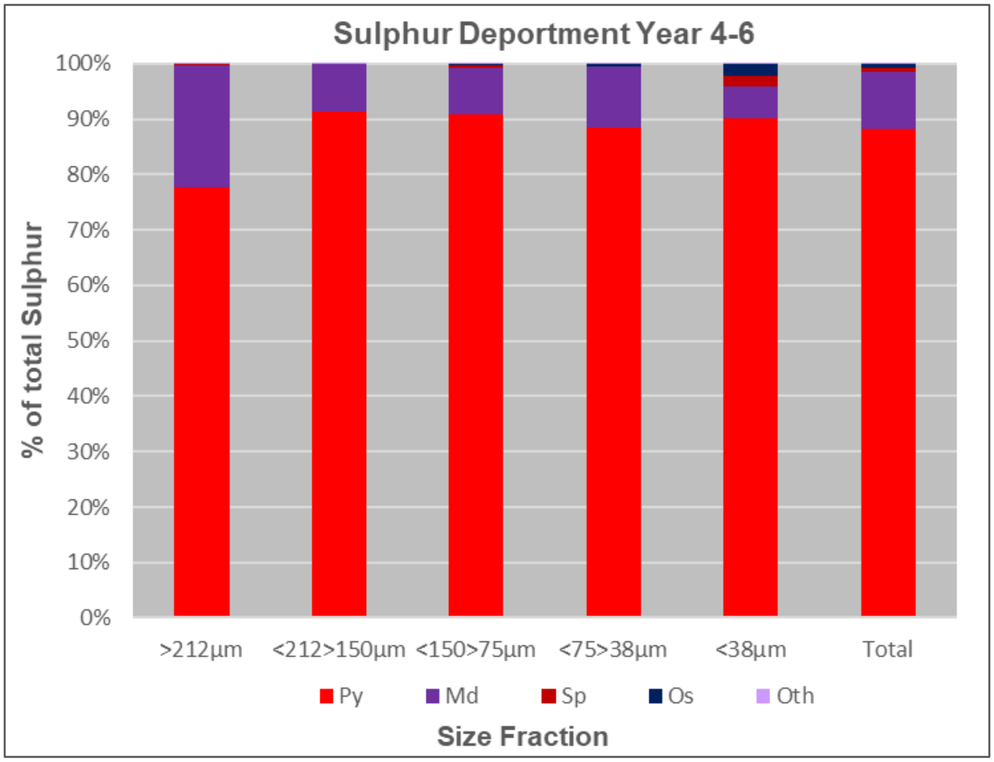
Abbreviations: Py – pyrite, Md – molybdenite, Sp – sphalerite, Os – other sulfides.

**Figure 13-7 Sulfur deportment, Year 1-3**



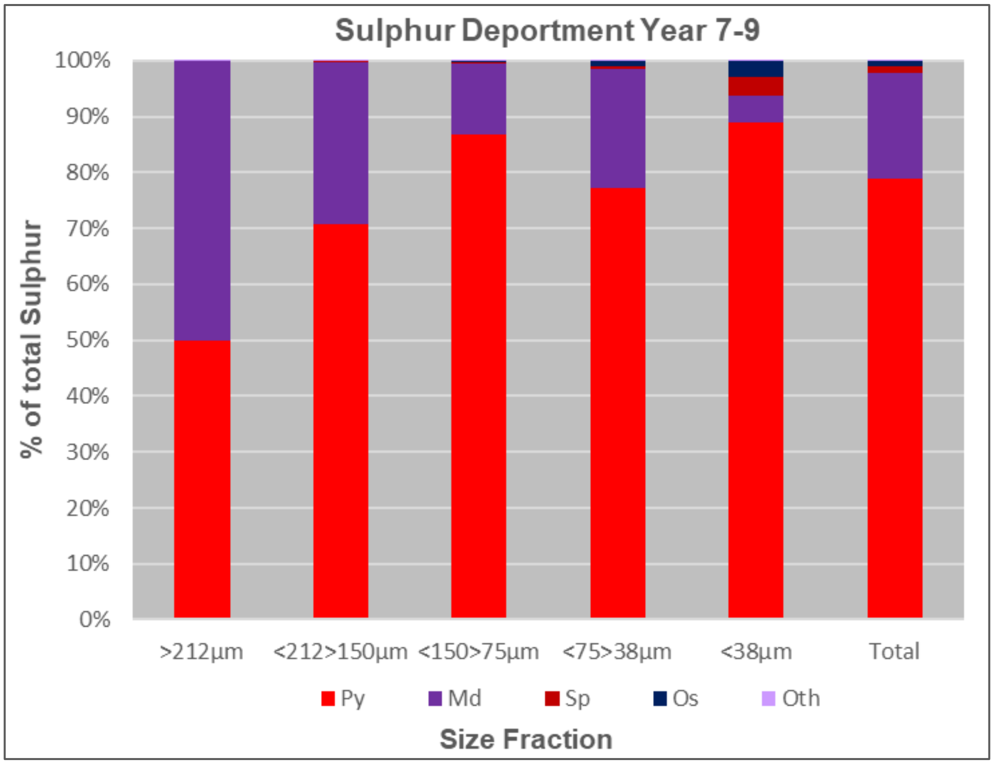
Abbreviations: Py – pyrite, Md – molybdenite, Sp – sphalerite, Os – other sulfides, Oth – other.

**Figure 13-8 Sulfur deportment, Year 4-6**



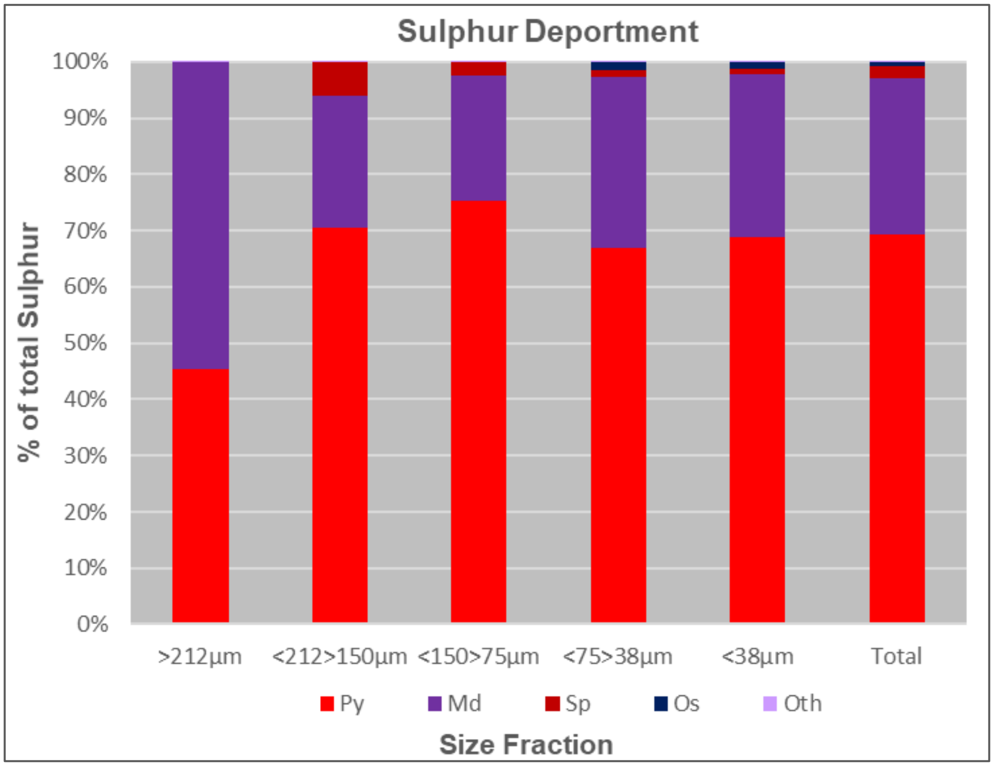
Abbreviations: Py – pyrite, Md – molybdenite, Sp – sphalerite, Os – other sulfides, Oth – other.

**Figure 13-9 Sulfur deportment, Year 7-9**



Abbreviations: Py – pyrite, Md – molybdenite, Sp – sphalerite, Os – other sulfides, Oth – other.

**Figure 13-10 Sulfur deportment, Year 10-EOM**



Abbreviations: Py – pyrite, Md – molybdenite, Sp – sphalerite, Os – other sulfides, Oth – other.

Table 13- shows 2D liberation of molybdenite for each composite at a $P_{80}$ of 208 µm. High molybdenite liberation (>84%) was measured throughout the LOM. It is indicated that an important amount of ore forms binary molybdenite-galena (Gn) aggregates concentrated in sizes of 38 µm and smaller. The distribution of these aggregates begins relatively high and gradually decreases until reaching 5.9% in Year 10-EOM.

**Table 13-8 Composite molybdenite liberation (%)**

| Size range | Liberation (%) – 2D | | | |
|---|---|---|---|---|
| **Mineral status** | **Year 1-3** | **Year 4-6** | **Year 7-9** | **Year 10-EOM** |
| Liberated | 84.7 | 86.9 | 90.4 | 93.7 |
| Binary – Py | 0.9 | 0.0 | 1.7 | 0.3 |
| Binary – Os | 0.0 | 0.0 | 0.0 | 0.0 |
| Binary – Gn | 13.7 | 12.9 | 7.8 | 5.9 |
| Multi-phase | 0.7 | 0.2 | 0.1 | 0.0 |
| **Total** | **100.0** | **100.0** | **100.0** | **99.9** |

Note: Numbers may not sum precisely due to rounding.

## Comminution

Comminution tests consisted of measuring the SMC (Dwi, Mia, Mic, Mih) and Bond Rod, Ball, and Abrasion indices. Table 13- shows a summary of the testwork results. Note that all units are in metric in the below table.

**Table 13-9 Summary of 2023 comminution testwork results**

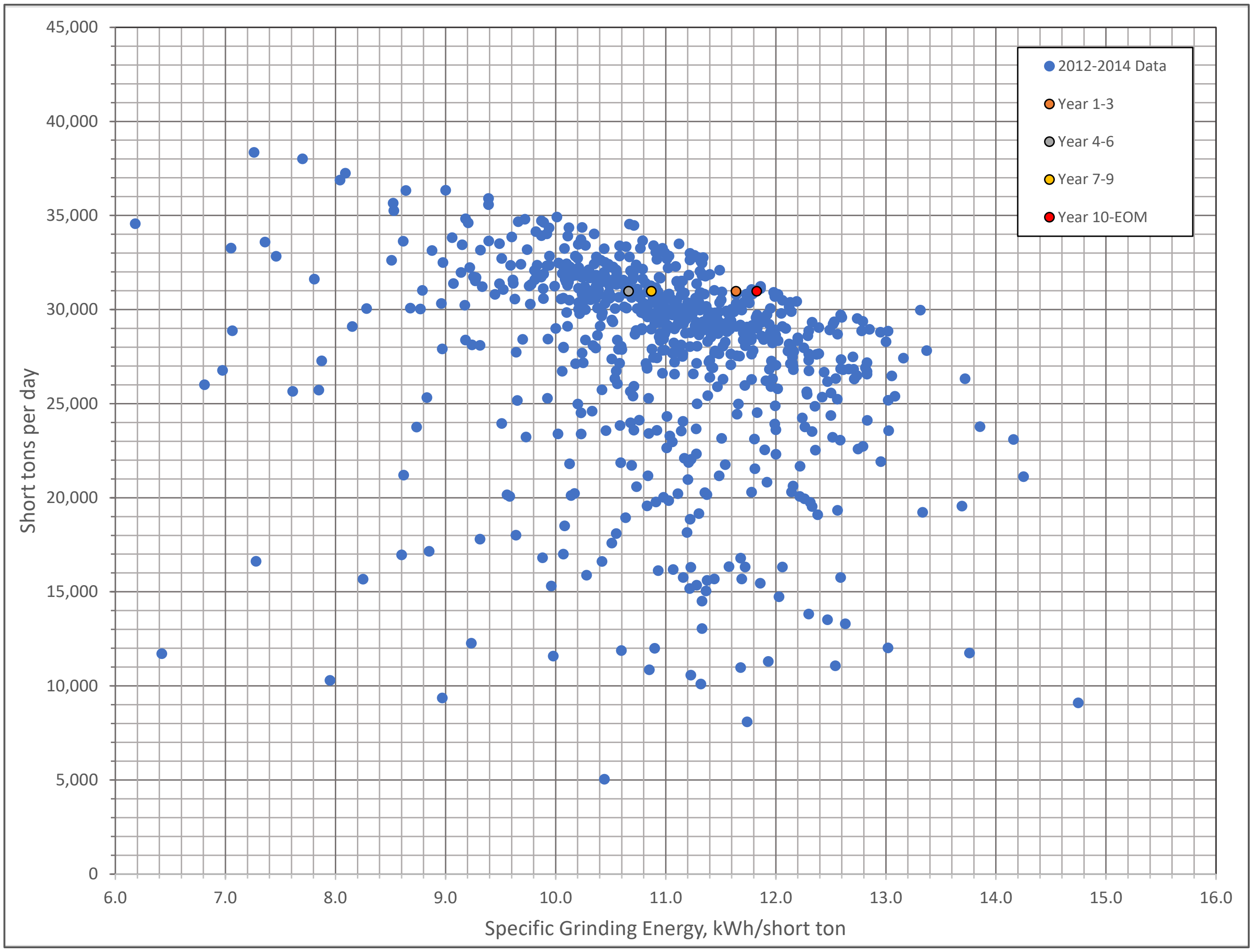
| Composite | DWi (kWh/m$^3$) | DWi (%) | Mia (kWh/t) | Mih (kWh/t) | Mic (kWh/t) | Bond Rod (kWh/t) | Bond Ball (kWh/t) | Bond Ai |
|---|---|---|---|---|---|---|---|---|
| Year 1-3 | 5.61 | 36 | 17.3 | 12.3 | 6.4 | 11.8 | 11.9 | 0.4 |
| Year 4-6 | 4.42 | 22 | 14.5 | 9.8 | 5.1 | 10.8 | 13.7 | 0.3 |
| Year 7-9 | 4.9 | 28 | 15.8 | 11 | 5.7 | 11.1 | 12 | 0.3 |
| Year 10-EOM | 5.69 | 37 | 17.6 | 12.6 | 6.5 | 11.7 | 12.2 | 0.4 |

Based on the testwork results, the calculated specific grinding energies required to achieve the target grind ($P_{80}$ 212 µm) (Table 13-) for the LOM are within the Operating SE range experienced previously by the mill, indicating their similarity to the historically processed ore from the perspective of hardness and comminution. The SE values for each LOM composite are plotted over the 2012–2014 data to show the relationship between the two datasets (Figure 13-11). Note that the Operating SE values are based on MCC (motor input) readings, and so the testwork-derived specific energies are factored up, by dividing through 0.96, as an adjustment for motor and drive train efficiency, before being displayed on the figure.

**Table 13-10 LOM three-year composite samples calculated specific grinding energy**

| Composite | kWh/st |
|---|---|
| Year 1-3 | 11.17 |
| Year 4-6 | 10.23 |
| Year 7-9 | 10.43 |
| Year 10-EOM | 11.35 |

**Figure 13-11 Composite calculated SE vs historical**



The hardest composite, representing the period from Year 10-EOM, is within the SE range experienced by TCM previously, at a throughput meeting the nominal throughput of 31,000 st/d at a 92% grinding circuit availability, or 28,500 st/d average, as designated for TCM's restart.

## Flotation

### *Rougher Flotation*

Rougher flotation tests were performed at a nominal primary grind size of 200 µm. Figure 13-12 shows the flowsheet schematic. Flotation reagents, such as collector and frother, were added in the primary grind and flotation cells, similar to historical operations. Figure 13-13 shows the rougher flotation results. All composites were able to achieve high rougher recoveries in the range of 94.31 % to 97%. Year 1-3 and Year 4-6 produced similar metallurgical recovery. The best grade/recovery curve was produced with Year 10-EOM most probably related to high molybdenite liberation as shown in Table 13-7. A separate sample named High Sulfur, which corresponds to the metasedimentary rocks, produced the weakest flotation response. Fortunately, metasedimentary rocks constitute only a small fraction of the ore and belong to the mine plan for Year 1-3 and Year 4-6, both of which have otherwise relatively good metallurgical performance. The metasedimentary rocks will be processed through the concentrator only as a blend as defined in the mine plan. The metasedimentary lithology and their constitution in the LOM orebody are discussed in Item 8.

**Figure 13-12 Flowsheet schematic for rougher flotation**

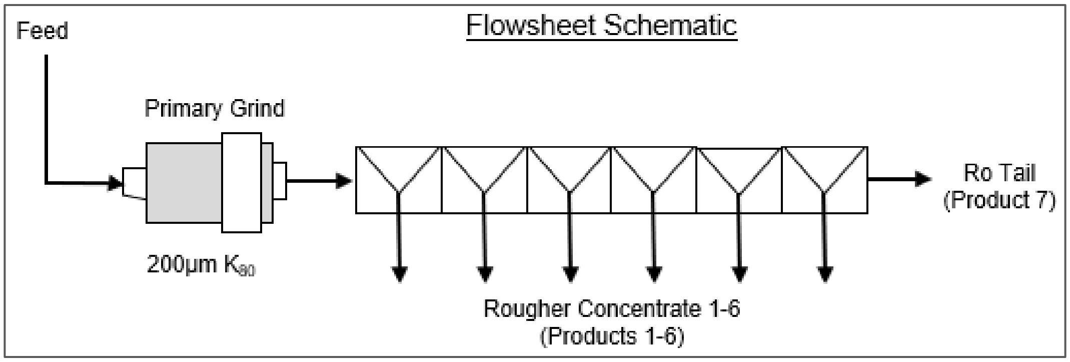
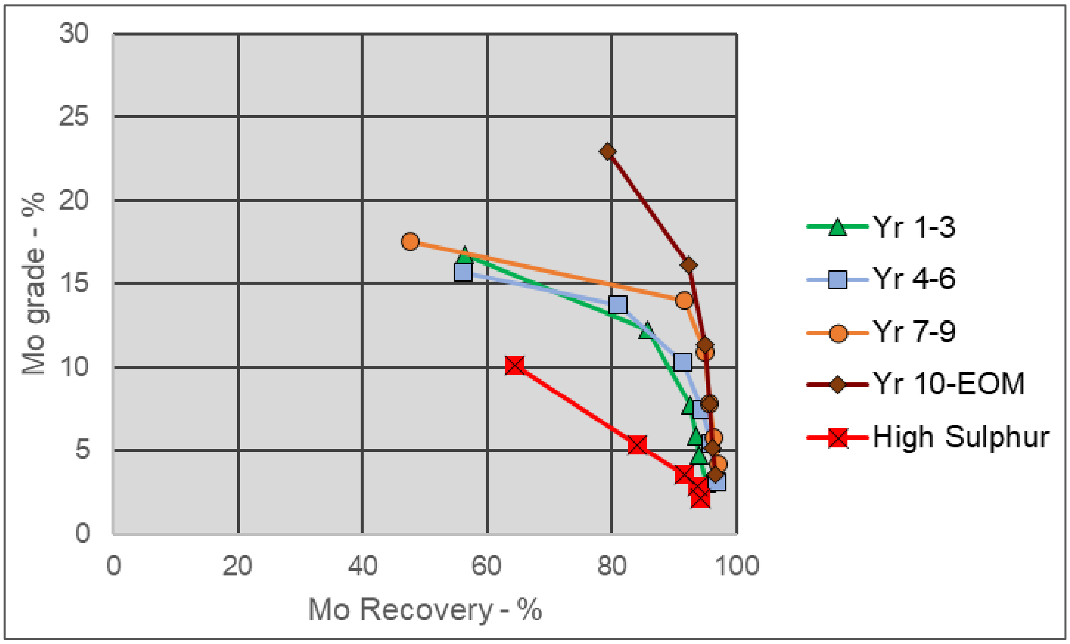


**Figure 13-13 Rougher flotation results**



### *Cleaner Flotation*

Cleaner flotation tests were performed under varying conditions, described below. Four sets of cleaner tests were performed with different objectives:

- Set 1 – Base Case: 3-minute regrind (target $P_{80}$ 42 µm), open circuit.
- Set 2 – Coarser Regrind: 1-minute regrind, open circuit.
- Set 3 – Coarser Regrind/Closed Circuit: Molybdenum first cleaner tails recirculated into pyrite rougher.
- Set 4 – High Sulfur: 1-minute regrind, closed circuit with pyrite; 3-minute regrind, open circuit; and 6-minute regrind, open circuit.

Figure 13-14 shows the flowsheet schematic for cleaner flotation. Figure 13-15 to Figure 13-18 show the grade/recovery curves for the four sets. For Sets 1 to 3, there is a common pattern indicating that the metallurgical performance improves towards the end of mine life, which corresponds well with the liberation data shown on Table 13-7. High molybdenum recoveries were achieved in Sets 1 to 3 with a range of 88.9% to 94.8% and concentrate grades ranging from 52.3% to 59.3% Mo. Set 4, which corresponds to the previously noted High Sulfur metasedimentary lithology, shows a weak metallurgical performance with much lower concentrate grades ranging from 20.8% to 41.5% Mo. Although its flotation response is weak, it is expected that the metasedimentary rocks can be processed for a saleable concentrate with appropriate blending strategies to be put in place.

**Figure 13-14 Flowsheet schematic cleaner flotation**

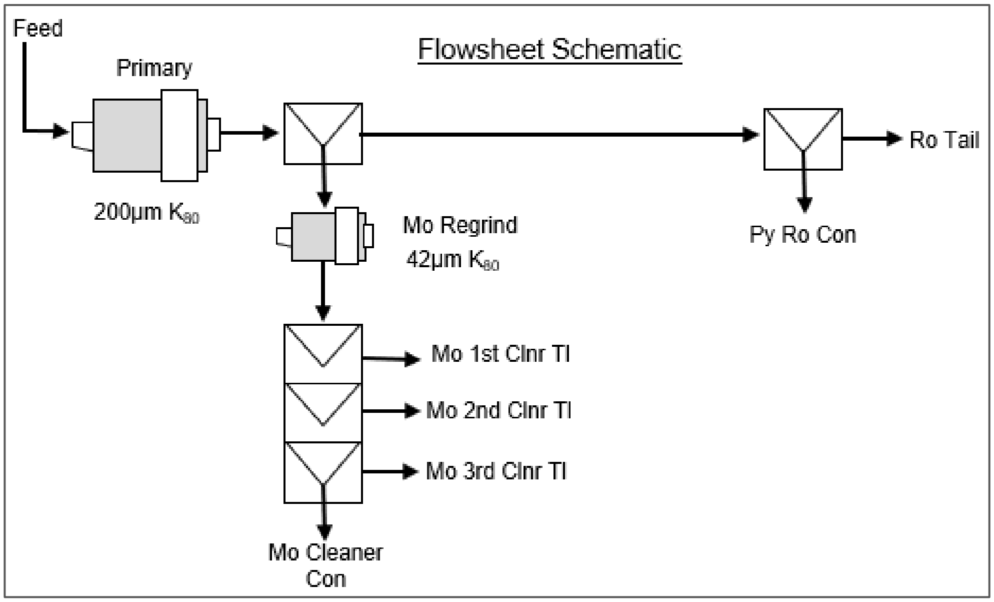


**Figure 13-15 Grade/Recovery curve – Base Case**

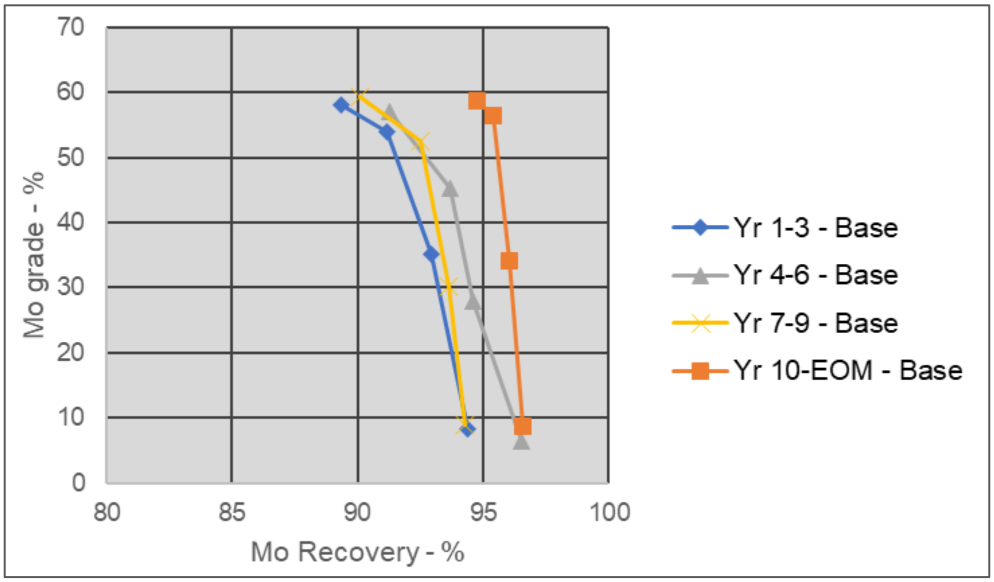


**Figure 13-16 Grade/Recovery curve – Coarser Grind**

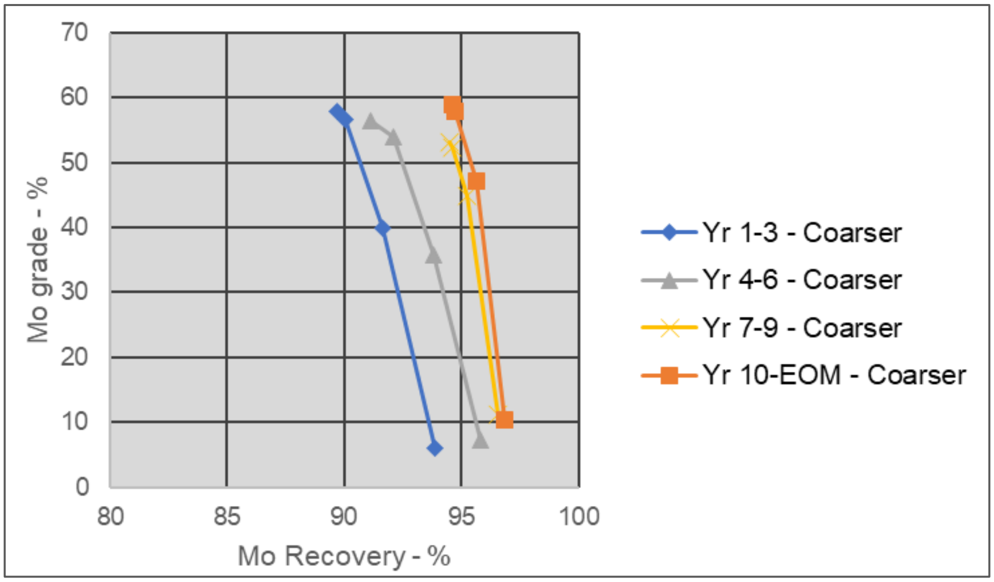


**Figure 13-17 Grade/Recovery curve – Closed Circuit**

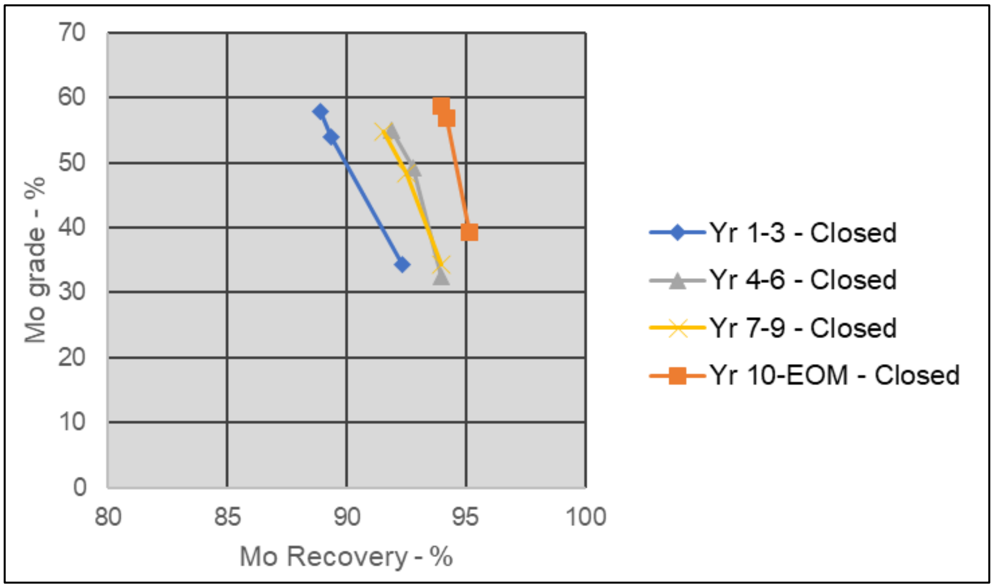


Figure 13-18 Grade/Recovery curves – High Sulfur

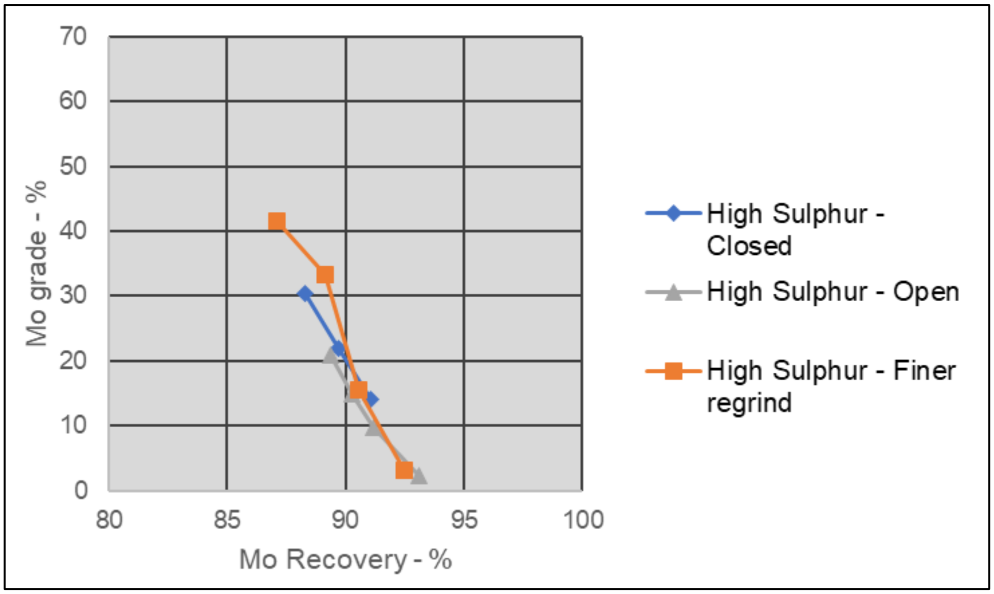
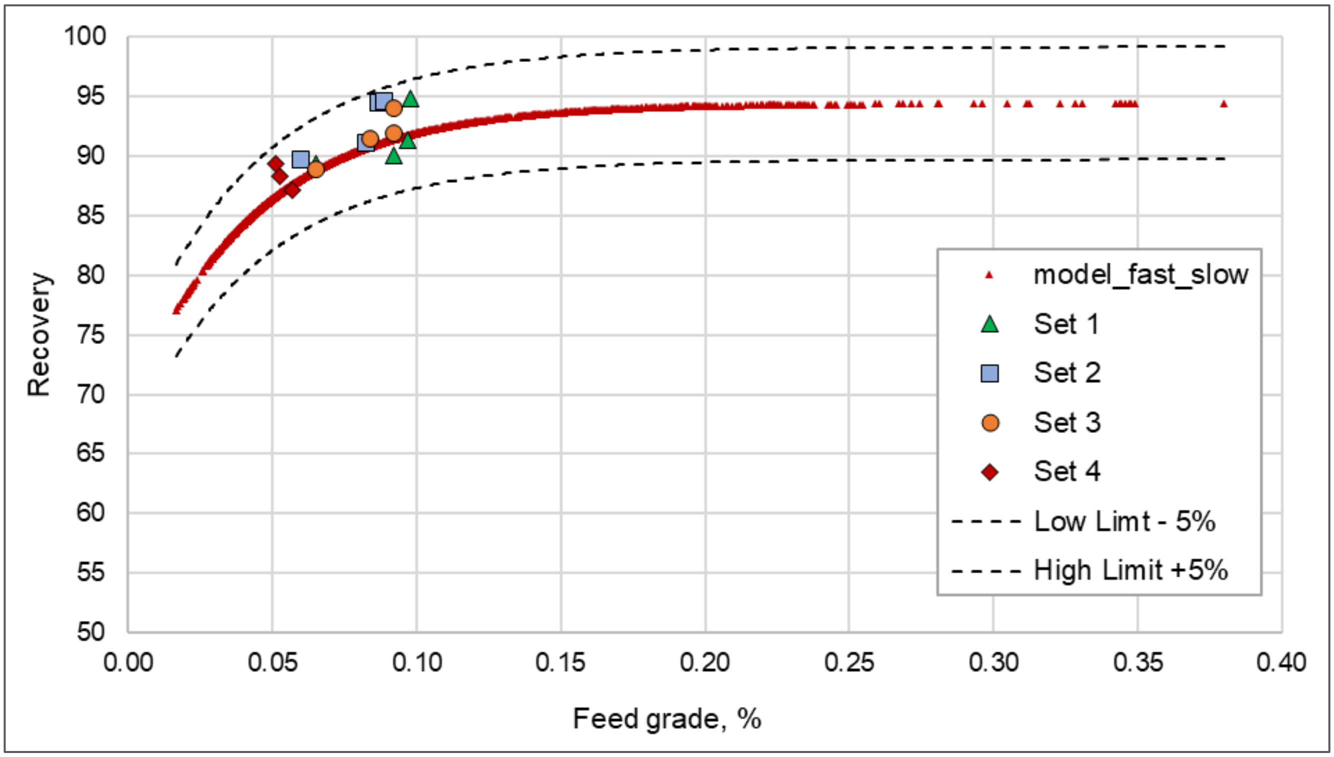


Figure 13-19 shows the flotation test results plotted over the fast/slow recovery model where it can be seen that the samples tested are within ±5% relative to the recovery model, confirming that the expected flotation response of the future TCM ore is aligned with historical performance.

Figure 13-19 Recent flotation tests results compared to fast/slow recovery model



### *Concentrate Dewatering and Leaching*

No testwork specific to concentrate dewatering (thickening, filtration, or drying) and acid leaching was completed. It is expected and assumed that the TCM restart LOM ore does not present any issues in these unit operations, given its similarity to historical feed, and the performance and ability of the TCM circuits to produce a clean saleable concentrate.

### *Pyrite Flotation*

The flotation testwork program completed by BaseMetLab also included a stage of rougher pyrite flotation to inform design of a new pyrite removal circuit. TCM's historical pyrite removal circuit had been removed but will be replaced with the new circuit prior to operations restarting. The target in pyrite flotation at TCM is to produce a non-sulfide tailings grade less than 0.1% S. Figure 13-20 and Table 13-10 show the results of all pyrite flotation tests, where most of the results corresponding to the main composites show 0.1% S or lower, except for one outlier (from the Year 4-6 set). As expected, the results corresponding to High Sulfur (metasediments) are significantly greater than the target tailings grade and are highlighted in the figure. As mentioned above, this is only a small portion of the ore; therefore, sulfur removal is expected to be well under control. This ore will not be fed directly to the concentrator; instead, it will be blended with the typical ore specified in the mine plan.

**Figure 13-20 Pyrite flotation results**

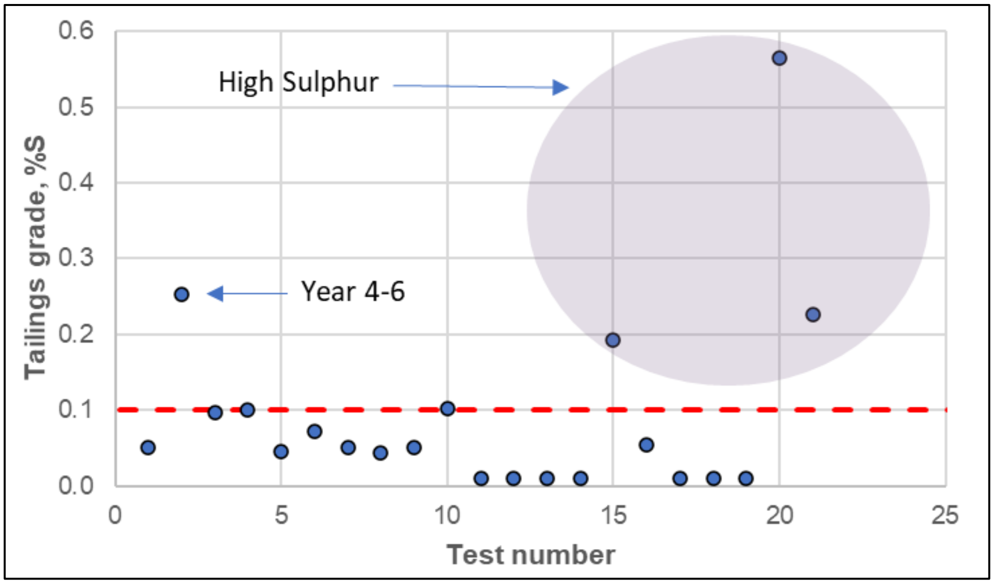


**Table 13-11 Pyrite flotation results**

| Test | Composite | % S |
|---|---|---|
| R1 | Y1-3 | 0.05 |
| R2 | Y4-6 | 0.25 |
| R3 | Y7-9 | 0.10 |
| R4 | Y10-EOM | 0.10 |
| CL5 | Y1-3 | 0.05 |
| CL6 | Y4-6 | 0.07 |
| CL7 | Y7-9 | 0.05 |
| CL8 | Y10-EOM | 0.04 |
| CL9 | Y1-3 | 0.05 |
| CL10 | Y4-6 | 0.10 |
| CL11 | Y1-3 | 0.01 |
| CL12 | Y4-6 | 0.01 |
| CL13 | Y7-9 | 0.01 |
| CL14 | Y10-EOM | 0.01 |
| R15 | High Sulfur | 0.19 |
| CL17 | Y4-6 | 0.05 |
| CL18 | Y7-9 | 0.01 |
| CL19 | Y10-EOM | 0.01 |
| CL20 | Y1-3 | 0.01 |
| CL21 | High Sulfur | 0.57 |
| CL22 | High Sulfur | 0.23 |

# 14 MINERAL RESOURCE ESTIMATE

## 14.1 Introduction

The TCM is an open pit operation that was active until 2014 when falling molybdenum prices made further exploitation of the deposit uneconomic. After approximately 10 years on care and maintenance, the mineral resource model used in the past required to be updated due to changes in the Company's software infrastructure and the understanding that grade differences exist between the two principal intrusive phases that host the molybdenum mineralization.

There is no indication in company records that suggest previous mineral resource models did not perform adequately or that a change in mining method might be advantageous for the potential extraction of additional Mineral Resources. Limited reconciliation data are shown in Table 14-1 for Phase VI and in Table 14-2 for Phase VII. Those data suggest that the previous model performed well; while some variability exists on a bench-by-bench basis, which is expected, larger volumes, such as mining phases, reconcile well. Note that the data are grade-based only; tonnage reconciliation data were not available.

**Table 14-1 Historical grade-based reconciliation data of mining Phase VI between blast-hole and historical mineral resource model, June 2009 to April 2011**

| Bench | Tons | Mo (%) Blast-hole assays | Mo (%) Mineral resource model | % Difference |
|---|---|---|---|---|
| 6850 | 393,995 | 0.105 | 0.105 | 0% |
| 6800 | 448,062 | 0.128 | 0.135 | -5% |
| 6750 | 2,042,213 | 0.158 | 0.160 | -1% |
| 6700 | 2,758,667 | 0.195 | 0.180 | 8% |
| 6650 | 2,834,940 | 0.187 | 0.181 | 4% |
| 6600 | 3,086,477 | 0.166 | 0.173 | -4% |
| 6550 | 2,599,831 | 0.163 | 0.165 | -1% |
| 6550 | 1,762,483 | 0.134 | 0.155 | -15% |
| 6550 | 816,814 | 0.109 | 0.117 | -7% |
| **Total Phase VI** | **16,743,482** | **0.164** | **0.165** | **-1%** |

**Table 14-2 Historical grade-based reconciliation data of mining Phase VII between blast-hole and historical mineral resource model, August 2011 to June 2014**

| Bench | Tons | Mo (%) Blast-hole assays | Mo (%) Mineral resource model | % Difference |
|---|---|---|---|---|
| 7100 | 133,229 | 0.024 | 0.027 | -13% |
| 7050 | 356,866 | 0.037 | 0.031 | 16% |
| 7000 | 882,135 | 0.045 | 0.039 | 15% |
| 6950 | 1,457,415 | 0.051 | 0.047 | 8% |
| 6900 | 1,933,032 | 0.063 | 0.063 | -1% |
| 6850 | 2,933,678 | 0.068 | 0.072 | -6% |
| 6800 | 3,296,105 | 0.081 | 0.082 | -1% |
| 6750 | 3,452,904 | 0.090 | 0.088 | 2% |
| 6700 | 2,849,884 | 0.102 | 0.100 | 3% |
| 6650 | 87,332 | 0.020 | 0.029 | -47% |
| 6650 | 3,179,911 | 0.101 | 0.104 | -3% |
| 6600 | 134,774 | 0.019 | 0.049 | -167% |
| 6600 | 2,736,021 | 0.122 | 0.120 | 2% |
| 6550 | 210,557 | 0.011 | 0.035 | -227% |
| 6550 | 2,101,685 | 0.129 | 0.135 | -5% |
| 6500 | 2,161,548 | 0.157 | 0.146 | 7% |
| 6450 | 1,805,030 | 0.160 | 0.136 | 15% |
| 6400 | 1,573,394 | 0.167 | 0.129 | 23% |
| 6350 | 813,866 | 0.184 | 0.112 | 40% |
| **Total Phase VII** | **32,099,366** | **0.103** | **0.097** | **5%** |

The mineral resource model presented herein is an updated model that does not consider additional core holes compared to the previous mineral resource model but utilizes a more detailed geological model to support the statistical evaluation of molybdenum assays. The current model distinguishes different intrusion lithologies, unlike previous models. Hence, the current mineral resource model for the Thompson Creek deposit is based on a reinterpretation of the host lithology.

The resource evaluations reported herein are reasonable representations of the global molybdenum Mineral Resources of the project at the current level of sampling. The mineral resources have been estimated in conformity with the widely accepted CIM Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines (CIM, Nov 2019) and are reported in accordance with the Canadian Securities Administrators' NI 43-101.

Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into Mineral Reserves.

## 14.2 Mineral Resource Estimation Methodology

Leapfrog version 2023.1.0 and its Edge extension was used to construct the domain solids, to prepare assay data for geostatistical analysis, construct the block model, estimate molybdenum grades, and tabulate mineral resources. The Mineral Resource Statement was prepared by Dr Lars Weiershäuser, PGeo, Director of Geology for Centerra, who is a QP pursuant to NI 43-101. The effective date for the Mineral Resource Statement is September 1, 2024.

The evaluation of Mineral Resources involved the following procedures:

1) Database compilation and verification
2) Construction of geological wireframes
3) Construction of wireframe models for major mineralized domains
4) Definition of geostatistical resource domains
5) Data conditioning (compositing and capping) for geostatistical analysis
6) Variography
7) Selection of estimation strategy and estimation parameters
8) Block modeling and grade interpolation
9) Validation, classification, and tabulation
10) Assessment of “reasonable prospects for eventual economic extraction”
11) Selection of reporting assumptions
12) Preparation of the Mineral Resource Statement
13) Review of the completed project.

The following sections summarize the methodology and assumptions made by Centerra to construct the mineral resource model.

## 14.3 Resource Database

The database used to evaluate the Thompson Creek Mineral Resources includes 431 core and reverse circulation boreholes (426,330 ft/129,945 m). All holes were drilled in close proximity to the deposit; hence, all were considered in the current model. The drilling data were collected by Cyprus (1968–1992), Thompson Creek Metals Company LLC (1994–2006), TCMC (formerly Blue Pearl Mining Ltd) (2006–2009), and Centerra (since 2010). The effective date for the drilling database is December 31, 2023. Drillhole collars were surveyed according to the local mine grid. Due to the largely historical nature of the drillhole data, little is known about survey procedures and general core recovery.

The drillhole data were imported into acQuire and subjected to built-in industry-standard data verification tools that were used to ensure data consistency (such that no overlapping or missing intervals occur in the data, for example). The drillholes were visually examined in three dimensions to ensure no obviously erroneous survey data are part of the dataset, and that the data are located within the existing pit extent. For a more detailed discussion on data quality, integrity, and verification, refer to Item 11 (Sample

Preparation, Analyses and Security). Generally, good correlation of previous mineral resource models with production data suggests sufficiently reliable drill data. The QP is of the opinion that the database is of sufficient quality to support Mineral Resource evaluation.

## 14.4 Geological Interpretation and Modeling

The previous geological and mineral resource model was constructed in 2010. Due to the significant time between the past and current work, software requirements changed and necessitated a rebuild of the models. This opportunity was used to introduce more granularity to the intrusion model since statistical analysis suggests slight grade differences between the two main intrusion types.

The molybdenum mineralization at Thompson Creek occurs primarily in a monzonitic to quartz-granodioritic intrusion of Cretaceous age that is hosted by carbonaceous argillite of the Mississippian Copper Basin Formation. Locally, the metasedimentary rocks have been mineralized. At the contact, the argillite has been metamorphosed to hornfels and skarn. The Thompson Creek mineralization generally strikes to the northwest with a northeasterly dip of approximately 40°. The package of intrusive rocks and their metasedimentary host is overlain by the Eocene age Challis Volcanics. The volcanic composition ranges from andesite to rhyodacite tuffs, flows, and agglomerates. The volcanic rocks filled paleo-valleys in the area can be up to 1,000 ft (300 m) thick.

There are two major structural features associated with the Thompson Creek deposit:

- The Raise Fault, which strikes northwest, parallel to the trend of the mineralization.
- The Unnamed Fault, which strikes 34° and dips steeply to the southeast. The Unnamed Fault separates the deposit into northwest and southeast portions. Original interpretations suggest that the southeast portion may be down dropped relative to the northwest portions.

The molybdenum mineralization occurs as a series of cross cutting quartz-molybdenite-pyrite veinlets and stringer zones. The mineralization strikes northwesterly and dips to the northeast about 40°. The deposit is approximately 5,000 ft long by 2,100 ft wide and 2,500 ft high. In addition to molybdenum, the deposit contains an average of less than 100 ppm Cu.

The mineralization was modelled using a 0.02% Mo nominal cut-off on a minimum 50 ft (15.24 m) composite length with up to 100 ft (30.5 m) waste inclusion to define mineralization boundaries. This nominal modeling cut-off grade was chosen based on past studies that considered grades of ore-waste boundaries during active mining. Current economic studies show that the cut-off grade has not changed much over time (see below); hence, the modeling cut-off grade of 0.02% Mo is still considered an appropriate threshold to determine the boundary between potentially economic mineralization and waste.

Once the mineralization was defined, further internal domaining was completed along lithological boundaries. No high-grade domaining was necessary because the data did not support the need for one or more additional high-grade domains. Figure 14-1 shows the global assay grade distribution; while a very small number of assays form a potential higher-grade cluster above 1% Mo, the number of assays in that group was too small for separate domaining, and those data were not spatially clustered.

Finally, a low-grade halo was built to encapsulate all remaining, isolated intersections outside of the main mineralized body. Figure 14-2 and Figure 14-3 are oblique views of the domain model.

**Figure 14-1** **Molybdenum assay distribution – A) Histogram (note inset for full assay range); B) Log probability distribution, showing a lack of a second population at the high-grade end of the spectrum**

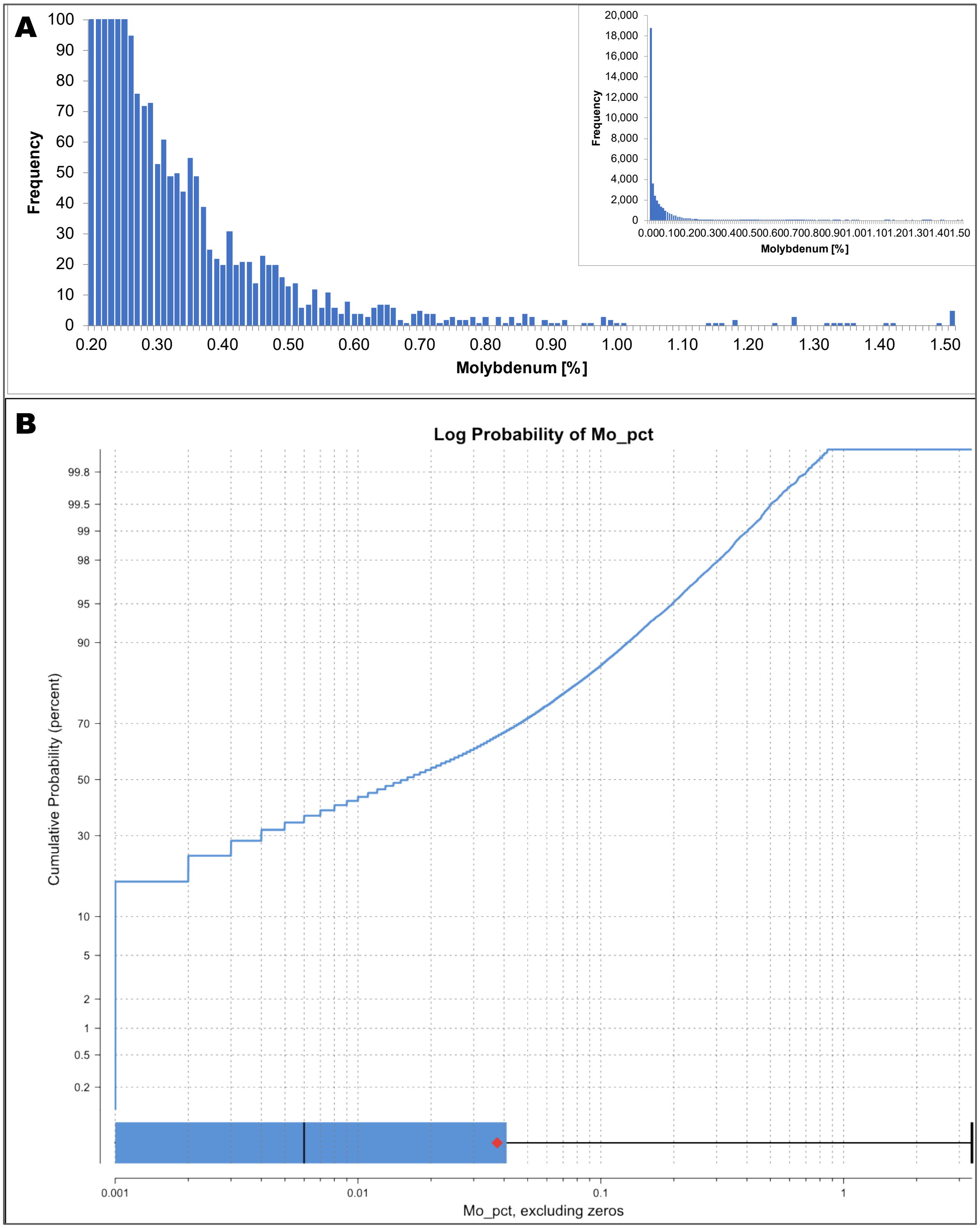


Figure 14-2 Oblique view to the east-southeast showing the northwesterly plunging intrusion and grade domains largely within the intrusion

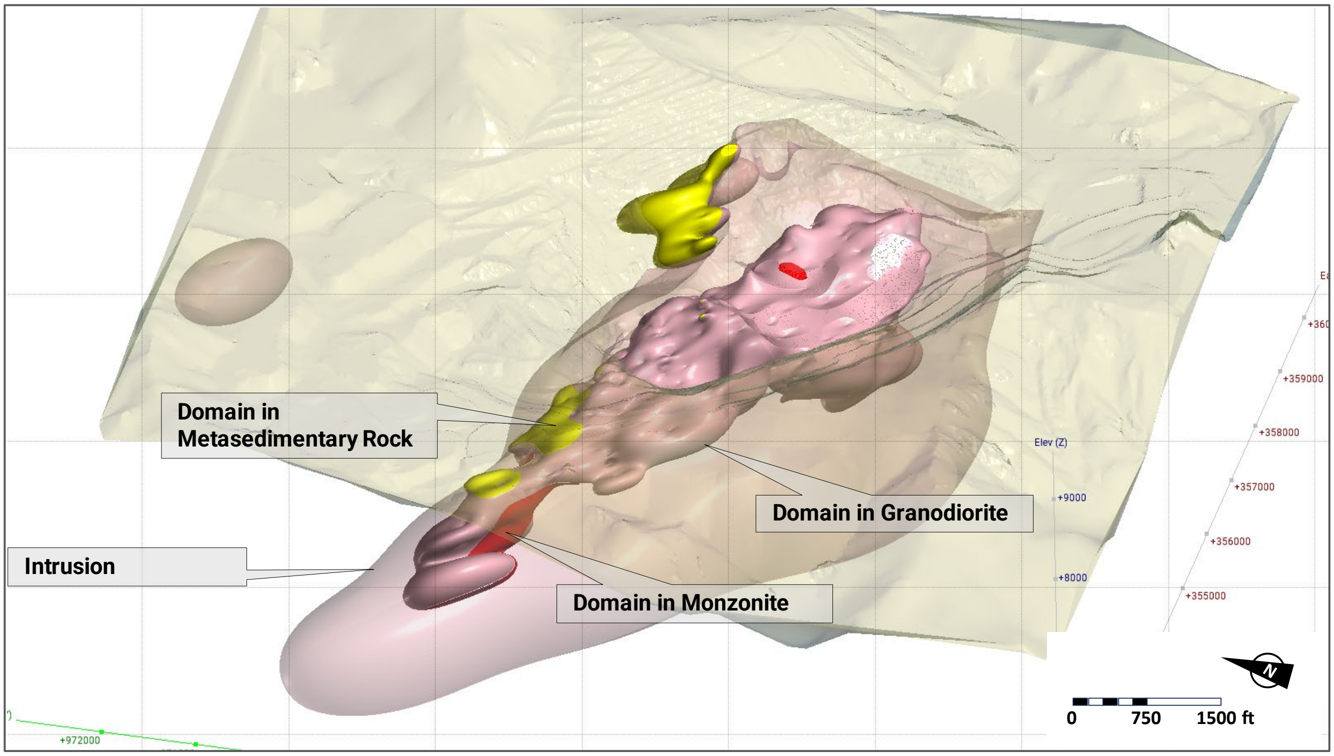
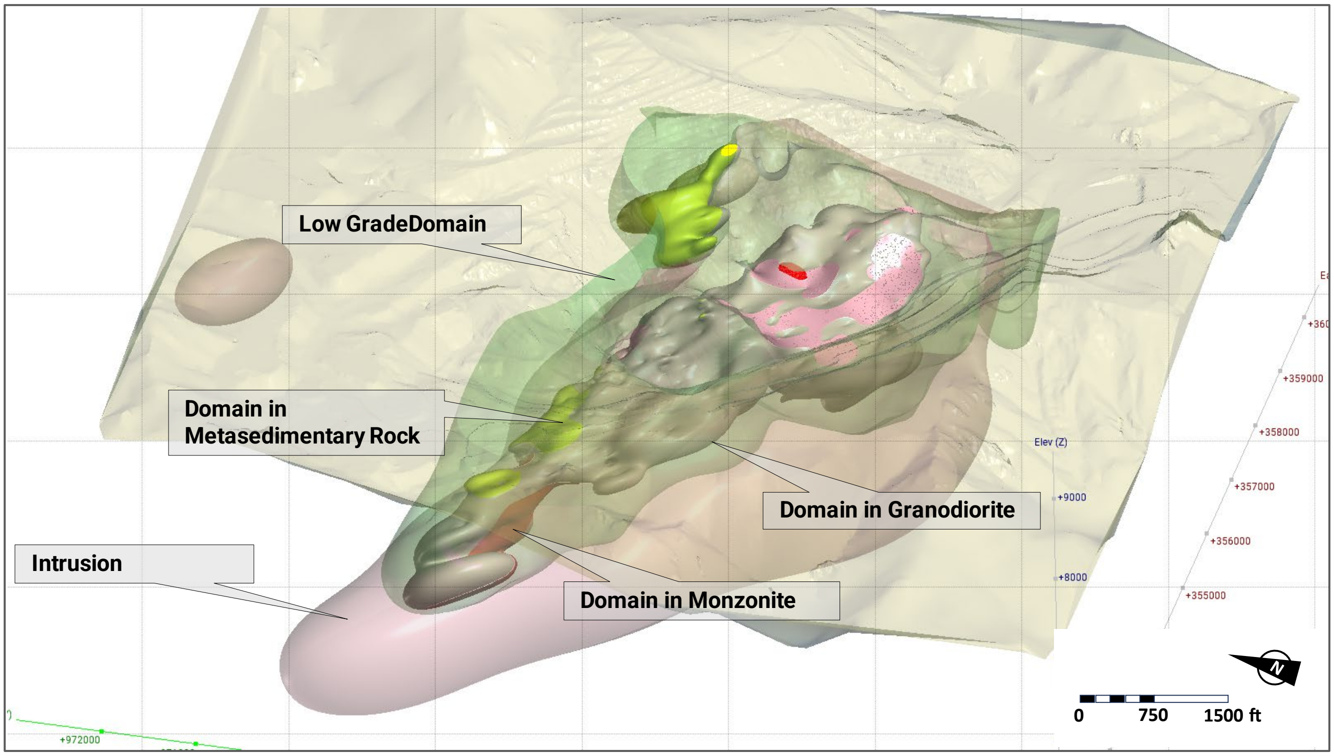


Figure 14-3 Oblique view to the east-southeast showing the northwesterly plunging intrusion and low-grade domain encapsulating the main grade domains



## 14.5 Specific Gravity

Specific gravity (SG) data have been poorly documented in the past, and SG values, or more specifically, a ton-factor, have been assigned for each lithology. Documentation about previous tests and how certain SG values were determined were not available. To address this shortcoming, Centerra, in the fall of 2023, submitted approximately 200 samples from various lithologies to Bureau Veritas (Reno) for SG determinations using the Archimedes' principle. Table 14-3 lists the average values applied to the model based on those samples.

**Table 14-3 Ton factors and SG**

| Lithology | Ton-factor (ft$^3$/short ton) | SG |
|---|---|---|
| Quartz Monzonite (mineralized) | 12.3077 | 2.603 |
| Quartz Monzonite (unmineralized) | 12.2936 | 2.606 |
| Granodiorite (mineralized) | 12.2232 | 2.621 |
| Granodiorite (unmineralized) | 12.1077 | 2.646 |
| Metasedimentary Rocks (mineralized) | 11.3606 | 2.820 |
| Metasedimentary Rocks (unmineralized) | 11.7740 | 2.721 |
| Challis Formation | 13.1461 | 2.437 |

The small number of samples used to determine SG values poses a certain amount of risk to the final resource tabulation; however, given the homogenous nature of the host rock and the small variations between the sample types, the risk is considered not material, especially considering that the overwhelming amount of mineralization is hosted in Granodiorite and Monzonite, which have a specific gravity difference of less than 2%.

## 14.6 Compositing, Statistics and Capping

Table 14-4 summarizes the molybdenum assay statistics for the deposit on a domain basis. Figure 14-4 shows the distribution of assay lengths. Most samples were taken at 10ft or shorter intervals; samples were composited to 50 ft length to match the resource block size. Historically, 50 ft composites were used and proved to provide good results when compared to production data. The block size is determined by the existing bench height and related smallest mining unit, and the past approach was to provide one composite data per block and drillhole. Centerra completed a sensitivity study to assess the impact of using 10 ft composites and found that the resulting block grade differences are immaterial.

**Table 14-4 Summary statistics of length-weighted molybdenum assays**

| Domain | Count | Mean | Std dev | CV | Min. | 25th | 50th | 75th | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Low Grade | 16,153 | 0.01 | 0.02 | 2.19 | 0.00 | 0.00 | 0.00 | 0.01 | 0.41 |
| Quartz-Monzonite | 3,429 | 0.11 | 0.11 | 1.09 | 0.00 | 0.03 | 0.07 | 0.13 | 1.42 |
| Metasedimentary Rocks | 202 | 0.07 | 0.07 | 1.09 | 0.01 | 0.03 | 0.05 | 0.08 | 0.64 |
| Granodiorite | 13,680 | 0.09 | 0.11 | 1.23 | 0.00 | 0.03 | 0.06 | 0.11 | 3.38 |

**Figure 14-4** **Sample length distribution within domains**

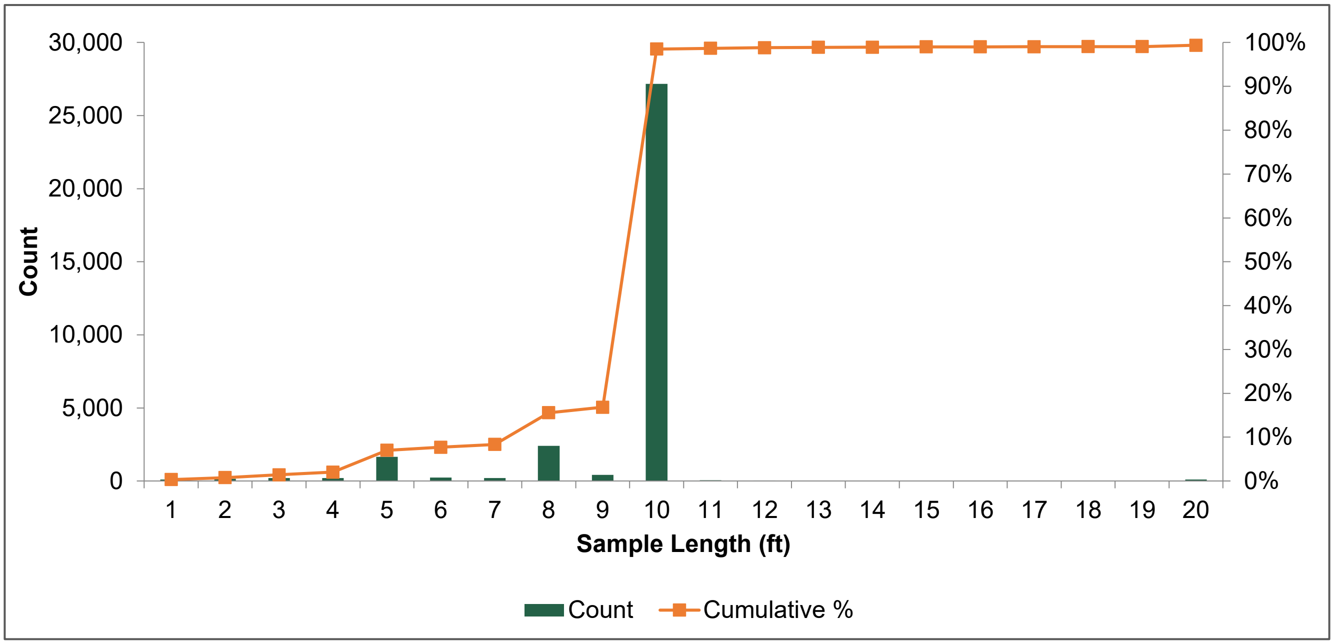


Table 14-5 and Table 14-6 show the molybdenum statistics of uncapped 50 ft and 10 ft composites, respectively. Note that while the maximum values of the 10 ft composites are larger than those of the 50 ft composites, the mean values are comparable, showing that the composite length has a minimal impact on the final block estimate.

**Table 14-5** **Summary statistics of length-weighted, uncapped 50 ft molybdenum composites**

| Domain | Count | Mean | Std dev | CV | Min. | 25th | 50th | 75th | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Low Grade | 3,437 | 0.01 | 0.01 | 1.75 | 0.00 | 0.00 | 0.00 | 0.01 | 0.21 |
| Quartz-Monzonite | 654 | 0.11 | 0.08 | 0.79 | 0.00 | 0.05 | 0.08 | 0.15 | 0.52 |
| Metasedimentary Rocks | 43 | 0.07 | 0.05 | 0.70 | 0.01 | 0.04 | 0.05 | 0.09 | 0.29 |
| Granodiorite | 2,610 | 0.09 | 0.08 | 0.88 | 0.00 | 0.04 | 0.07 | 0.11 | 0.99 |

**Table 14-6** **Summary statistics of length-weighted, uncapped 10 ft molybdenum composites**

| Domain | Count | Mean | Std dev | CV | Min. | 25th | 50th | 75th | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Low Grade | 16,471 | 0.01 | 0.02 | 2.15 | 0.00 | 0.00 | 0.00 | 0.01 | 0.41 |
| Quartz-Monzonite | 3,100 | 0.10 | 0.11 | 1.05 | 0.00 | 0.04 | 0.07 | 0.14 | 1.42 |
| Metasedimentary Rocks | 190 | 0.07 | 0.07 | 1.09 | 0.01 | 0.03 | 0.05 | 0.08 | 0.64 |
| Granodiorite | 12,583 | 0.09 | 0.10 | 1.15 | 0.00 | 0.03 | 0.06 | 0.11 | 2.39 |

Samples were composited to a nominal length of 50 ft; residual samples with a length of less than 10 ft were distributed evenly between other composites of the corresponding drillhole intersection. This approach ensures that all sampled intervals within a domain are considered for grade estimation. The minimal length of 10 ft for any given composite provides a good balance between near equal length composites and the desire to consider entire mineralized domain intersections. Composite length was not considered as an additional weight during estimation, but tests suggest that the impact would be immaterial to the total metal inventory.

High-grade capping analysis was performed on all composites in grouped resource domains except for those in the “Metasedimentary Rock” domain. High-grade capping values were selected for the domains based on statistical tools such as the effect on the coefficient of variation, logarithmic probability plots, and the grade distribution as assessed on histograms (Figure 14-5). Separation of grade populations characterized by inflections in the probability plot or gaps in the high-grade tails of the grade distribution were indicators of potential capping values. Table 14-7 shows the capping values for each domain and the impact on the calculated metal content. Table 14-8 shows the statistics of capped composites.

**Figure 14-5** **Example of composite data distribution (Quartz-Monzonite domain) used for the determination of capping Values (red dashed lines show capping value)**

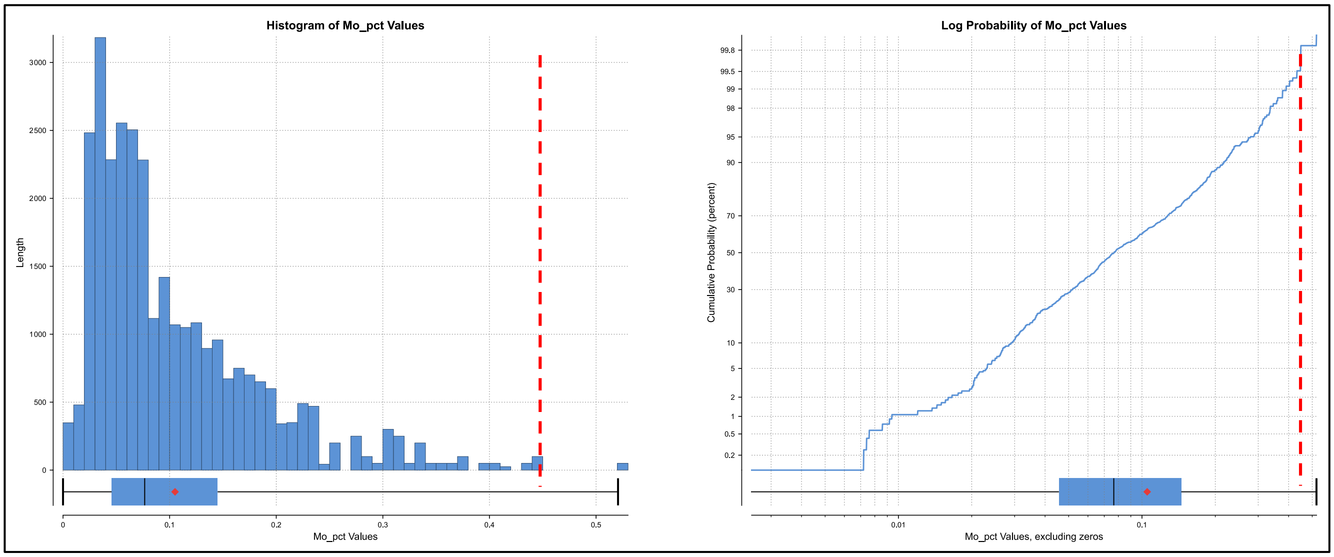


**Table 14-7** **Capping values and impact on calculated metal content by domain**

| Domain | No. of data | Cap value (Mo %) | No. capped | Percentile uncapped | Metal loss (%) |
|---|---|---|---|---|---|
| Low Grade | 3437 | 0.10 | 16 | 0.9953 | 2.56 |
| Quartz-Monzonite | 654 | 0.45 | 3 | 0.9954 | 0.11 |
| Metasedimentary Rocks | 43 | 0.35 | 0 | 1.0000 | 0.00 |
| Granodiorite | 2610 | 0.50 | 11 | 0.9958 | 0.69 |

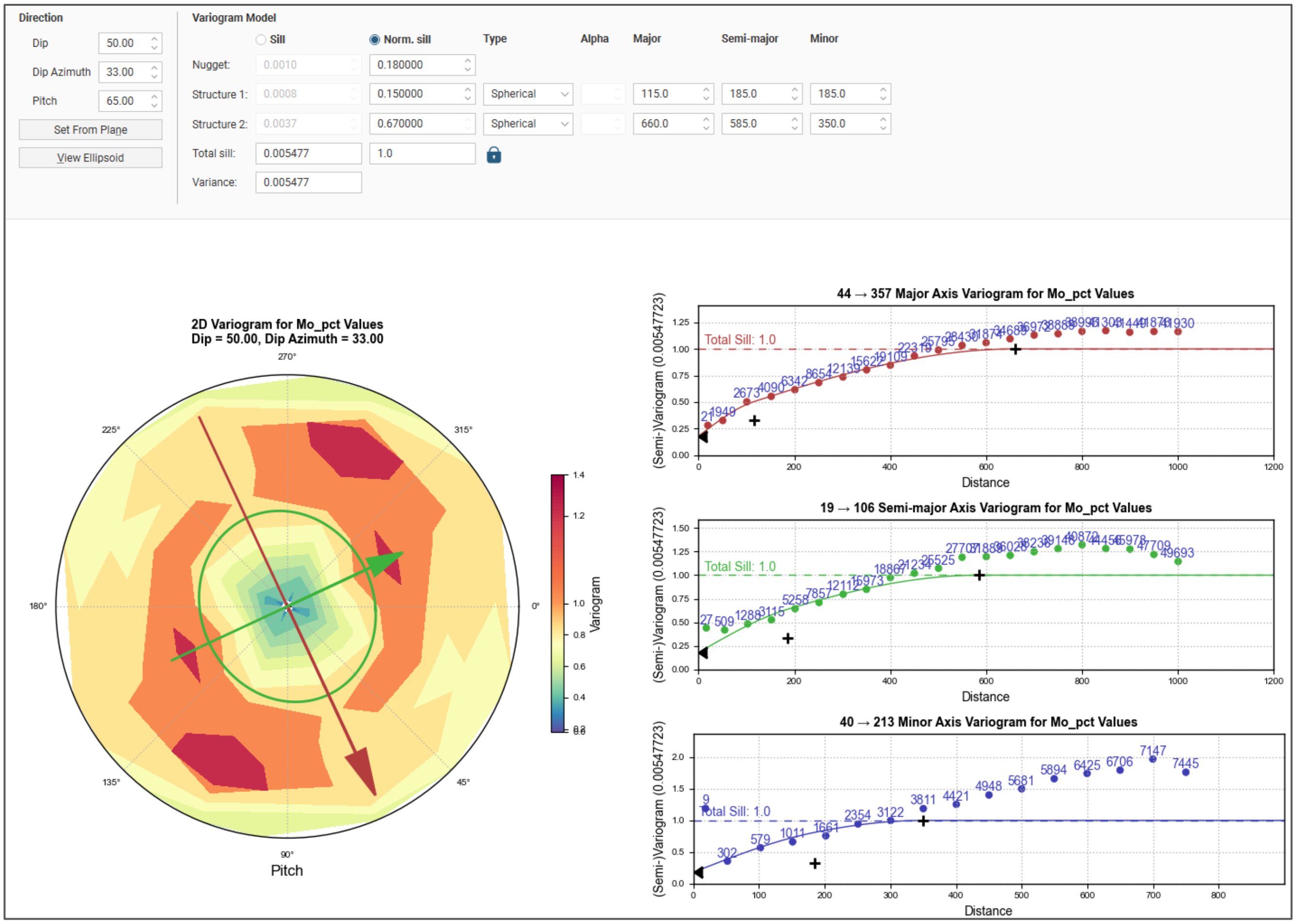
**Table 14-8** **Summary statistics of length-weighted, capped 50 ft molybdenum composites**

| Domain | Count | Mean | Std dev | CV | Min. | 25th | 50th | 75th | Max. |
|---|---|---|---|---|---|---|---|---|---|
| Low Grade | 3,437 | 0.01 | 0.01 | 1.55 | 0.00 | 0.00 | 0.00 | 0.01 | 0.10 |
| Quartz-Monzonite | 654 | 0.11 | 0.08 | 0.79 | 0.00 | 0.05 | 0.08 | 0.15 | 0.52 |
| Metasedimentary Rocks | 43 | 0.07 | 0.05 | 0.70 | 0.01 | 0.04 | 0.05 | 0.09 | 0.29 |
| Granodiorite | 2,610 | 0.09 | 0.07 | 0.83 | 0.00 | 0.04 | 0.07 | 0.11 | 0.45 |

## 14.7 Variography

Variograms were modelled in Leapfrog Edge in three dimensions using capped composites. The best-fit model orientations roughly correspond to the strike and dip of each domain. For each domain different spatial metrics were assessed, such as traditional semi-variograms, correlograms, pairwise variograms, and covariance models. The variography studies examined the orientation and dips of the solids to determine the two principal directions; a third direction was then selected in the best continuity direction. The continuity model was then created by selecting nuggets in the downhole direction and one or two structures were modelled resulting in an orientation (rotations) and ranges (major, semi-major, and minor axes) of continuity. Figure 14-6 shows the experimental variograms for the Granodiorite domain. Composites in the metasedimentary rocks did not yield a stable variogram; hence, an inverse distance squared estimator was applied. Table 14-9 shows a summary of variogram parameters used in the final estimation.

**Figure 14-6 An example of an experimental variogram for the Granodiorite domain**



**Direction**

Dip: 50.00
Dip Azimuth: 33.00
Pitch: 65.00

**Variogram Model**

| | ○ Sill | ● Norm. sill | Type | Alpha | Major | Semi-major | Minor |
|---|---|---|---|---|---|---|---|
| Nugget: | 0.0010 | 0.180000 | | | | | |
| Structure 1: | 0.0008 | 0.150000 | Spherical | | 115.0 | 185.0 | 185.0 |
| Structure 2: | 0.0037 | 0.670000 | Spherical | | 660.0 | 585.0 | 350.0 |
| Total sill: | 0.005477 | 1.0 | | | | | |
| Variance: | 0.005477 | | | | | | |

**Table 14-9 Summary of variogram parameters**

| Domain | Rotation | | | Variogram model | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Nugget* | CC*† | Structure | Range (ft) | | |
| | Dip | Dip azimuth | Pitch | | | | Major | Semi-major | Minor |
| Low Grade | 40 | 45 | 35 | 0.15 | 0.85 | Spherical | 750 | 750 | 285 |
| Quartz-Monzonite | 50 | 33 | 55 | 0.20 | 0.60 | Spherical | 270 | 245 | 185 |
| | | | | | 0.20 | Exponential | 450 | 360 | 250 |
| Granodiorite | 50 | 33 | 65 | 0.18 | 0.15 | Spherical | 115 | 185 | 185 |
| | | | | | 0.67 | Spherical | 660 | 585 | 350 |

* Normalized to 1.

† CC: percent of the sill

## 14.8 Block Model Parameters

An unrotated block model was created using Seequent's Edge module within Leapfrog. The block model coordinates are based on the local Imperial mine grid. Table 14-10 summarizes the block model definition.

**Table 14-10 Block model definition**

| Axis | Origin* | Block size** | Block count |
|---|---|---|---|
| X | 350,000 | 50 | 200 |
| Y | 962,000 | 50 | 200 |
| Z | 9,200 | 50 | 90 |

* Mine Grid. ** Block size in feet.

## 14.9 Estimation

The block model was populated with molybdenum values using ordinary kriging (OK) for most domains except for the Metasedimentary domain where an inverse distance squared ($ID^2$) estimator was employed, because the small number of available data in the mineralized metasedimentary rock domain prevented the determination of a robust variogram model. All domains were estimated using three estimation runs with progressively relaxed search ellipsoids and data requirements. Domains use soft boundaries to honor distribution characteristics of the intrusive-hosted mineralization. The soft boundaries consider data up to 50 ft between the granodiorite and monzonite domains and 20 ft along the boundaries of the metasedimentary domain. The low-grade domain utilizes hard boundaries. Figure 14-7 shows an example contact plot that shows the sharp grade drop along the domain boundary. Table 14-11 summarizes the data requirements for each grade domain. Search ranges were based on the variogram ranges; the first pass search ranges correspond to two-thirds of the full variogram range, while the second pass corresponded to the full variogram ranges. The third pass search ranges correspond to 1.5 times the full variogram range. Search ranges in the meta-sedimentary rocks domain are the same as those in the quartz-monzonite domain since no stable variogram was modelled.

Care was taken that the grade domains were fully filled with estimated blocks in three passes. Sample requirements aim to strike a balance between too few samples that would lead to a more erratic (local) grade distribution and too many samples resulting in an overly smooth grade distribution.

**Figure 14-7 Example of contact plot, Monzonite domain**

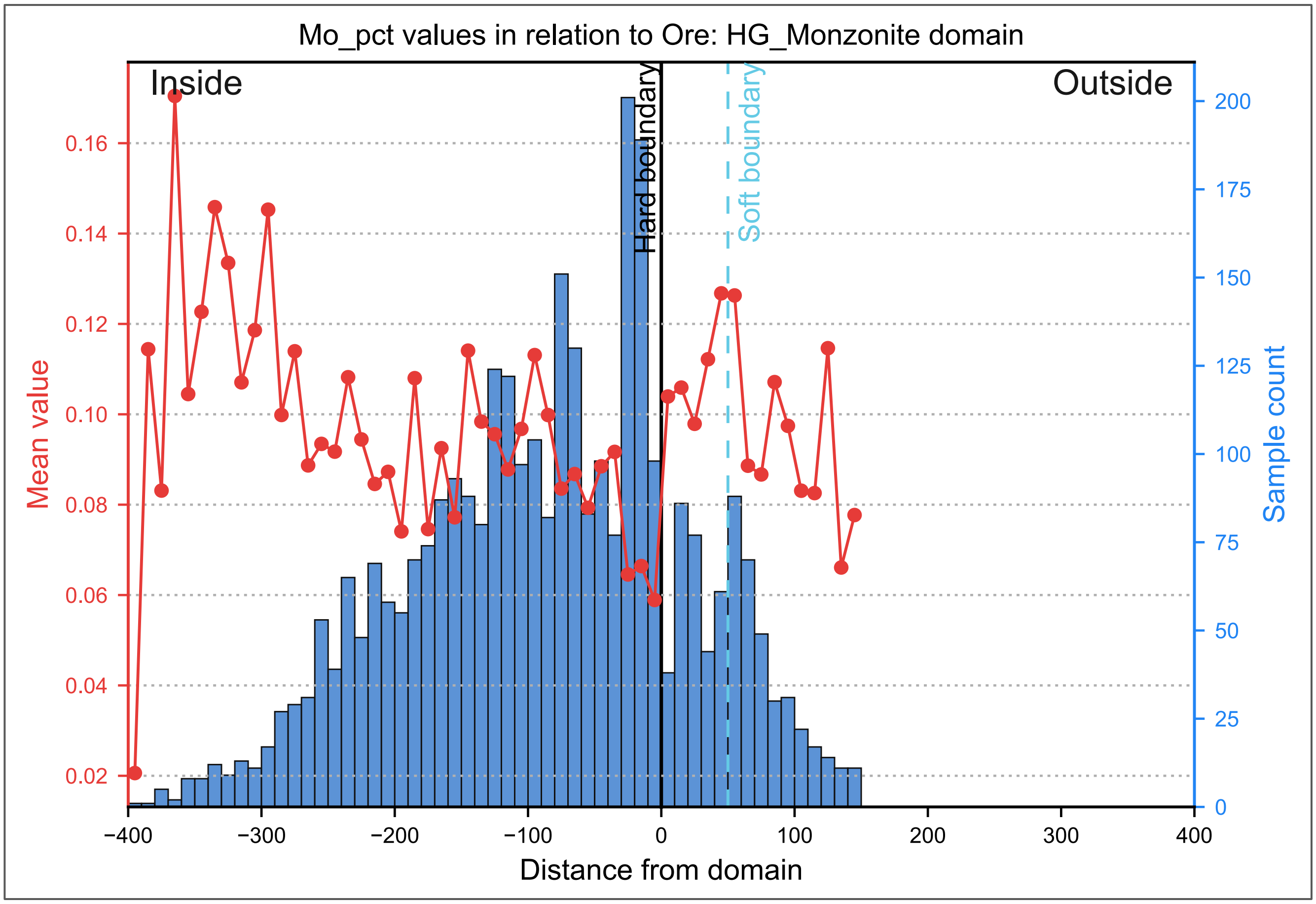


**Table 14-11 Data and search parameters for estimation**

| Domain | Est. pass | Est. | Ellipsoid ranges | | | Ellipsoid directions | | | No. of samples | | DDH limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | X | Y | Z | Dip | Dip azimuth | Pitch | Min. | Max. | Max./ hole |
| Low Grade | 1 | OK | 400 | 700 | 150 | 40 | 45 | 0 | 5 | 8 | 2 |
| | 2 | | 525 | 525 | 200 | | | | 3 | 10 | 2 |
| | 3 | | 750 | 750 | 285 | | | | 2 | 12 | |
| Quartz-Monzonite | 1 | OK | 300 | 270 | 160 | 50 | 33 | 55 | 5 | 8 | 2 |
| | 2 | | 450 | 360 | 250 | | | | 3 | 10 | 2 |
| | 3 | | 675 | 550 | 375 | | | | 2 | 12 | |
| Metasedimentary Rocks | 1 | ID2 | 300 | 250 | 150 | 50 | 45 | 15 | 5 | 8 | 2 |
| | 2 | | 500 | 400 | 200 | | | | 3 | 10 | 2 |
| | 3 | | 600 | 500 | 300 | | | | 2 | 12 | |
| Granodiorite | 1 | OK | 440 | 390 | 240 | 50 | 33 | 65 | 5 | 8 | 2 |
| | 2 | | 650 | 585 | 350 | | | | 3 | 10 | 2 |
| | 3 | | 1000 | 750 | 525 | | | | 2 | 10 | |

## 14.10 Block Model Validation

The block model estimate was validated using visual (Figure 14-8), comparative, and statistical methods. Block grades were compared against the informing composites on section and in plan view to ensure that block grades correspond well to local composite grade changes, and that mineralization trends seen in assays and composites were reflected in block grade distribution. Furthermore, visual inspection ensured that high-grade samples did not result in excessively large volumes containing high grade blocks.

**Figure 14-8 North-south cross section showing good agreement between 50 ft composite and block grades**

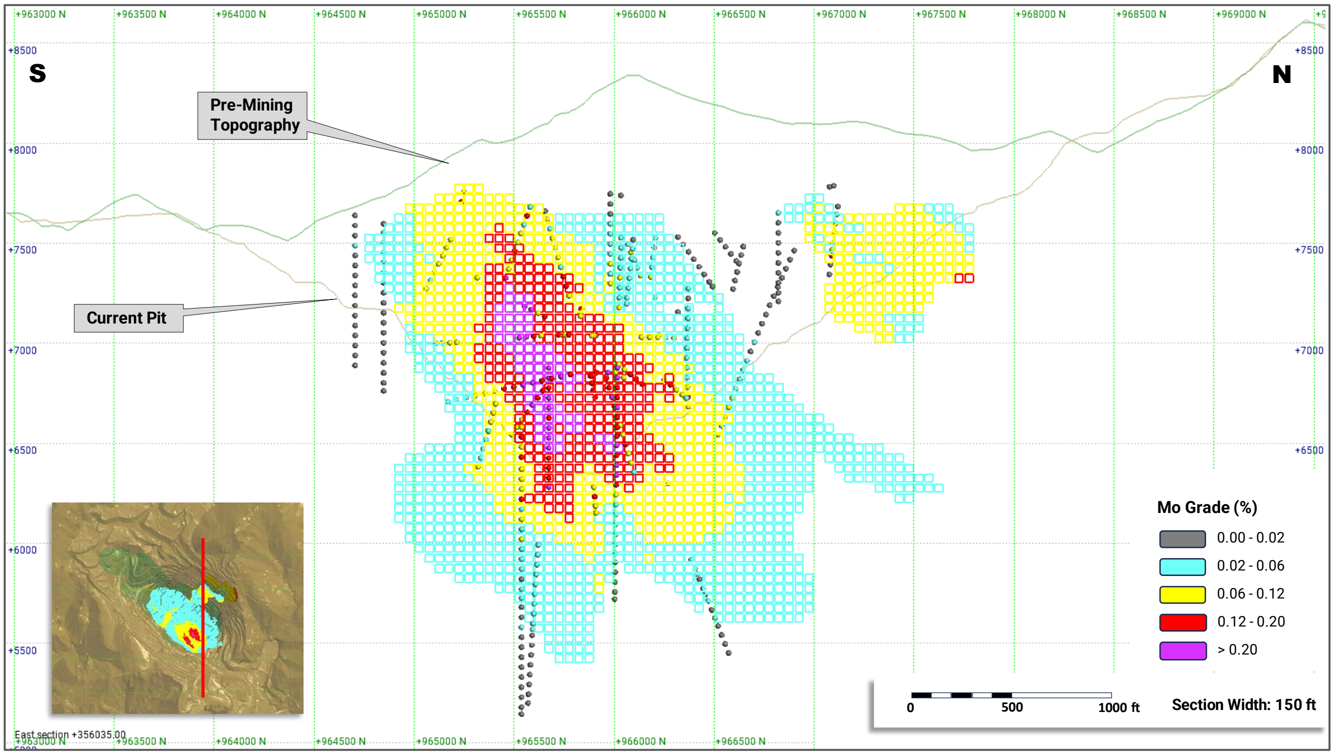


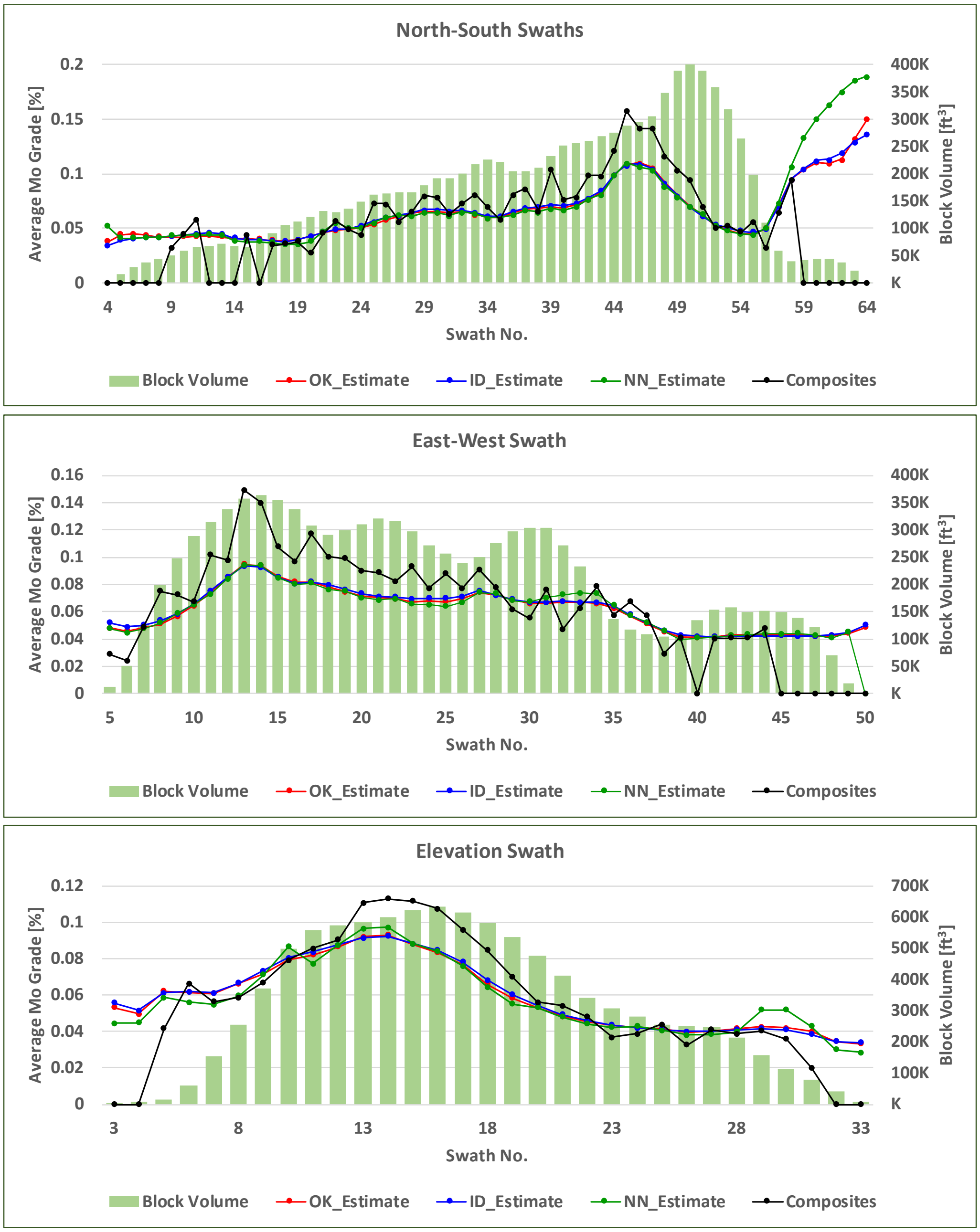
Table 14-12 shows the percent difference between the comparative models within the conceptual pit shell used for Mineral Resource reporting. The total mineral inventory above a cut-off grade of 0.02% Mo agrees well between the estimates using alternative estimators. The metal content of the three models is within 5% of the final model, suggesting the OK estimator provides a reasonable global estimate of the metal content in the deposit.

**Table 14-12 Comparison between model inventory and parallel estimates using Nearest Neighbor and Inverse Distance estimators**

| | Mass | | Mo grade | | Metal content | |
|---|---|---|---|---|---|---|
| | Mt | Difference to model | % | Difference to model | M lb | Difference to model |
| Model | 116.20 | | 0.07 | | 173.47 | |
| Nearest Neighbor | 113.63 | -2% | 0.07 | 2% | 173.21 | 0% |
| Inverse Distance | 107.61 | -7% | 0.07 | 3% | 164.70 | -5% |

Swath plots (Figure 14-9) were prepared to assess the compliance of the estimates to the informing data; they show good correlation between the three estimators and the general trend of the underlying data. Locally, all estimates appear to underestimate the metal content slightly. This apparent underestimation is due to the clustered nature of the assay data in the core of the deposit where the grades tend to be highest when compared across the entire deposit. A large number of samples with high grades will skew the average towards higher grades; however, in block estimation, where a set number of samples is used for the estimation of block grades, this bias is removed. The good agreement between three different estimators suggests that the estimation use for final resource reporting is reliable. Additional information can be found below in Item 14.12 discussing risks and uncertainties.

**Figure 14-9 Swath plots through the high-grade domains of the deposit**



Unfortunately, reconciliation data are limited to two mining phases (Phase VI and Phase VII – see Item 14.1 Introduction). Hence, any information from benchmarking of the current model against historical information is limited. However, this updated model compares well with previous mineral resource models, and anecdotal reconciliation between production records and historical resource numbers showed good agreement. This information, coupled with the current block model validation, suggests this updated mineral resource model will perform well on a global basis.

## 14.11 Classification

Mineral Resource classification is a subjective concept and industry best practices suggest that a Mineral Resource classification should consider the confidence in the geological continuity of the mineralization domains, the quality and quantity of exploration data supporting the estimates, and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim to integrate all these concepts to delineate regular areas of similar resource classification.

Classification was performed in two steps: first, blocks were coded according to the parameters shown in Table 14-13; results are shown in Figure 14-10. A manual smoothing process was applied in a second step to reclassify small clusters of blocks with a higher or lower classification than surrounding blocks (Figure 14-11). This task was accomplished through the construction of classification solids that were used to code the block model with the final classification.

**Table 14-13 Parameters for classification**

| Class | Parameters |
|---|---|
| Measured | • Pass 1<br>• Average distance to data less than 300 ft<br>• Minimum of four holes<br>• Manual smoothing |
| Indicated | • Pass 1 or Pass 2<br>• Average distance to data less than 500 ft<br>• Minimum of two holes<br>• Manual smoothing |
| Inferred | • Average distance to data less than 500 ft<br>• Manual smoothing |

Figure 14-10 Initial block classification (note blocks representing mined material have been omitted)

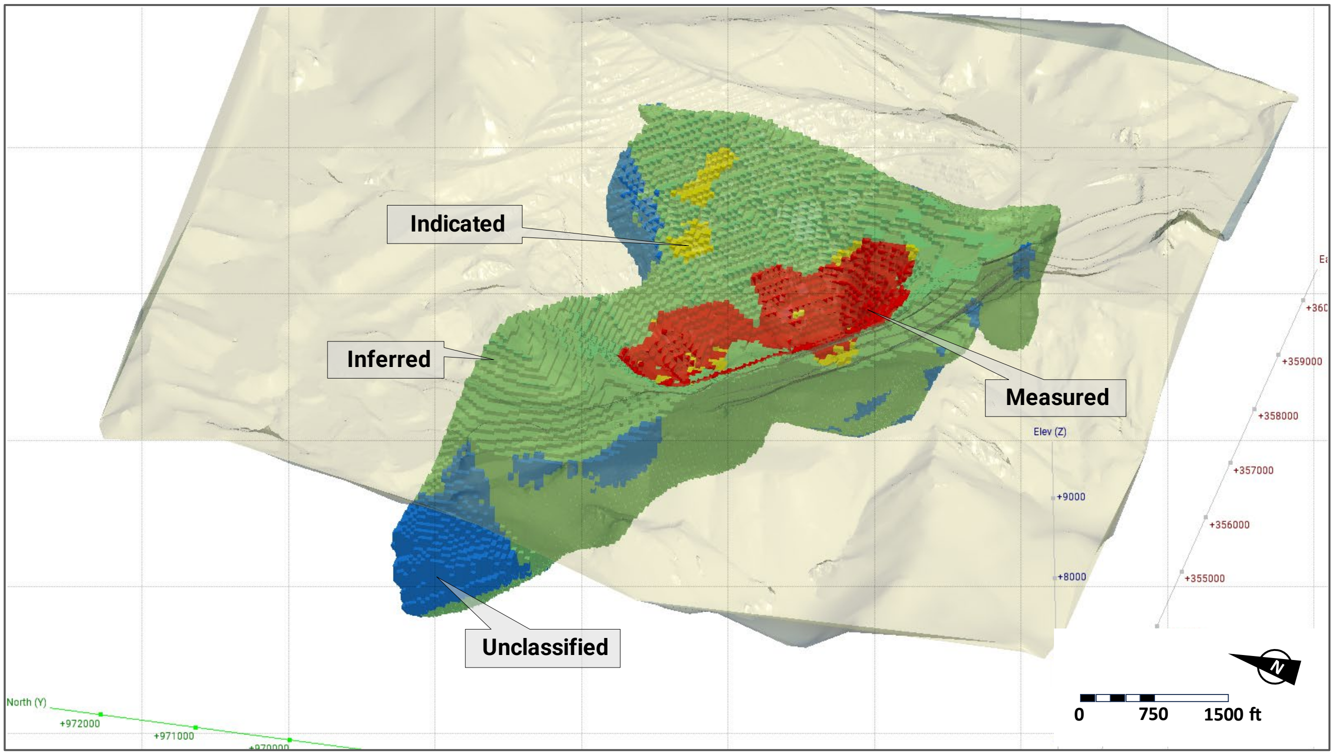
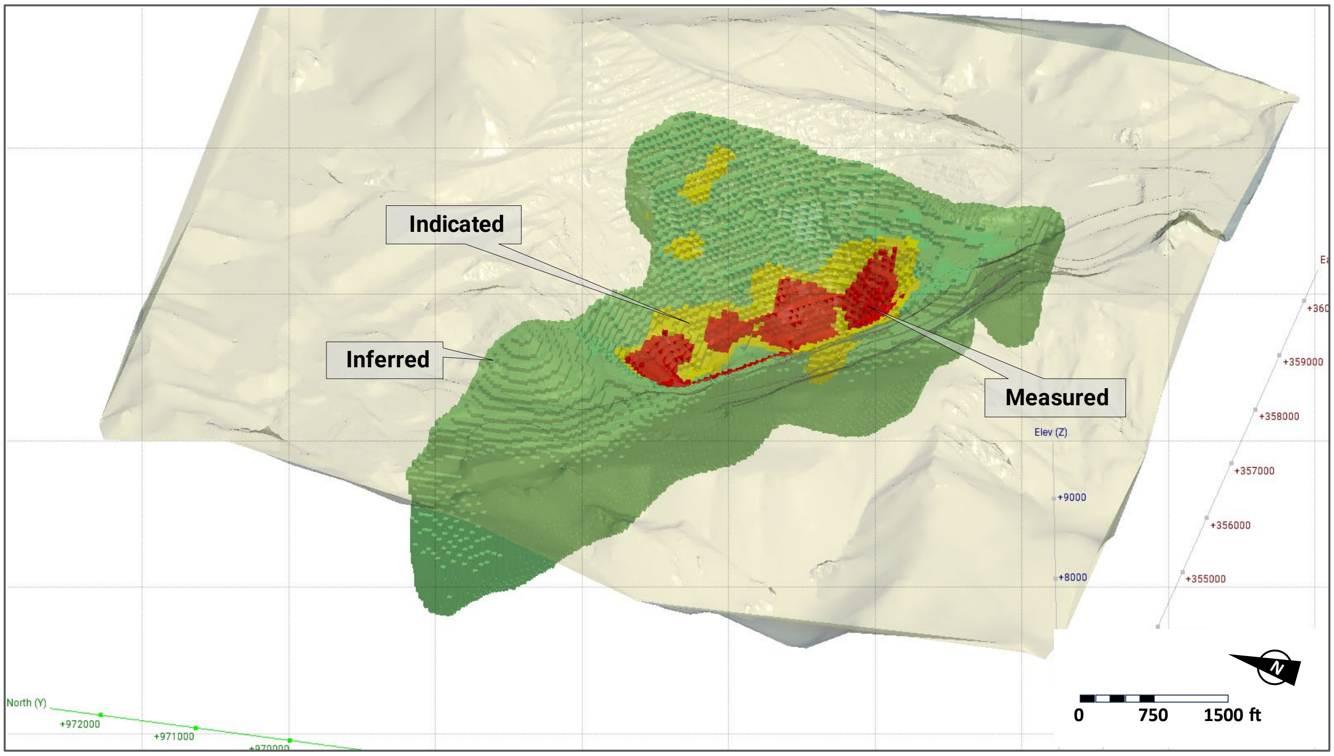


Figure 14-11 Final block classification (note blocks representing mined material have been omitted)



## 14.12 Sources of Risk and Uncertainty in the Mineral Resource Estimate

Mineral Resources in general may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent Mineral Resource estimates. Factors that may affect the Mineral Resource estimates include metal price, changes in interpretations of mineralization geometry, continuity of mineralization zones, changes to kriging assumptions, metallurgical recoveries, operating costs, confidence in the modifying factors, socio-economic, and changes in taxation, land tenure requirements or in permitting requirements.

Specific risks of this Mineral Resource model include:

- The quality of the exploration data that are the basis for this model
- Limited number of SG data available for the determination of bulk SG
- A lack of demonstratable reconciliation between historical blast-hole and production data and the current model
- Apparent underestimation of grade throughout some parts of the deposit.

The majority of the exploration data available for Mineral Resource estimation has been produced at the company mine laboratory, which did not and does not hold ISO certification for the analytical procedures used to determine molybdenum grade in the samples. According to past reports, geologists at the time of drilling did not submit standard reference material in the normal sample stream, but the procedures at the laboratory did include the insertion of standard reference material. Past independent reviews of the assay data (e.g. TCMC, 2011) discuss in detail the verification steps completed at the time and concluded that the data are generally trustworthy and suitable for Mineral Resource estimation work. While some amount of risk remains, it is the QP’s opinion that the risk on a global basis is low.

SG data are important in the tabulation of material (mineralized and unmineralized) and as an extension of metal content. Even small changes in SG can have noticeable impacts on the global material content of a model. Ideally, the SG of samples during exploration or production drilling is determined on an ongoing basis in order to provide a robust dataset. Those data were not available, which prompted a program by Centerra to build a limited dataset of SG data. The number of data are large enough to be statistically significant; the rock types of this deposit are largely similar to each other, which is reflected in the small variations in available SG data. Those data fall well within expected ranges for similar rocks in other environments. However, due to the large impact even small changes in SG can have on the global metal content of a deposit, the risk associated with the limited SG data is considered moderate.

The TCM operated successfully over approximately 29 years (1983 to 1992 and 1994 to 2014). Mining operations stopped when molybdenum prices fell below a threshold that made operations uneconomic; the operations did not suffer from problems of grade reconciliation or difficult distribution of mineralization. While reconciliation data would provide additional support for the mineral resource model presented herein, the QP is of the opinion that the lack of such data only poses a minor risk, considering the long production history of the mine.

The swath plots shown above suggest that at least some portions of the deposit have been underestimated; extensive tests using different estimators and estimation parameters, as well as capped and uncapped data suggest that the estimation is robust and not affected significantly by changes in parameters. Furthermore, the data distribution does not indicate support for additional high-grade domaining within the identified mineralization envelope. Considering much of the core of the mineralization has been mined, coupled with the good agreement between different estimation approaches, and an apparent underestimation (rather than overestimation), the associated risk is considered low to moderate.

## 14.13 Reasonable Prospects for Eventual Economic Extraction

The "reasonable prospects for eventual economic extraction" requirement generally implies that quantity and grade estimates are high enough that when reasonable and transparent economic assumptions and parameters are applied and that when Mineral Resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recovery, the deposit may conceptually be economic. Centerra considers that the molybdenum mineralization found at Thompson Creek is amenable to open pit extraction as the TCM is an open pit mine currently under care and maintenance, and according to the CIM best practice guidelines (CIM, Nov 2019):

*"For Mineral Resources that are amenable to open pit mining methods, the "reasonable prospects for eventual economic extraction" should consider not only an economic limit (such as the cut-off grade or value), but technical requirements as well (such as the wall slope angles). At a minimum, the constraints can be addressed by creation of constraining surfaces (pit shells) using either commercial software packages or manual methods. The constraining surfaces can then be used in conjunction with other criteria for the preparation of Mineral Resource statements."*

The reasonable prospects for economic extraction parameters for the TCM include cut-off grade considerations and CIM guidelines below:

- Reasonable long-term commodity price(s)
- Assumed mining methods
- Exchange rate(s)
- Mineral process recovery
- Operating costs relating to mining, processing, general and administration, smelter terms
- Royalties, among others.

Centerra used a pit optimizer to assist with determining which portions of the molybdenum deposits show "reasonable prospects for eventual economic extraction" from an open pit and to assist with selecting reporting assumptions. The optimization assumptions are summarized in Table 14-14. Mineral Resources are reported within this conceptual pit shell exclusive of Mineral Reserves and above a cut-off grade of 0.025% Mo.

**Table 14-14 Conceptual open pit optimization assumptions**

| Parameter | Units | Value |
|---|---|---|
| Pit bench height | ft | 50 |
| Overall slope angle | ° | Variable, 35-43 |
| Mining cost | $/st mined | $1.77-$2.17 |
| Direct processing cost | $/st processed | $4.73 |
| G&A | $/st processed | $1.62 |
| Total process-based costs | $/st processed | $6.75 |
| Molybdenum recovery | % | 81.95% |
| Molybdenum price | $/lb | $18.5 |

The resource cut-off grade was established based on an open pit mining scenario excluding Mineral Reserve modifying factors such as external dilution and sustaining costs, and a Mineral Resource molybdenum price derived from Centerra's analysis of its peers and senior producers' year ending 2023 Resource and Reserve metal prices as well as from internal market analyses. The Resource metal price is 15% higher than the Reserve metal price used. The cut-off grade parameters for the Mineral Resource cut-off grade are summarized in Table 14-15.

**Table 14-15 Cut-off grade parameters for Resource**

| Item | Units | Value |
|---|---|---|
| Mining cost | $/st mined | $1.77-$2.17 |
| Direct processing cost | $/st processed | $4.73 |
| G&A | $/st processed | $1.62 |
| Total process-based costs | $/st processed | $6.75 |
| Metal price | $/lb metal | $18.5 |
| Process recovery | % | 81.95% |
| Total selling cost | $/st metal | $1,460.31 |
| Molybdenum grade internal cut-off | % | 0.025% |

## 14.14 Mineral Resource Statement

CIM Definition Standard for Mineral Resources and Mineral Reserves (CIM, May 2014) define a Mineral Resource as:

*"[A] concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling."*

Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

The Mineral Resources were estimated in conformity with the widely accepted CIM Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines (CIM, Nov 2019).

Mineral Resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent Mineral Resource estimates. They may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic, and other factors.

The Mineral Resource Statement for the Thompson Creek deposit is presented in Table 14-16. The statement was prepared by Dr Lars Weiershäuser, PGeo (APGO#1504).

**Table 14-16 Mineral Resource Statement, TCM – September 1, 2024**

| Class | Mass (Mst) | Mo grade (%) | Metal content (M lbs) |
|---|---|---|---|
| Measured | 5.5 | 0.059 | 6.6 |
| Indicated | 49.8 | 0.057 | 56.8 |
| **Measured + Indicated** | **55.3** | **0.057** | **63.4** |
| Inferred | 11.6 | 0.072 | 16.7 |

Notes:

- Mineral Resources are reported exclusive of Mineral Reserves; Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- Mineral Resources are considered for open pit extraction.
- Resources are reported using a 0.025% Mo cut-off grade within a conceptual pit shell and exclusive Mineral Reserves.
- Economic parameters for the determination of the resource cut-off grade include:
  - Molybdenum price of US$18.5/lb
  - Mining costs of $1.77-$2.17/ton, and a G&A and processing cost of $6.75/ton processed. Sustaining costs were not included in the resource cut-off grade calculation.
  - 82% mill recovery.
- Mineral Resources are classified and have been estimated in accordance with CIM Definition Standards.
- As required by reporting guidelines, rounding may result in apparent summation differences between tons, grade, and metal content.

## 14.15 Mineral Resource Sensitivity

A grade-tonnage curve of the global mineralization is presented in Figure 14-12, while a grade-tonnage curve considering only Measured and Indicated Mineral Resources, inclusive of Reserves, is presented in Figure 14-13. The grade-tonnage curves illustrate the sensitivity of the Thompson Creek deposit to different cut-off grades within the conceptual pit shape, based on the parameters in Table 14-15.

**Figure 14-12 Molybdenum grade-tonnage curve of global mineralized material**

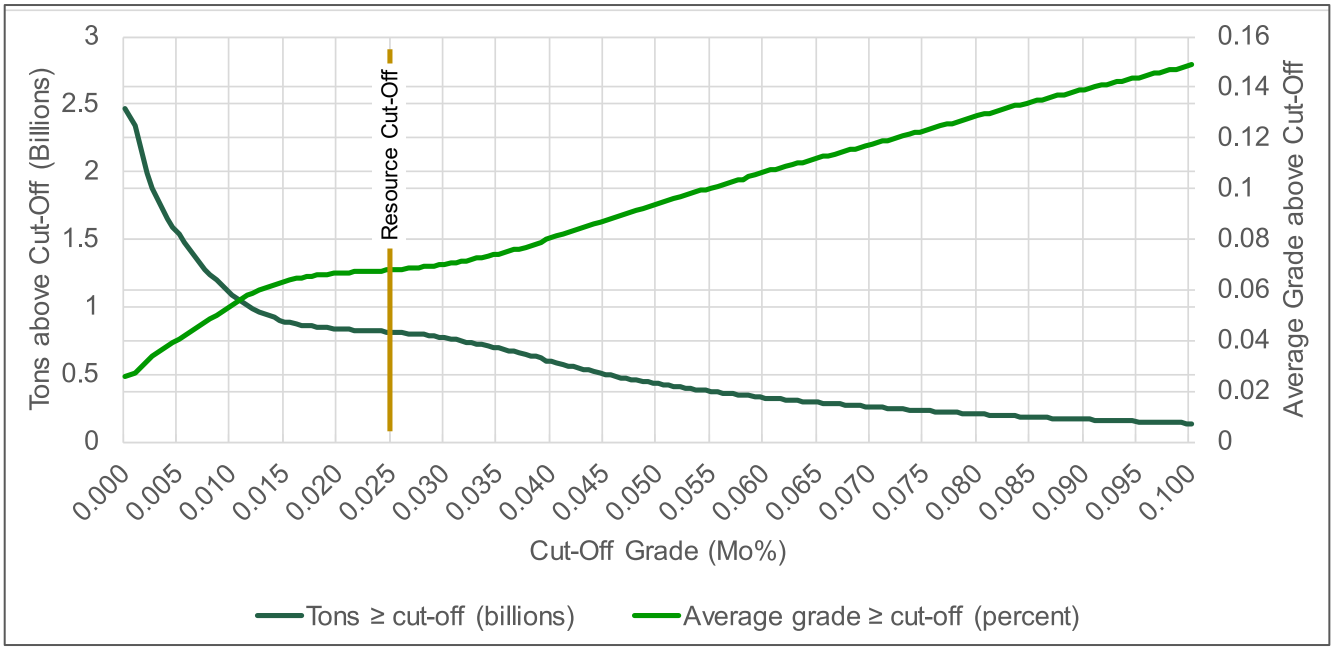
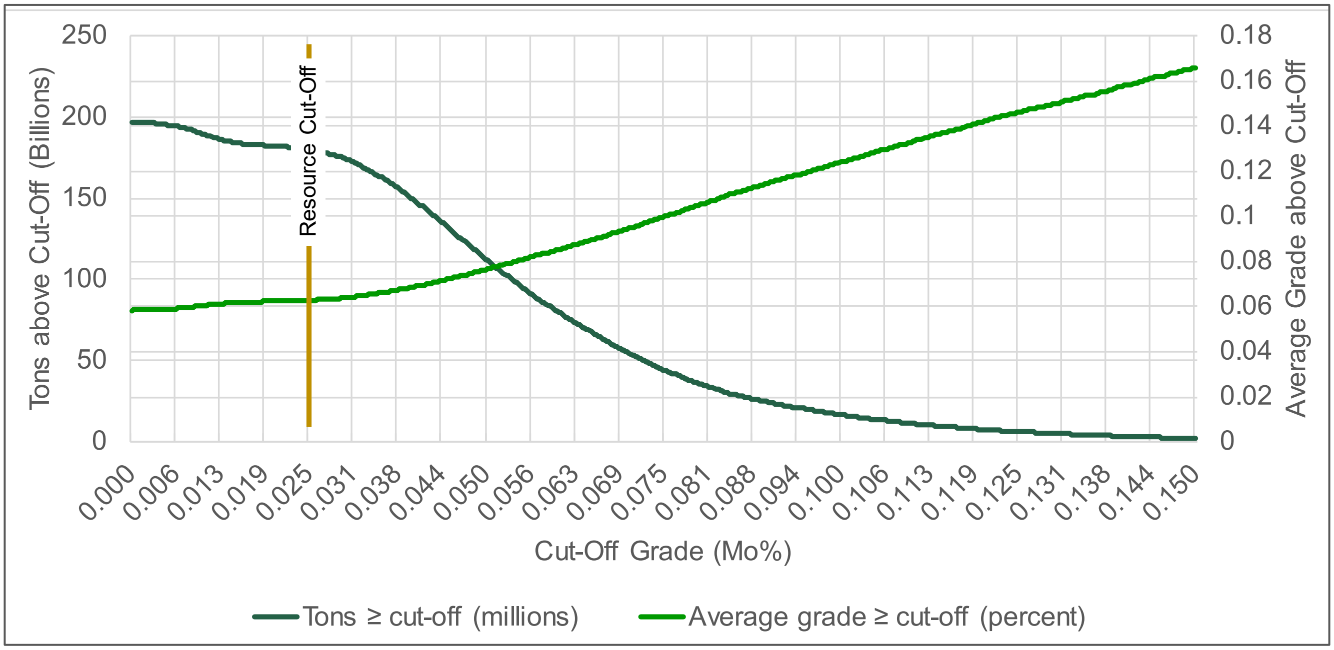


**Figure 14-13 Molybdenum grade-tonnage curve of Measured and Indicated Mineral Resources (inclusive Mineral Reserves)**



## 14.16 Other Relevant Factors

The QP is not aware of other relevant factors that would affect the Mineral Resources estimation.

# 15 MINERAL RESERVE ESTIMATE

## 15.1 Introduction

The conversion of Mineral Resources to Mineral Reserves requires the accumulated knowledge achieved through pit optimization, detailed mine design, and associated modifying parameters. Reserve estimation was completed using Datamine's NPV Scheduler software. Detailed access, haulage, and cost criteria were applied in this process for TCM. The project was built in the US customary system of measurement (short tons) and molybdenum is measured in percent molybdenum (% Mo) metal.

The existing workings and infrastructure as well as proximity of metal to the current topographic surface support mining of the Mineral Reserves with open pit mining techniques. To estimate the Mineral Reserves pit phases were designed following permitting requirements and an optimized pit shell-based analysis of discounted cashflow using a base sales price of US$16.00/lb molybdenum. The quantities of material within the designed pits were calculated using a base cut-off grade of 0.030% Mo.

## 15.2 Conversion Assumptions, Parameters and Methods

The conversion of Mineral Resources to Mineral Reserves requires consideration of:

- The ore extraction method(s) used in relation to the orebody characteristics, which determine mining dilution and recovery
- Project operation costs and resulting cut-off grades.

In accordance with CIM definition standards, only Measured and Indicated Mineral Resource categories can be converted to Mineral Reserves through the application of appropriate modifying factors. Inferred Mineral Resources are treated as waste for the purpose of Mineral Reserve estimates.

Dilution calculations and cut-off grade are considered to incorporate modifying factors in converting Mineral Resources to Mineral Reserves. Dilution, a measure of the waste rock included in the mined ore stream, accounts for mining factors such as equipment size and mining method. Cut-off grade incorporates economic, processing, and other factors. Pit optimization, geotechnical criteria, pit design processes, and other mining details discussed in Section 16 all contribute to modifying factors by defining the ultimate pit bounding the Mineral Reserves reported in Table 15-1. The cut-off grade may be modified during the course of mining operations to optimize business profits. These operational cut-off grades may accomplish different specific purposes.

### 15.2.1 Dilution and Mining Recovery

The Mineral Reserves are reported using diluted % Mo grades. Dilution is applied first in the resource model, where sample grades in a block are averaged such that each block having dimensions 50 ft (X) by 50 ft (Y) by 50 ft (Z) contains a single grade. The QP considers the averaging of grades into a block this size sufficient to account for the impact of the selectivity of the mining equipment in diluting grade and accounting for mining recovery, therefore a dilution factor of 0% and a mining recovery of 100% is used. As Centerra has experienced at other operations, operational controls will be put in place to ensure controlled blast movement is achieved and that dig limits are followed with minimal additional dilution or ore losses affecting the plant feed. Further dilution is applied in the mineral reserve model to account for zones where blocks contain a combination of backfill material and in-situ material; backfill material is treated as having 0% Mo, and a weighted average grade is computed between the in-situ material and the backfill material.

### 15.2.2 Process Recovery

For the purpose of estimating Mineral Reserves, process recovery is calculated on a block-by-block basis, with variations based on grade in % Mo. The coefficients were derived from model fitting to plant data, resulting in the equation as described in Section 13.6.2.

### 15.2.3 Internal Cut-Off Grade

The internal cut-off grade takes into account all operating costs (mining, processing, G&A and sustaining costs), but only includes the incremental ore mining and processing cost that exceeds the waste mining cost of that same block. If, after mining, the material can pay for downstream processing costs and other ore related costs, then it qualifies as ore. This ensures that all material mined from the pit that provides a positive economic benefit from processing is fed to the plant.

The calculation for internal cut-off grade is:

$$Int. CoG\ (\%) = \frac{Total\ Ore\ Based\ Cost\ (\$/ton)}{Process\ Recovery(\%) * \left(Payable\ Metal\ Price(\$/ton)\right) - Selling\ Costs(\$/ton))}$$

The cut-off grade used by Centerra to determine whether a block was designated ore or waste was the internal cut-off of 0.030% Mo. To maintain consistency with what was used in the optimization, this cut-off grade was used as a basis to define ore and waste in the production schedule.

The internal cut-off grade was calculated using the parameters in Table 16-10 as follows:

$$Int. CoG = \frac{\$7.73\ (\$/ton)}{85.14\% * (\$31{,}245.97\ (\$/ton) - \$1{,}460.31\ (\$/ton))} = 0.03\%$$

## 15.3 Reserve Estimate

The Mineral Reserve estimate for TCM is presented in Table 15-1.

**Table 15-1 Thompson Creek Mineral Reserve estimate as of September 1, 2024**

| Classification | Ore (Mst) | Mo grade (%) | In situ Mo metal (Mlb) | Waste (Mst) | Strip ratio (waste/ore) |
|---|---|---|---|---|---|
| Proven | 49 | 0.076 | 75 | 386 | 3.1 |
| Probable | 75 | 0.057 | 86 | | |
| **Proven and Probable** | **125** | **0.065** | **161** | | |

Source: Centerra, 2024

Notes:

- Mineral Reserves stated in the table above are the economic portion of the Measured and Indicated Mineral Resource contained within the engineered pit design following the selected ultimate Pseudoflow pit shell.
- Mineral Reserves are stated in terms of in-situ tons and grade before process recovery is applied.
- Modifying factors such as dilution and mining loss have been accounted for and are discussed in Section 15.2.1.
- The economic assumptions used for the Mineral Reserve estimate include: ore mining cost of $2.17/ton; waste mining cost of $1.77/ton; mining sustaining cost of $0.06/ton; G&A, processing, and sustaining costs of $7.33/ton ore; and selling cost of $1,460/ton metal in concentrate.
- Mineral Reserves are based upon a 0.030% Mo internal cut-off grade with some marginal material included, using a $16.00/lb Mo price with a variable molybdenum recovery as described in Section 15.2.
- Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.

## 15.4 Relevant Factors

Due to flattened slopes in the north pit wall where a significant failure has occurred, the pit crest has been designed to extend beyond the previously permitted disturbance area for the pit. In July 2024 TCM received approval for the proposed pit highwall layback.

As a result of the pit wall slope adjustments, the amount of waste mined has increased and the waste rock storage facilities (WRSFs) included in this plan are configured differently from what is stated in the current waste rock management plan filed with regulators. TCM intends to submit an updated Phase VIII Mine Plan of Operations to the regulators to address the changes to the WRSFs. An initial internal environmental effects assessment has been completed and no significant environmental impacts are expected to occur. A permit review and potential permit adjustments may be required to store waste rock material associated with this plan.

The QP is not aware of any other existing environmental, permitting, legal, socio-economic, marketing, political, or other factors that are likely to materially affect the Mineral Reserve estimate beyond those discussed herein.

# 16 MINING METHODS

## 16.1 Introduction

The TCM is a conventional hard rock open pit mine currently in care and maintenance. The mine has historically self-performed all drill, blast, load, haul, and support operations and plans to self-perform major mining activities in the future. Mining is planned on 50 ft benches using two existing cable shovels, a Bucyrus 495HD and a P&H 2300, as the primary loading units. A fleet of existing Cat 789C haul trucks will be reconditioned, and two new Cat 789 haul trucks will be purchased to achieve the mine production requirements. Blast-hole drilling will be performed with one new Atlas Copco Pit Viper 271 and two existing drills.

Ore will be mined at an average rate of 35,000 tons per day with most mined ore direct tipped into the primary crusher, while a low-grade stockpile will be utilized throughout the mine life to manage the grade being fed to the plant. Waste rock will be mined with the same fleet as the ore and placed in one of two WRSFs: the Buckskin WRSF or the Pat Hughes WRSF. The Buckskin WRSF is located northwest of the TCM pit and contains a storage capacity for 133 million tons of waste material. The Pat Hughes WRSF is located southeast of the TCM pit and contains a storage capacity for 265 million tons of waste material. Both WRSFs are to be topped from stockpiles containing volcanic Type I (non-acid generating – NAG) waste rock material, which will be used to cap WRSFs and the TSF at the end of the mine life. Volcanic Type I stockpile capacity is included in the total WRSF capacities indicated above, and additionally a 14 million tons operational stockpile for Type I waste will be utilized to facilitate closure needs. The Type I stockpile will be emptied during the closure process.

## 16.2 Geotechnical Design – Pit Slopes and Waste Rock Storage Facilities

### 16.2.1 Geotechnical Wall Slope Design Sectors

**Pit Slope Design**

The open pit slope design is based on studies conducted by Call & Nicholas, Inc. (CNI) which commenced in 2022 and involved a geotechnical drilling campaign, site investigation, audits of the Phase VI and Phase VII mined slopes, and stability analyses that were calibrated to major slope instabilities in the Phase VI and Phase VII north wall pushbacks (CNI, 2022; CNI, 2024). This work utilized conclusions and data from pit slope design work conducted since 1992 (CNI, 1992; CNI, 2000; CNI, 2004; CNI, 2011; CNI, 2017). The pit slope recommendations were utilized by Centerra to develop the Phase VIII LOM pit design, which conforms to the recommended pit slope configuration.

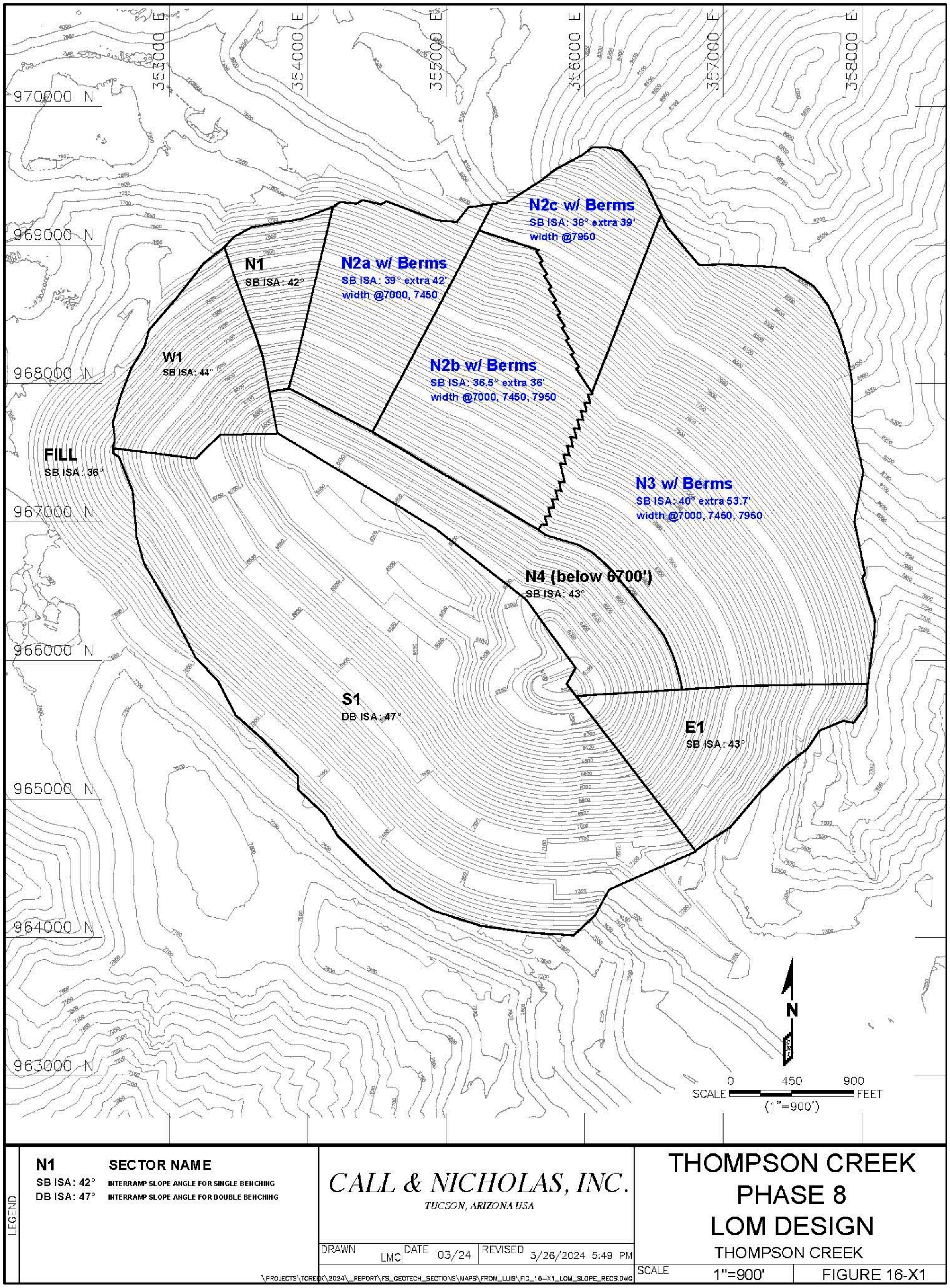
Figure 16-1 and Table 16-1 summarize inter-ramp slope angles (ISA) and bench designs by pit sector based on the results of the geotechnical analyses. For clarity, the north wall strikes southeast/northwest and slopes towards the southwest. Overall stability analyses conclude that the north wall must be effectively depressurized 300–400 ft behind the slope. Additionally, water infiltration and recharge from

Debit Spring must be mitigated and any perched water above the 7700 elevation must be removed. With these conditions met, the LOM slopes achieve the design acceptance criterion for stability.

Geotechnical berms are included in the LOM design at the 7000, 7450, and 7950 elevations (Figure 16-1 and Table 16-1). These are 80–90 ft wide benches that allow for steeper ISAs, provide additional rock fall protection, and limit the size of potential inter-ramp slope failures. The geotechnical berms can also be used to place slope monitoring instrumentation and dewatering infrastructure. The berm on the 7000 level extends to all walls, whereas the upper two berms are limited to the west, north, and east walls.

Input parameters, slope stability analyses and resulting pit slope angles are supported by a thorough geotechnical dataset and past mining experience. Overall stability analyses for the north wall are further supported by calibration analyses to past instabilities. The overall analyses indicate that aggressive depressurization is needed to meet the design acceptance criterion (DAC). In the absence of effective depressurization, the north wall does not meet acceptable DAC. The use of horizontal drains to achieve the required depressurization is an experienced based approach and should be followed up with further hydrogeologic investigation and groundwater modeling to confirm viability. The 2023 geotechnical drilling investigation indicated high variability in the Challis volcanics with low-strength subunits. Further drilling, and geologic interpretation are warranted to address the impact of low-strength volcanic subunits on slope stability.

**Figure 16-1 Slope angles by pit sector**



Source: CNI, 2024. Recommended ISAs are shown with the sector number.

**Table 16-1 ISAs and bench design**

| ISA zone | Wall sector | Elevation | Wall dip direction | | ISA (°) | Bench layout | | | Geotechnical berm [1] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Down dip (DDR) (min – max) | Up dip (min – max) | | Bench height (ft) | Bench face angle (°) | Catch bench width (ft) | Berm width (ft) | Extra width | No. |
| ISA24-01* | W1 | All | 100–160 | 280–340 | 44 | 50 | 70 | 33.6 | 80 | 46.4 | 2 |
| | N1 | Above 6700 | 160–190 | 340–010 | 42 | 50 | 70 | 37.3 | 80 | 42.7 | 2 |
| | N3 | Above 6700 | 190–270 | 010–090 | 40 | 50 | 65 | 36.3 | 90 | 53.7 | 3 |
| | N4 | Below 6700 | 160–270 | 340–090 | 43 | 50 | 70 | 35.4 | NA | | |
| | E1 | All | 270–320 | 090–140 | 43 | 50 | 70 | 35.4 | 80 | 44.6 | 1 |
| | S1 | All | 320–100 | 140–280 | 47 | 100 | 75 | 66.5 | 80 | 13.5 | 1 |
| ISA24-02a | N2a | Within N2A Solid | All | | 39 | 50 | 65 | 38.4 | 80 | 41.6 | 2 |
| ISA24-02b | N2b | Within N2B Solid | All | | 36.5 | 50 | 65 | 44.3 | 80 | 35.7 | 2 |
| ISA24-02c | N2c | Within N2C Solid | All | | 38 | 50 | 65 | 40.7 | 80 | 39.3 | 1 |
| Fill | Fill | All | All | | 36 | 50 | 60 | 40.0 | NA | | |

Source: CNI, 2024

* ISA022-02a and ISA22-02b override ISAs by wall orientation.

[1] Wide geotechnical berms at 7000, 7450, 7950 levels. 7000 level berm should be continuous around the pit for access. 7450 and 7950 levels should have dual access.

## Past Slope Instability

Table 16-2 presents a comparison of the slope configuration of past areas of slope instability in the north wall versus slope design parameters utilized for the Phase VIII pit design. The 2024 design is substantially flatter than slope angles used for past mining. Areas of past slope instability in the north wall are attributed to the following:

- Weak rock in the Debit Creek phyllic-altered zone (Altered Intrusives), which forms the toe of the Debit Creek instability (sectors N2a and N2b)
- Long fault structures, which are daylighted in the eastern portion of the north wall (sector N3)
- Long fault structures, which form wedge geometries in the western portion of the north wall (Central Wedge and DSC failures, sector N2b)
- Pore pressure attributed to groundwater and seepage from the Debit Spring area.

**Table 16-2 Summary of north wall slope failures**

| Name | Date | Area | Phase | Configuration of slope prior to failure | | | 2024 Design | |
|---|---|---|---|---|---|---|---|---|
| | | | | Slope dip direction (°) | Slope angle (°) | Slope height (ft) | Slope domain | Design ISA (°) |
| 2009 Debit Creek Slide | 17 Sep 2009 | NW | VI | 173 | 42–45 | 420 | N2a | 39 |
| 2009 Central Wedge | Apr 2009 to Aug 2009 | N | VII | 227 | 44–45 | 735 | N2b | 36.5 |
| 2009 South Slide | May 2009 | NE | VI | 245 | 45 | 330 | N3 | 40 |
| 2012 Debit Slide | 15 May 2012 | N | VII | 200 | 43 | 550 | N2a | 36.5 |
| 2012 South Slide | Aug 2012 | NE | VII | 250 | 44–45 | 500 | N3 | 40 |
| 2013 Central Wedge | 9 Jun 2013 | N | VII | 220 | 42–47 | 800 | N2b | 36.5 |
| 2014 Debit Slide Central | 1 May 2014 | N | VII | 207 | 43 | 1,200 | N2a/N2b | 39/36.5 |

Source: CNI, 2024

## Data

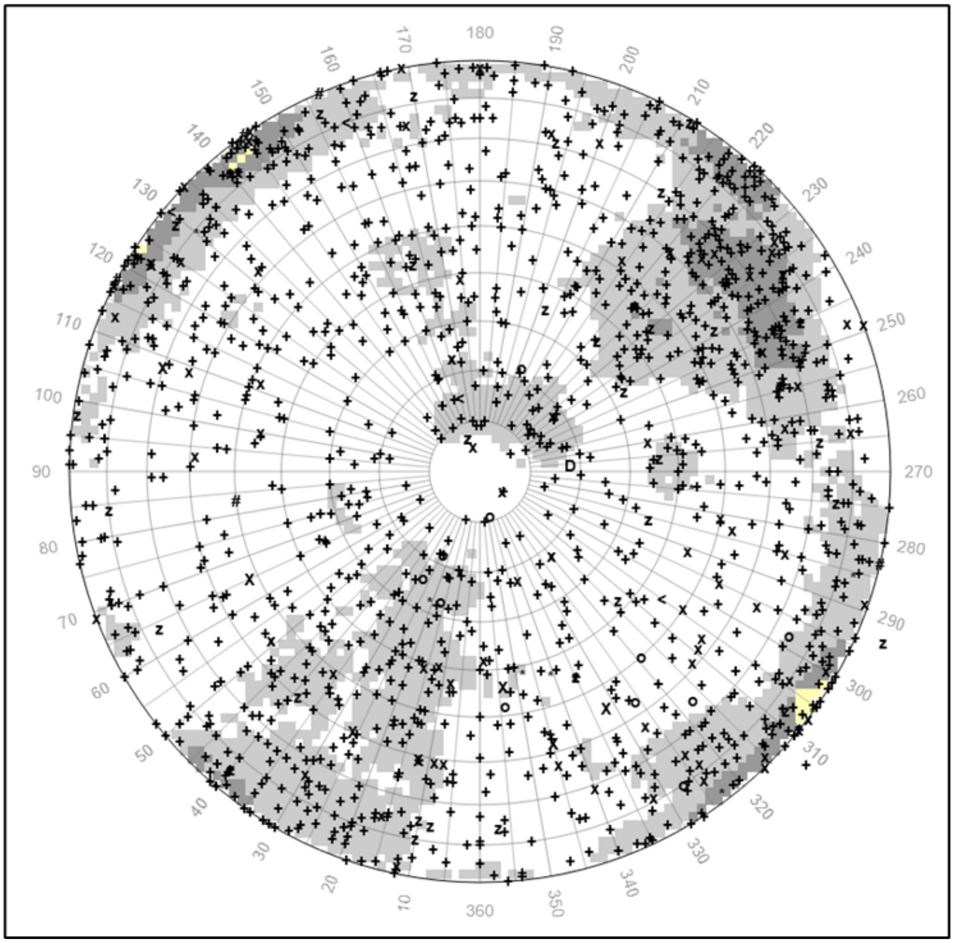
Data used for the geotechnical assessment have been collected during several campaigns beginning in 1992. To support the Phase VIII mine plan, 14 core holes were completed in 2023, and were logged for geomechanical properties, surveyed with televiewer logs for structure orientations, and were sampled for strength testing. Eleven of the 2023 core holes were instrumented with up to four vibrating wire piezometers (VWPs). Table 16-3 summarizes the available data. The data used in the analysis work includes structural data from major structure mapping completed in 2008 (CNI, Hobach, 2008) and 2023 (CNI, 2024), rock fabric mapping completed by CNI between 1992 and 2010, the compiled rock strength database (CNI, 2024), an updated rock quality block model (CNI, 2024), north wall light detection and ranging (LiDAR) scans from 2007 to 2015, and a point cloud created from drone photogrammetry by CNI in 2021. The 2021 point cloud was used for mapping to augment the major structure database, complete a pit slope audit, and more precisely locate structures for 3D stability analyses. Figure 16-2 is a stereographic project of the rock fabric database. The structural orientations shown are observed across the mine in all rock types.

**Table 16-3 Geotechnical database summary**

| Data type/source | Year | Quantity | Collected by |
|---|---|---|---|
| Geotechnical Core Holes – Oriented Core, RQD, Hardness Logging | 1992 boreholes | 5 holes; 589 m logged | CNI |
| | 1998 boreholes | 3 holes; 1,018 m logged | CNI |
| | 2010 boreholes | 4 holes; 1,097 m logged | Contract Geologists |
| | 2023 boreholes | 14 holes; 4,268 m logged | CNI |
| Exploration Core Holes – RQD and Hardness Logging | 1999 boreholes | 1 hole; 114 m logged | Contract Geologists |
| | 2007 boreholes | 8 holes; 2,354 m logged | TC Geologists |
| | 2008 boreholes | 26 holes; 10,438 m logged | TC Geologists |
| | 2009 boreholes | 6 holes; 2,804 m logged | TC Geologists |
| Rock Quality Block Model | 2023 | 70 holes; 24,721 m RQD data | CNI |
| Rock Fabric Mapping | 1992 | 12 cells | CNI |
| | 1996 | 8 cells | CNI |
| | 1999 | 47 cells | CNI |
| | 2004 | 60 cells | CNI |

| Data type/source | Year | Quantity | Collected by |
|---|---|---|---|
| | 2010 | 98 cells | CNI |
| Major Structure Mapping | 1997 | Mapped on 1 in = 200 ft mine plan | CNI – D. Sims |
| | 2008 | Mapped on 1 in = 200 ft mine plan | CNI – P. Hobach |
| | 2021 | Photogrammetry point cloud of exposed benches | CNI |
| Major Structure Model | 2023 | 49 3D fault planes | CNI |
| Lab Testing Data: Unconfined Compressive Strength (UCS), Brazilian Disk Tension (DT), Triaxial Compression Strength (TCS), Small Scale Direct Shear (SSDS), and Atterberg Limits (AL) | 1999 | 6 UCS, 6 DT, and 4 SSDS | CNI |
| | 2010 | 4 DST and 4 AL | CNI |
| | 2011 | 20 UCS, 23 TCS, 32 DT, and 18 SSDS | CNI |
| | 2022 (WRSF) | 4 AL and 1 SSDS | CNI |
| | 2023 | 19 UCS, 32 TCS, 15 DT, 8 AL, and 29 SSDS | CNI |
| Rock Type Solids | 2010 | 4 Rock type solids | TC and CNI |
| | 2023 | 6 Geomechanical rock type solids | CNI |
| North Wall LiDAR Scans | 2007 to 2015 | Monthly scans | TC |
| Groundwater Pore Pressure | 2023 | 28 VWPs Installed in 11 core holes | CNI |

**Figure 16-2 Thompson Creek rock fabric database**



Source: CNI, 2024. Lower hemisphere stereographic projection.

Table 16-4 summarizes the quantity of geomechanical testing data by test type and rock type. Intact and fracture strengths are summarized by rock type in Table 16-5.

**Table 16-4 Quantity of geomechanical testing by rock type**

| Rock type | Uniaxial compression | Uniaxial comp. (w/E&V) | Triaxial compression | Brazilian disk | Small scale direct shear |
|---|---|---|---|---|---|
| Volcanics | 5 | 2 | 9 | 9 | 6 |
| MSD – Argillite | 5 | - | 3 | 1 | 5 |
| Skarn/Hornfels | 11 | 7 | 15 | 6 | 11 |
| Fresh Intrusives | 16 | 8 | 22 | 28 | 18 |
| Altered Intrusives | 7 | 5 | 6 | 7 | 3 |
| Fault Gouge and Clay Remolds | - | - | - | - | 10 |

**Table 16-5 Material strength summary**

| Rock type | RQD | Intact strength | | | | | | Fracture strength | |
|---|---|---|---|---|---|---|---|---|---|
| | | UCS (psi) | Young's Modulus (psi x $10^6$) | Poisson's ratio | Friction angle (°) | Cohesion (psi) | Tensile strength (psi) | Friction angle (°) | Cohesion (psi) |
| Volcanics | 30% | 3,578 | 1.66 | 0.25 | 52.3 | 610.6 | 543.6 | 22.2 | 5.06 |
| Metasediments Argillite | 33% | 4,851 | 1.0 | 0.25 | 45.8 | 984.6 | 1,796.7 | 25.3 | 2.25 |
| Skarn/Hornfels | 58% | 21,827 | 11.8 | 0.20 | 60.0 | 2,920.9 | 1,728.9 | 22.7 | 2.49 |
| Fresh Intrusives | 31% | 21,231 | 8.97 | 0.24 | 54.3 | 3,417.4 | 1,524.0 | 27.7 | 3.44 |
| Altered Intrusives | 17% | 2,750 | 1.03 | 0.27 | 54.1 | 446.0 | 488.1 | 26.2 | 5.92 |
| Fault Gouge and Clay Remolds | - | - | - | - | - | - | - | 26.7 | 8.83 |

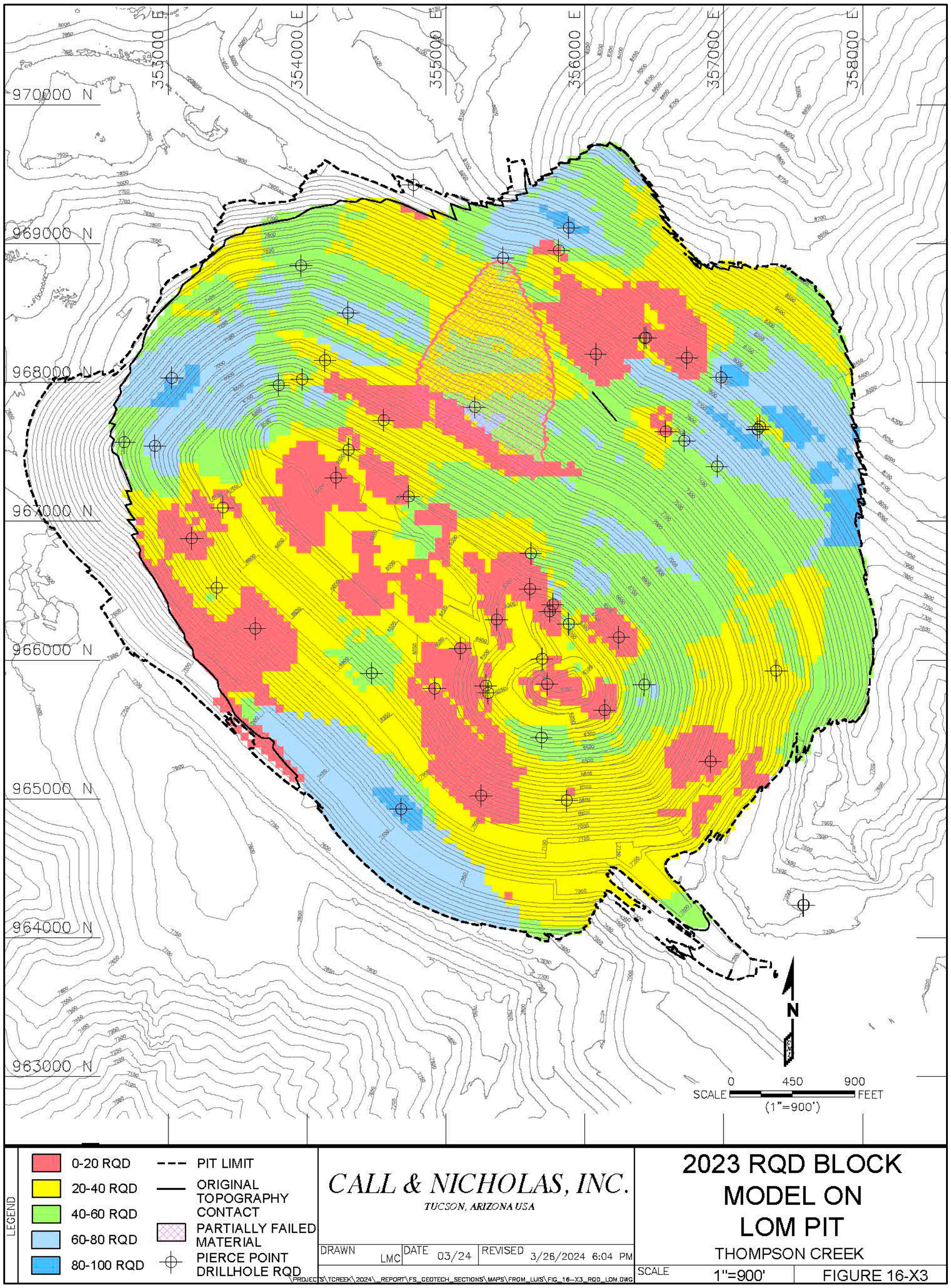
## Geotechnical Modeling

A rock quality block model was completed in 2023 using RQD data from 81,105 ft of logging from 70 core holes. Drillhole pierce points are shown in Figure 16-3, on the Phase VIII pit plan. RQD was utilized for the geotechnicalblock model estimation as the database for this parameter was the most complete. The RQD block model is shown projected to the Phase VIII LOM on Figure 16-4. Multiple methods of block model validation were utilized including comparison of multiple estimation methods (inverse distance, nearest neighbor kriging, ordinary kriging, and others), visual validation, cross validation, and change of support. Six geomechanical rock types, defined and modeled as solids shown in Figure 16-3, are supported by the RQD block model; these solids were used in the overall stability analysis:

- Challis Volcanics – Eocene volcanic sequence of low-moderate competency.
- Quartz Monzonite and Granodiorite (Fresh Intrusives) – pit bottom, Cretaceous-age intrusive rocks of high competency.
- Granodiorite (Fresh Intrusives) – pit bottom, Jurassic-age intrusive rocks of high competency.
- Metasediments – argillites of the Mississipian Copper Basin formation of low-moderate competency.

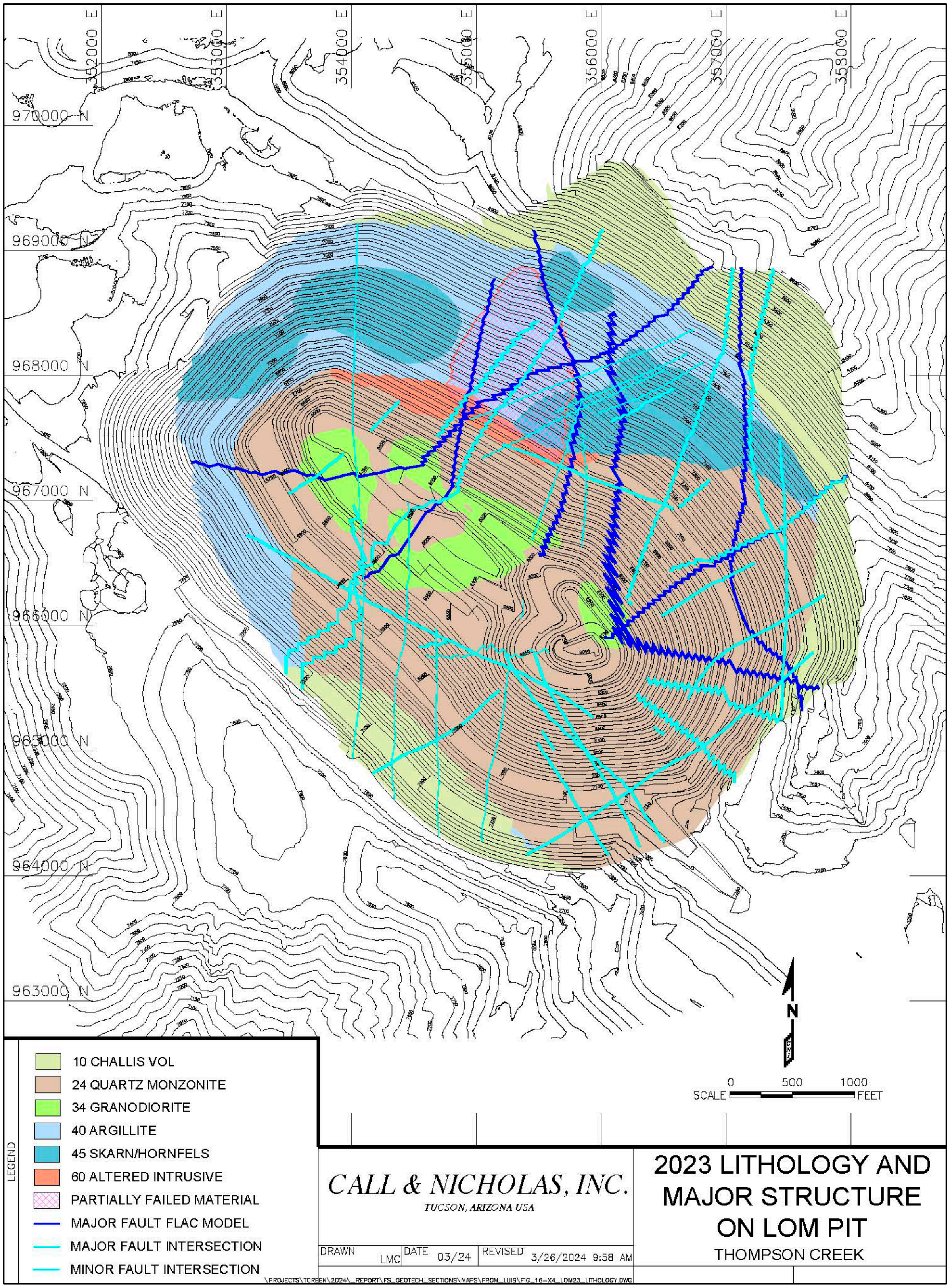
- Skarn/Hornfels – Mississipian Copper Basin altered argillites of low-moderate competency near the intrusive contact.
- Altered Intrusives – phyllic altered, low-strength intrusive rocks due to contact metamorphism at the intrusive/metasediments contact.

**Figure 16-3 RQD block model exposed on the Phase VIII LOM**



Source: CNI, 2024

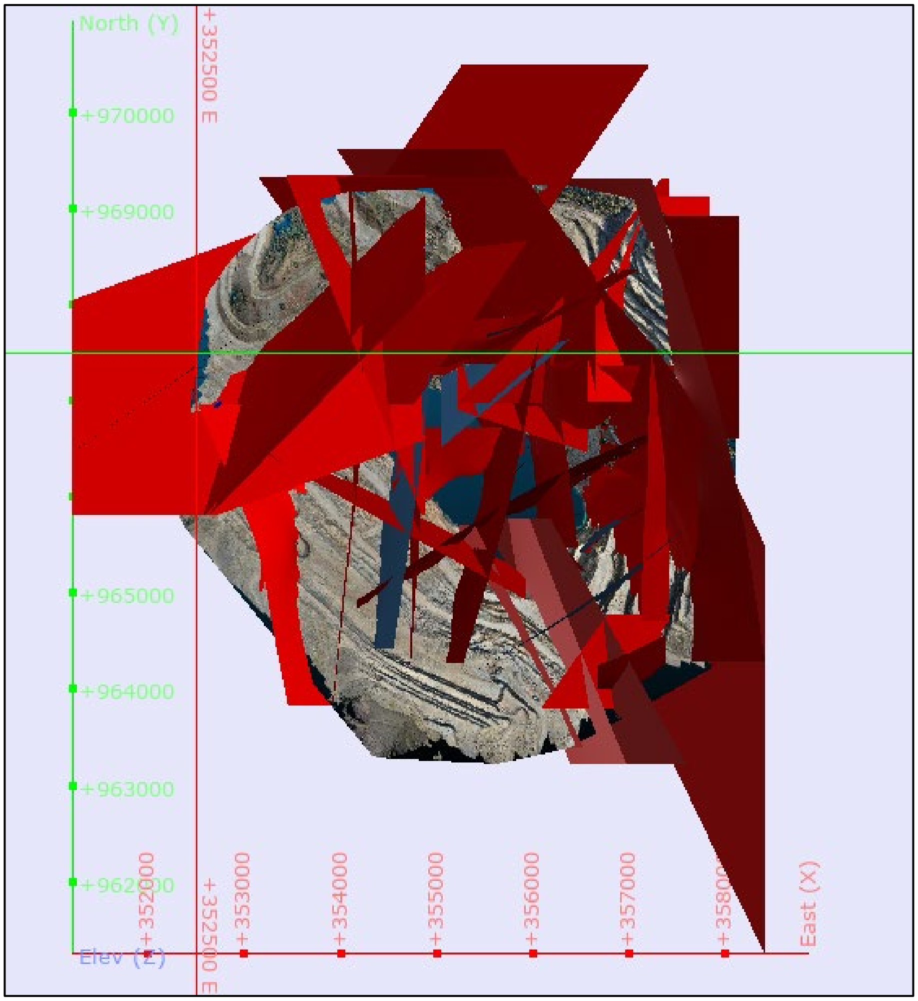
**Figure 16-4 Geomechanical rock types on Phase VIII LOM**



Source: CNI, 2024

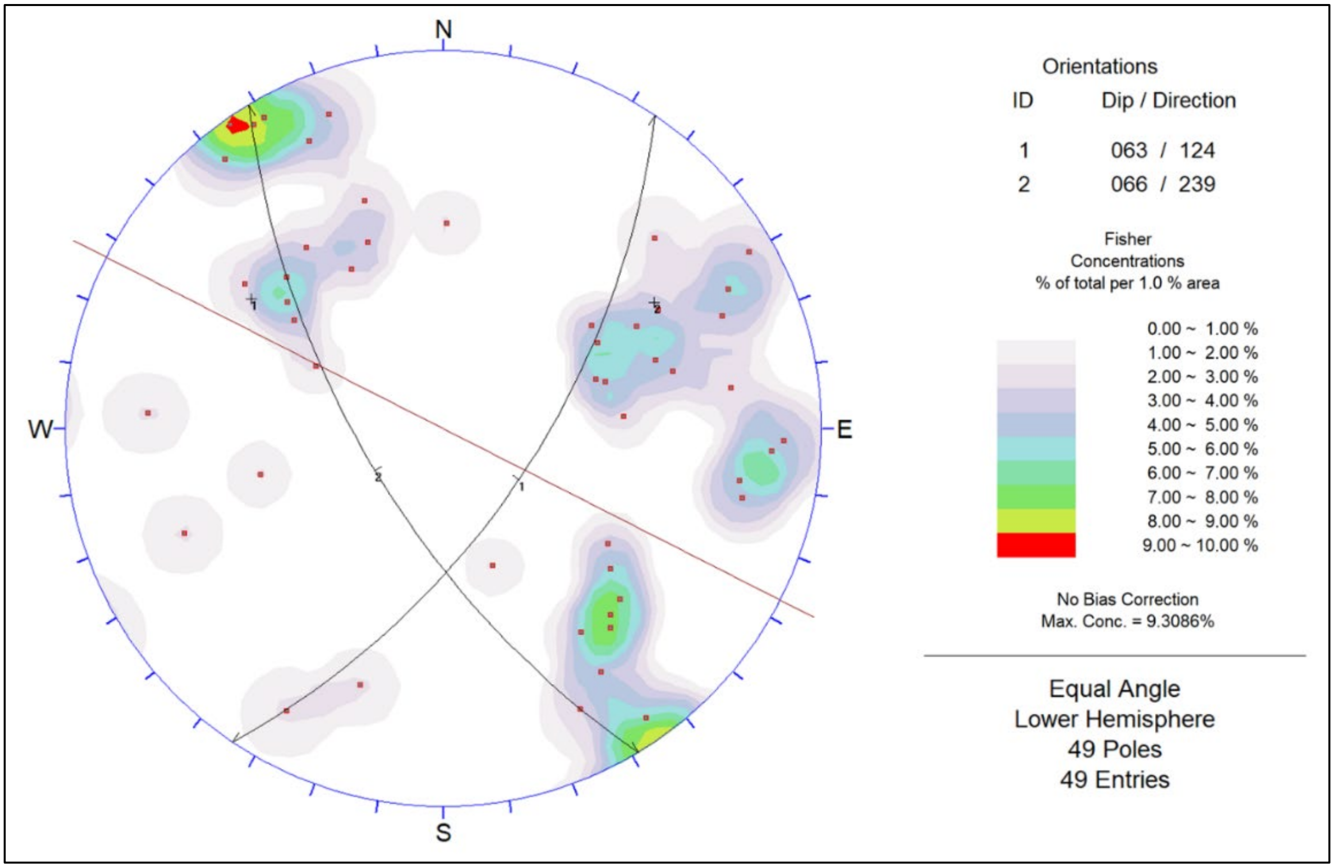
A 3D major structure model was completed in 2023 utilizing all data sources. Figure 16-5 shows the extended 3D fault planes of the major structure model. Figure 16-6 displays poles to the fault planes, great circles for wedge structures, and the pit wall strike used for the north wall overall stability analysis. These wedge structures are also shown on Figure 16-5.

**Figure 16-5 Thompson Creek 2023 major structure model**



Source: CNI, 2024

**Figure 16-6 Thompson Creek 2023 major structure database**

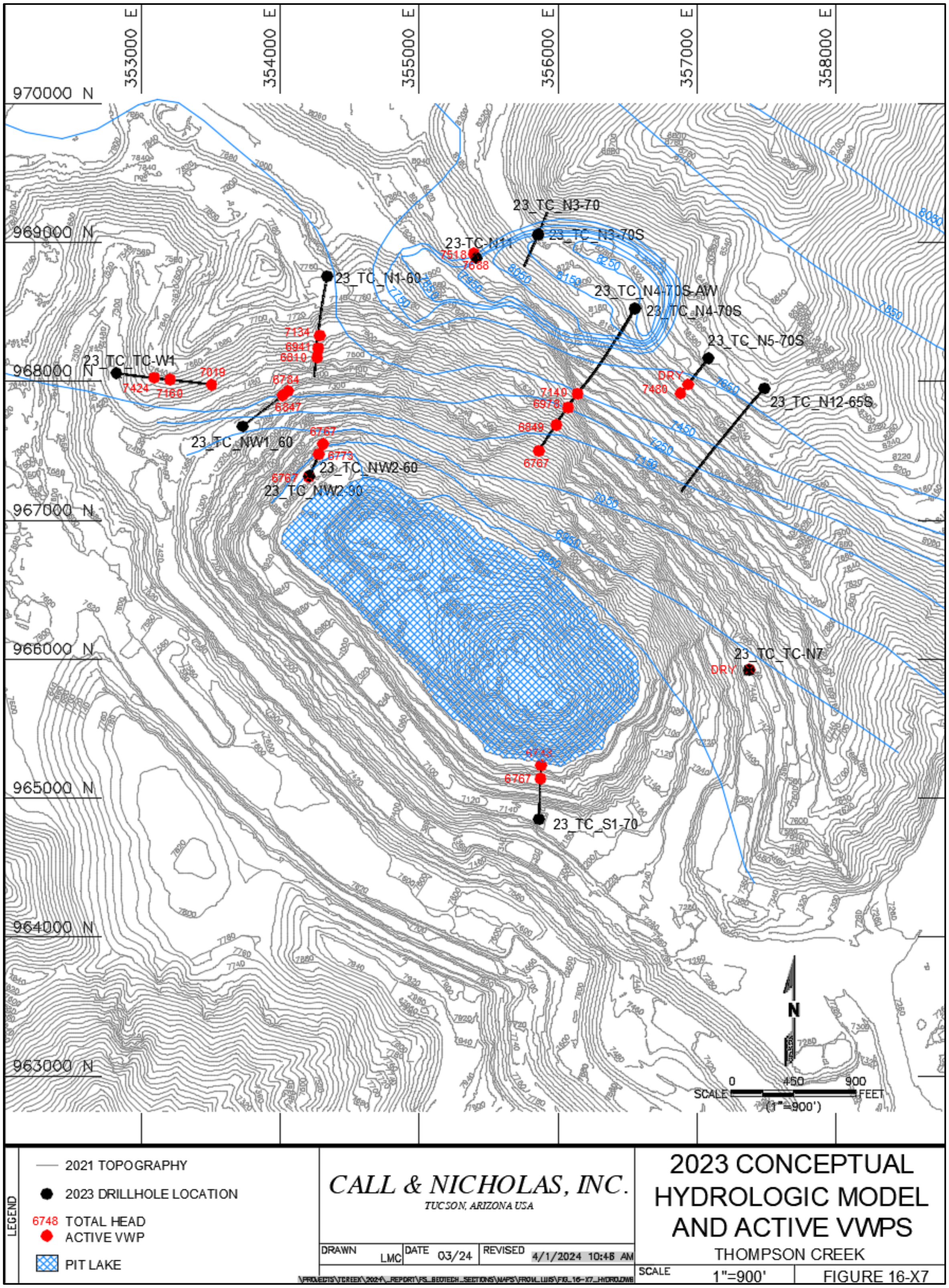


Source: CNI, 2024. Lower hemisphere stereographic projection.

## Pit Hydrogeologic Modeling

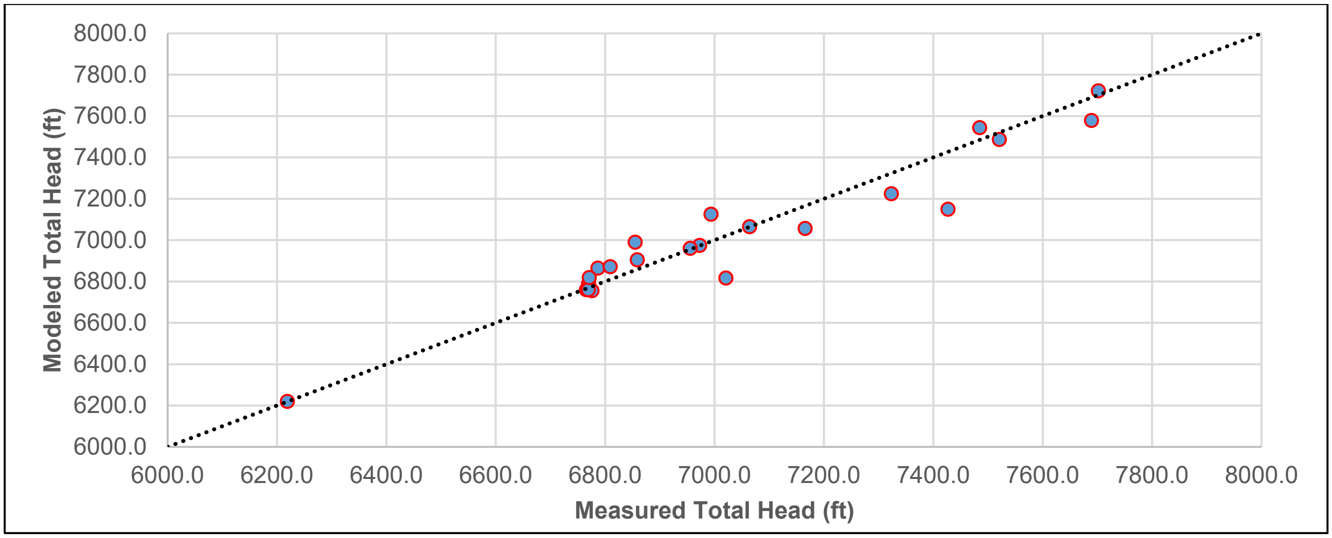
Figure 16-7 shows the locations of the 2023 core holes and VWPs. A steady-state groundwater flow model was developed with FLAC3D and calibrated to pore pressure readings from 23 VWPs installed in 10 drillholes within the model domain. This model was developed for stability modeling purposes and is not considered to be a full hydrogeologic model. There are several stacked piezometers from which to obtain estimates of the hydraulic gradient. The regional phreatic surface was obtained from a groundwater model produced by Lorax (2008). This model indicates a phreatic surface at an elevation of approximately 7,400–7,600 ft in the area, which is corroborated by the VWP data. The data indicate a relatively high piezometric surface in the north wall and a downward flow gradient. A source of recharge above the regional groundwater table, reflecting the influence of the Debit Spring, was needed to match VWP data to the groundwater model pore pressure. Figure 16-7 shows the interpretation of the current phreatic surface. The fit of the flow model to the piezometric data is shown on Figure 16-8.

**Figure 16-7 2023 VWP installations and modeled phreatic surface**



Source: CNI, 2024

**Figure 16-8 Groundwater flow model fit to piezometric data**



Source: CNI, 2024. 13.5% Normalized RMSE

## Pit Slope Stability Analyses

Pit slope stability analyses were conducted to determine slope angles which meet the DAC shown in Table 16-6. The analysis methods utilized were based on the controlling failure modes as determined from analysis of the geotechnical data and mining experience.

**Table 16-6 Slope design control by pit wall sector**

| Wall | Design control | Analyses | Year | Design acceptance criterion | Design ISA (°) | Analysis results |
|---|---|---|---|---|---|---|
| W1 | Bench-scale | Backbreak (CNI) | 2004 | 80% CBW reliability | 44 | >80% CBW reliability |
| N1 | Transition sector | Backbreak (CNI) | 2004 | 80% CBW reliability | 42 | >80% CBW reliability |
| N3 | Inter-ramp | FLAC3D | 2023-24 | SRF = 1.2 | 40 | SRF >1.2, 300' depressurized |
| | | Inter-ramp (CNI) | 2022 | 80% Reliability non daylighted, failure tons | | 80% Reliability non daylighted, failure tons |
| N4 | Bench-scale | Slope Audit (CNI) | 2023-24 | 80% CBW reliability | 43 | >80% CBW reliability |
| E1 | Transition sector | Backbreak (CNI) | 2004 | 80% CBW reliability | 43 | >80% CBW reliability |
| S1 | Bench-scale | Backbreak (CNI) | 2004 | 80% CBW reliability | 47 | >80% CBW reliability |
| | | FLAC | 2022 | SRF = 1.2 | | SRF = 1.23, natural drainage |
| N2a | Overall | FLAC3D | 2023-24 | SRF = 1.2 | 39 | SRF = 1.15-1.25, 300-400' depressurized |
| | | FLAC | 2023 | SRF = 1.2 | | SRF = 1.25, depressurized |
| N2b | Overall | FLAC3D | 2023-24 | SRF = 1.2 | 36.5 | SRF = 1.15-1.25, 300-400' depressurized |
| N2c | Overall | FLAC3D | 2023-24 | SRF = 1.2 | 38 | SRF = 1.15-1.25, 300-400' depressurized |
| | | 2D LE | 2023-24 | FOS = 1.2 | | FOS = 1.2, 300= depressurized |

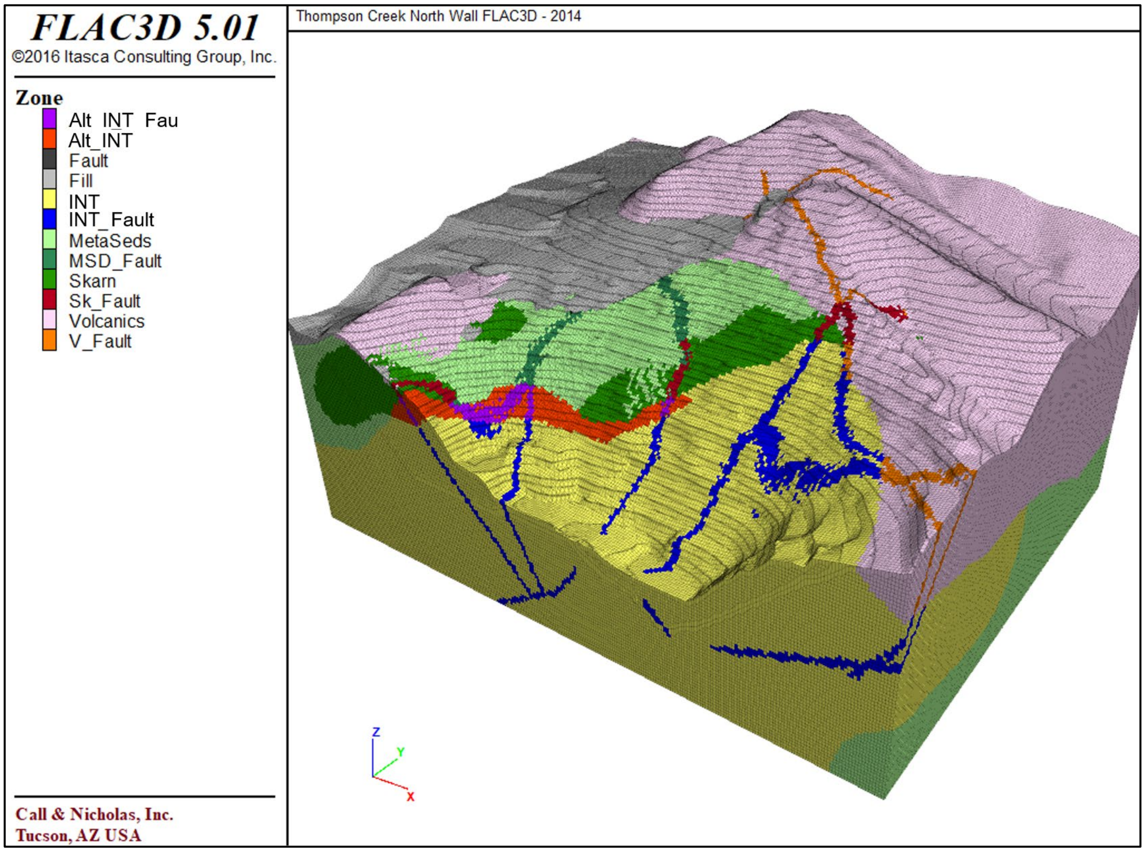
Source: CNI, 2024

### North Wall Overall Stability Analysis

Overall slope stability analysis of the north wall sectors was performed using Itasca's FLAC3D® (Fast Lagrangian Analysis of Continua in Three Dimensions) for the hydrological and geotechnical analyses. All simulations began with the pre-mine topography and were run through a series of excavations to simulate the development of stress and pore pressure history up to and including the Phase VIII LOM design. Strength reduction factor (SRF) analysis was used to identify the location and timing of critical slip surfaces as they developed in the model grid.

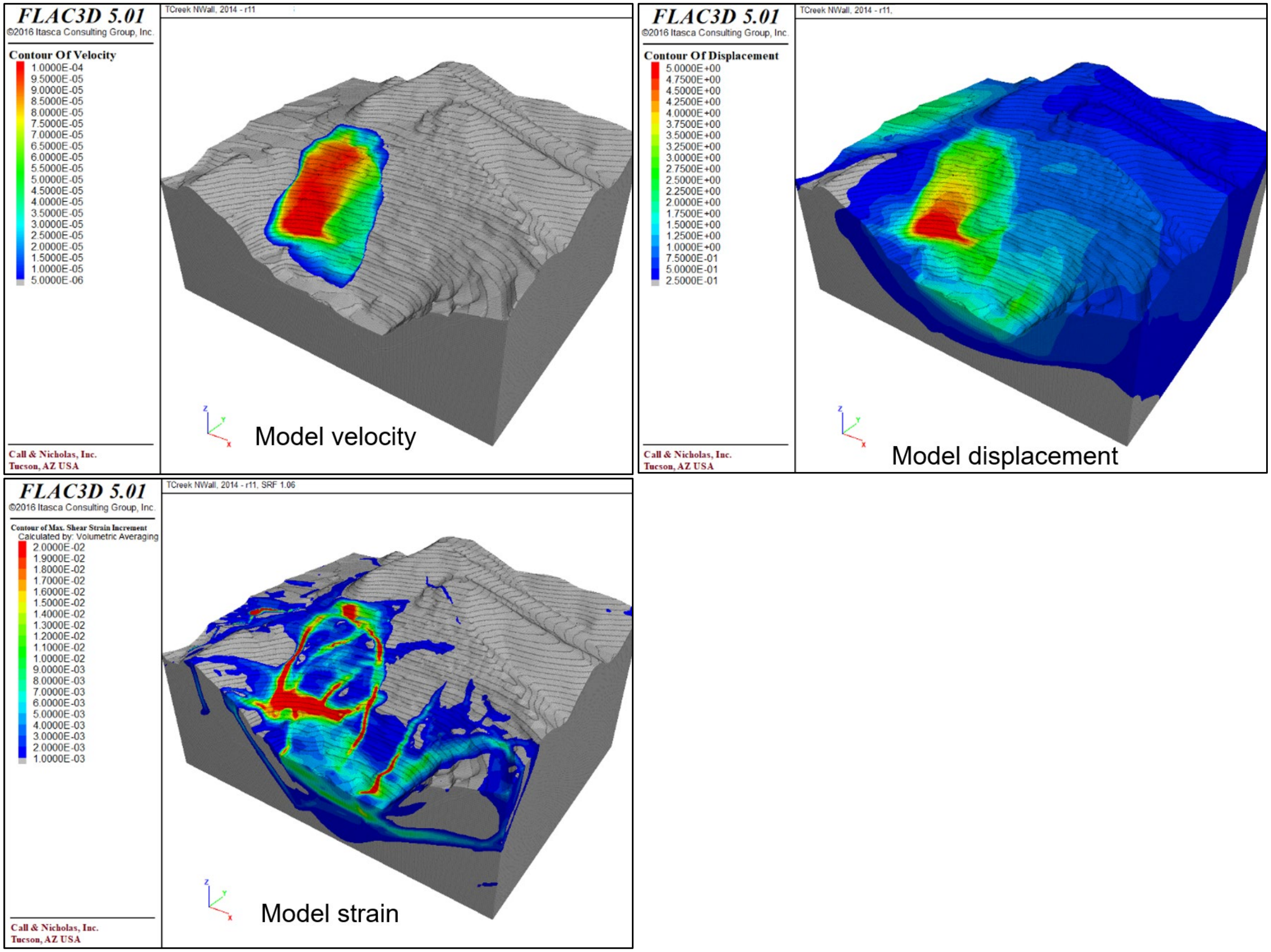
Material property calibrations were completed by back analyzing the 2014 Debit Slide Central failure, which was a large-scale failure that occurred in the north wall during the Phase VII pushback. The combination of an over-steepened slope mined at a 43° inter-ramp angle with a lack of adequate depressurization and recharge from Debit Springs led to conditions that initiated failure. Failure was initiated in the saturated, weak, and altered intrusive rock due to excessive loading from the overlying metasediments. Failure propagated up the metasediments through heavily fractured rock mass. Figure 16-9 shows the FLAC3D model zones on the 2014 pre-failure topography. Material strengths were adjusted until the model displacements matched the observed displacements of the 2014 failure as shown in Figure 16-10. These calibrated strengths were used in the forward analysis of the Phase VIII LOM pit.

**Figure 16-9 FLAC3D model zones 2014 pre-failure surface**



Source: CNI, 2024

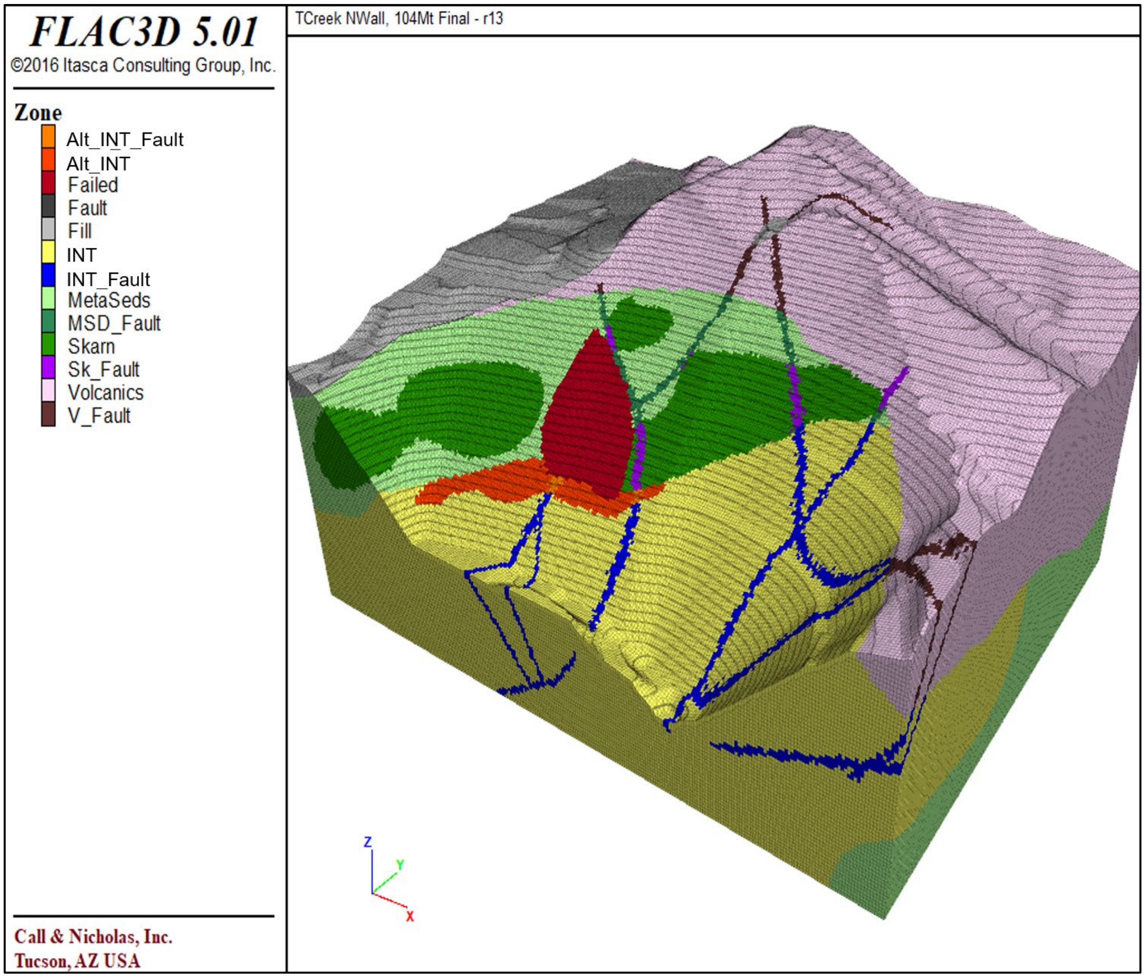
**Figure 16-10 FLAC3D analysis of the 2014 Debit Creek failure**



Source: CNI, 2024

Model zones cut to the Phase VIII LOM pit are shown in Figure 16-11. The overall stability of the final wall was analyzed for a range of groundwater pore pressure conditions to determine the amount of depressurization required to achieve an SRF of 1.2. With a minimum of 300 ft of effective depressurization behind the wall, the LOM slope achieved an SRF of 1.2 (Figure 16-12), which meets design acceptance criterion. Full depressurization results in a maximum 1.20–1.25 SRF, which is considered low with respect to typical DAC for this condition in the range of a 1.3 SRF. A summary of the model results is provided in Table 16-7.

**Figure 16-11 FLAC3D model zones on Phase VIII LOM**

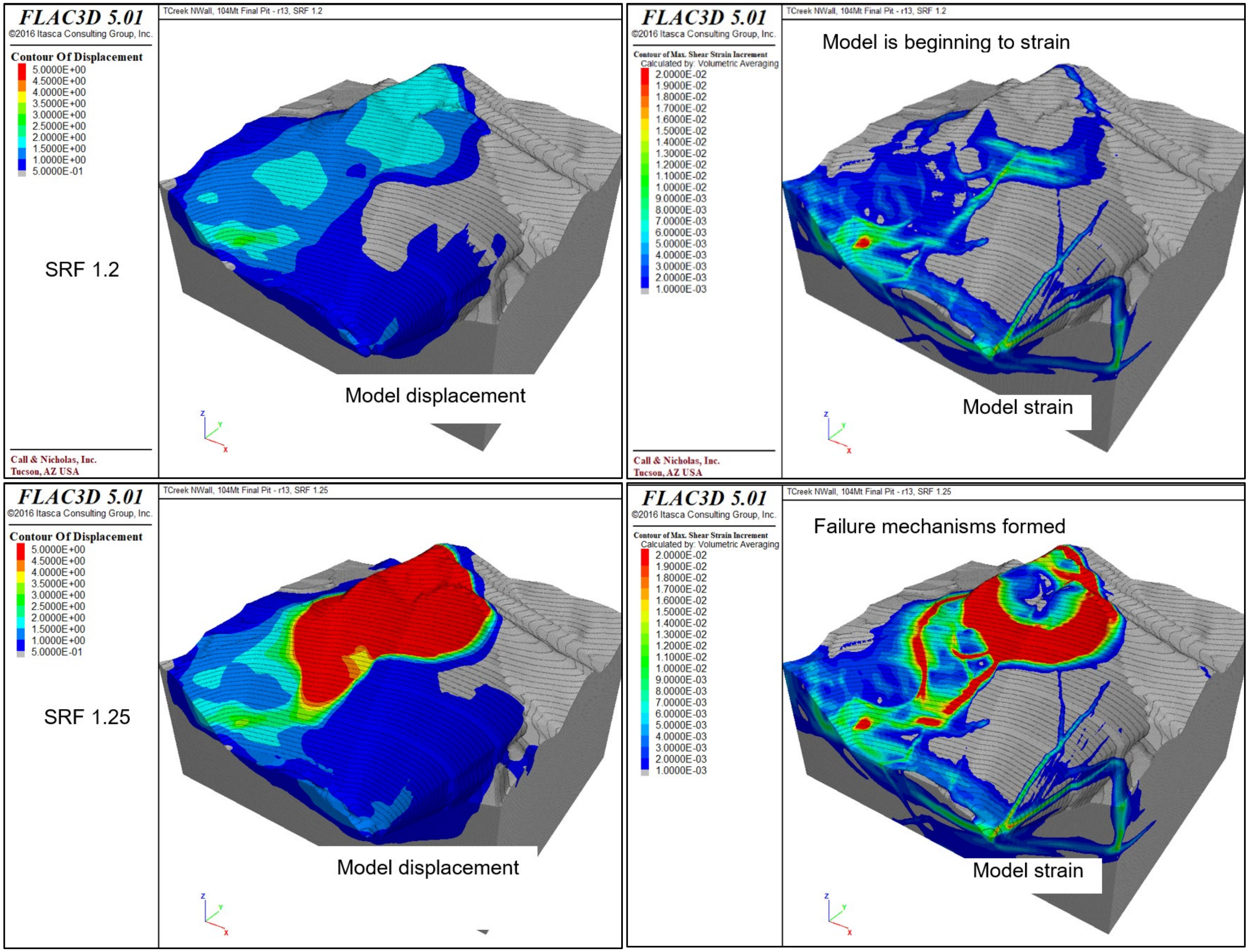


Source: CNI, 2024. Showing partially failed material remaining in LOM slope.

**Table 16-7 Summary of FLAC3D simulation results**

| Analysis | Mine cut | Pore pressure assumption | SRF |
|---|---|---|---|
| Back analysis | 2014 | Estimated based on 2023 calibration | <1.0 |
| Current slope | 2023 | Calibrated to 2023 piezo data | ~1.0 |
| Predictive | Phase VIII LOM | Fully depressurized | 1.20–1.25 |
| | | CNI estimate (natural depressurization only) | 1.05–1.075 |
| | | 300’ effective depressurization | 1.15–1.20 |

Figure 16-12 Phase VIII SRF 1.2 with 300’ effective depressurization



Source: CNI, 2024

### Sector N2a

The ISA for sector N2a was based on 2D overall slope analysis using FLAC (CNI, 2023) and FLAC3D (CNI, 2024). This sector is characterized by weak phyllic-altered intrusive rock between the 6700 and the 7050 elevations. The design consists of an interramp slope angle of 39° with 80 ft wide geotechnical berms at the 7000 and 7450 elevations resulting in a 38° overall slope angle.

### Sectors N2b, N2c

Phase VII mining of the north wall resulted in two large failures related to major structure, poor rock quality, and pore water pressure: the Debit Creek Slide that occurred in May 2012, and the May 2014 Debit Slide Central failure. The Phase VIII LOM plan will not completely mine out the failed wedges, and there is a risk of similar instabilities in the north wall. The design slope angles for sectors N2b and N2c were initially determined using SVSlope 3D Limit Equilibrium analysis (CNI, 2022). FLAC3D overall stability analyses (CNI, 2024) were later conducted and concluded that 300–400 ft of depressurization is needed to achieve the design acceptance criterion of a minimum 1.2 SRF.

The sector N2b slope design includes an ISA of 36.5° with three 80 ft wide berms at the 7000, 7450, and 7950 elevations, resulting in a 35° overall slope angle. Sector N2c is above the Debit Slide Central failure zone in unbroken rock mass. The N2c slope design includes a 38° ISA and an 80 ft geotechnical berm at the 7950 elevation.

### Sector N3

Sector N3 was analyzed for inter-ramp and overall slope stability. In this sector, pitward dipping faults caused inter-ramp slope collapses totaling 1.7 million tons (1.5 million tonnes) in 2012 during Phase VII mining. The Phase VII slope was mined at an inter-ramp angle of 44-45°.

CNI's proprietary *Interramp* (Ryan and Pryor, 2000) software was used to estimate expected failure tonnages for various inter-ramp slope angles (CNI, 2022). Forward analyses show that there is a significant increase in the expected failure volumes when the slope exceeds 38° for the full-slope height. Therefore, a 38° slope angle should not be exceeded. The slope design for sector N3 is an ISA of 40°, decoupled by three 90 ft geotechnical berms at the 7000, 7450, and 7950 levels, which results in a 38° slope angle.

Additionally, FLAC analysis of sector N3 concludes that a depressurized zone extending a minimum 300 ft horizontally behind the pit slope will be required to achieve the DAC of a minimum 1.2 SRF.

### Sectors N1, N4, S1, E1, W1

Slope angles for the south (S1), west (W1), east (E1), and lower north (N4) wall sectors are not limited by overall slope nor inter-ramp slope stability. The ISA designs for these sectors were obtained from bench-scale stability analyses conducted in 2011 and 2017 (CNI, 2011; CNI, 2017) and the 2021 slope audit (CNI, 2022). For sectors E1, W1, N1 and N4, a single-bench (50 ft) design is utilized. N1 is a transition sector.

A double-bench (100 ft) slope configuration and a 47° ISA are utilized in sector S1 where rock quality and structure are more amenable to steeper angles. Presplit blasting is required in this sector to achieve the bench-scale design.

### 16.2.2 Waste Rock Storage Facilities Geotechnical Design

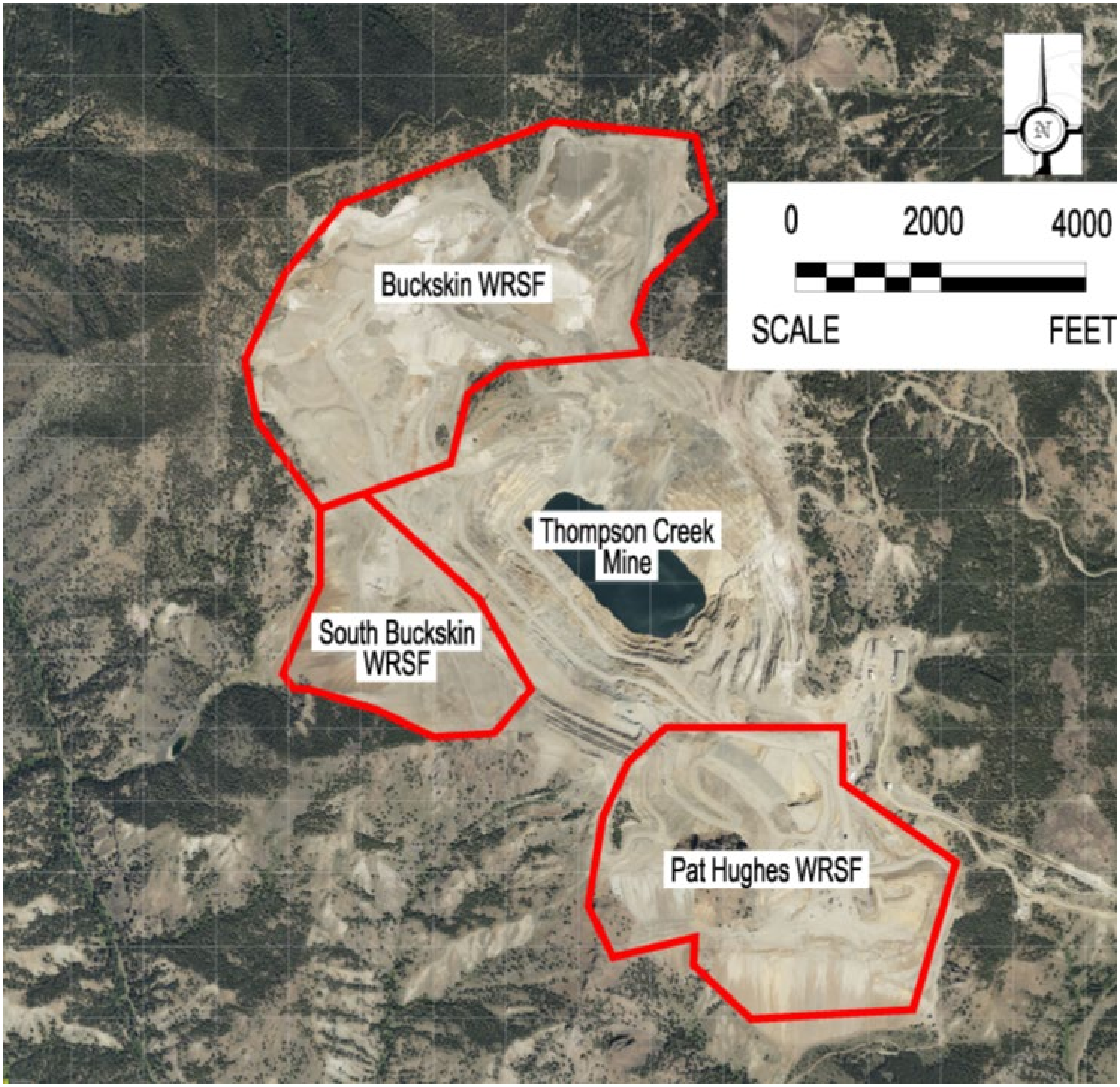
Geotechnical review of the Pat Hughes and Buckskin WRSF Phase VIII EOM design was conducted by CNI (CNI, 2024), which consisted of a visit to the site to review general conditions, mapping of surficial WRSF material, laboratory testing of weathered Challis Volcanics waste material, general review of data sources (primarily previous reports), and slope stability analysis. This work was supported by experience and history of WRSF construction from start of mine operations in 1981 to stoppage in 2016 and several past geotechnical studies involving foundation investigation, laboratory testing, and geotechnical analyses (Table 16-8).

**Table 16-8 Summary of geotechnical work completed for the Pat Hughes and Buckskin WRSF**

| Report (consultant, date, title) | Summary of geotechnical work completed |
|---|---|
| Golder Associates, November 1980<br>Waste Dump Investigation and Design Phase I, Thompson Creek | *The Golder 1997 report references work completed:*<br>Foundation investigation completed. 4 boreholes and 20 test pits completed. |
| Golder Associates, March 1997<br>Waste Rock Management Plan | Completed stability analyses, underdrain construction designs, and laboratory testing. |
| Shannon & Wilson, April 18, 1997<br>Review of Waste Rock Dumps, TCM Supplemental EIS, ID | Review of the Golder 1997 report. |
| Golder Associates, May 23, 1997<br>Response to Comments by Shannon & Wilson | Responses to the S&W review. |
| Shannon & Wilson, June 16, 1997<br>Rock Dumps TCM Custer County, ID | Review of the Golder 1997 report. |
| Montgomery Watson, June 17, 1997<br>Thompson Creek Mine Waste Rock Dumps Stability Analysis Review | Review of the Golder 1997 report. |
| Johnson, TCM, 2000<br>Report on Pat Hughes Dump Stability Analysis (internal) | - |
| Andek and SWRCE, March 2011<br>Preliminary Design Report Thompson Creek Mine Pat Hughes and Buckskin Waste Rock Dumps Sediment and Water Management Facilities | Completed a site visit. Completed a water management plan. |
| BGC Engineering, Aug 18, 2011<br>Waste Dump Design and Underdrain Assessment | Completed a review of previous geotechnical work. Completed stability and deformation analyses. |
| Call & Nicholas, May 2022<br>Waste Rock Storage Facilities Geotechnical Slope Stability Study Thomspon Creek Mine | Completed a site investigation. Foundation and waste rock samples collected. Laboratory testing completed. Stability analyses completed. |
| Call & Nicholas, February 2024<br>Waste Rock Storage Facilities Geotechnical Slope Stability Study Thomspon Creek Mine | Stability analyses updated to match Phase VIII EOM WRSF designs. |

WRSF expansions are planned in both the Buckskin and Pat Hughes areas (Figure 16-13). Expansion of Pat Hughes will occur in end-dumped lifts placed partially over existing waste material which varies in thickness up to 500 ft. Three end-dump lifts of 500 ft, 250 ft, and 300 ft in height, with platforms separating each lift, will be constructed below the 7300 level. Above the 7300 level, the Pat Hughes WRSF will be bottom-up construction in lifts 50 ft in height. The Buckskin WRSF expansion consists of bottom-up construction in lifts 50 ft in height over existing waste material.

**Figure 16-13 Pat Hughes and Buckskin WRSF locations**



Source: CNI, 2024

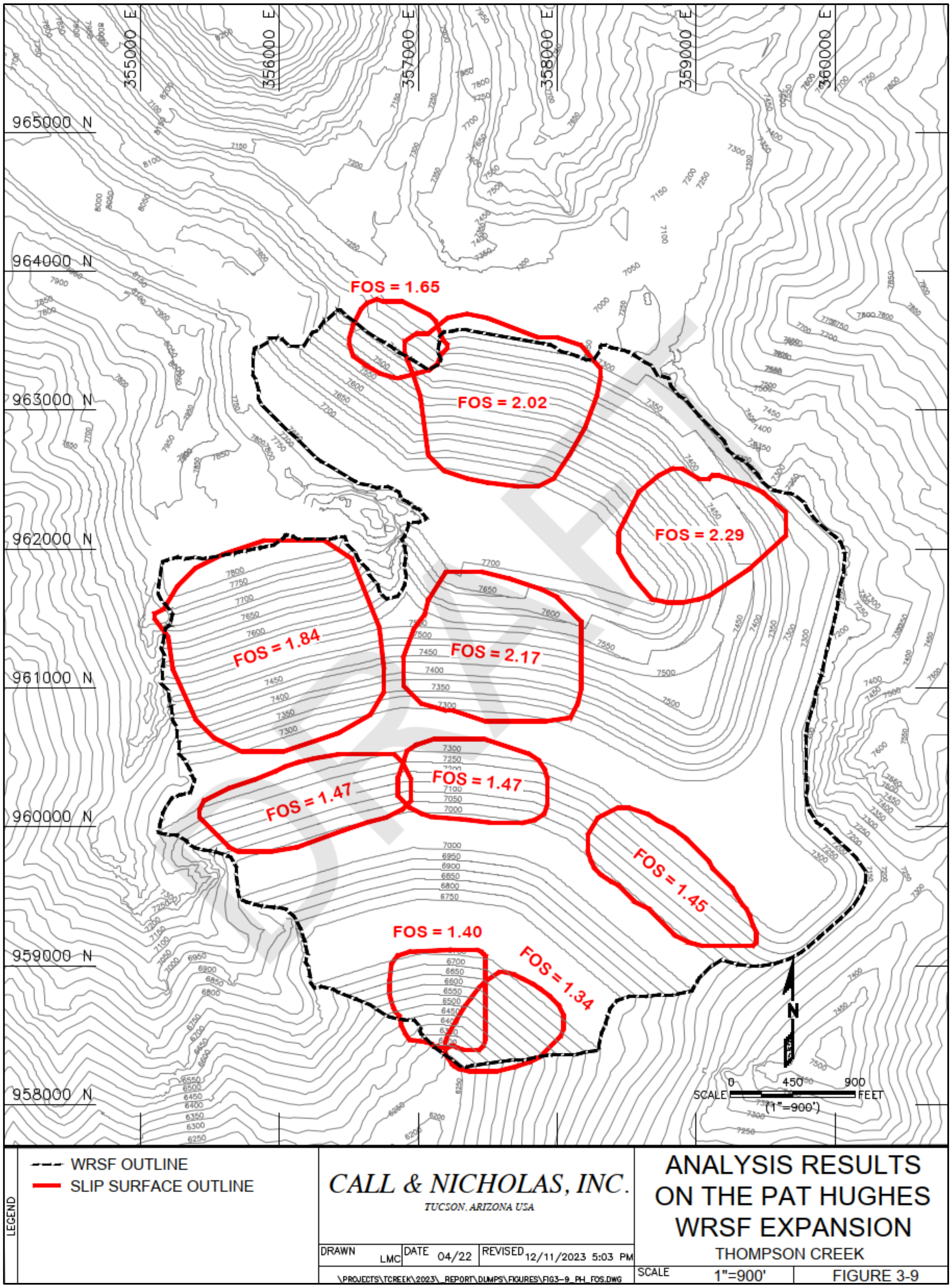
The Pat Hughes and Buckskin WRSFs are constructed in drainage valleys. The foundation dips are up to 30° and are confined within the valleys. Soil classification testing of foundation samples show that the soils are a veriety of gravels, clayey sands (SC), and lean clays (CL).

The following were concluded from the geotechnical review:

1) The 2023 EOM Pat Hughes and Buckskin WRSF expansion designs meet design acceptance criteria of a minimum 1.3 factor of safety static (Figure 16-14 and Figure 16-15) and 1.0 pseudostatic with respect to overall stability utilizing 3D limit equilibrium analyses.
2) The Pat Hughes and Buckskin WRSFs have potential for shallow, near-crest failures, which is an inherent risk associated with WRSF faces constructed at the angle of repose. The risk of near-crest failures is best mitigated by short dumping and dozer pushing, crest cutting, and limiting the crest-advance rate.
3) The potential for seismic-induced liquefaction was addressed by BGC (2011), wherein it is stated that lacustrine foundation materials found in the Buckskin area, which have the potential for liquefaction failure, are locally distributed and discontinuous. Along with other information, BGC concludes that a significant liquefaction-related adverse impact is not reasonably foreseeable.
4) Conditions of the existing foundation could not be confirmed, as the majority of the foundation footprint is covered. Geotechnical drilling, test pits, and characterization of the foundation were conducted by Golder (1980, 1981) and SRK (1981). Stability analyses assumed that the foundation has been prepared by removing weak material. The foundation shear strength utilized in stability analyses (34° friction, zero cohesion) was taken from BGC (2011).
5) The Leps lower bound curve was utilized to model the waste rock shear strength in the Pat Hughes WRSF stability analyses. A blended strength of the Leps lower bound and small-scale direct shear testing from the weathered Challis Volcanics was used to model the waste rock shear strength in the Buckskin WRSF. Table 16-9 and Figure 16-16 summarize shear strength functions of materials used in stability analyses.
6) Seismic-induced deformation analyses conducted by BGC (2011) concluded that deformations will be of nominal magnitude and in the range of what is expected for settlement. This conclusion is reasonable and applicable to the Phase VIII WRSF expansion plan.
7) The following are required to mitigate potential WRSF stability issues related to weathered Challis Volcanics and other low-strength waste material:
    a) A nominal tonnage of low strength weathered Challis Volcanics will be placed in the Pat Hughes WRSF. This material and other low-strength waste material must be blended with coarser, more competent waste rock to a minimum 1:3 ratio, managed on a daily basis, as large, continuous segments of low-strength material will create planes of weakness and resulting instability.
    b) Place low-strength material in the core of bottom-up constructed WRSFs and place higher-strength coarser grained material around the outer edge of these WRSFs to encapsulate low-strength material and maintain stability. A preliminary estimate of the thickness of outer coarse-grained material is 200 feet, which is approximately one third of the overall slope height.

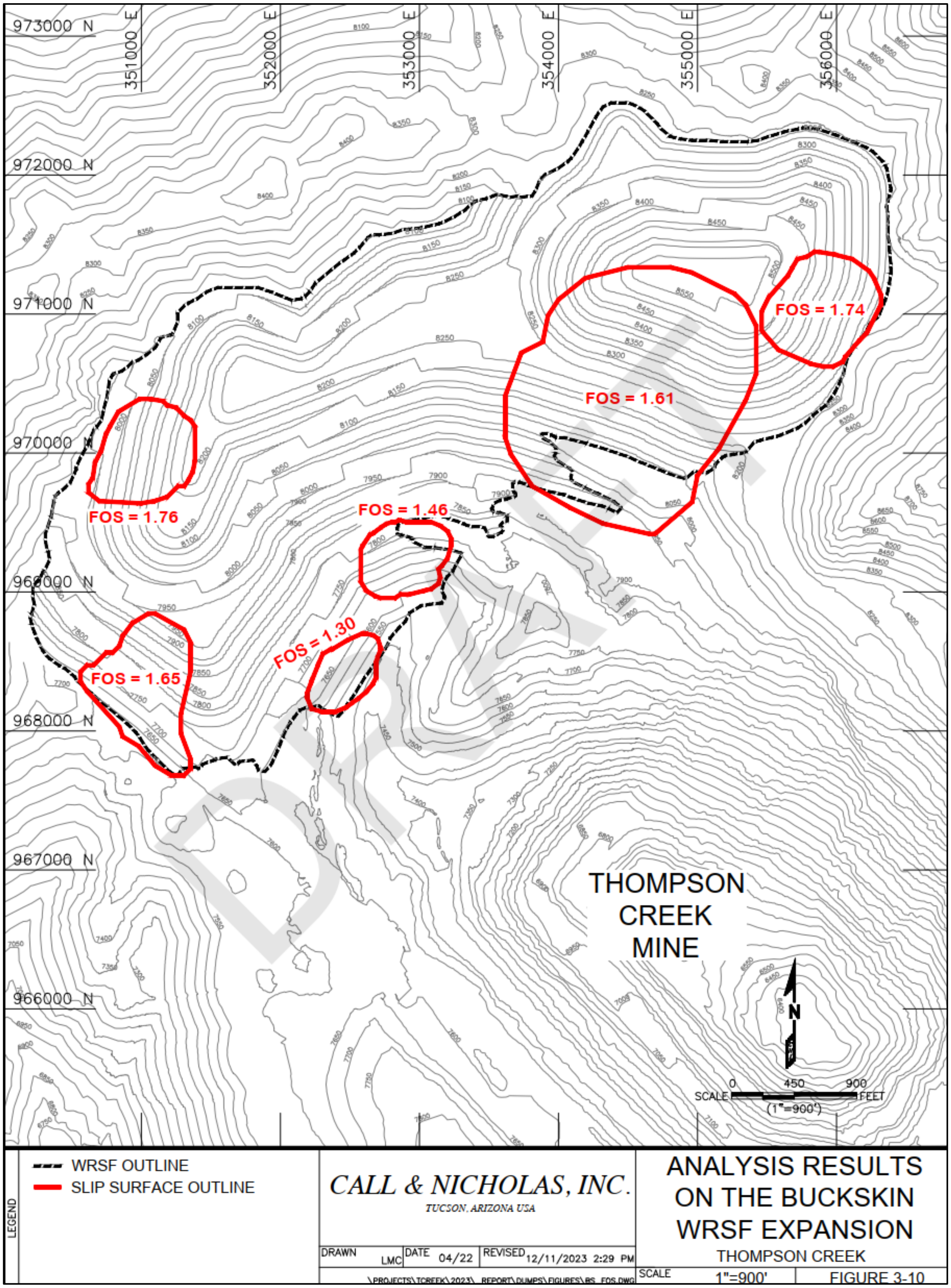
8) The Pat Hughes and Buckskin WRSFs are placed in drainage valleys. Therefore, drainage diversions, underdrains (French drains), drains to mitigate seeps, and other surface water management infrastructure are needed to prevent pore-pressure induced failures. Underdrains and other water management infrastructure have been constructed previously. The effectiveness of this infrastructure and the need and design of additional infrastructure are issues that need to be addressed.

**Figure 16-14 Pat Hughes stability analysis results**



Source: CNI, 2024

Figure 16-15 Buckskin stability analysis results



Source: CNI, 2024

**Table 16-9 Summary of material properties**

| Material name | Unit weight (pcf) | Linear | | Power | |
|---|---|---|---|---|---|
| | | Friction angle (°) | Cohesion (psi) | K (for x in psi) | M ( ) |
| [1] Waste Rock (Leps lower) | 120 | - | | 1.188 | 0.898 |
| [2] Waste Rock (blended) | 120 | - | | 1.185 | 0.829 |
| [3] Weathered Challis Volcanics | 111.1 | - | | 1.778 | 0.637 |
| [4] Colluvium/ Foundation | 100 | 34 | 0 | - | |

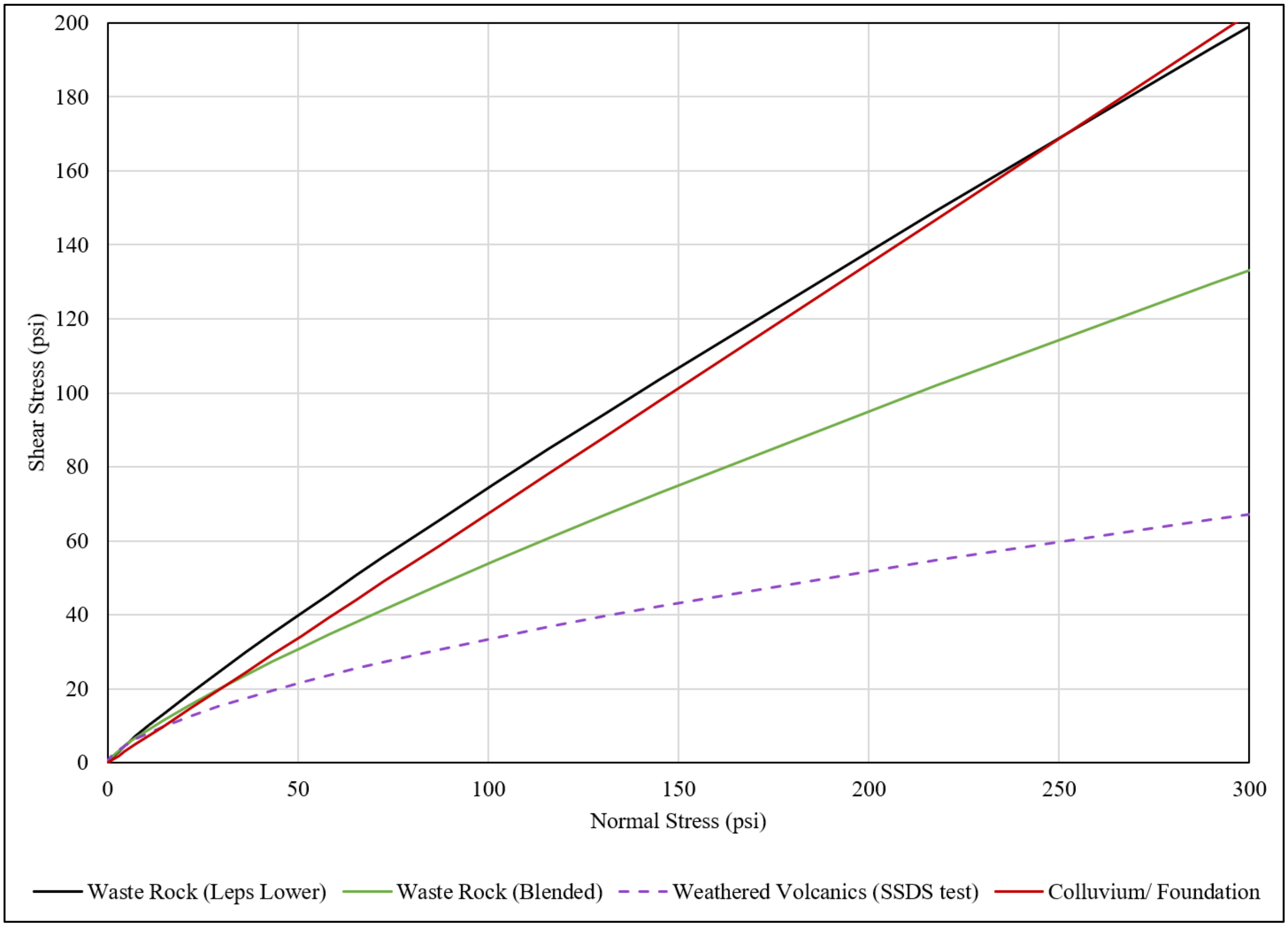
[1] Leps envelope, lower bound, for top down construction (Leps, 1970).

[2] The blended strength incorporates 50% of the Leps, lower bound, and 50% of the weathered volcanics strength.

[3] Weathered Challis Volcanics from SSDS laboratory test (sample from Buckskin WRSF).

[4] Colluvium strength from the *Final Waste Rock Management Plan* report (Golder, 1997 and BGC, 2011).

**Figure 16-16 Summary of material strengths used in WRSF stability analyses**



Source: CNI, 2024

## 16.3 Pit Optimization

A pit optimization was completed using Datamine's Studio NPVS pit optimization software. The pit optimization is based on a first principles cost buildup, considering historic and current cost estimates, of mining, processing and selling related costs, slope angles, and metal recoveries. These pit optimization factors differ from those reported in the final economic analysis, which is based on the pit design criteria and production schedule that follows the optimization work. The pit optimization software considered grades and tonnages in the model along with prices, recovery factors and mining, processing, and administrative costs to evaluate what material could be economically extracted through the use of the pseudoflow algorithm.

### 16.3.1 Mineral Resource Models

Only Measured and Indicated Mineral Resources, as described in Section 14, were considered in the evaluation. Blocks classified as Inferred Mineral Resources were considered waste and grades were set to zero.

### 16.3.2 Topographic Data

Base topographic data are a combination of an aerial survey completed by Badger Aerial in 2021, which was adjusted to reflect recent mining activity with an effective date of January 1, 2024, and a bathymetric survey conducted by Golder in 2018. The result from Badger Aerial is used for areas above the pit lake level. The result from the bathymetric survey by Golder was used for areas below the pit lake surface. The combination of these two surfaces represents the current topography used for pit optimization.

Centerra also considered two other surfaces – a “mined out” surface representing the extent of historical mining at TCM, and a “failure zone” surface representing the historical slope failure. The QP assumed material above these surfaces was barren and loose – applying no recoverable economic benefit and assuming slope designs as per CNI's recommendation for “fill” material and densities as per the assumed density for fill material from the resource model. This material would also not incur drilling and blasting costs.

### 16.3.3 Parameters and Constraints

This section includes a summary of key input parameters and constraints for the pit optimization study. Diluted grades were used as described in Item 15.2.1.

The pit optimization was completed using a base selling price of US$16/lb molybdenum. A series of 86 pits were generated, resulting in prices between US$5.28/lb and US$20.00/lb molybdenum. Each incremental pit represents a US$0.16/lb molybdenum change in selling price.

#### Slope Angles

Slope criteria for the TCM pit optimization work were issued by CNI on January 12, 2024 (CNI, 2024). Guidance issued in this memo was used by Centerra to assign slope angles during pit optimization.

ISAs suitable for pit optimization are listed above in Item 16.2.1. The approximate location of the ISA zones described by CNI can be seen above in Figure 16-1.

### Royalties

The QP is not aware of any royalties paid on metal production from TCM.

### Mining Costs

Mining costs were based on the first principles cost model developed by Centerra. The mining costs used for pit optimization were US$1.77/st for waste and US$2.17/st for processed material. Sustaining capital for mining of US$0.06/st was also considered in the pit optimization.

### Processing Cost and Metal Recovery

The processing costs were based on a preliminary plant operating cost estimated by Hatch (2023). The processing cost used for pit optimization was US$4.73/st ore processed.

A processing sustaining capital was calculated, inclusive of TSF construction requirements. This was applied as an ore-based cost, with US$0.94/st processed used for pit optimization.

Processing recovery was calculated as described in Item 13.6.2.

### General and Administrative Costs

G&A costs were based on a G&A model developed by Centerra for TCM. G&A was applied as an ore-based cost, with US$1.62/st processed used for pit optimization. An additional US$0.04/st processed was applied for G&A related sustaining capital.

### Concentrate Parameters and Selling Costs

Concentrate parameters were supplied by Centerra, including a concentrate moisture content of 3% and a concentrate grade of 53.6% Mo.

The total concentrate transport charge is US$187.50/st concentrate (wet). Transport losses of 0.5% are assumed. Payable metal is 97.75%, with a metal deduction of 1% applied. A roasting charge of US$0.55/lb payable metal is applied.

### Best-Case and Worst-Case Analysis Parameters

Incremental shells were evaluated using a best and worst schedule, discounted cashflow analysis, described in Item 16.3.4. For this analysis, a plant feed rate of 10.4 million tons per annum and a discount rate of 5% were used. Table 16-10 tabulates input parameters for the pit optimization routine.

**Table 16-10 Summary of pit optimization economic input parameters by item**

| Item | Units | Value |
|---|---|---|
| **Mining** | | |
| Mining cost – Waste | US$/st mined | 1.77 |
| Mining cost – Ore | US$/st mined | 2.17 |
| Mining sustaining capital | US$/st mined | 0.06 |
| Mining dilution | % | 0 |
| Mining recovery | % | 100 |
| **Processing** | | |
| Direct processing cost | US$/st ore | 4.73 |
| G&A | US$/st ore | 1.62 |
| Processing sustaining capital (includes TSF construction) | US$/st ore | 0.94 |
| G&A sustaining capital | US$/st ore | 0.04 |
| Total ore-based costs (includes incremental ore mining cost) | US$/st ore | 7.73 |
| Annual plant feed rate | Mst/a | 10.4 |
| **Selling** | | |
| Base metal price | US$/lb metal | 16.00 |
| Concentrate moisture content | % $H_2O$ | 3% |
| Transport charges | US$/st concentrate (wet) | 187.50 |
| Transport losses | % | 0.50 |
| Metal payable | % | 97.75 |
| Metal deduction | % | 1.00 |
| Roasting charge | US$/lb payable metal | 0.55 |
| **Other** | | |
| Discount rate | % | 5.00 |

Source: Centerra, 2024

### 16.3.4 Pit Optimization Results

During the pit optimization, a series of nested pits were generated between US$5.28/lb molybdenum and US$20.00/lb molybdenum selling price, at US$0.16/lb molybdenum price increments. As the applied molybdenum price increases, the pit shells grow larger in size, and the ore and waste tonnages both increase.

A best-case and worst-case schedule, discounted cashflow analysis, and stripping ratio were performed to assist in determining the ultimate pit. In this analysis, a best-case and worst-case schedule is produced for each incremental pit shell, and a pre-capital NPV is calculated at an assigned discount rate.

A "best-case" schedule represents the most improvement that can be made to NPV through phasing, with each incremental shell from the pit optimization mined in succession up to the shell for which the analysis is being conducted. By mining each shell in succession, the highest value material is mined first, and incrementally lower value material is mined with each incremental pit shell. Such a sequence is usually infeasible from an operational perspective, as the incremental pit shells from the pit optimization often do not have a mineable width between them. Thus, it is very unlikely that the best case can be achieved in practice.

A “worst-case” schedule represents the NPV achieved if no phasing is used. In this case, material is mined from surface topography down, bench-by-bench, to the analyzed shell with no incremental phasing. This is the worst-case because no improvement is made to NPV through phasing, and it represents the floor of what should be possible for NPV improvement in phase design. In practice, phase designs are typically used to accelerate mining of higher value material earlier in the schedule, improving NPV above the worst-case level.

For most open pit projects, phasing will achieve a pre-capital NPV somewhere between the best-case and worst-case level. For this reason, the average of best-case and worst-case NPV is often used to assist in pit selection. TCM presents a unique case where the optimization is actually the definition of the last phase, and the ore primarily exists at the bottom of the pit below existing highwalls. The incremental shells produced in the pit optimization are not wide enough to support multiple pushbacks in a lateral direction at the prices and costs being considered for this study. Given this circumstance, it is not practical to add any incremental phasing besides mining the southern and northern walls of the pit separately. It is possible to improve NPV by accelerating the mining of ore from the south wall whereas the north wall can be mined with a slight time lag. TCM also requires approximately 120–125 Mst of ore to be processed through the mill in order to re-slope and close the tailings facility at the end of the mine life, as described in Item 18.3.2. For this reason, the resulting strip ratio and total tons of ore were considered more useful for assistance in pit selection.

The results from the pit optimization study for TCM, including quantities, grade, and best-case and worst-case NPVs for each incremental shell are shown in Table 16-11. Based on an analysis of incremental pit shells using a $16.00/lb molybdenum sales price, the selected pit corresponds to the 1.00 revenue factor (RF) pit shell for the ultimate pit limit.

**Table 16-11 Summary of pit optimization results**

| Pit ID | RF | Molybdenum | Mining – cumulative | | | | Strip ratio | Schedule results at 10.4 Mst/a crusher feed | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sales price (US$/lb Mo) | Total rock (Mst) | Total ore (Mst) | Ore grade (Mo %) | Total waste (Mst) | Waste/Ore (st/st) | Cumulative NPV at 5% (US$ M) | | | Mine life (years) |
| | | | | | | | | Best | Average | Worst | |
| Pit 43 | 0.75 | $12.00 | 57 | 27 | 0.067% | 30 | 1.10 | $181 | $178 | $174 | 2.6 |
| Pit 44 | 0.76 | $12.16 | 61 | 29 | 0.067% | 32 | 1.12 | $187 | $183 | $179 | 2.8 |
| Pit 45 | 0.77 | $12.32 | 63 | 30 | 0.067% | 34 | 1.13 | $191 | $186 | $182 | 2.9 |
| Pit 46 | 0.78 | $12.48 | 67 | 31 | 0.067% | 36 | 1.15 | $195 | $190 | $186 | 3.0 |
| Pit 47 | 0.79 | $12.64 | 67 | 31 | 0.067% | 36 | 1.15 | $195 | $191 | $186 | 3.0 |
| Pit 48 | 0.80 | $12.80 | 71 | 33 | 0.066% | 38 | 1.15 | $201 | $195 | $190 | 3.2 |
| Pit 49 | 0.81 | $12.96 | 72 | 33 | 0.066% | 39 | 1.15 | $202 | $196 | $191 | 3.2 |
| Pit 50 | 0.82 | $13.12 | 78 | 35 | 0.065% | 42 | 1.19 | $207 | $201 | $195 | 3.4 |
| Pit 51 | 0.83 | $13.28 | 78 | 36 | 0.065% | 42 | 1.19 | $208 | $201 | $195 | 3.4 |
| Pit 52 | 0.84 | $13.44 | 80 | 36 | 0.065% | 43 | 1.19 | $209 | $203 | $196 | 3.5 |
| Pit 53 | 0.85 | $13.60 | 118 | 44 | 0.067% | 74 | 1.69 | $235 | $224 | $213 | 4.2 |
| Pit 54 | 0.86 | $13.76 | 125 | 46 | 0.067% | 79 | 1.73 | $240 | $228 | $215 | 4.4 |
| Pit 55 | 0.87 | $13.92 | 125 | 46 | 0.067% | 79 | 1.73 | $240 | $228 | $215 | 4.4 |
| Pit 56 | 0.88 | $14.08 | 129 | 47 | 0.067% | 82 | 1.73 | $242 | $229 | $216 | 4.5 |
| Pit 57 | 0.89 | $14.24 | 133 | 48 | 0.066% | 84 | 1.76 | $244 | $230 | $217 | 4.6 |
| Pit 58 | 0.90 | $14.40 | 135 | 49 | 0.066% | 86 | 1.75 | $245 | $231 | $217 | 4.7 |
| Pit 59 | 0.91 | $14.56 | 137 | 50 | 0.066% | 87 | 1.74 | $246 | $232 | $217 | 4.8 |
| Pit 60 | 0.92 | $14.72 | 145 | 52 | 0.065% | 93 | 1.77 | $249 | $233 | $217 | 5.0 |
| Pit 61 | 0.93 | $14.88 | 195 | 61 | 0.067% | 134 | 2.19 | $265 | $240 | $215 | 5.9 |
| Pit 62 | 0.94 | $15.04 | 327 | 86 | 0.068% | 242 | 2.82 | $290 | $240 | $190 | 8.2 |
| Pit 63 | 0.95 | $15.20 | 364 | 93 | 0.068% | 271 | 2.93 | $297 | $237 | $177 | 8.9 |
| Pit 64 | 0.96 | $15.36 | 392 | 100 | 0.067% | 292 | 2.91 | $302 | $232 | $163 | 9.6 |
| Pit 65 | 0.97 | $15.52 | 424 | 107 | 0.067% | 317 | 2.98 | $307 | $228 | $149 | 10.3 |
| Pit 66 | 0.98 | $15.68 | 428 | 108 | 0.067% | 320 | 2.96 | $307 | $227 | $147 | 10.4 |
| Pit 67 | 0.99 | $15.84 | 428 | 108 | 0.067% | 320 | 2.96 | $307 | $227 | $146 | 10.4 |
| **Pit 68** | **1.00** | **$16.00** | **465** | **116** | **0.066%** | **349** | **3.02** | **$309** | **$218** | **$127** | **11.1** |
| Pit 69 | 1.01 | $16.16 | 465 | 116 | 0.066% | 349 | 3.02 | $309 | $218 | $126 | 11.1 |
| Pit 70 | 1.02 | $16.32 | 471 | 117 | 0.066% | 354 | 3.01 | $309 | $216 | $122 | 11.3 |

| Pit ID | RF | Molybdenum | Mining – cumulative | | | | Strip ratio | Schedule results at 10.4 Mst/a crusher feed | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sales price (US$/lb Mo) | Total rock (Mst) | Total ore (Mst) | Ore grade (Mo %) | Total waste (Mst) | Waste/Ore (st/st) | Cumulative NPV at 5% (US$ M) | | | Mine life (years) |
| | | | | | | | | Best | Average | Worst | |
| Pit 71 | 1.03 | $16.48 | 500 | 122 | 0.066% | 377 | 3.08 | $310 | $207 | $105 | 11.8 |
| Pit 72 | 1.04 | $16.64 | 500 | 122 | 0.066% | 377 | 3.08 | $310 | $207 | $105 | 11.8 |
| Pit 73 | 1.05 | $16.80 | 500 | 123 | 0.066% | 378 | 3.08 | $310 | $207 | $104 | 11.8 |
| Pit 74 | 1.06 | $16.96 | 507 | 125 | 0.066% | 381 | 3.04 | $309 | $203 | $96 | 12.1 |
| Pit 75 | 1.07 | $17.12 | 541 | 132 | 0.066% | 409 | 3.11 | $307 | $189 | $72 | 12.7 |
| Pit 76 | 1.08 | $17.28 | 553 | 134 | 0.066% | 419 | 3.14 | $307 | $185 | $64 | 12.8 |
| Pit 77 | 1.09 | $17.44 | 560 | 135 | 0.066% | 425 | 3.14 | $306 | $182 | $59 | 13.0 |
| Pit 78 | 1.10 | $17.60 | 571 | 137 | 0.065% | 434 | 3.16 | $305 | $178 | $51 | 13.2 |
| Pit 79 | 1.11 | $17.76 | 583 | 140 | 0.065% | 443 | 3.18 | $303 | $173 | $42 | 13.4 |
| Pit 80 | 1.12 | $17.92 | 585 | 140 | 0.065% | 445 | 3.18 | $303 | $171 | $40 | 13.5 |
| Pit 81 | 1.13 | $18.08 | 590 | 141 | 0.065% | 449 | 3.18 | $302 | $169 | $35 | 13.6 |
| Pit 82 | 1.14 | $18.24 | 601 | 143 | 0.065% | 457 | 3.19 | $301 | $163 | $26 | 13.8 |
| Pit 83 | 1.15 | $18.40 | 605 | 144 | 0.065% | 461 | 3.20 | $300 | $161 | $23 | 13.9 |

Source: Centerra, 2024

Notes: Selected pit – 1.00 RF.

[1] Mine Life assumes all pre-stripping occurs in year 1.

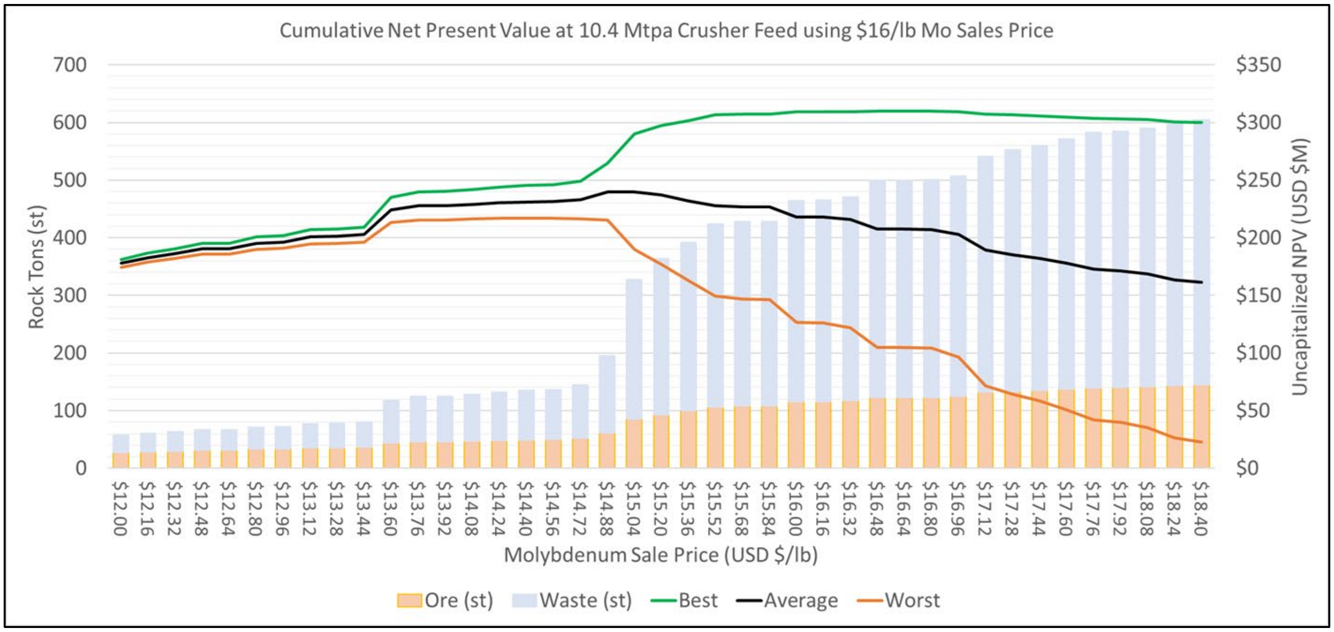
A summary of the Measured and Indicated mill feed tons, grades, and waste tons for the selected pit can be found in Table 16-12. The pit selection curve including pit shell quantities, and best- and worst-case analyses can be seen in Figure 16-17. The selected final pit ($16.00) can be seen in Figure 16-18. The mill feed material cut-off grade is 0.030% Mo.

**Table 16-12 Pit Optimization Output**

| Cut-off grade | Classification | Total ore (Mst) | Mo grade (%) | Contained Mo metal (Mlb) | Waste (Mst) | Strip ratio (waste/ore) |
|---|---|---|---|---|---|---|
| 0.03% Mo | Measured | 47 | 0.077% | 72 | 349 | 3.02 |
| | Indicated | 69 | 0.059% | 82 | | |
| | **Measured and Indicated** | **116** | **0.066%** | **146.7** | | |

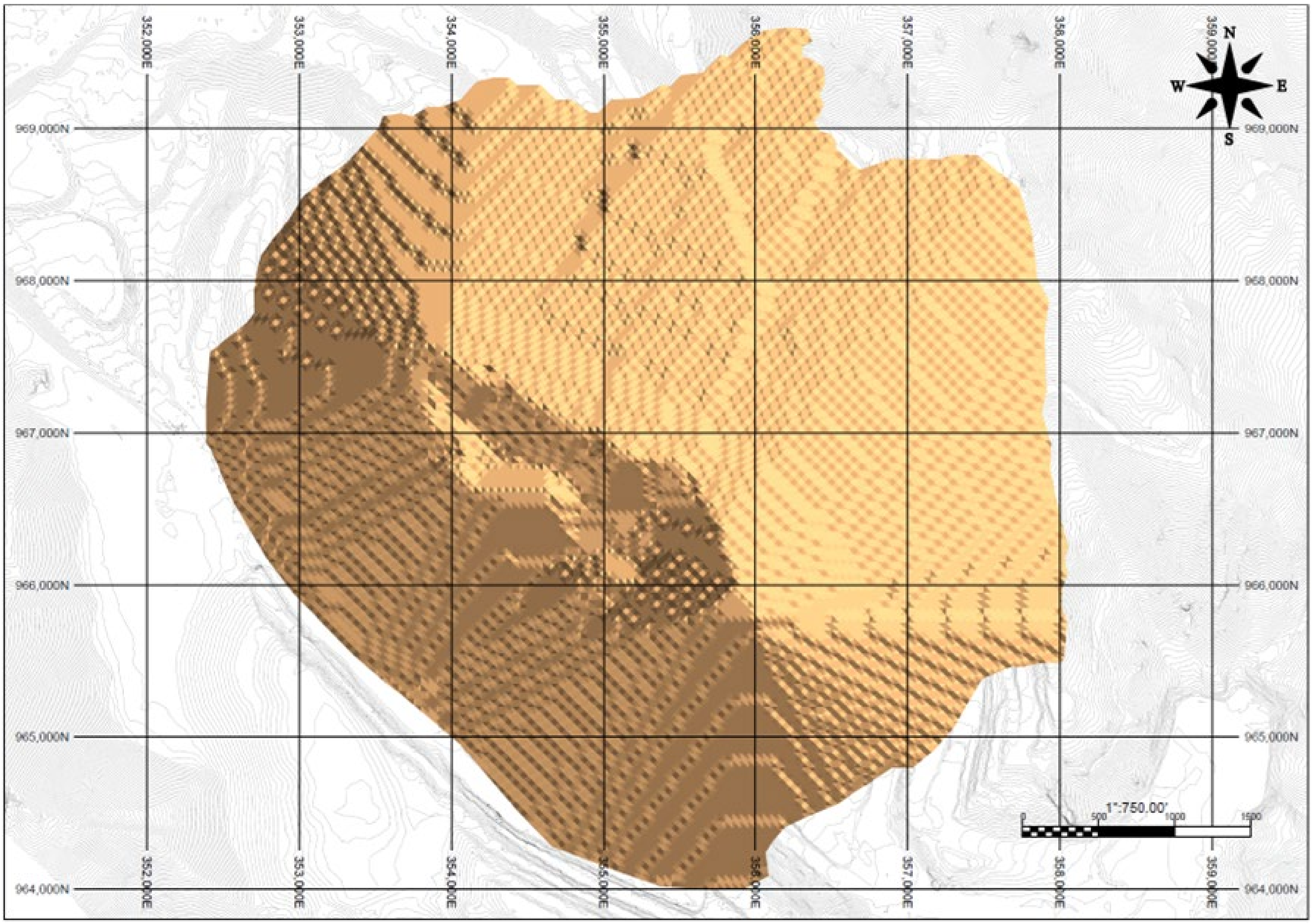
Source: Centerra, 2024

**Figure 16-17 Pit selection curve for Thompson Creek**



Source: Centerra, 2024

**Figure 16-18 Selected ultimate pit for Thompson Creek (1.00 RF)**



Source: Centerra, 2024

## 16.4 Pit and Phase Design

Based on the results from the pit optimization study, an ultimate pit was designed, and a series of wall development phases were developed to maximize NPV by delivering ore as early in the schedule as possible. The pit is designed following the selected optimized pit shell as closely as possible while maintaining a practical mine and phase design. Minimum mining widths and access roads have been considered within the mine designs.

In designing roads, the amount of access roads left behind in the ultimate pit wall was minimized to avoid reduction of the ultimate pit wall angle which can have substantial impact on project NPV by reducing ore mining and increasing waste stripping. The ultimate pit contains an access road on the south side of the pit that minimizes the required additional waste stripping and keeps the ultimate shell as close to permitted boundaries as possible. More detail is given with regards to ramp placement in Item 16.4.2 below.

The differences between the selected pit optimization shell and the ultimate pit design described in Item 16.4 are summarized in Table 16-13.

**Table 16-13 Difference between selected pit shell and ultimate pit design for TCM**

| Source | Ore (Mst) | Grade (%) | Contained metal (Mlb) | Waste (Mst) |
|---|---|---|---|---|
| Pit optimization shell | 116 | 0.066% | 154 | 349 |
| Designed ultimate pit | 125 | 0.065% | 161 | 386 |
| Difference (Design-Shell) | 9 | -0.001% | 7 | 37 |
| % Difference (Design-Shell)/Shell | 8% | -2% | 5% | 10% |

Source: Centerra, 2024

### 16.4.1 Pit Design Criteria

Design criteria for pit slopes are based on the geotechnical recommendations in Section 16.2. Face slopes, bench heights, and catch bench widths used to design both the ultimate pit and wall pit phases are described in Item 16.2.1.

Design criteria for haul roads are based on the current haulage fleet owned by the TCM, which consists of Cat 789C trucks as the primary hauling unit. The selected truck fleet dictated the selected road width and grade for haul road designs at TCM. These criteria accommodate typical haulage conditions on dual lane roads for the Cat 789 trucks.

For areas close to the bottom of the ultimate pit, the design was adjusted to maximize ore recovery at pit bottom. Between the 6200 level and 6100 level, the road is designed to accommodate Cat 789C trucks with single lane access on a 12% grade.

Road design parameters used in each of these situations are described in Table 16-14.

**Table 16-14 Road design parameters for TCM**

| Road design criteria | Cat 789C – dual lane | Cat 789C – single lane |
|---|---|---|
| Minimum design width* | 110 ft | 88 ft |
| Maximum grade | 10% | 12% |

Source: Centerra, 2024

Note: Minimum design width includes running surface, space for drainage, and a safety berm on the outside edge of the road.

### 16.4.2 Pit Phasing

As discussed in Item 16.3, the width of the economic pit generated by the current resource model at TCM does not enable mining of multiple lateral pushbacks between the existing open pit and the selected ultimate pit.

While lateral pushbacks are not a reasonable approach to phasing at TCM, directional wall pushbacks can be mined on different sides of the pit. This pushback method is generally constrained by accesses. The access to the pit bottom is located in the highwall on the southern side of the pit. No access is included on the north wall due to high starting topography and shallow slope angles.

The mining strategy for TCM involves splitting the ultimate pit design into two primary phases – one on the north side of the ultimate pit, and the other on the south side. In order to maintain access to the north phase without including a ramp on the north highwall, a “scissor-mining” strategy is used. The north side is split into multiple wall subphases that have disposable external access points. From these external access points, internal ramps are built to access lower benches, then unstacked when the next access point is reached. As mining progresses toward pit bottom, the "external access" points are located where road access from the south phase aligns with the edges of the north phase. The longer truck haulage distance and mine sequencing associated with the scissor-mining strategy have been accounted for in the LOM plan.

Following the completion of the south and then north phases, two small ramp retreat phases are completed in the pit bottom extracting additional ore, enabled by creating new access ramps in the pit bottom with waste backfill.

In Figure 16-19, the pre-mining phase solids are pictured inside of the ultimate pit. In all figures, the ultimate shell is in gray, South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, and Ramp Retreat-2 is purple. In Figure 16-20, the South phase, including access on the south highwall and designated pit exit points, is shown. In Figure 16-21 to Figure 16-23, the sub-phases North-1 through North-3 are pictured. In Figure 16-24, the final two ramp-retreat pit phases are shown. The pit exit points and access ramps are noted in the figures.

It should be noted that material from both the South phase and North phase are planned to be mined at the same time. Thus, the figures below represent the access strategy for each phase and the general sequence, but do not represent the mine schedule. End-of-period figures for the mine schedule can be found in Item 16.6.

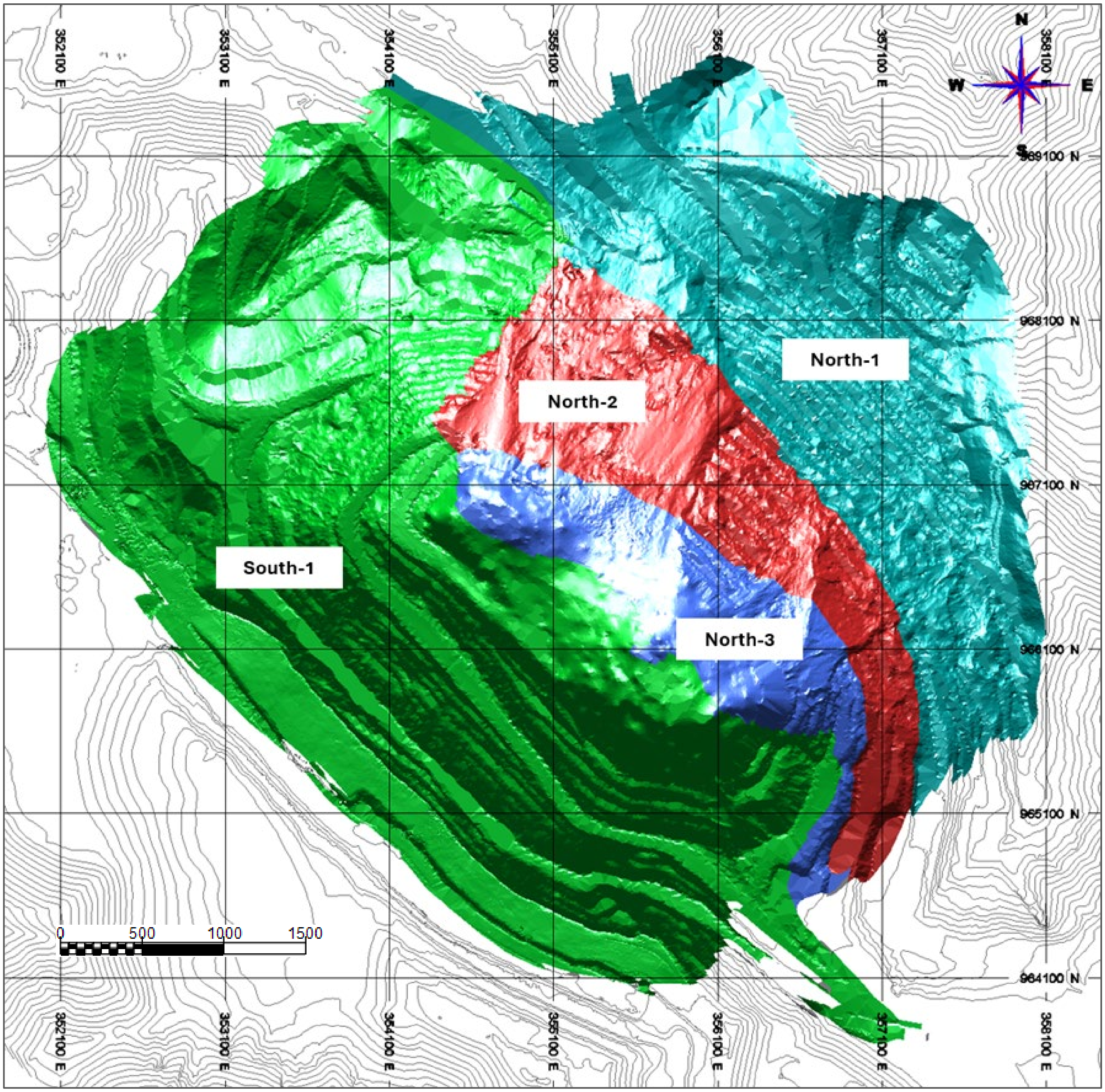
Production quantities for each phase are provided in Table 16-15.

**Table 16-15 Production physicals by phase**

| Phase | Ore mass (Mst) | Contained Mo | | Waste mass (Mst) | Total mass (Mst) | Strip ratio (w/o) |
|---|---|---|---|---|---|---|
| | | Grade (Mo %) | Metal (Mlb) | | | |
| South | 70.7 | 0.060 | 84.9 | 167.9 | 238.5 | 2.38 |
| North01 | 1.4 | 0.060 | 1.6 | 97.6 | 99.0 | 70.9 |
| North02 | 6.0 | 0.059 | 7.1 | 91.4 | 97.4 | 15.23 |
| North03 | 42.8 | 0.073 | 62.9 | 28.8 | 71.7 | 0.67 |
| Ramp Retreat 1 | 1.3 | 0.068 | 1.8 | 0.3 | 1.6 | 0.23 |
| Ramp Retreat 2 | 2.4 | 0.053 | 2.5 | 0.1 | 2.5 | 0.04 |
| **Total** | **124.5** | **0.065** | **161.0** | **386.2** | **510.7** | **3.10** |

Source: Centerra, 2024

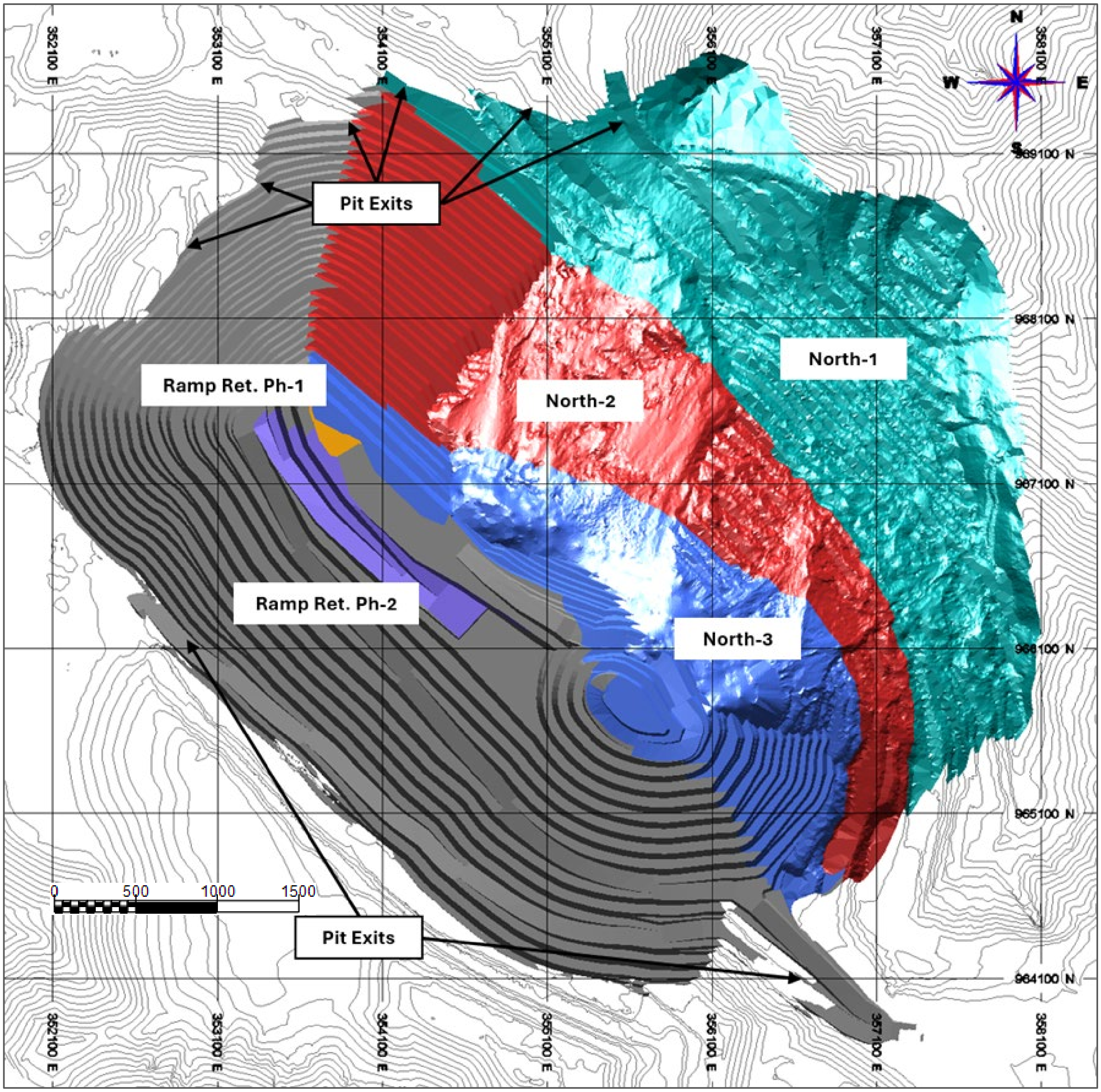
**Figure 16-19 Pre-mining phase solids for Thompson Creek**



Source: Centerra, 2024

Notes: South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, Ramp Retreat-2 is purple, and ultimate pit in grey.

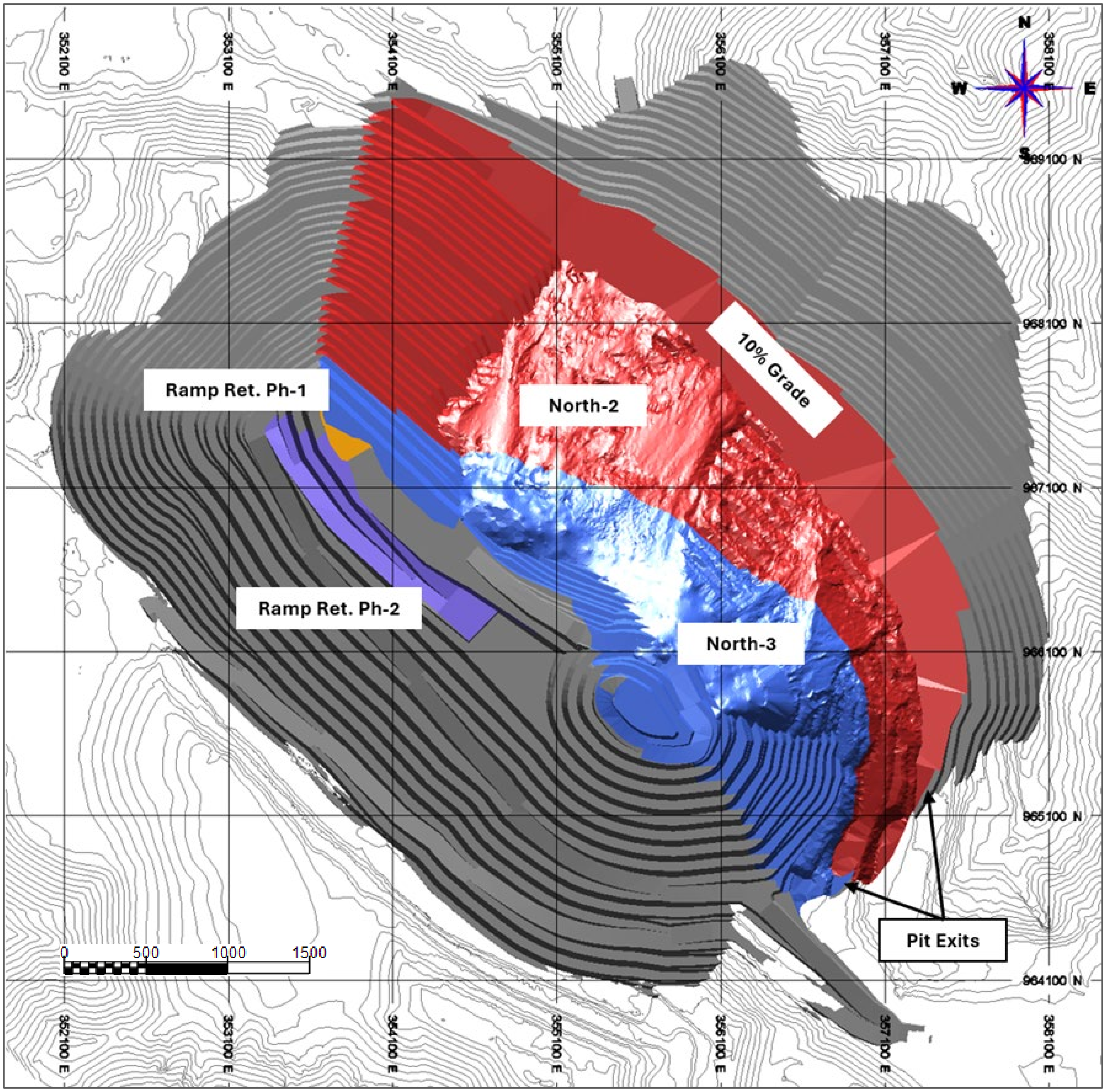
**Figure 16-20 TCM following completion of the South phase**



Source: Centerra, 2024

Notes: South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, Ramp Retreat-2 is purple, and Ultimate Pit in grey.

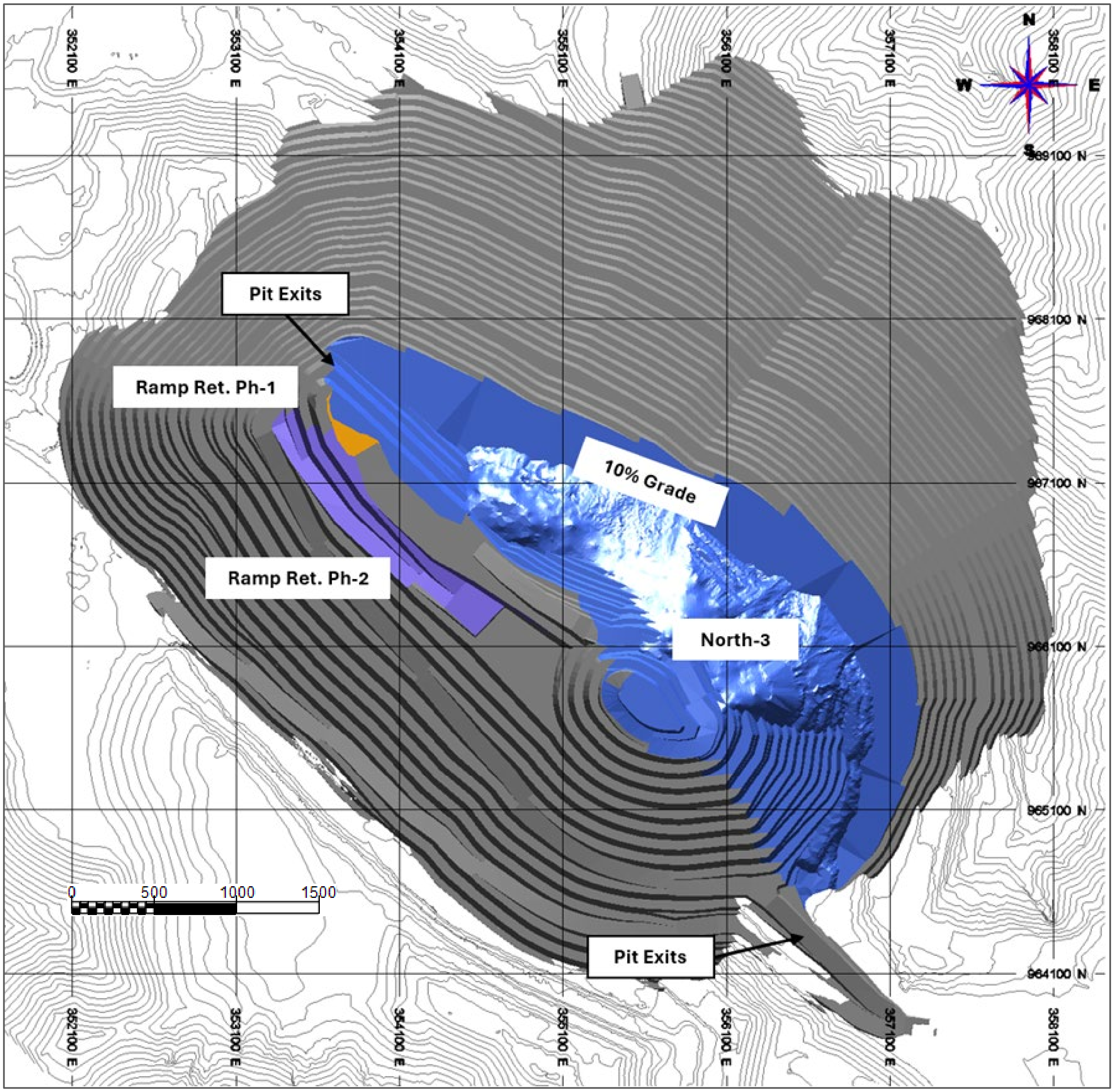
Figure 16-21 TCM following completion of the North-1 sub-phase



Source: Centerra, 2024

Notes: South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, Ramp Retreat-2 is purple, and Ultimate Pit in grey.

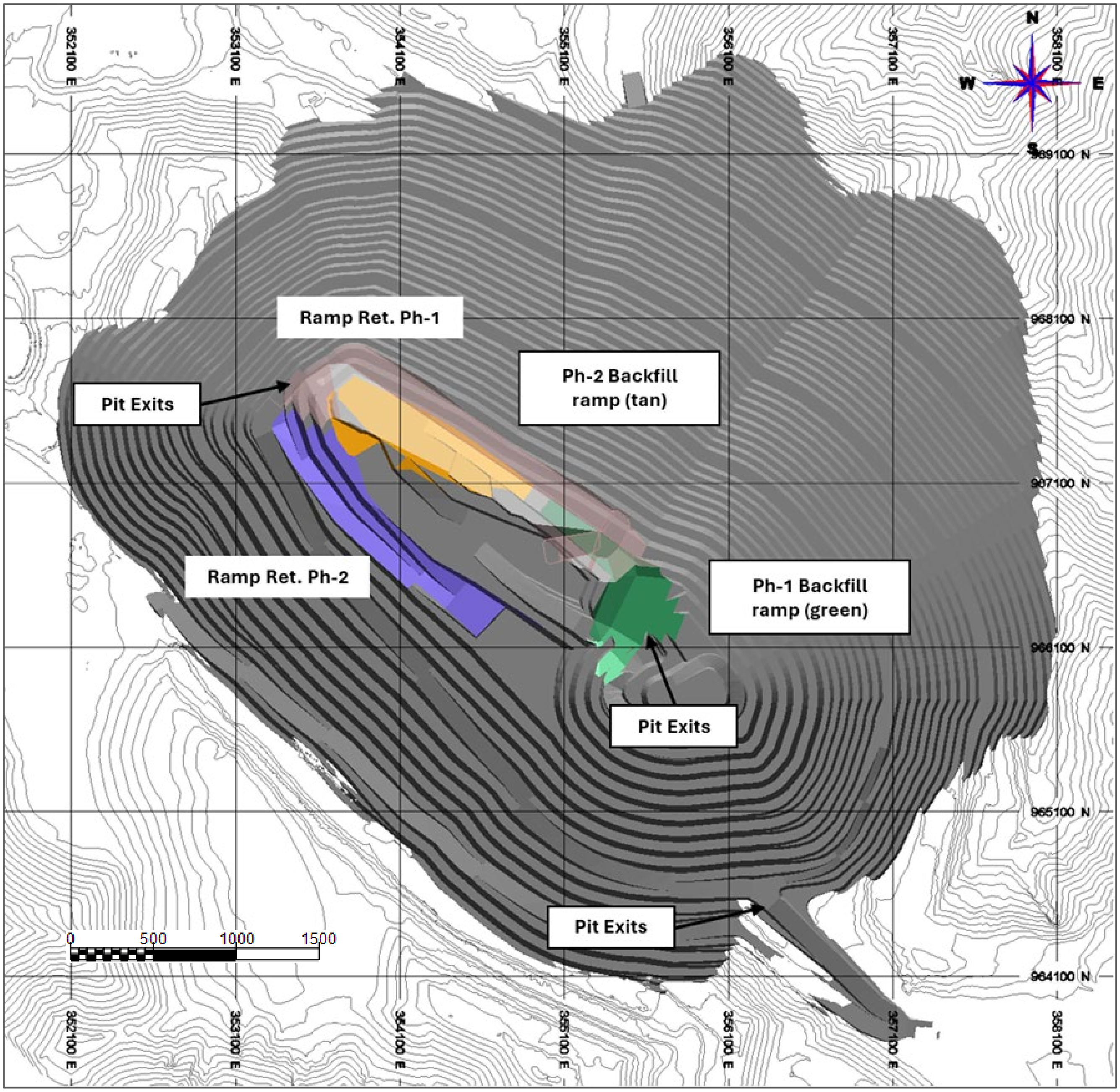
Figure 16-22 TCM following completion of the North-2 sub-phase



Source: Centerra, 2024

Notes: South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, Ramp Retreat-2 is purple, and Ultimate Pit in grey.

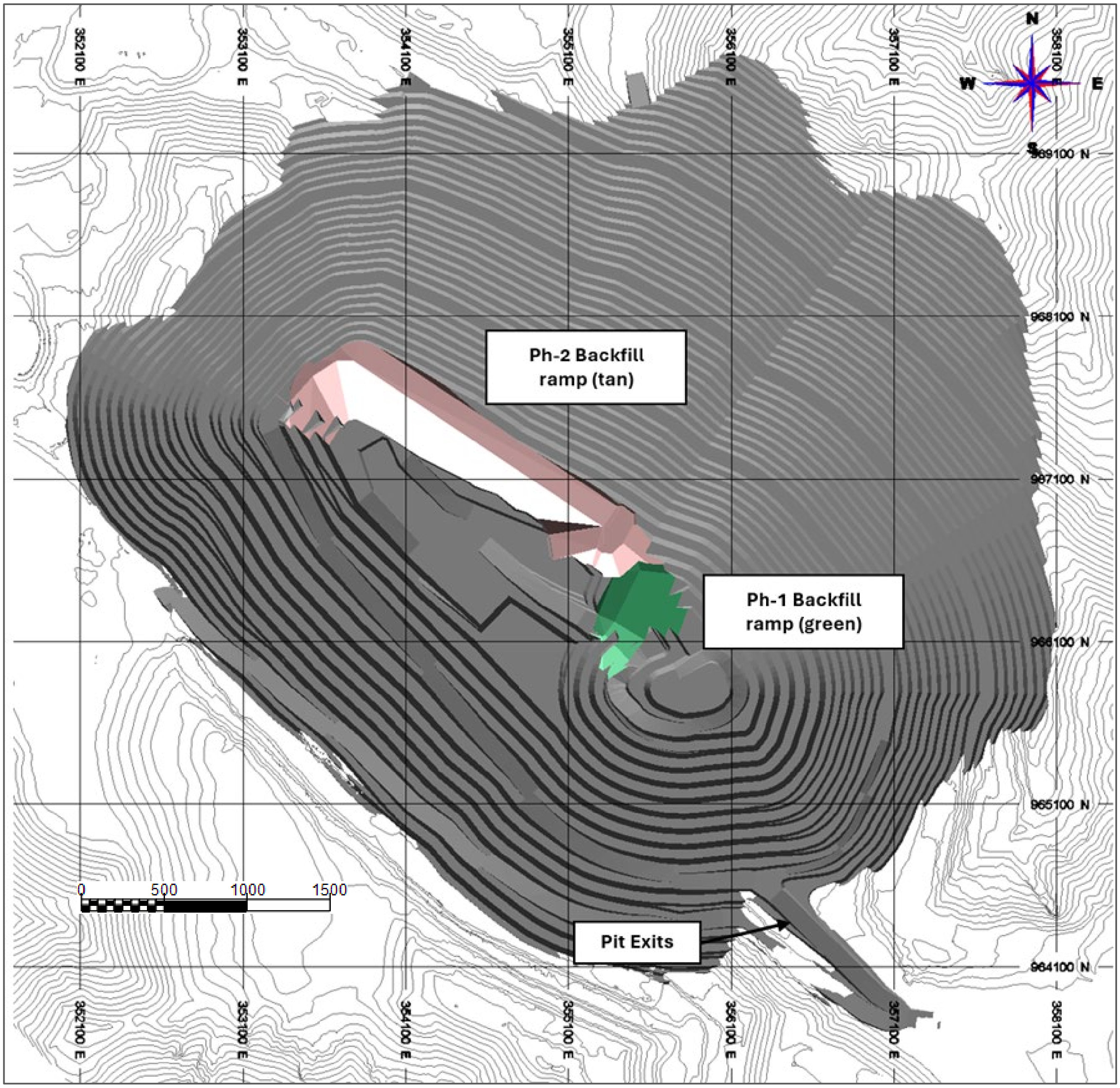
**Figure 16-23 TCM following completion of the North-3 sub-phase**



Source: Centerra, 2024

Notes: South phase is green, North-1 is cyan, North-2 is red, North-3 is blue, Ramp Retreat-1 is orange, Ramp Retreat-2 is purple, and Ultimate Pit in grey.

**Figure 16-24 TCM following completion of mining**



Source: Centerra, 2024

Notes: Pit exit for final pit configuration is annotated.

## 16.5 Waste Rock Storage Facility Design

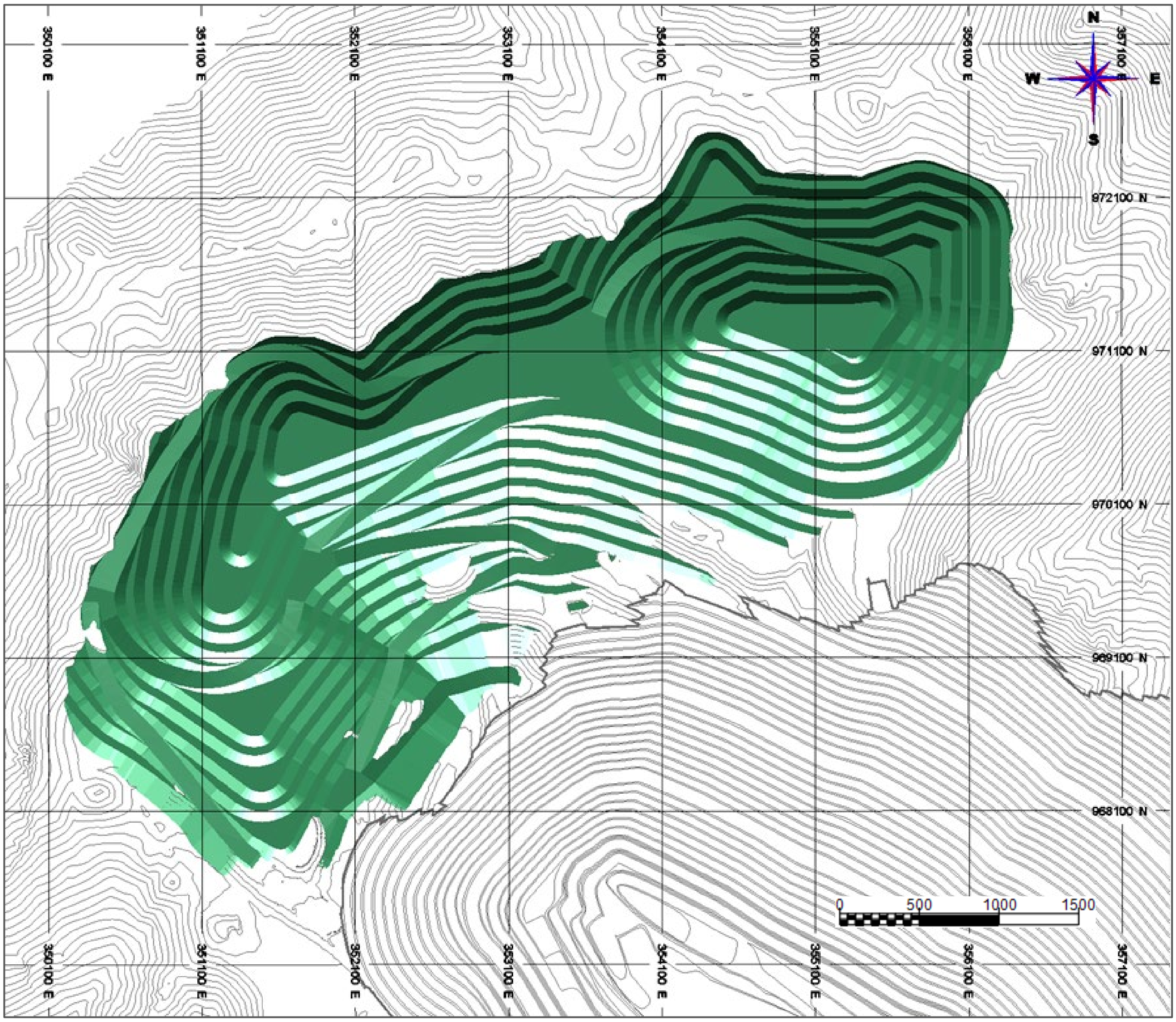
TCM has two primary WRSFs: the Buckskin WRSF and the Pat Hughes WRSF. The Mine Plan calls for an expansion of the WRSFs to store the waste rock produced in the mining schedule portrayed in Item 16.6.

### 16.5.1 WRSF Designs

The WRSFs are designed in a series of lifts built at the natural angle of repose of the waste rock, leaving catch benches at regular intervals which results in a structure that has an overall slope angle equal to the reclamation requirements at closure. The intent is to minimize dozer work and the cost of reclamation works at closure.

The Buckskin WRSF has a total capacity of 80 million cubic yards (yd$^3$) and is designed to be reclaimed to a final overall angle of 1V:2.5H. New lifts are constructed in 50 ft vertical increments, with 54 ft catch benches between lifts. Figure 16-25 shows the post-mining and pre-closure configuration of the Buckskin WRSF.

**Figure 16-25 Post-mining and pre-closure configuration of the Buckskin WRSF**

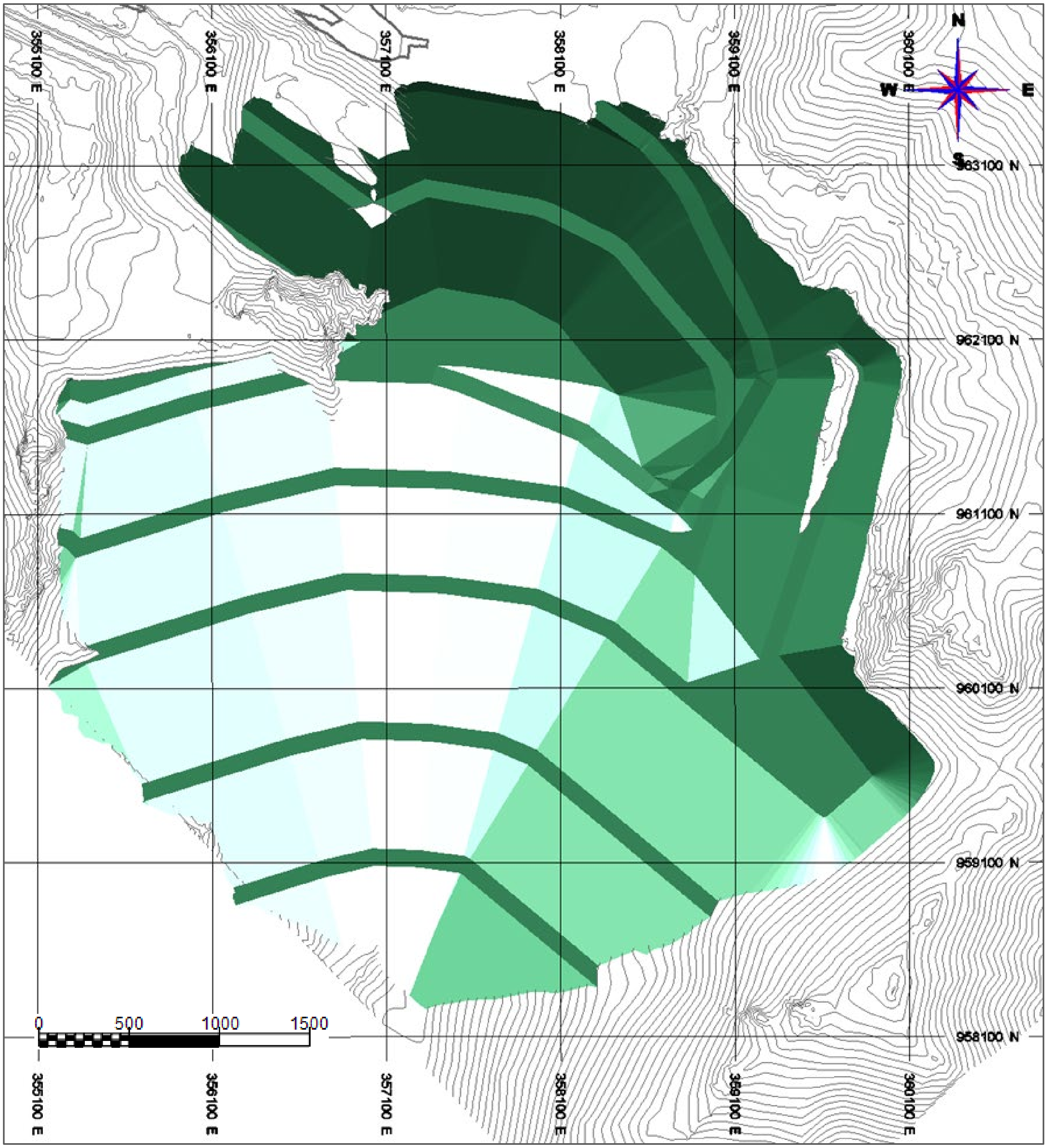


Source: Centerra, 2024

Figure 16-26 shows the post-mining and pre-closure configuration of the Pat Hughes WRSF, which has been designed with a total capacity of 162.3 million yd$^3$.

Both dumps also contain a Type I Volcanic NAG stockpile at the top – these stockpiles are important at closure and are discussed in Item 16.5.2.

**Figure 16-26 Post-mining and pre-closure configuration of the Pat Hughes WRSF**

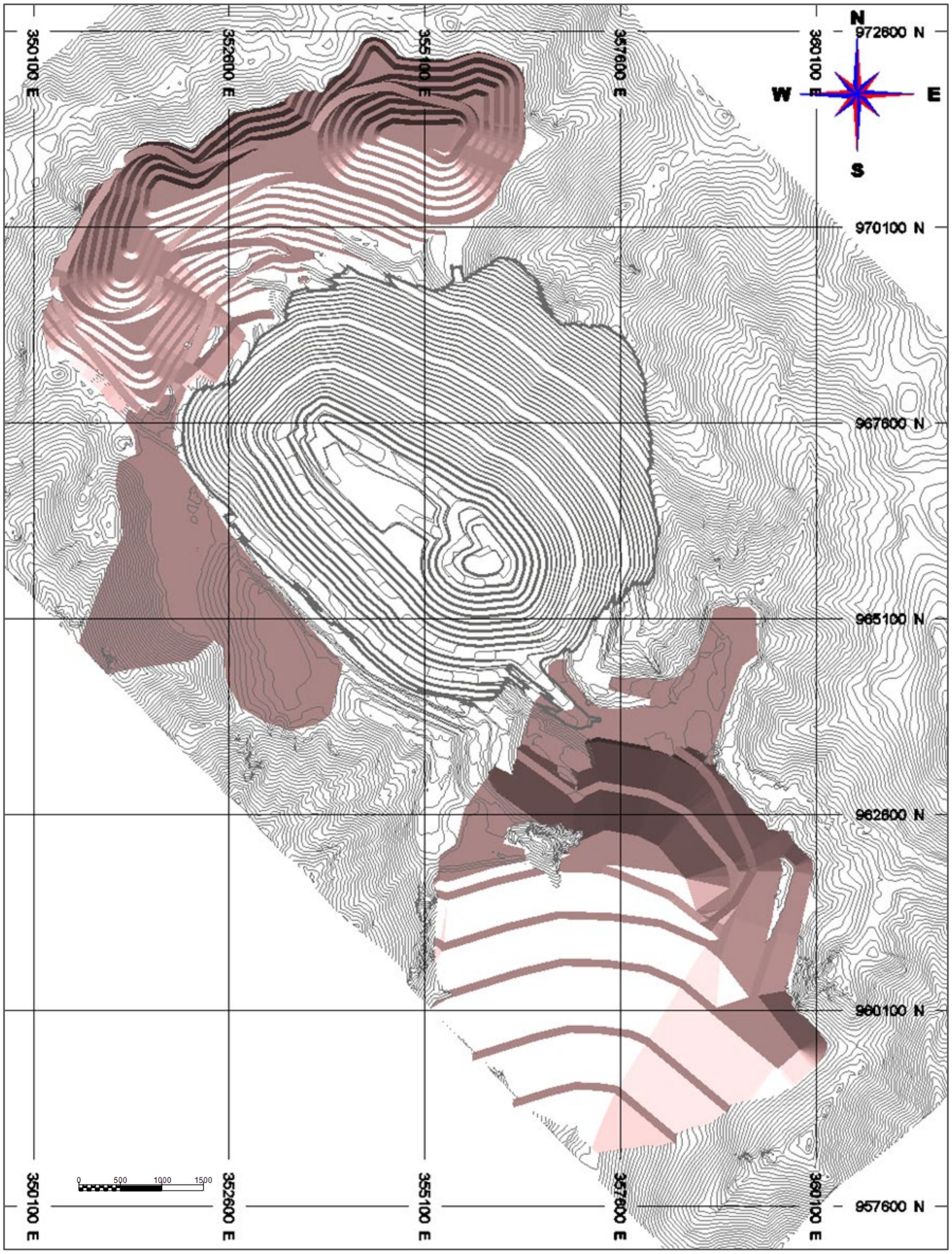


Source: Centerra, 2024

The two WRSFs and their volcanic Type I stockpiles contain a combined 234 million yd$^3$ of waste rock storage capacity. All WRSFs are designed assuming a swollen waste rock density of 16.5 ft$^3$ per ton.

The final configuration of the WRSF areas are highlighted in Figure 16-27 below.

**Figure 16-27 Post-mining pre-closure configuration of WRSFs**



Source: Centerra, 2024

### 16.5.2 Potentially Acid Generating Waste

It is understood that traditionally the Buckskin WRSF was used primarily to dump Type I NAG waste, and the Pat Hughes WRSF was used primarily to dump Type II (Potentially Acid Generating, or PAG) waste. To achieve the proposed schedule in Item 16.6, Type II waste needs to be managed in the Buckskin WRSF. The distribution of new Type I and Type II waste placed in each WRSF is quantified in Table 16-16. Volcanic NAG stockpiles are not included; all material dumped in volcanic NAG stockpiles is by definition Type I waste.

**Table 16-16 ARD classification by WRSF**

| WRSF | Type I waste (NAG) (Mst) | Type II waste (PAG) (Mst) | % Type II waste (PAG) |
|---|---|---|---|
| Pat Hughes | 55 | 204 | 79% |
| Buckskin | 44 | 84 | 66% |
| **Total** | **99** | **287** | **74%** |

Source: Centerra, 2024

The classification of acid rock drainage (ARD) potential is not known for planned waste material that is not in-situ. This non in-situ waste includes material that has been previously backfilled in the planned pit, and material along the north wall that has potentially been moved by historical highwall failures. In these cases, it was assumed that they are Type II and should be handled as such until testing can be performed during mining that could prove otherwise.

## 16.6 Mine Production

The mine plan begins with mining in the South phase only. Mining begins in the South phase to target the ore with the lowest available strip ratio and to allow time for resolution of outstanding permitting and geotechnical requirements. Sufficient stock to consistently feed the mill is not available at the start of this schedule. Thus, the mill feed begins processing in Year 4, and gradually ramps up before achieving full capacity of 28,500 tons per day in Year 5.

The North phase extends outside of previously permit boundaries are shown in Figure 16-28. In July 2024 TCM received approval for the pit highwall layback acreage subject to a minor update to the reclamation plan.

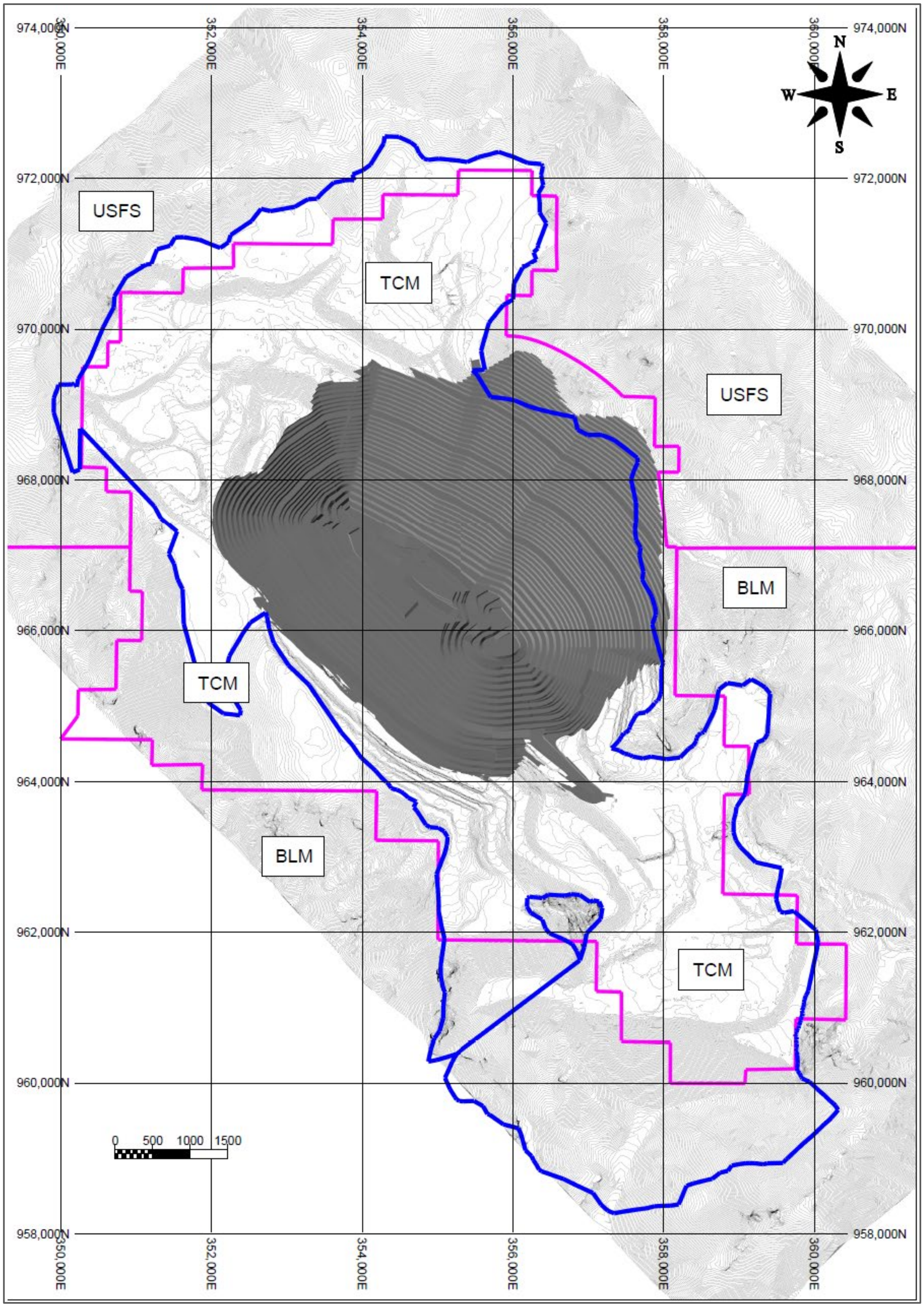


**Figure 16-28 Pit design – permit boundary (blue), and property boundary (pink)**

Source: Centerra, 2024

### 16.6.1 Mine Production Schedule

The yearly mine production schedule is presented in Table 16-17. Additional graphs showing the production of the mill and mine can be found in Figure 16-29 and Figure 16-30.

Table 16-18 shows a total open pit mine life of approximately 13 years, plus two years of ore stockpile reclamation. Mill production will run for approximately 12 years (including ramp-up and ramp-down periods). Ore processing was based on a production rate of 28,500 tons per day, and total material movement was driven by the capabilities of the existing TCM equipment fleet and vertical advance constraints in the open pits.

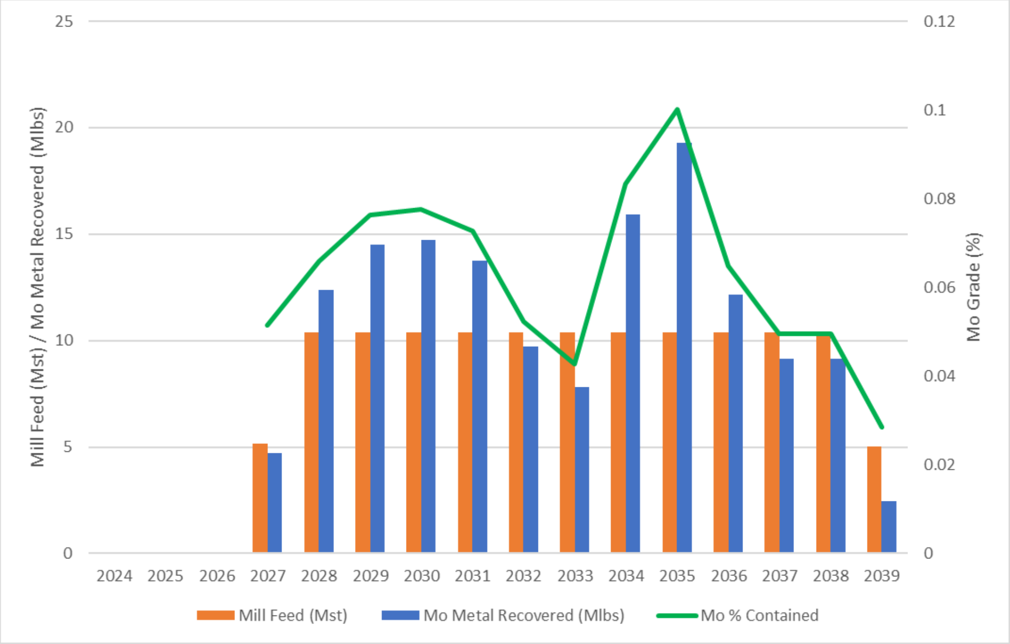
Mine scheduling was carried out using Hexagon’s MinePlan Schedule Optimizer (MPSO) optimizing for NPV while respecting the mill production rate and the loading and haulage capabilities of the planned TCM fleet, included a prescribed mining ramp-up period. The required number of haulage trucks and loaders were calculated in MPSO using haulage profiles and shovel dig rates to ensure that the equipment list was sufficient to meet the planned production rate. A low-grade stockpile with a capacity of 25 million tons has been utilized to facilitate the accelerated mining of pit bottom ore zones, bringing metal production forward in time. These stockpiles are then reclaimed to bridge the development of the North phase and again at the end of the mine life.

**Table 16-17 Annual production schedule**

| | | Production year | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mining** | Ore mined | Mst | | | | 7.8 | 20.4 | 17.9 | 17.1 | 8.8 | 4.2 | 1.8 | 20.0 | 19.2 | 7.2 | | | | **124.5** |
| | | Mo % | | | | 0.045 | 0.054 | 0.062 | 0.063 | 0.078 | 0.067 | 0.040 | 0.066 | 0.081 | 0.068 | | | | **0.065** |
| | Waste mined | Mst | 4.9 | 50.0 | 48.0 | 44.2 | 36.5 | 33.2 | 27.9 | 28.2 | 52.8 | 38.2 | 16.7 | 4.9 | 0.8 | | | | **386.2** |
| | Total mined | Mst | 4.9 | 50.0 | 48.0 | 52.0 | 56.9 | 51.0 | 45.0 | 37.0 | 57.0 | 40.0 | 36.7 | 24.2 | 8.0 | | | | **510.7** |
| | Strip ratio | (waste/ore) | N/A | N/A | N/A | 5.67 | 1.79 | 1.86 | 1.63 | 3.19 | 12.45 | 20.66 | 0.84 | 0.26 | 0.11 | | | | **3.10** |
| **Milling** | Ore milled | Mst | | | | 5.1 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 5.0 | **124.5** |
| | | Mo % | | | | 0.051 | 0.066 | 0.076 | 0.078 | 0.073 | 0.053 | 0.043 | 0.083 | 0.100 | 0.065 | 0.050 | 0.050 | 0.028 | **0.065** |
| | | Mo recovery % | - | - | - | 89.0 | 90.5 | 91.3 | 91.4 | 91.0 | 89.1 | 87.8 | 91.7 | 92.5 | 90.4 | 88.8 | 88.8 | 85.3 | **90.5** |
| | | Rec Mo Mlb | - | - | - | 4.7 | 12.4 | 14.5 | 14.7 | 13.7 | 9.7 | 7.8 | 15.9 | 19.3 | 12.2 | 9.1 | 9.1 | 2.4 | **145.6** |

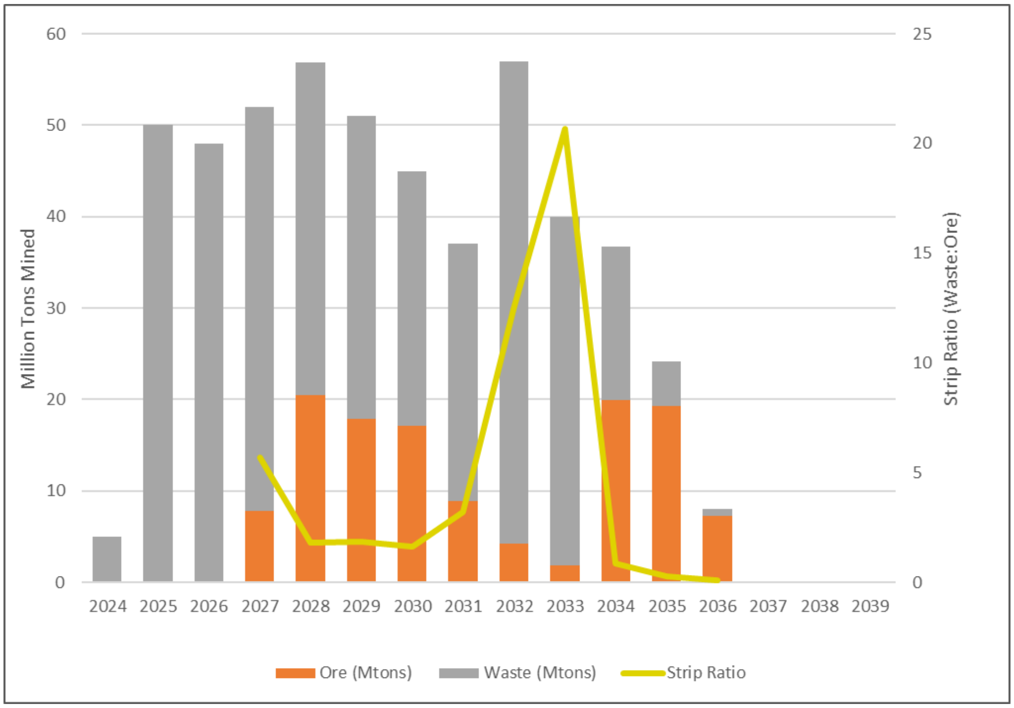
Source: Centerra, 2024

**Figure 16-29 Mill feed and metal production by year**



Source: Centerra, 2024

**Figure 16-30 Mine production by year**



Source: Centerra, 2024

## 16.7 Mining Fleet and Labor Requirements

### 16.7.1 General Equipment Requirements and Fleet Selection

All mine production equipment on site is owned by Centerra. This equipment includes a Bucyrus 495HD cable shovel, a P&H 2300XP cable shovel, a Bucyrus RD340D hydraulic shovel, and a fleet of 17 Cat 789C haul trucks. Moreover, two Cat 789 haul trucks will be purchased to achieve the mine production requirements. The equipment fleet also includes two existing and one new Atlas Copco PV271 production drills, one Cat 993K wheel loader, three D10 track dozers, one D8 track dozer, one D6 track dozer, one Cat 385 backhoe, two Cat 16M graders, among other minor support equipment.

Primary equipment required to achieve the production schedule are listed in Table 16-18. In some cases, existing equipment on site is refurbished to meet these requirements, and in other cases new equipment will need to be purchased. Additional maintenance and light vehicles will be required to support the primary fleets.

**Table 16-18 Required mine production equipment**

| Category | Make | Model | Maximum no. of units |
|---|---|---|---|
| Primary Cable Shovel | Bucyrus | 495HD (40 $yd^3$) | 1 |
| Secondary Cable Shovel | P&H | 2300XP (28 $yd^3$) | 1 |
| Hydraulic Shovel | Bucyrus | RH340D (40 $yd^3$) | 1 |
| Stockpile Loader | Cat | 993K | 1 |
| Primary Truck | Cat | 789C (200 ton) | 19 |
| Primary Drill | Atlas Copco | PV271 | 3 |
| Pre-shear Drill | Atlas Copco | D60 | 1 |
| Track Dozer D10 | Cat | D10 | 3 |
| Track Dozer D8 | Cat | D8 | 1 |
| Wheel Dozer | Cat | 844H | 1 |
| Primary Wheel Loader | Cat | 972H | 1 |
| Secondary Wheel Loader | Cat | 966G | 1 |
| Stemming Loader | Cat | 928G | 1 |
| Motor Grader | Cat | 16M | 2 |
| Cable Reeler | Cat | 988B | 1 |
| Backhoe 365 | Cat | 365C | 1 |
| Backhoe 385 | Cat | 385 | 1 |
| Sand Truck | Peterbilt | - | 2 |
| Water Truck | Cat | 785B | 2 |

Source: Centerra, 2024

### 16.7.2 Drilling and Blasting

Production drilling will be performed by the owner. Blasting will be performed by a contractor. The contractor will be responsible for providing ammonium nitrate for blasting, with the mine supplying diesel fuel to manufacture ammonium nitrate and fuel oil (ANFO) explosives. The design parameter used to define drill and blast requirements are based on a 10.6-inch diameter blasthole on a 24 ft by 28 ft pattern for all production blasts. Benches are blasted and mined on 50 ft levels with 5 ft of sub-drill. Buffer rows and pre-shear holes are planned to allow for controlled blasting and to minimize damage to the highwalls. The powder factor for the blasting is 0.64 lb/st for both ore and waste.

### 16.7.3 Loading and Hauling

The main loading units at TCM are a Bucyrus 495HD 40 $yd^3$ cable shovel, a P&H 2300XP 28 $yd^3$ cable shovel, and a Bucyrus RD340D 40 $yd^3$ hydraulic shovel. Cat 789C haul trucks with 200-ton capacity are the main hauling units; the shovels will require three to five passes to load the trucks. The production schedule calculates the required loader and truck hours needed to meet production targets in the mine schedule.

The required truck hours were estimated in Hexagon MinePlan 3D based on travel times. Increased haul truck cycle times due to the scissor-mining strategy for the North Wall were taken into consideration, as described in Item 16.4.2. Based on similar operations and historical performance, the loading and haulage equipment listed in Table 16-18 are reasonable for an operation of this size and scale.

### 16.7.4 Support and Auxiliary Equipment

Support equipment will consist of three Cat D10 track dozers, one Cat D8 track dozer, and one Cat 844H wheel dozer as the main dozing units. Two Cat 16M graders service the access road, haul roads, and waste dumps along with two Cat water trucks. Mobile light plants will be utilized for lighting the working areas during production in low light conditions. One Cat 993K wheel loader will service the stockpile. Other auxiliary equipment such as maintenance and light vehicles will support the operation.

### 16.7.5 Labor Requirements

Centerra plans to operate TCM by directly employing personnel for operations, technical, and management roles. Labor requirements increase during the mine restart ramp-up and are reduced at mine ramp-down. Maximum labor requirements for the mine at the peak of production are estimated to be 204.

### 16.7.6 Ore Control

Blast-hole cuttings will be collected and taken to the mine laboratory, where they will be analyzed and assayed for molybdenum grades. The mine will utilize mine planning software to record analytical data and generate dig lines flagging different ore zones as well as Type I and Type II waste types.

## 16.8 Mine Dewatering

Mine dewatering will be based on two parts, pit slope active depressurization and pit passive groundwater and catchment collection into a sump. Horizontal drains will be installed to assist with pit slope dewatering. As part of the current pit slope stability investigation, piezometers are being installed to monitor the groundwater level. Depressurizations wells will be placed to draw down the water and minimize the pore pressure behind the pit walls. The surface water reaching the pit catchment area will be directed to sumps and pumped out of the pit, described in more detail in Item 20.5.

# 17 RECOVERY METHODS

## 17.1 Introduction

TCM has existing process plant facilities at the mine site that will be used to treat remaining ore to produce high-grade molybdenum concentrate. Processing operations at TCM began in 1983 and have since produced saleable high-grade molybdenum concentrates at recoveries of 90% Mo or better. Thompson Creek utilizes a conventional process flowsheet similar to other primary molybdenum producers.

Currently, most of the plant is on a care and maintenance basis with only leaching and high-grade circuits operating to treat custom feeds. Prior to full-scale production, a restart preparation period will be required to bring the concentrator from its current care and maintenance state to a fully operational state. Where necessary, new replacement equipment will be installed, or existing equipment and circuits will be refurbished prior to the restart period as necessary.

## 17.2 Flowsheet

The process flowsheet consists of primary crushing, coarse ore stockpile, semi-autogenous grinding (SAG) milling and ball milling grinding with their cyclone classification circuits, rougher/scavenger flotation, concentrate regrinding, four-stage cleaner flotation, concentrate thickening, leaching, filtration, drying, and packaging. In addition to the main molybdenum processing line, there is a HPM circuit used to generate a separate high-grade molybdenum product.

The process flowsheet for the concentrator is shown in Figure 17-1. The highlighted items indicate equipment that will be replaced or added to the flowsheet to improve and facilitate stable operations. Where equipment needs replacement, a like-for-like replacement will be obtained as much as practicably possible. Descriptions of the specific replacement and refurbishments are described in the subsequent sections.

Figure 17-1 Process Plant overall process flow diagram

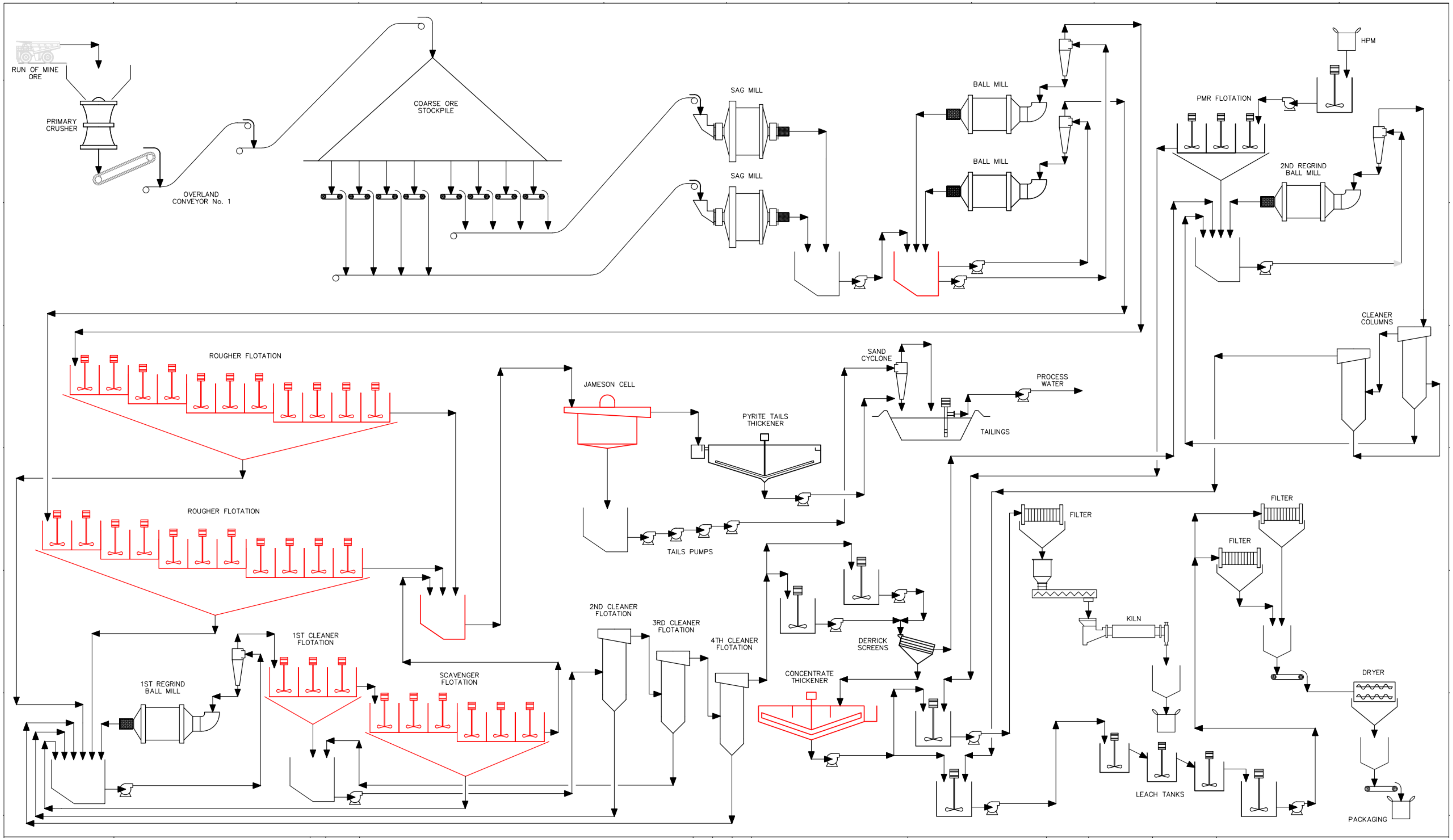


Table 17-1 summarizes the major process equipment and provides their key specifications.

**Table 17-1 Major equipment specifications**

| Function | Equipment | Units | Specifications |
|---|---|---|---|
| Crushing | Crusher type | | Gyratory |
| | Crusher size | inch | 60 x 89 |
| | Crusher installed power | hp | 600 |
| | Nominal throughput | st/h | 1,583 |
| | Utilization | % | 75 |
| Grinding | Nominal throughput | st/h | 1,290 |
| | Utilization | % | 92 |
| | No. of grinding lines | each | 2 |
| | SAG mills size | ft | 32 x 13 |
| | SAG mills installed power (per mill) | hp | 8,000 |
| | Ball mills size | ft | 16.5 x 26 |
| | Ball mills installed power (per mill) | hp | 4,000 |
| | Ball mill product $P_{80}$ | µm | 212 |
| | Hydrocyclone diameter | inch | 26 |
| | Hydrocyclone, total no. | each | |
| Flotation and regrind | Rougher flotation cell type | | Mechanical self-aspirated |
| | Rougher flotation cell size | $ft^3$ | 1000 |
| | No. of rougher banks | each | 2 |
| | No. of cells per rougher bank | each | 11 |
| | Regrind mill size | ft | 8 x 9 |
| | Regrind mill installed power | HP | 250 |
| | Regrind hydrocyclone diameter | inch | 6 |
| | Regrind mill product $P_{80}$ | µm | 42 |
| | No. of cleaning stages | each | 4 |
| | First cleaner flotation cell type | | Mechanical self-aspirated |
| | No. of first cleaner cells | each | 3 |
| | Cleaner/Scavenger flotation cell type | | Mechanical self-aspirated |
| | No. of cleaner/scavenger cells | each | 6 |
| | 2nd, 3rd, 4th cleaner flotation cell type | | Column |
| | Diameter, column cells | inch | 60 |
| Concentrate leaching and dewatering | Thickener diameter | ft | 30 |
| | No. of leaching tanks | each | 4 |
| | Size leach tanks (diameter x height) | ft | 8.75 x 11.5 |
| Pyrite removal | Pyrite flotation cell type | | Jameson Cell |
| | Pyrite flotation cell size | | B8500/12 |

## 17.3 Process Description

The following sections describe the existing processing facilities at TCM.

### 17.3.1 Process Design Criteria

The Thompson Creek Concentrator is proposed to process molybdenum ore at a rate of 10.4 million short tons per year for approximately 12 years. The corresponding average daily mill throughput rate is 28,500 st/d or a nominal rate of 30,971 st/d (1,290 st/h) at a 92% annual operating availability. Design criteria are listed in Table 17-2.

**Table 17-2 Process design criteria**

| Description | Unit | Value |
|---|---|---|
| **Ore processing rate** | | |
| Annual throughput | Mst | 10.4 |
| Operating days per year | days | 365 |
| Operating hours per day | hours | 24 |
| Shifts per day | | 2 |
| Hours per shift | | 12 |
| Crushing circuit availability | % | 75 |
| Concentrator availability | % | 92 |
| Nominal crushing circuit throughput | st/d | 37,991 |
| Nominal crushing circuit throughput | st/h | 1,583 |
| Nominal concentrator throughput | st/d | 30,971 |
| Nominal concentrator throughput | st/h | 1,290 |
| **Ore properties** | | |
| SG | | 2.6 |
| Moisture content | % w/w | 2 |
| Grinding circuit SE | kWh/st | 11.35 |
| Grinding circuit product $P_{80}$ | µm | 212 |
| **Head grade and recoveries** | | |
| Ore molybdenum grade | % | 0.08 |
| Molybdenum recovery | Mo % | 90.5 |
| Concentrate production (daily) | dry st/d | 40.5 |
| Concentrate molybdenum grade | Mo % | 54.2 |
| Concentrate molybdenite grade | $MoS_2$ % | 90.4 |
| Molybdenum production (daily) | dry st/d | 22.0 |

The concentrator availability is set at 92.0%, just above the 91.7% achieved in 2012, the last full operating year for which data are available for review. A 92.0% availability is a typical achievable target for concentrators of this type. Based on the 2012 availability, and restart activities, it is expected that Thompson Creek will be able to achieve the 92.0% availability.

The design grind circuit specific energy is based on the Year 10-EOM composite, being the highest energy required of all four composites. It is calculated using the SMC Mia and Bond Ball Work Index values for Year 10-EOM composite, discussed in Item 13. The grinding circuit has enough installed grinding power, 24,000 hp (2 x 8,000 hp SAG mills and 2 x 4,000 hp ball mills) to provide the power necessary to grind the ore, with some margin. As noted in Item 13, the grinding circuit has historically been able to process ore at a greater than 11.35 kWh/st specific energy, at a higher throughput than the nominal 1,290 st/h.

A nominal solids mass and molybdenum balance for the major circuits is presented in Table 17-3. The Coarse Ore Stockpile, between the Crushing and Grinding circuits, supplies the surge capacity necessary to harmonize the differing operating availabilities and nominal hourly throughputs between the two circuits.

**Table 17-3 Nominal hourly solids balance**

| Circuit | Solids st/h | %Mo | Mo st/h |
|---|---|---|---|
| Crushing | 1,583.3 | 0.08 | 1.27 |
| Grinding | 1,290.8 | 0.08 | 1.03 |
| Rougher Flotation Feed | 1,290.8 | 0.08 | 1.03 |
| Rougher Concentrate | 19.4 | 5.12 | 0.99 |
| Rougher Tails | 1,271.4 | 0.003 | 0.04 |
| Cleaner Flotation Feed | 19.4 | 5.12 | 0.99 |
| Cleaner Concentrate | 1.7 | 54 | 0.94 |
| Cleaner Scavenger Tails | 17.6 | 0.29 | 0.05 |
| Concentrate Handling | 1.7 | 54 | 0.94 |
| Pyrite Removal Feed | 1,289.0 | 0.007 | 0.09 |
| Pyrite Tailings | 19.3 | 0.214 | 0.04 |
| Non-Pyrite Tailings | 1,269.7 | 0.004 | 0.05 |

### 17.3.2 Primary Crushing

The primary crusher is located near the open pit along with other mining infrastructure and equipment. Run of mine (ROM) ore from the open pit is transported via haul trucks to the primary gyratory crusher and dumped into the crusher dump pocket. The ore is processed through the existing 60-inch x 89-inch gyratory crusher with an installed motor power of 600 hp. The crushed ore product discharges to an apron feeder and is transported, via a series of two overland conveyors, to the coarse ore stockpile.

A comprehensive gyratory crusher inspection was completed in 2023 and a course of actions was recommended to upgrade the gyratory crusher to reliable and stable operation. These recommended rebuild and refurbishment activities will be completed as part of restart activities. The gyratory crusher discharge apron feeder was visually inspected, and recommended actions for its refurbishment will also be taken during restart activities.

### 17.3.3 Overland Conveying and Coarse Ore Stockpiling

Crushed ore from the primary crusher is conveyed via two overland conveyors and deposited onto the coarse ore stockpile for storage upstream of the processing plant. The stockpile is not covered but includes a wind fence to control fugitive dust. This stockpile has a total capacity of approximately five days of production and a live capacity of approximately 24 hours.

Stockpiled ore is reclaimed by two parallel process lines, each equipped with four apron feeders located in the reclaim tunnel beneath the stockpile. The reclaimed material from each line is discharged onto its dedicated SAG mill feed conveyors which transport the stockpiled ore from the reclaim tunnel into the SAG mills within the main mill building.

A full inspection of the overland conveyors (Conveyors 1 and 2) and SAG mill feed conveyors (Conveyors 3 and 4) was conducted in 2023 and maintenance actions were recommended. These will include a full belt replacement for Conveyor 1, a variety of idler replacements, rip detection system upgrades, and general maintenance activities. The upgrades will be completed as part of restart activities. The stockpile reclaim feeders were also inspected and recommendations for service will be completed as part of restart activities.

### 17.3.4 Grinding

The primary grinding circuit consists of two parallel grinding lines, each with one SAG mill and one ball mill operated in a closed-circuit configuration with two classifying hydrocyclone clusters. The two grinding lines will operate at a nominal, combined throughput rate of 1,290 st/h.

The SAG mills are 32 ft in diameter and 13 ft in length with 8,000 hp of installed power on each and are driven by two 4,000 hp motors, in a dual-pinion arrangement. Grinding media is 5.25-inch steel balls and steel mill liners are utilized.

Slurry from the SAG mill discharges by gravity to a pump box and is pumped to the ball mill cyclone cluster feed pump box.

The grinding cyclone clusters, each with six 26-inch cyclones per cluster, classify the combined SAG and ball mill product slurries into fine ($P_{80}$ 212 µm) and coarse fractions, with the fines proceeding to the rougher flotation circuit and the coarse fraction being fed to the ball mills for further size reduction. The two ball mills installed in the process plant measure 16.5 ft in diameter and 26 ft in length, each with 4,000 hp of installed power. Each mill is driven by one 4,000 hp drive in a single pinion drive arrangement. The ball mills utilize steel liners due to the use of the grinding circuit as a conditioning stage for the fuel oil reagent. The ball mills will grind the ore with 3–4-inch (76–102 mm) steel balls.

Collector (fuel oil) and frother are added to the grinding circuit to promote mixing of the flotation reagents with the slurry and condition the slurry ahead of the rougher flotation circuit.

A grinding area sump pump will be available to collect spillage and wash-down water and will pump this material to the cyclone feed pump-box.

As is typical in base metals concentrators, the Thompson Creek milling circuit sets the throughput capability of the overall concentrator. To achieve the 10.4 Mst/a ore processing rate, a nominal 1,290 st/h at 92.0% annual availability is required. Thompson Creek was able to achieve this annual throughput in 2011, but no clear availability information is available. In 2012, throughput was just shy of target, at 10.3 Mst/a, at an availability of 91.7%.

The SAG mills, cyclone clusters, and ball mills were all inspected for recommended actions to be completed during restart activities. The mill trunnions, bearings, girth gears, pinions, clutches, motors and drives were all thoroughly inspected, as well as the hydrocyclones. The SAG No. 2 west clutch as well as Ball Mill No. 2 clutch will be changed out. The Ball Mill No. 1 girth gear will be flipped, as its driving flank is noted to be in moderate to verging on poor condition, while the non-driving flank is in like new condition. The Ball Mill No. 1 pinion will be replaced. All other required actions for the balance of equipment inspected in the grinding circuit will be completed prior to restart.

It is expected that the restart actions will contribute to helping the grinding circuit with maintaining the targeted 92% availability, as is typically achieved or exceeded, in similar grinding circuits for base metals ore processing.

In addition to bringing the existing equipment to a state ready for reliable and steady operation, new equipment will also be installed, including:

- A new cyclone feed pump-box, to increase reliability and stability of cyclone feed
- New liner and lifter design for the SAG mills.

The current SAG mill liners are a rail bar lifter type design, and it is noted that the utilization of the grinding circuit motor nameplate was in the 78% range for 2012. An opportunity may exist to utilize the SAG mill motors more fully with improvements in lifter, grate, or pulp discharge design. Also, there may be operational opportunities to increase power draw, and potentially exceed the current annual throughput design rate.

### 17.3.5 Rougher Flotation

The historical rougher flotation circuit consisted of two banks, each with 11 rougher flotation cells. The cells were WEMCO #164 cells which provide 1,000 ft$^3$ of volume each and were operated through a self-aspirated mechanism, not requiring any additional air blower or associated piping.

For the restart, the rougher flotation circuit will be replaced with new cells of the same specification. New equipment will consist of two banks of 11 of the same style WEMCO #164 tank cells, as per the historical rougher design. Rougher flotation reagent addition includes fuel oil for a molybdenum collector, and a frother which are introduced in the grinding circuit. In this stage, a rougher concentrate will be recovered and sent to the cleaner circuit. Overall molybdenum recovery in this roughing stage will be 94%. Rougher tailings will report to the pyrite separation flotation circuit.

Product from each flotation bank proceeds to the regrind circuit feed pump box. Tailings from the rougher flotation circuit flows by gravity to the pyrite flotation (de-sulfuring) circuit and then on to the TSF.

### 17.3.6 Concentrate Regrinding and Cleaner Flotation

Rougher concentrate is advanced to the first regrind circuit, which consists of the first regrind ball mill and first regrind cyclone. The first regrind ball mill measures eight feet in diameter and nine feet in length with an installed motor power of 250 HP and is in closed circuit with the 6” diameter first regrind cyclone. rougher concentrate is fed to the first regrind cyclone feed pumpbox. Fines, at a 42 µm P80, from the cyclone cluster proceed to the first cleaner flotation bank while the coarse fraction is recirculated to the first regrind ball mill for further size reduction.

The first regrind ball mill measures 8 ft in diameter and 9 ft in length with an installed motor power of 250 hp and is in closed circuit with a cluster of 6-inch diameter cyclones. The first regrind mill was inspected as part of the SAG and ball mill inspections, and its trunnion, trunnion bearings, pinion and gear were reported to be in good condition. Regular preventive maintenance activities and breaking up the regrind mill's static charge will be required before restart.

The first cleaner flotation circuit consists of three cleaner cells and six scavenger cells. The cells are WEMCO #120 cells, each of which provides 300 $ft^3$ of volume. During restart activities, the first cleaner and scavenger cells will be replaced with in-kind equipment.

Concentrate from the first three cleaner cells is collected in the second cleaner flotation feed pump-box. Tailings from the first cleaner cells feed the six scavenger cells. Concentrate from the scavenger cells is recirculated back to the first regrinding circuit. Tailings from the scavenger cells will be piped so that they can be routed directly to the final tailings sump, or can be combined with the rougher tailings for pyrite removal, before routing to tailings deposition in the TSF.

Lime and Nokes reagents are used within the cleaner flotation circuit to depress copper, iron, and lead sulfide minerals.

The first cleaner concentrate feeds a series of three 60-inch diameter flotation columns in series (designated as the second, third, and fourth cleaner columns). The second cleaner column tailings are recirculated to the first regrind circuit and the concentrate is fed to the third cleaner flotation column. Tailings from the third column recirculate to the feed of the second cleaner column and concentrate feeds to the fourth cleaner column. Tailings from the fourth cleaner column can be recirculated to the concentrate regrind circuit, fed to the second cleaner column, or diverted to a de-agglomeration step. This latter step has been used to control the gamma levels if they are above the product specification level. The cleaning system has been configured to allow a high level of flexibility to respond to changes in the ore.

The fourth cleaner column concentrate is sent to a stock tank that feeds a fine screening circuit with an aperture size of 37 µm, producing screen undersize and oversize fractions.

### 17.3.7 Concentrate Leaching and Dewatering

Undersize material from the cleaner concentrate screening circuit is sent to the final concentrate thickener which measures 30 ft in diameter. The thickener underflow is sent to a stock tank that feeds the molybdenum concentrate leaching process at a controlled rate.

The existing thickener was inspected and found to be in poor condition. It will be replaced with a new 30 ft diameter thickener during restart activities.

The leaching circuit consists of four agitated leach tanks, each measuring 8.75 ft in diameter and 11.50 ft in height. The leaching process further improves the grade and quality of the molybdenum concentrate by dissolving impurities such as copper and lead into the leachate at high temperature. A mixture of hydrochloric acid (HCl), ferric chloride ($FeCl_3$) and salt (NaCl) is currently used on site as the lixiviant. Sodium chlorate will be used as a replacement for ferric chloride for future processing.

The leached molybdenum concentrate is dewatered using filter presses. Filtrate is sent to a leach thickener with the solids thickened and returned to the filter feed tank. The thickener overflow is sent to neutralization and then to tailings. The filtered molybdenum concentrate cake is collected and conveyed to a Holoflite dryer to reduce the moisture content of the final product before packaging. Both the leaching and the drying circuit employ wet scrubbing systems to deal with any vapors, gases, or particulate produced in either circuit.

### 17.3.8 High-Performance Molybdenum Circuit

Screen oversize from the concentrate screening circuit is stored in Stock Tank No. 5 and fed to the hydrocyclone cluster associated with the second regrind circuit. The cyclone underflow returns to No. 2 regrind mill for further grinding while the fine material in the overflow is sent to either the 24-inch (610 mm) or the 30-inch (762 mm) cleaner column. In each case, the column tails can be sent to either No. 1 or No. 2 regrind mill. Final cleaner flotation concentrate from these columns is sent for storage in stock tanks. From the stock tanks the concentrate is filtered with the filtrate reporting to the molybdenum concentrate thickener while the solids report to a Holoflite dryer. The product from this dryer can be directly bagged and may not be further processed. However, when sent for further processing, the material is first cooled and then, optionally, it may be processed through a jet mill to approximately 3–4 µm. At this size, the material can be packaged and sold or can be sent for a final reduction step in pancake mills to produce a superfine product of approximately 1–2 µm.

The addition of storage tanks enables the high-grade upgrading circuit to treat custom material from other operations. This allows the plant to process custom material in isolation from the rest of the plant. The HPM circuit has been operated throughout the Thompson Creek care and maintenance period.

### 17.3.9 Pyrite Removal

The process plant has historically operated a pyrite removal circuit. This circuit consisted of WEMCO self-aspirated tank cells. The original pyrite flotation equipment was removed from the process plant when the mine was put under care and maintenance to make space for a copper cementation circuit installation as part of the toll milling process. A new pyrite removal circuit will need to be constructed prior to restart of the process plan to again enable pyrite removal.

The new pyrite removal circuit will consist of a single high-capacity Jameson Cell which will be fed from the existing pyrite flotation conditioning tank. Pyrite concentrate will be collected in a launder that will feed tailings pumps to be pumped to the final sub-aqueous pyrite deposition site. Tailings from the pyrite flotation circuit will tie into the existing tailings piping and pumping system.

## 17.4 Tailings Disposal

Details on tailings disposal can be found in Item 18.2 in this report.

## 17.5 Reagents

A summary of the reagents used at TCM and their rates of consumption are listed in Table 17-4.

**Table 17-4 Reagent consumptions**

| Reagents | Units | Rates |
|---|---|---|
| Collector | lb/st milled | 0.15 |
| Frother | lb/st milled | 0.02 |
| Lime | lb/st milled | 0.69 |
| Nokes | lb/lb Mo product | 0.06 |
| Flocculant | lb/lb Mo product | 0.0005 |
| Sodium chlorate | lb/lb Mo product | 0.02 |
| Hydrochloric acid | lb/lb Mo product | 0.036 |
| Salt | lb/lb Mo product | 0.002 |
| Pyrite collector – PAX | lb/st milled | 0.01 |

### 17.5.1 Collector (Fuel Oil)

Fuel oil is used in the process as a molybdenum flotation collector. Fuel oil is transported to site in bulk tankers and offloaded into the diesel storage tank through a transfer pump. Fuel oil is metered and can be applied to the SAG mill feed and rougher flotation feed at dosing points.

### 17.5.2 Frother

NALFLOTE 9837 reagent is used in the process as a frother for flotation. The frother is transported to site in bulk tankers and offloaded into the storage tank through a transfer pump. Frother is metered and can be applied to the SAG mill feed and rougher flotation feed at dosing points.

### 17.5.3 Lime (Quicklime)

Lime is used in the process as a pH modifier and a flotation depressant. Lime is shipped to site in bulk tankers and offloaded to the storage silo on site. The lime supplied is slaked and diluted on site in a slaking mill before being stored in the lime slurry storage tank for metering into the process.

### 17.5.4 Nokes Reagent

Nokes reagent (sodium dithiophosphate) is used in the process as a flotation depressant and is shipped to site by road in 2,000 lb totes in a heated box truck. Nokes is mixed with fresh water to the target make-up strength and metered to application points in the rougher and cleaner flotation circuits using the reagent mixing, storage, and metering equipment inside the process plant.

### 17.5.5 Flocculant

Flocculant is used in the process to aid in thickening and settling of solids in slurry. It is shipped to site in 2,200 lbs bulk bags. Flocculant is diluted with water to the target make-up strength and metered to the process using the reagent mixing, storage, and metering equipment inside the process plant.

### 17.5.6 Sodium Chlorate

Sodium chlorate is used in the process as an oxidant in the concentrate leaching lixiviant solution. Sodium chlorate is shipped to site by road in totes weighing 2,200 lbs each. The reagent is mixed with fresh water to the target make-up strength before being added to the lixiviant solution in the lixiviant storage tank.

### 17.5.7 Hydrochloric Acid

Hydrochloric acid is used in the process as a pH modifier and key component of the lixiviant solution used for concentrate leaching. Hydrochloric acid is shipped to site in bulk tankers and offloaded into a storage tank through a transfer pump. Hydrochloric acid is mixed with process water and stored in the lixiviant storage tank before addition to the leaching circuit.

### 17.5.8 Salt

Salt is applied to the lixiviant solution in the concentrate leaching process. Salt is shipped to site by road in bulk trucks and is offloaded to storage equipment on site. The salt is mixed with fresh water and with the lixiviant solution.

### 17.5.9 Pyrite Collector

Potassium amyl xanthate (PAX) reagent is used in the process as a collector to recovery sulfides in the pyrite separation circuit. PAX reagent is transported to site in 2,000 lb reagent bags. PAX is mixed with fresh water to the target make-up strength and metered to the conditioning tank ahead of the pyrite removal circuit using the reagent mixing, storage, and metering equipment inside the process plant.

## 17.6 Plant Power Supply

Electrical energy is obtained from the grid. Consumption, based on operation reporting, is approximately 22 kWh/st ore milled.

## 17.7 Plant Water Supply

The following different water services are used in the process plant:

- Fresh water: Fresh water has been pumped during past operations from the nearby Salmon River. There is a considerable amount of water in the old pit on site that can be used as a source of fresh water and process water as needed. The pit has pumping equipment installed for removal of pit water.

- Reclaim water: Reclaim water is recovered from the tailings management facility from the reclaim pumping barges and transported to the process plant for use as process water.
- Process water: Water overflow from the concentrate thickener is used as process water for dilution of ore in the grinding and flotation circuits.

## 17.8 Plant Services

In general, the plant services (such as compressed air, fire water, etc.) required for the restart of the Thompson Creek process plant are all existing and are designed for the operation of the facilities for the nameplate production of 28,500 tons per day. Further, certain plant facilities are certified and/or in current use, specifically around the HPM circuit. No significant changes are forecasted for the required capacities of existing utilities and services at site. Restart of the plant services will require servicing of existing equipment and/or replacement of damaged/inoperable equipment and wear parts.

# 18 MINE INFRASTRUCTURE

The overall site plan view for TCM (Figure 18-1) shows the major project facilities, including the open pit mine, mine facilities, TSF, waste rock dumps, water ponds, site access road and mill facilities. TCM is accessible by commercial air carriers to Idaho Falls, Idaho (179 miles), Boise, Idaho (169 miles) or Butte, Montana (245 miles), then by vehicle via public roads. The site is accessed through a 3.7-mile gravel road connected to a public access road via Clayton, Idaho. Concentrate is transported by truck from the site directly to customers.

**Figure 18-1 Overall site layout**

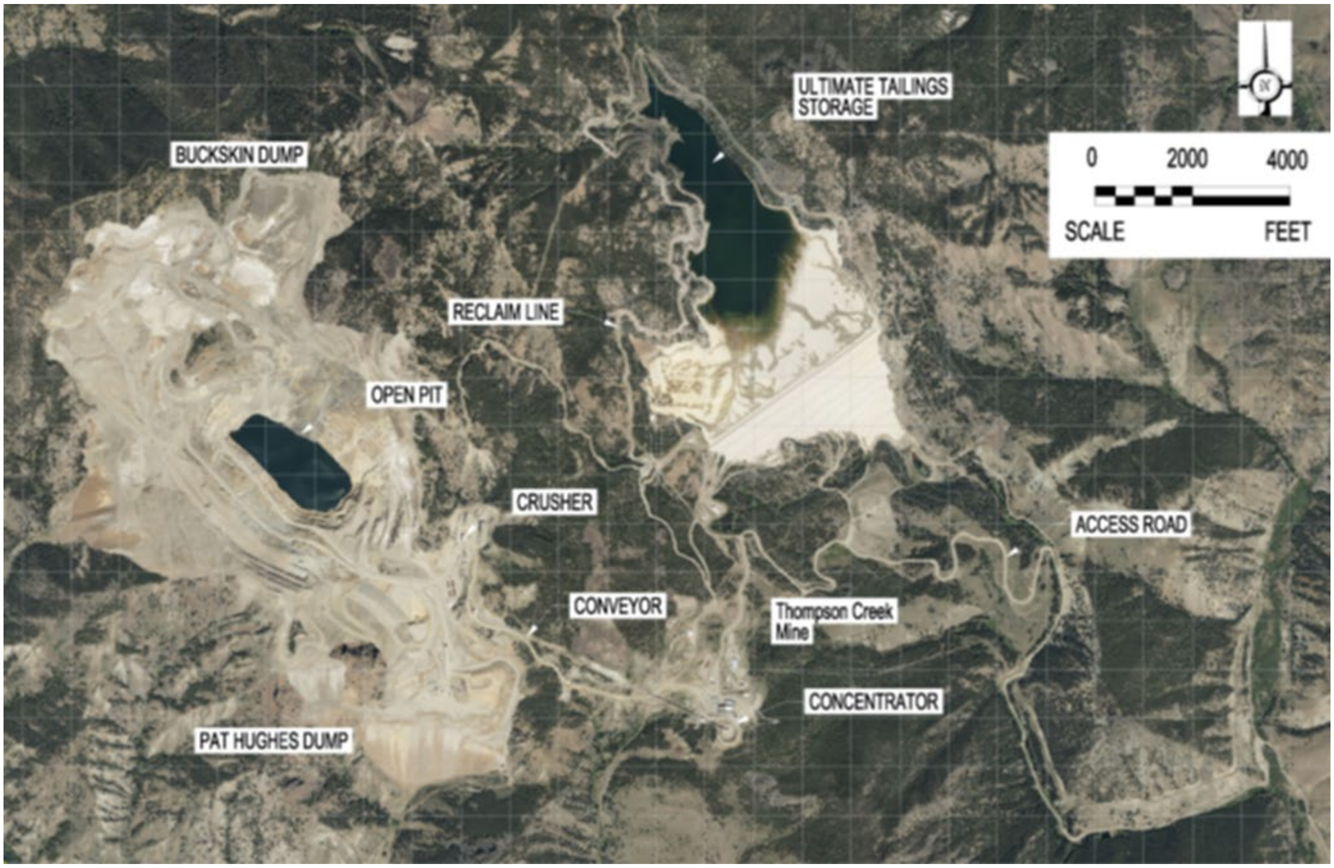


Image from Google Earth™, 2024

## 18.1 Site Infrastructure

The primary infrastructure at TCM includes a concentrator, TSF, mine pit, waste dumps and water ponds that are described elsewhere in this report. The remaining infrastructure at the site is listed below:

- Mill warehouse: The mill warehouse has remained operational by mine operations throughout the care and maintenance period and kept in good condition.

- Assay lab: The assay lab has been continuously operational to support mine operations and the treatment of third-party concentrate. Additional assay equipment will be required to support future operations.
- Mine dry: The mine dry has remained in use by mine operations and kept in good condition.
- Administration building: The administration building has been used continuously throughout care and maintenance by mine operations and remains in good condition.
- Maintenance shop building: The maintenance shop has remained in operation by mine operations and remains in good condition. Modernization and restocking of tools will be required.
- Light vehicle maintenance shop: The light vehicle maintenance shop has remained in operation by mine operations and remains in good condition.
- Heavy vehicle maintenance shop: The heavy vehicle maintenance shop has remained in operation by mine operations and remains in good condition.
- Drive buildings: The overland conveyor drive houses require refurbishment to restore reliable and safe transport of ore.
- Tailings cyclone station: The tailings cyclone station must be refurbished to restore the equipment and ensure reliable and safe processing of final tailings. Discharge piping for the pyrite concentrate, sands, and fines are in place and will be re-used as required.
- Tailings pumphouse: The tailings pumphouse remained operational during the processing of third-party concentrates. The equipment requires refurbishment, but no replacements are required. Piping from the process plant to the tailings pumphouse is in place.
- Plant electrical substation: The plant electrical substation has remained operational and was well maintained since the mine was put into care and maintenance.
- Water treatment plant: The water treatment plant has remained operational and well maintained since going into care and maintenance.
- Fire protection systems: Fire protection systems throughout the mine site have been routinely inspected and tested.

### 18.1.1 Power

Electrical power is provided to the site by the Bonneville Power Administration through a 24.7-mile, 230 kV power line to the South Butte substation, then by a 2.6-mile, 69 kV line to the mill site. Both lines are owned by TCM.

The onsite 69 kV substation has been continuously energized and does not need upgrades.

### 18.1.2 Site Communications

The existing plant communication infrastructure consists of the following systems:

- The process control network, which is ethernet based, services the plant control system (PCS) throughout the process plant and remote areas. Fiber optic cabling is extended to all buildings. There is a central fiber hub that houses the switches to branch communication to various buildings including remote locations. Some areas in the process plant contain outdated Controlnet equipment that will be upgraded to the standardized ethernet.

- The business network is ethernet based. There is fiber optic cabling available to all buildings. There are several wireless outdoor hubs that are left over from the old mesh network. Inside the main building are multiple wireless connections along with wired ethernet. The existing business network is sufficient for the restart and does not require upgrades.
- The landline telephones have multiple lines. The system utilizes VoIP (Voice over Internet Protocol) for the majority of phone lines. The plant also maintains some traditional phone lines in all areas in the event of power outages. The site also utilizes the paging and intercom system with phones throughout the plant that can be used for paging. The system is sufficient for the restart and does not require upgrades.
- The radio network has been updated to a digatal system.
- There is currently no mobile telephone service at TCM.

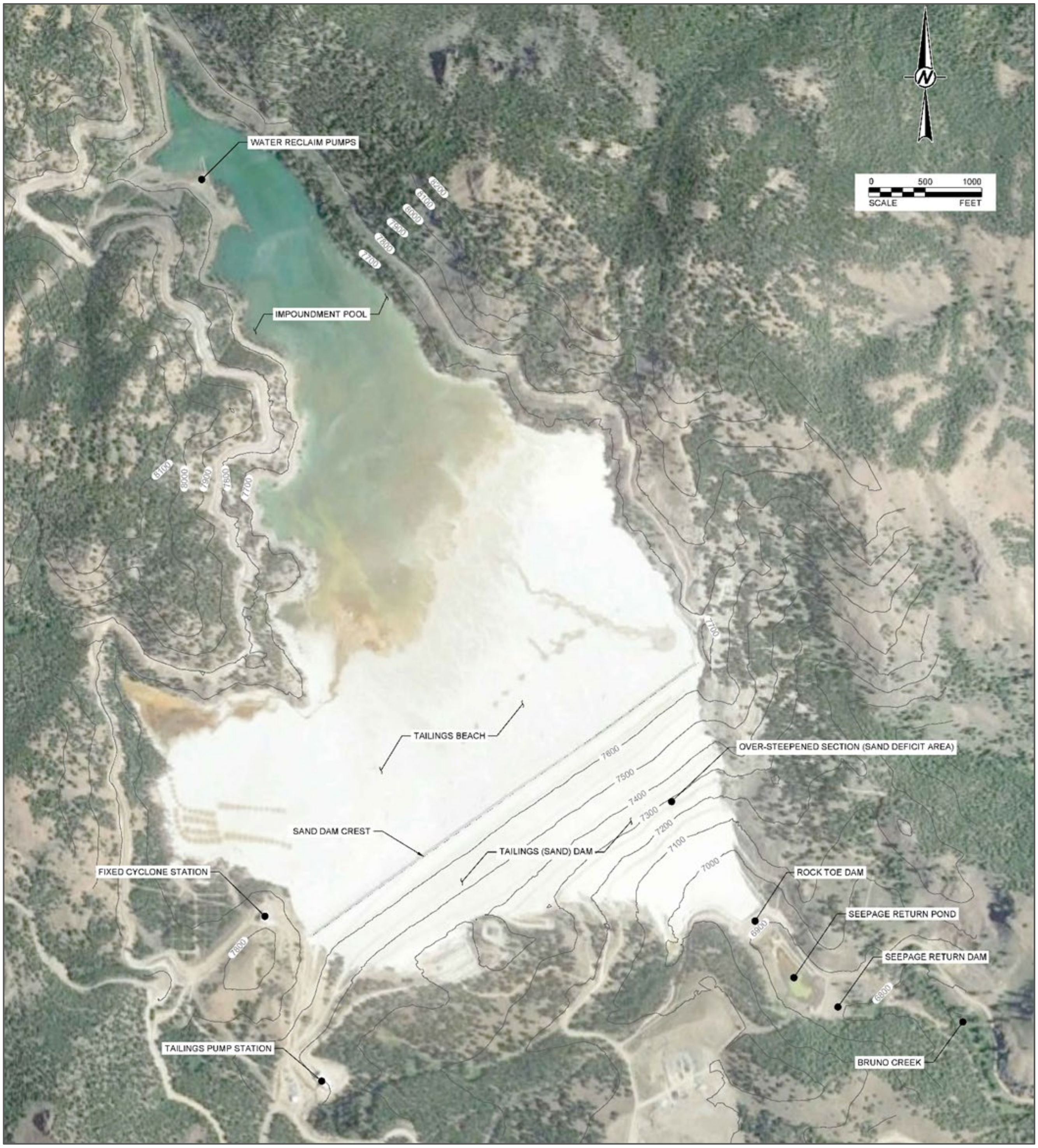
## 18.2 Tailings Infrastructure

Mine tailings produced at the TCM are stored in the Bruno Creek Tailings Impoundment, which commenced operations in August 1983. Tailings deposition has been ongoing since then, with the exception of temporary shutdowns for six months in 1991, from December 1992 to March 1994, and from December 2014 to present. The TSF is situated in the Bruno Creek drainage, a tributary to Paasasikwana Naokwaide, which in turn flows to the Salmon River.

Containment of impounded tailings is provided by a cyclone sand dam, which is raised sequentially as a centerline structure. In this type of operation, tailings can be split into a coarse fraction and a fine fraction using a cyclone system. The coarse tailings fraction (cyclone underflow) is deposited hydraulically from the dam crest, or elsewhere as needed, to raise the dam and form the outer confining shell of the dam. The fine tailings fraction (cyclone overflow) is discharged as a dilute slurry into the basin upstream of the dam. When the cyclone system is not operating, particularly when weather or ground conditions are unfavorable, the whole tailings stream is deposited into the impoundment, either from the dam crest for beach building or from perimeter discharge points.

Typical operations to date have involved the use of on-dam cyclones mounted on a header pipeline extending along the dam crest for approximately six to seven months each year, with a typical sand recovery (defined as dry mass of cyclone underflow divided by total tailings dry mass) of approximately 45% when the cyclone system was operating. As a result, approximately 25% of the tailings stream (by dry mass) has consisted of sand for dam construction on an annual basis with the on-dam cyclones. A plan view of the TSF in its current configuration is shown in Figure 18-2, with key features labeled. In addition to the features shown, the TSF has a subdrain system that collects and conveys seepage from the base of the cyclone sand deposit, thereby lowering water levels in the sand dam.

## Figure 18-2 Bruno Creek Tailings Impoundment



### 18.2.1 Tailings Facility Design

#### TSF Design History

The initial TSF design (SRK, 1981b) was sized to accommodate tailings through the Phase VI mine plan, consisting of 200 million tons of tailings (including both the sand dam and the impounded tailings). The dam was configured to have a 3H:1V out-slope and reach a crest elevation of 7,600 ft-asl. The Phase VI crest elevation was reached in 2009. The Phase VII expansion design (WMCI, 2007) included continued construction of the sand dam using a centerline construction method to reach a crest elevation of 7,646 ft-asl, thereby adding 34 million tons of tailings storage beyond the Phase VI capacity (including both the sand dam and the impounded tailings). The design downstream slope was steepened from 3H:1V to 2.8H:1V to allow the existing rock-toe dam, seepage return dam (SRD), and pump-back facilities to remain in place without modification. The Phase VII crest elevation was reached in 2013.

#### Current TSF Design

The Phase VIII plan (Golder and WMCI, 2008) is the current design and was initiated for a short time in 2013 and 2014 before the current temporary shutdown. It includes continued construction of the sand dam using a centerline construction method to reach a crest elevation of 7,742 ft-asl, thereby adding 100 million tons of tailings storage beyond the Phase VII capacity (including both the sand dam and the impounded tailings, but not including tailings needed to reach closure grades). The design downstream slope is steepened from 2.8H:1V to 2.75H:1V to reduce sand dam construction quantities and allow the existing SRD and pump-back facilities to remain in place without modification. The Phase VIII design requires realignment of the sand dam crest near the left abutment due to topographic constraints, which will necessitate mechanical placement of sand with compaction in controlled lifts in this area. Mechanical placement and compaction will also be used at one location along the left groin where it is necessary to steepen the dam out-slope to 2H:1V locally in order to avoid overtopping the adjacent ridgeline.

The Phase VIII expansion design includes enlargement of the rock-toe dam using a downstream construction method. Modifications to the Phase VIII expansion design were presented in a final design package issued in July 2014 (Golder, 2014) and approved by the Idaho Department of Water Resources (IDWR) in February 2015. After a period of five years had elapsed without dam construction due to the current temporary shutdown, IDWR required renewal of the dam construction approval. In February 2020, a design package with minor updates was submitted for IDWR’s review (Golder, 2020), and approval was obtained in September 2021. It is anticipated that execution of preparatory work for mill restart in 2025 will likely avert the need for an additional renewal of the dam construction approval.

The sand dam reached a crest elevation of approximately 7,660 ft-asl before the current temporary shutdown. Since entering the temporary shutdown in December 2014, tailings systems have not operated and the tailings dam, beach, and impoundment have not been raised.

##### *Fixed Cyclone Station*

Raising of the sand dam after mill restart will require increased on-specification sand recovery from tailings cyclone operations to produce sufficient volumes of dam construction material. At the start of the current temporary shutdown, there already existed a sand deficit from previous operations totaling approximately 7.5 million tons (Golder, 2015b), which has left some areas lower in elevation and steeper than intended. To help recover from this shortfall and to enable improved future operations, a fixed cyclone station was constructed above the right abutment of the sand dam in 2012. With this modification, sand recovery from cycloning was projected to increase significantly. However, the fixed cyclone station suffered from operational and equipment problems, causing delays that eventually resulted in the system seeing very limited use before the current temporary shutdown. Following the restart of milling operations, the intent of TCM is to use the fixed cyclone station to maximize on-specification sand recovery. TCM personnel (Kopp, 2017) have indicated that the fixed cyclone station was designed for the LOM and will require no major additions for mill restart. However, an assessment is currently underway to evaluate improvements to the system that would increase on-specification sand recovery and enable delivery of cyclone sand to locations downslope from the dam crest so that the existing deficit can be eliminated as quickly as feasible after mill restart.

The remaining tailings capacity to reach the Phase VIII crest elevation of 7,742 ft-asl (2,360 m-asl) is estimated to be 94 million tons. The current mine plan is considered to be compatible with the approved Phase VIII expansion design in terms of the ultimate dam configuration, since excess tailings beyond the amount stored up to the Phase VIII design grades will be used upstream of the dam crest to help reach closure grades across the impoundment surface. The amount of additional tailings needed to reach closure grades is subject to adjustment but is currently estimated as 30 million tons based on the conceptual closure plan. The excess tailings tonnage in the mine plan is comparable to that amount.

The ultimate LOM tailings dam will have a height of approximately 815 ft, as measured from the lowest elevation along the sand dam toe to the crest. The crest length will be approximately 4,900 ft. A cross section taken where the dam is at its maximum height and depicting the current and ultimate LOM tailings zones within the TSF and the underlying native soil and rock strata is shown in Figure 18-3. A plan view of the ultimate LOM (pre-reclamation) TSF configuration is shown in Figure 18-4.

**Figure 18-3 Cross section through TCM TSF showing underlying strata**

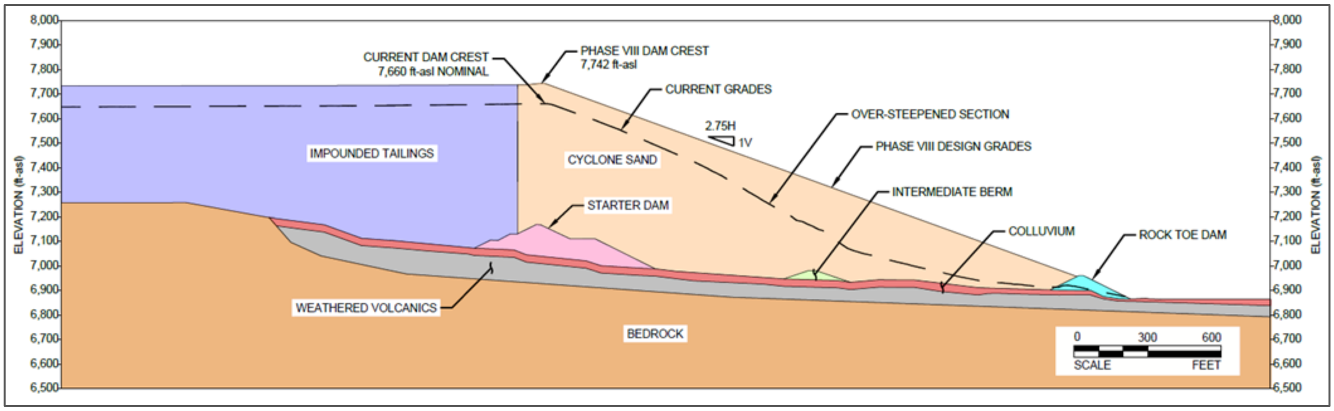
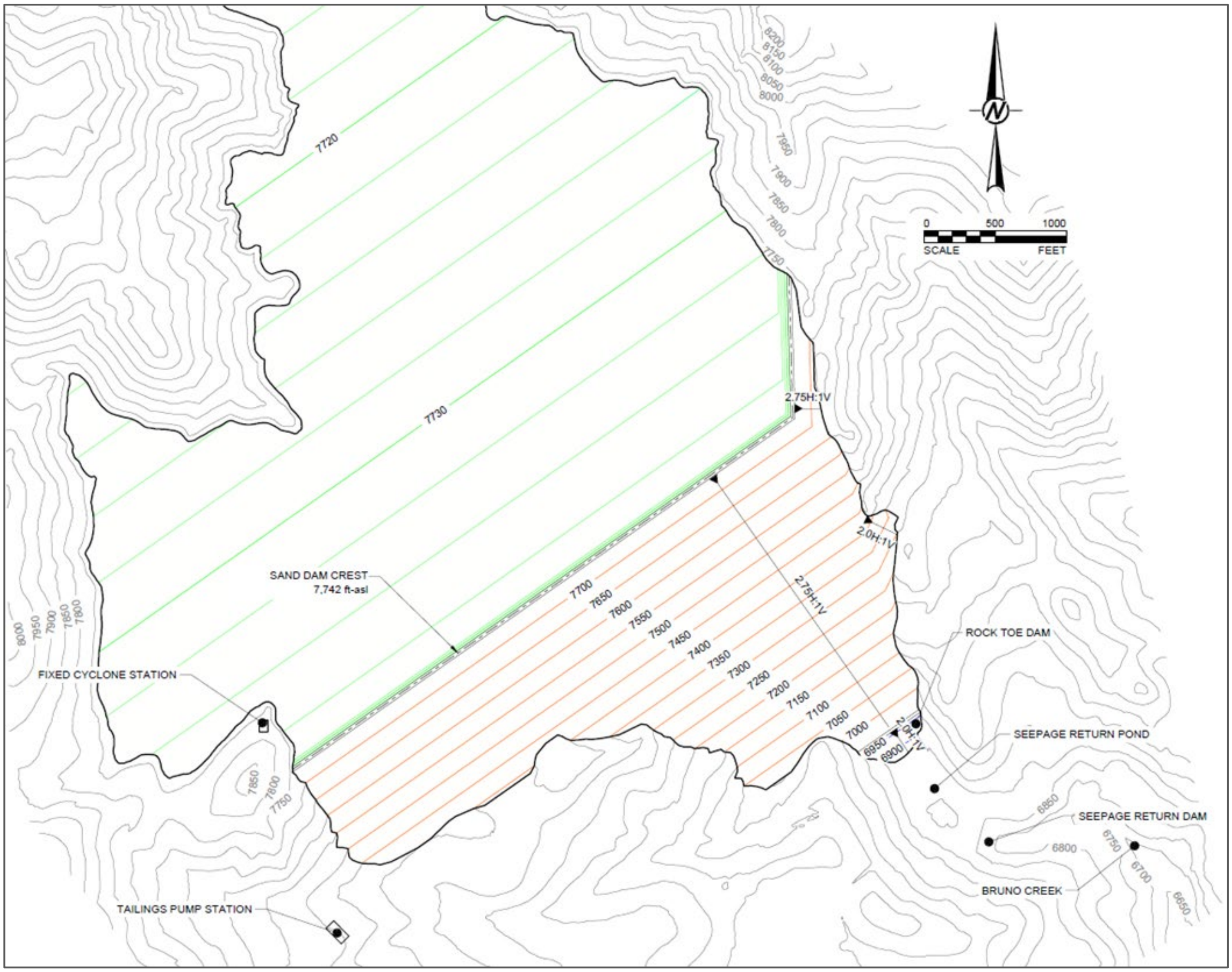


Figure 18-4 Plan view of TCM TSF Phase VIII configuration



## 18.2.2 TSF Water Management

### Storm Storage and Required Freeboard

Slurry tailings deposition from the dam crest and perimeter discharge points has created a gently sloping tailings surface that directs free water from tailings deposition, precipitation, and snowmelt to the upstream (northwestern) portion of the impoundment, well away from the dam. The volume of accumulated free water in the impoundment pool must be limited during operations to maintain sufficient storage to retain the design storm event volume in the impoundment while leaving at least five feet of dry freeboard. Because there is no emergency spillway during operations, the inflow design flood (IDF) is the probable maximum flood (PMF) event, which considers 15.32 inches of precipitation occurring over the entire impoundment and upgradient catchment area during the 96-hour probable maximum precipitation (PMP) event. The PMF is estimated to result in 1,731 acre-feet, or 75 million cubic feet, of inflow to the TSF. At the present TSF elevation, this corresponds to a 10 ft rise in the impoundment pool.

### Bruno Creek Surface Water Diversion

A stormwater diversion system is in place to reduce inflow to the impoundment during the late spring, summer, and early fall months. The diversion system includes one diversion berm in the main Bruno Creek drainage, two diversion berms in drainages west of the main Bruno Creek drainage, a diversion berm upstream of the area known as the Hawk's Nest, and a pipeline to convey diverted flows around the right abutment of the sand dam for discharge back into the Bruno Creek drainage below the SRD. The system is designed to convey flows associated with most storm events. Flows from large storm events are intended to overflow the system and enter the impoundment. For conservatism, calculation of the IDF did not consider diversion of runoff from the upgradient catchment area.

### Water Reclaim Facilities

Water reclaim from the TSF is accomplished using shore-mounted vacuum pumps with floating intakes at the northwestern limit of the impoundment to feed a pipeline that is capable of conveying the flow to the mill for reuse. The existing system was designed for the ultimate LOM and would require no major additions or upgrades for mill restart. However, replacement of the shore-mounted pumps with barge-mounted pumps is recommended for improved operability.

### Seepage Return Dam and Pond

The SRD, located downstream of the sand dam and rock-toe dam, was designed as part of the initial TSF design (SRK, 1981a). The SRD is important to the site water balance, as it is designed to collect and store seepage water from the TSF in the seepage return pond, from which it can be pumped to the mill for reuse as process water. An existing pump-back system located in the Bruno Creek drainage below the SRD is used to capture seepage that migrates below the SRD and pump it to the seepage return pond. These systems remain in operation during the current shutdown and require no major modifications for mill restart. However, accumulated sediment should be removed from the seepage return pond as a maintenance activity prior to mill restart.

## 18.2.3 Tailings Transport and Processing

### Tailings Pump Station

Continued raising of the sand dam beyond the Phase VI crest elevation of 7,600 ft-asl required that the original tailings pump station be replaced with a facility capable of delivering whole tailings to the tailings header pipeline at dam crest elevations up to 7,646 ft-asl for Phase VII and eventually up to 7,742 ft-asl for Phase VIII.

Construction of a new tailings pump station was completed in December 2010. The tailings pump station operated successfully from commissioning in 2011 through the beginning of the current temporary shutdown in December 2014. TCM personnel (Kopp, 2017) have indicated that the tailings pump station was designed for the ultimate LOM and will require no major additions or upgrades for mill restart.

### 18.2.4 Key Data Inputs and Analyses for Phase VIII Design

**Materials Distribution and Properties**

Extensive geologic and geotechnical investigations have been completed at various stages of TSF design and construction to characterize tailings and dam foundation materials (SRK, 1981b, 1990; WCC, 1997; Golder, 2007b, 2011). Key information from these studies was combined to develop a stratigraphic site model that has been incorporated into numerous geotechnical evaluations.

**Seismicity**

Due to the known level of seismicity of the area and the potential for strength loss under earthquake loading for saturated native soils and low-density tailings, site-specific seismic hazard analyses have been completed to support the TSF design at various stages of development (SRK, 1981b; URS, 2000; Golder, 2007b, 2011, 2021). Golder (2011) reviewed faults and lineaments within 6–15 miles of the site by desktop study and in the field, including aerial reconnaissance, to assess the potential for surface rupture hazard or earthquake shaking hazard at the TSF. The study concluded that the evaluated faults and lineaments within 6–15 miles of the site are not seismogenic and do not present a surface fault rupture hazard. Golder (2021) completed the most recent seismic hazard assessment (SHA), incorporating updates consistent with the state of practice and considering the Stanley earthquake of March 31, 2020, which had a moment magnitude of 6.5 and an epicenter approximately 32 miles west-northwest of the site. The SHA applied both deterministic and probabilistic methods. The maximum credible earthquake (MCE) identified from the deterministic SHA was selected for seismic analysis and development of earthquake acceleration time histories, which is consistent with the requirements of the Idaho Administrative Procedures Act (Chapter 37.03.06, Safety of Dams Rules) and the Global Industry Standard on Tailings Management (ICMM et al., 2020). The MCE ground motions are representative of a moment magnitude 7.1 earthquake on the Lost River Fault about 16 miles east of the Bruno Creek Tailings Impoundment.

**Seepage Analysis**

Seepage analyses were completed by Golder (2011) for the ultimate LOM configuration using a finite-element groundwater modeling computer program. Hydraulic property inputs to the model were obtained from historical field and laboratory programs at the site. The seepage analyses were used to estimate phreatic levels within four selected design cross-sections for use in stability and liquefaction analyses. The seepage modeling was first conducted for cross sections depicting the existing dam and impoundment configuration as of May 2010. The resulting piezometric surfaces and predicted seepage flow rates were then compared against available piezometric data from instruments installed within the sand dam and measured subdrain flow rates from the weirs below the rock-toe dam to verify the model. The modeling inputs were adjusted until reasonable agreement with the available data was obtained.

Following verification against the existing conditions, the cross sections were modified to reflect the dam and impoundment configuration at the end of the LOM and the seepage modeling was repeated. The results were thought to be conservative and appropriate for use in stability and liquefaction analyses.

### Stability Analysis

Golder (2011) evaluated the stability of the dam and impoundment for the ultimate LOM design geometry under static and earthquake loading conditions. Computerized, 2D limit-equilibrium analyses were used to evaluate static and seismic (pseudostatic) slope stability along the four design cross-sections for which seepage analyses had been completed. Circular slip surfaces and path (non-circular) slip surfaces were considered. Design criteria for the Bruno Creek Tailings Impoundment require a minimum static factor of safety (FS) of 1.5 and a minimum FS of 1.0 for pseudostatic analyses. The FS indicated by the stability analyses met or exceeded the design criteria in each analyzed case.

Golder Associates Ltd (2020) performed dynamic ground response analyses for estimation of seismic loading-induced deformations of the TSF at the ultimate LOM configuration when subjected to 84th percentile spectral accelerations (ground motions) from the MCE. The computed dam crest displacements indicated that the expected lateral displacement of the dam crest due to the MCE in the ultimate LOM configuration is between about 2.0 ft and 5.6 ft. The expected vertical displacement of the dam crest due to the MCE in the ultimate LOM configuration was found to be between about 1.3 ft and 3.0 ft. These magnitudes of expected deformation are considered to be tolerable for this structure.

### Liquefaction Analysis

Detailed liquefaction analyses of the ultimate LOM TSF configuration were completed by Golder (2011) to assess the potential for loss of shear strength in cyclone sand and impounded tailings in response to seismic loading from the design earthquake (seismic liquefaction) or changing pore water pressure conditions in the sand dam and impoundment (static liquefaction). Material property inputs were derived from data obtained from a cone penetration testing program, drilling and coring program, and laboratory testing program (including critical state triaxial testing) carried out in 2010 and 2011. Estimated seismic loading was compared against the resistance of the tailings to cyclic loading to demonstrate that a sufficient margin of cyclic resistance is available to prevent seismic-induced liquefaction. Analyses were also completed to assess dam stability under conditions where saturated tailings exhibit residual undrained strengths representing a static liquefaction scenario. In each case, the FS against instability was found to be at least 1.2. Hence, instability due to static liquefaction was considered to be unlikely.

## 18.2.5 TSF Status during the Current Temporary Shutdown

A historical deficit in sand production has resulted in over-steepened areas that remain on the dam face during the current temporary shutdown, with the mid-valley portion of the dam out-slope lower in elevation and steeper than its intended configuration. Dam stability in this configuration was analyzed shortly after announcement of the temporary shutdown (Golder, 2015a) and indicated an acceptable FS for static conditions. Golder Associates Ltd (2021) performed dynamic ground response analyses for estimation of seismic loading-induced deformations of the TSF in its current configuration when subjected to 84th percentile spectral accelerations (ground motions) from the MCE, as well as several less intense ground motions representing a range of annual exceedance probabilities. These analyses indicated seismic-induced displacements that are expected to be tolerable for the current configuration up to at least the ground motion with a 0.1% annual exceedance probability (1 in 975 years), but the results indicated that large displacements and loss of tailings containment could occur in the event of the MCE. For this reason, it is important that the fixed cyclone station be used to maximize on-specification sand recovery following mill restart, with sand distributed to areas of the dam that are currently below intended grades, with the objective of enhancing seismic stability as quickly as feasible. WSP (2024a) conducted a thermal evaluation to assess whether the annual cyclone sand deposition season could be lengthened without significant risk of creating permanently frozen zones or lenses within the sand dam for the purpose of increasing sand volumes for dam construction.

Additionally, Paterson and Cooke (2023) analyzed the fixed cyclone station in combination with historical tailings properties to evaluate the achievable range of on-specification sand recovery. Based on findings from these two evaluations, TCM intends to operate the fixed cyclone station for nine months out of each year with a target sand recovery of 60% (increased from 45% for the on-dam cyclones) and an assumed availability of 85% after mill restart until the sand dam is fully constructed. WSP (2024b) carried out detailed tailings deposition modeling for this period on annual timesteps based on the updated cyclone operation criteria. The corresponding tailings deposition volumes are summarized in Table 18-1. A diagram showing the maximum-height dam cross-section at the ultimate LOM configuration, with the year-by-year sand placement sequence after mill restart also shown, is provided in Figure 18-5.

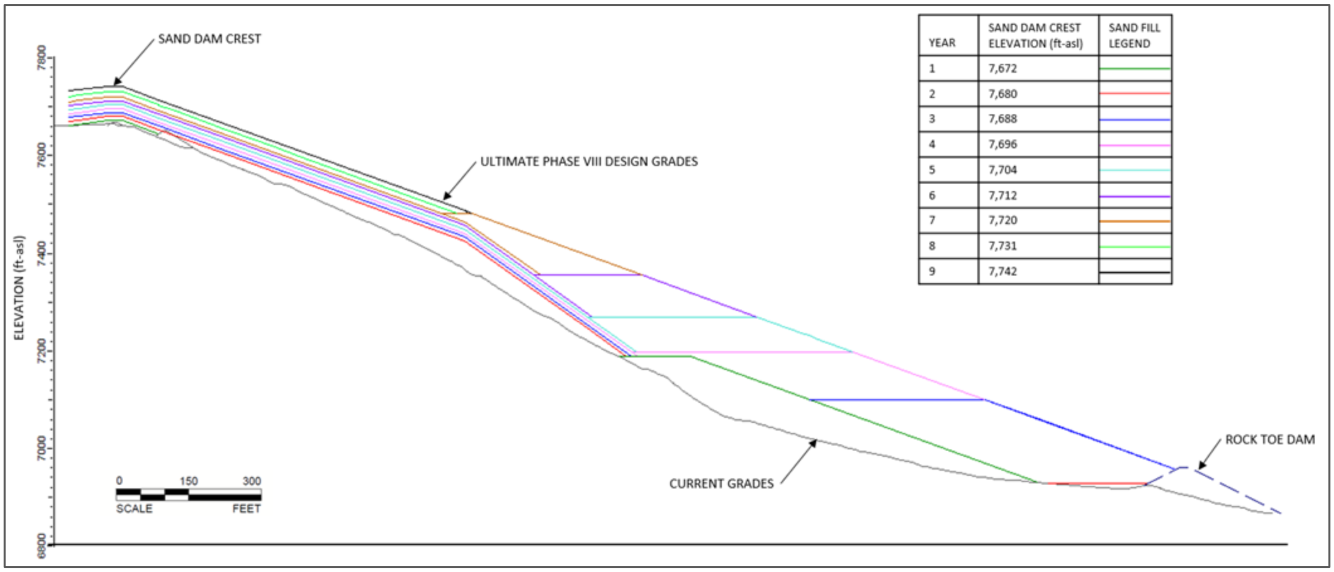
**Table 18-1 Tailings deposition and static stability FS by year**

| Year | Cyclone sand | Cyclone overflow (fines) | Whole tailings | Static FS |
|---|---|---|---|---|
| 1 | 2,621,000 tons | 1,747,000 tons | 771,000 tons | 1.7 |
| 2 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.6 |
| 3 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.6 |
| 4 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.6 |
| 5 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.9 |
| 6 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.9 |
| 7 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.8 |
| 8 | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.8 |
| 9 (Note 1) | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.8 |
| 10 (Note 1) | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | 1.8 (Note 2) |
| 11 (Note 1) | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | |
| 12 (Note 1) | 3,978,000 tons | 2,652,000 tons | 3,770,000 tons | |
| 13 (Note 1) | 1,278,000 tons | 852,000 tons | 2,881,000 tons | |

Notes:

1. Tailings produced after the design grades have been reached will be used to help reach closure grades across the impoundment surface. The tonnages shown correspond to the cyclone operation parameters used in the tailings deposition modeling. However, the cyclone system will only be operated as needed to produce sand for dam construction. Whole tailings will be deposited across the impoundment surface otherwise.
2. The sand dam geometry and seepage conditions are not projected to change materially from Year 10 through Year 13, so the indicated FS is considered to be applicable through that timeframe.

Figure 18-5 Cyclone sand placement sequence by year



As shown, sand deposition near the dam toe is prioritized in the first three years after mill restart to enhance dam stability as quickly as feasible. A change from historical sand deposition practices will be needed to deliver sand to areas lower on the dam face and to deposit it in paddocks as shown. Design work to enable tailings placement in this way is in progress. Seepage and stability analyses were conducted by WSP (2024b) for each annual timestep based on the output geometry from the deposition modeling. The results from the seepage and stability modeling indicate a static stability FS of at least 1.5 for each annual timestep, as shown in Table 18-1. Additionally, it is likely that estimated deformations from the MCE will be reduced to tolerable levels within the first three to four years after mill restart. The likelihood of experiencing the MCE or a seismic event with an annual exceedance probability greater than 0.1% (1 in 975 years) at the site during the anticipated remaining duration of the temporary shutdown or during the first three to four years after mill restart is low.

As reported in the latest site visit report by the Engineer of Record (WSP USA Inc., 2023), the tailings dam appears to be in good condition overall. No features indicative of seepage through the dam face were observed. The dam crest and tailings beach upstream of the dam crest were observed to be in good condition, and the impoundment pool was located well away from the sand dam. The vertical support members and associated jacking system for the tailings header pipeline appeared to be in fair condition. It was observed that the tailings header pipeline and sand delivery pipeline across the dam crest will require some rehabilitation prior to Phase VIII restart. Discharge from the tailings dam subdrains through the main weir structures below the rock toe dam appeared clear. The ancillary facilities appeared to be in satisfactory condition and were functioning as intended.

Monitoring of piezometric conditions in the sand dam is conducted using a network of 14 vibrating wire transducers installed in standpipe piezometers that are distributed across the sand dam and penetrate to the base of the cyclone sand deposit. Piezometric monitoring during operation and during the current temporary shutdown has indicated satisfactory performance of the subdrain system and embankment. Monitoring of the TSF also includes routine measurement of seepage flow rates and turbidity, routine measurement of impoundment pool elevation, routine measurement of meteorological and snowpack conditions, daily visual observation by qualified site personnel, semi-annual visual inspection by the Engineer of Record, and annual visual inspection by IDWR. Installation of additional piezometers (preliminarily 10–15), slope inclinometers (preliminary 1–3), and thermistor arrays (preliminarily 3–5) is recommended to augment the current monitoring infrastructure in preparation for mill restart. It is expected that the number and locations of additional instruments will be finalized later in 2024.

### 18.2.6 TSF Construction Tasks for Phase VIII Expansion

**Tasks Required Before Mill Restart**

Several construction activities remain to be completed before mill restart:

- Implement improvements to the fixed cyclone station and tailings delivery system that will enable on-specification sand recovery of 60% and tailings placement in the zones shown in Figure 18-5.
- Remove the existing tailings overflow ponds, decommission the existing decant pipeline to the sediment interceptor pond, and construct new tailings overflow ponds and a new decant pipeline.
- Re-establish the pyrite circuit in the mill that was removed during the current temporary shutdown. This system is important for reducing the potential for subdrain system clogging.
- Remove the existing sediment interceptor pond, decommission the existing decant pipeline to the seepage return pond, and construct a new sediment interceptor pond and decant pipeline.
- Install a new upper right abutment subdrain system and drain pipeline.
- Install a new lower right abutment subdrain along the dam groin.
- Raise the rock-toe dam with associated subdrain system modifications to provide for containment of tailings at the toe of the dam while allowing continued use of the seepage return pond.
- Install new piezometers, slope inclinometers, and thermistor arrays for enhanced performance monitoring after mill restart.

**Tasks After Mill Restart**

The following tasks are to be completed after restart of the mill and before Phase VIII completion:

- Clear and grub the Phase VIII sand dam footprint.
- Remove and stockpile topsoil from the Phase VIII sand dam footprint.
- Incrementally raise the sand dam crest and build the dam face using cyclone underflow tailings.
- Recover from the existing cycloned sand deficit and restore the sand dam out-slope to the extent possible.
- Install new piezometers in the sand dam.
- Construct a retaining structure to maintain a minimum 10 ft horizontal separation between the sand dam toe and the tailings hut.
- Plan for timely initiation of tailings surface grade reversal in anticipation of closure at the end of Phase VIII mining and milling operations (Doughty, 2017).

TCM anticipates that following mill restart, the fixed cyclone station and associated sand tailings delivery pipelines will quickly become the primary means of producing and delivering sand tailings to the dam crest and face. The expected increase in sand recovery will allow TCM to continue dam building as needed, but also focus on distributing more tailings sand to the areas that are the farthest below design grades. This can be enhanced by extending the cycloning season to the extent practicable. Depending on the actual sand recovery achieved during the remaining LOM, a deficit may still remain after Phase VIII operation. Any such deficit will need to be addressed through placement of suitable material to establish the design slope as part of closure.

Closure requirements for the TSF at the completion of the LOM are described in an Abandonment Plan (Golder, 2019), which has been approved by IDWR. The costs presented in the report have been updated to reflect 2023 values. The closure procedures include:

- Regrade the tailings surface during the last several years of mill operations (Doughty, 2017) as needed to reverse the impounded tailings grade and create a final surface that slopes towards the southwestern limit of the impoundment, with a basin upstream of the dam crest capable of temporarily storing the IDF and a riprap-armored channel across the final impounded tailings surface to convey flow from the upstream Bruno Creek drainage to the right abutment.
- Construct an open-channel spillway at the right abutment and riprap-armored channels downstream of the spillway to convey flows away from the TSF and back into the Bruno Creek drainage below the SRD.
- Construct benches lined with erosion-resistant material across the sand dam face to direct runoff into riprap-armored out-slope channels along the left and right dam groins.
- Install soil cover across the impoundment surface and establish vegetation.

## 18.3 Site Water Management

### 18.3.1 Introduction

Concurrent with Phase VII operations, technical studies were conducted in support of the Phase VIII Expansion Environmental Impact Statement (EIS), which was approved by the United States Environmental Protection Agency (EPA). Lorax Environmental Services Limited (Lorax) conducted technical studies assessing water quantity and water quality to inform the Phase VIII EIS and positive Record of Decision (ROD) issued by the Bureau of Land Management (BLM) in August 2016. Technical studies in support of the Phase VIII EIS included:

- Climate and Hydrology Baseline Description (Lorax, 2011a)
- Site Runoff Model and Waste Dump Catchment Water Balance (Lorax, 2011b)
- Pat Hughes Waste Dump Geochemical Characterization and Drainage Water Quality Prediction (Lorax, 2011c)
- Buckskin Waste Dump Geochemical Characterization and Drainage Water Quality Predictions (Lorax, 2011d)

- Water Resources Baseline Description (Lorax, 2011e)
- Tailings Drainage Chemistry and Embankment Sands Seepage Estimate (Lorax, 2011f)
- Regional Groundwater Assessment (Lorax, 2011g)
- Pit Lake Modeling and Water Quality Predictions (Lorax, 2011h)
- Hydrogeological Assessment of Mine Drainages (Lorax, 2011i)
- Geochemical Source Term Methodology and Approach Summary (Lorax, 2012a)
- Groundwater Flux Estimates; Approach and Methodology (Lorax, 2012b)
- Water Management Plan (Lorax, 2012c).

A site-wide water balance model (WBM) was developed to inform mine restart decision-making, specifically to inform pit dewatering strategies in support of a prefeasibility study (Lorax, 2022). The WBM update was informed by previous work conducted in support of the EIS, including the tailings impoundment water balance which defined water quantities associated with tailings deposition, mill reclaim, and dam seepage (ANDEK, 2011).

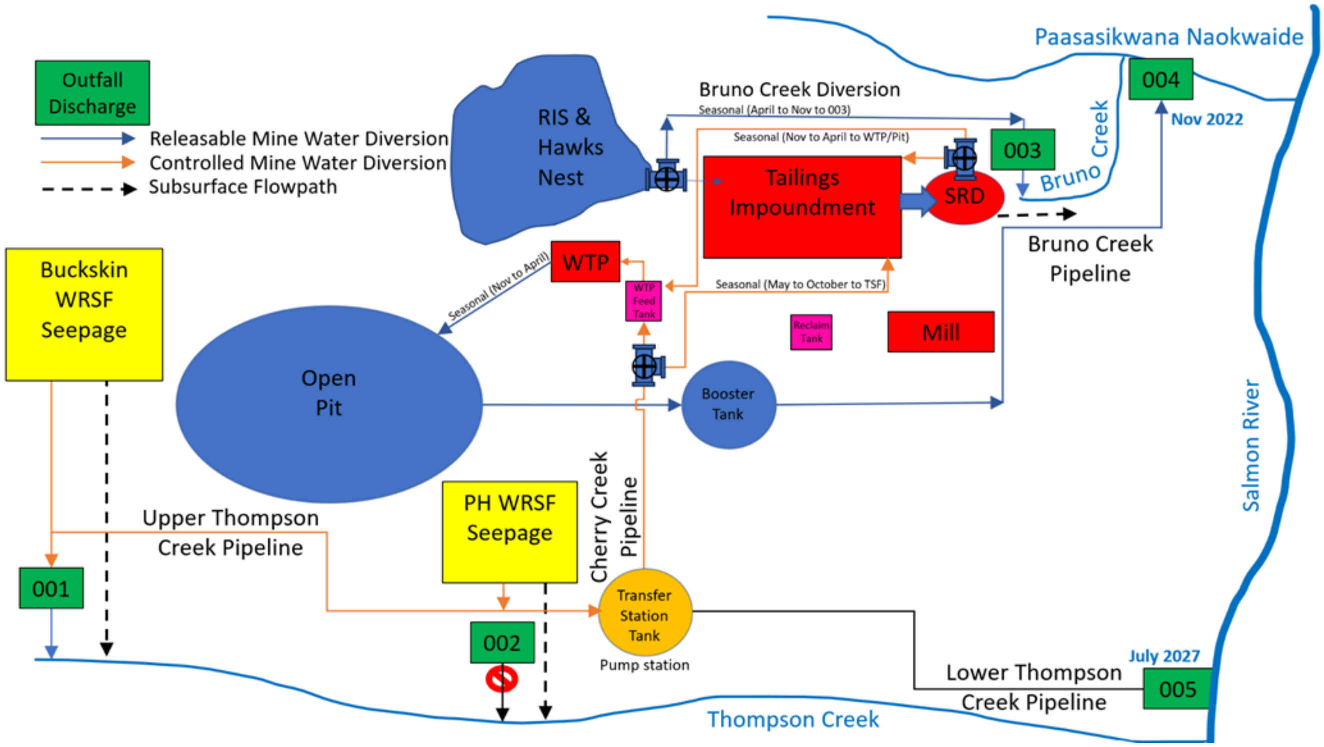
Lorax has conducted a water quality and water quantity assessment in support of the project feasibility study. Following this introduction, background information sources, approach, results, and a summary of uncertainties to be addressed as the project advances through detailed design are presented below.

Water quality metrics herein are expressed in metric to conform with industry standards for the sector.

### 18.3.2 Background and Information Sources

The project includes mine impacted drainages as well as receiving environment watersheds, namely Thompson Creek and Paasasikwana Naokwaide, which flow into the Salmon River (Figure 18-6). Mine impacted drainages include Buckskin Creek, Pat Hughes Creek, and Bruno Creek. Buckskin and Pat Hughes creeks are tributaries of Thompson Creek and are adjacent to the open pit, each containing separate WRSFs. The TSF is within Upper Bruno Creek, which flows to Paasasikwana Naokwaide and the Salmon River.

**Figure 18-6 Water management layout schematic (pit dewatering phase)**



The Project is authorized to discharge water from the mine to the receiving environment as per approved IPDES permits. Discharge is authorized to Thompson Creek at Outfall 001 (Buckskin WRSF), Outfall 002 (Pat Hughes WRSF), Bruno Creek at Outfall 003 (TSF clean water diversions), Paasasikwana Naokwaide at Outfall 004 (pit water), and the Salmon River at Outfall 005 (pit water) in accordance with permit conditions. Based on the permit conditions, the water quality is not suitable to discharge at Outfall 002. Additional infrastructure will be required to support discharge to the Salmon River at Outfall 005.

The open pit is the central water management feature for the Project during the current care and maintenance period and includes inputs from runoff, direct precipitation, groundwater inflow, diverted seepage from the Buckskin and Pat Hughes WRSFs, and seepage from the TSF dam via the SRD. Dewatering of the open pit by discharging water to the permitted discharges will be required to facilitate mining restart.

Water quality and water quantity screening was conducted to inform the approach for evaluating Project effects on water quality, water quantity, and water management consistent with the Phase VIII EIS.

### 18.3.3 Water Quality

A water quality assessment was conducted, including source term validation of estimated water quality from mine waste sources, a screening of the flooded open pit water quality to approved discharge standards, and a performance review of groundwater quality and receiving environment water quality. Findings from the water quality assessment are summarized as follows:

- Source terms developed for the Phase VIII EIS were intended to estimate long-term drainage chemistry. Validation of these source terms using the last 10 years of monitoring data confirms that these source terms remain an accurate or conservative representation of water quality from these facilities.
    - Buckskin WRSF source terms conservatively represent drainage quality from this facility.
    - Pat Hughes WRSF Base Case source terms accurately reflect typical (median) concentrations, and the Upper Case source terms reflect maximum or 90th percentile concentrations.
    - TSF source terms capture the range of chemistry that is typically observed in TSF drainage, except for D-Fe and D-Mo, which are underestimated. Elevated concentrations of these parameters may reflect anoxic seepage chemistry, with concentrations expected to decline during aeration which would occur during water management.
- Water quality samples collected throughout the water column of the flooded pit in June 2019, July 2020, and November 2022 were screened against approved discharge limits and applicable water quality guidelines. Maximum observed concentrations are well below approved discharge limits and demonstrate the water is suitable for discharge to the 004 and 005 outfalls.
- Groundwater monitoring data from monitoring wells downgradient of seepage collection systems for the Buckskin and Pat Hughes WRSFs and seepage return dam (SRD) for the TSF were reviewed through November 2023. Key outcomes of this review are summarized below:
    - Seepage collection and containment systems below the Pat Hughes WRSF are required to prevent seepage from the WRSF from infiltrating conductive colluvium in the lower part of the drainage.
    - Although Buckskin WRSF seepage currently meets permit limits which allow for seasonal discharge to Thompson Creek, a groundwater seepage cutoff wall was installed at the base of the Buckskin WRSF as a preventative measure.
    - Consistent with best management practices for source control, existing seepage collection systems and associated groundwater cutoff walls should be maintained through the proposed Project to minimize contaminant loadings to Thompson Creek via groundwater pathways. Additional seepage control measures are proposed for the Project, consistent with the Phase VIII expansion and EIS.
    - Seepage from the TSF is managed through a range of containment measures including a French drainage collection system beneath the TSF dam, a lined

seepage return dam and pond, and a seepage groundwater collection and pump back system located below the SRD. No discernable trends in Bruno Creek surface water quality or groundwater quality have been observed in the monitoring well located downgradient of the SRD, demonstrating their effectiveness.

- Receiving environment water quality monitoring data from stations down-gradient of the Project including Thompson Creek, Paasasikwana Naokwaide, and Salmon River were screened against applicable water quality guidelines. The results of this review demonstrate the performance of existing water management systems that are in place for the Project are protective of the receiving environment.

### 18.3.4 Climate and Hydrology

Representative climate and streamflow inputs to the WBM are built upon previous work conducted in support of the Phase VIII EIS. The climate and hydrology data set was compiled from regional and local data sources and spans a 23-year period of record (1987 through 2009). Since an additional 14 years of data are now available, an assessment was performed to determine if there have been significant shifts in the regional climate and streamflow regime that could translate to additional uncertainty in the predictive model outputs. The assessment compared air temperature, precipitation, snowpack, and streamflow records between the recent data and the 1987 through 2009 referenced period. The assessment concluded with a recommendation to update the climate and streamflow inputs for future studies; however, an update to the model climate input series was not deemed necessary.

### 18.3.5 Mine Plan

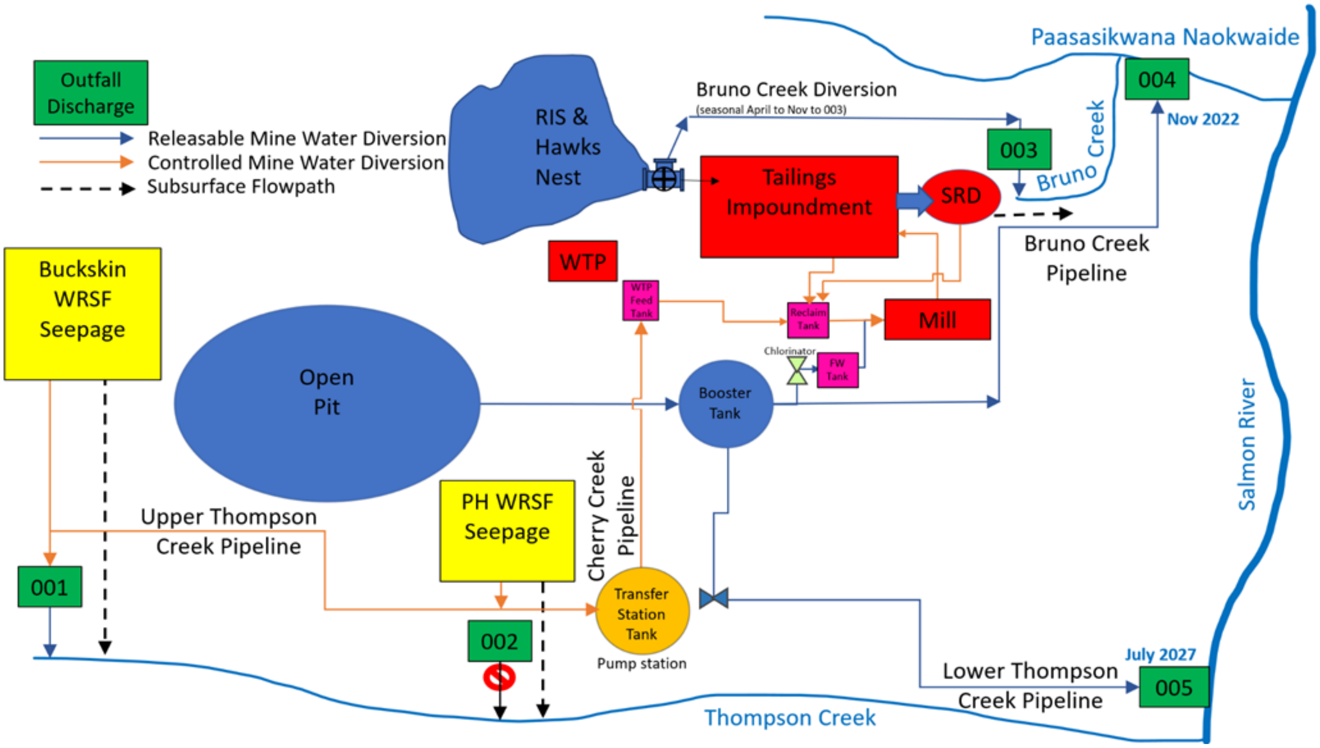
The mine plan for the Project is the key driver of potential effects on water quality and quantity. The mine plan for the feasibility study was developed to align with the Phase VIII EIS. As such, the water management systems that are currently in place and proposed for Phase VIII are applicable to and consistent with the Project. Specifically, the water management infrastructure and general strategy for water management during operations through closure remains valid. One exception concerns management of the currently flooded pit. The dewatering and supporting water management strategy is a key component of the Project and a focus of this assessment.

The WBM is coded with the open pit development and milling schedule corresponding to the Phase VIII mine plan. Key to the WBM, milling is planned to commence in July 2027 at an average rate of 28,500 tons per day and extend through November 2038. Pit development is planned to take place such that the south highwall is developed below elevation 6,360 ft, the current base of the pit, by the end of 2031. This schedule defines the key driver for dewatering the pit.

### 18.3.6 Site Wide Water Balance

A site wide WBM was constructed to inform water management requirements for the Project. The WBM includes flows from surrounding catchment areas that cover approximately 410 square miles including Thompson Creek, Bruno Creek, Paasasikwana Naokwaide, and the Salmon River. The WBM includes Project specific facilities and their respective catchments including the open pit, Buckskin and Pat Hughes WRSFs, TSF impoundment, and associated water management infrastructure including the mill, SRD pond, and WTP, and discharge outfalls consistent with approved IPDES permits for site discharges. Key model connections are illustrated for the pit dewatering phase (Figure 18-6) and post-dewatering phase (Figure 18-7). A

Figure 18-7 Water management layout schematic – operations phase



The WBM incorporates a daily time-step and relies upon the 23-year historical climate and streamflow record consistent with the Phase VIII EIS. The model is run for 23 realizations, iteratively cycling through the historical daily climate and streamflow inputs. The approach generates an ensemble of model outputs, from which descriptive statistics such as, 5th percentile, median, and 95th percentile, are reported.

Groundwater inflows to the pit in the WBM are informed by numerical groundwater modelling and have been updated for the FS with specific simulations to estimate groundwater inflows to the flooded pit during dewatering. Inflows for the life of mine pit were also estimated to inform the operational water balance and timing of pit flooding.

The WBM evaluated four periods to inform mine water management decision-making and design:

- Dewatering of the flooded pit, simulation period 2023 to 2031: maximize discharge and evaluate the timing of pit dewatering, bench access, mill startup (2027), and progressive ore release.
- Early Operations, post-pit dewatering, simulation period 2032 to 2033: evaluate water demand, storage, and discharge requirements for early operations following pit dewatering.

- EOM Operations, post-pit dewatering, simulation period 2034 to 2038: evaluate water demand, storage, and discharge requirements for EOM operations.
- Post-Closure pit flooding, simulation period 2038 to 2126: evaluate duration required for pit to fill with water to a final managed water elevation of 7,030 ft amsl.

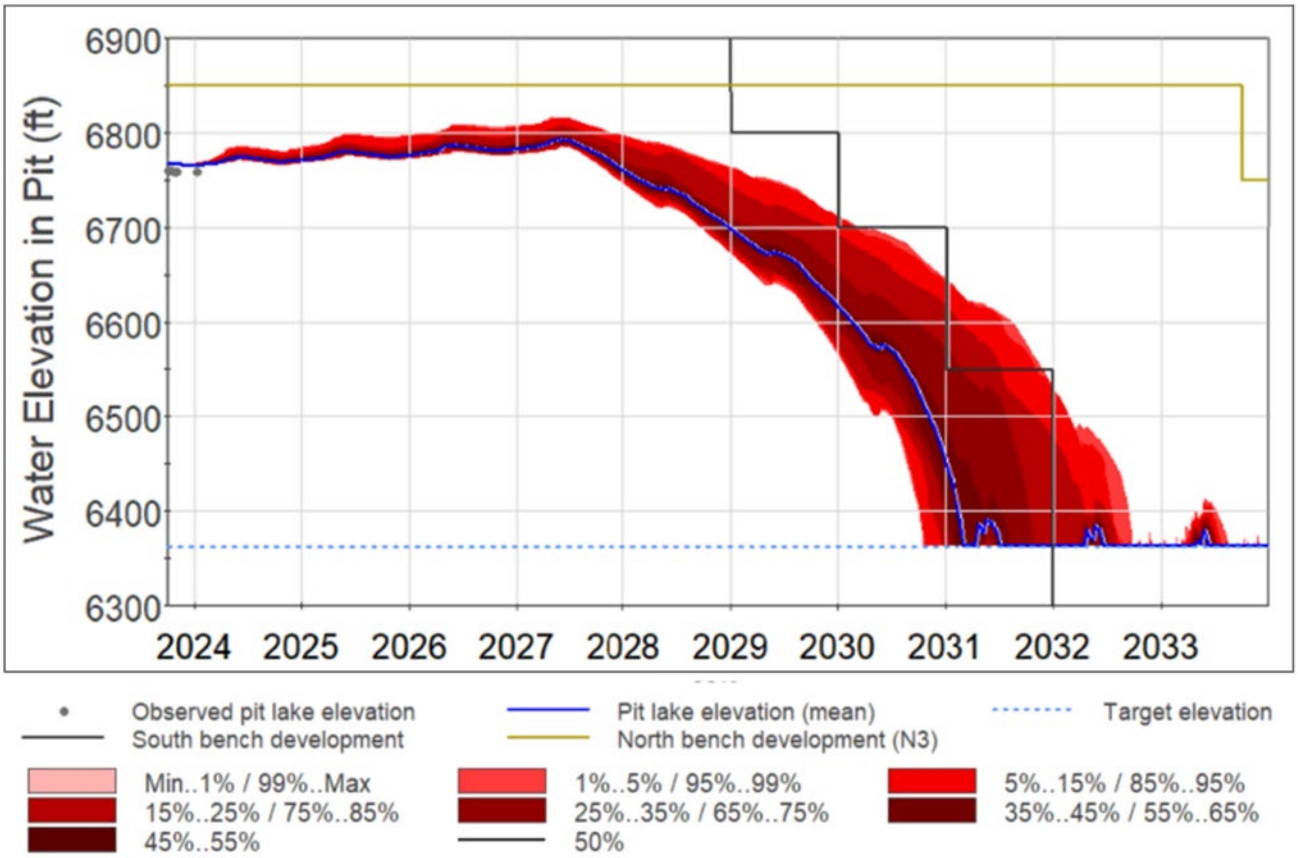
### Water Management

Base Case water balance model results are summarized below for the four periods or mine phases: Period 1 – Pit Dewatering; Period 2 – Early Operations; Period 3 – EOM Operations; and Period 4 – Post-Closure, pit flooding.

#### *Period 1 – Pit Dewatering*

Period 1 scenario prioritized pit dewatering to inform bench development and ore release leading up to mill operation, which is the primary demand for water consumption, and continuing until the pit is dewatered. Base Case results indicate that the water elevation in the pit will require approximately 3 to 5 years of dewatering following the start of milling, 2027, to be drawn down to the current base of the pit. 5th and 95th percentile results from 23 model realizations are shown in Figure 18-8. At the upper end, this duration could impact mining operations if additional capacity to dewater the pit were not enacted (e.g., increasing the discharge capacity out Outfall 004 or 005, initiating discharge via 005 prior to 2027). The likelihood of this outcome is considered low because of the conservatism built into the WBM inflow assumptions such as, overestimation of modelled pit inflows based on a comparison of simulated versus measured pit water levels. The WBM assumed a target dewatering elevation of 6,364 ft amsl. Based on the volume-elevation curve for current pit conditions, approximately 1 million ft3 of residual pit water is stored in the pit sump following dewatering.

**Figure 18-8 WBM Period 1 results – Base Case pit dewatering schedule**

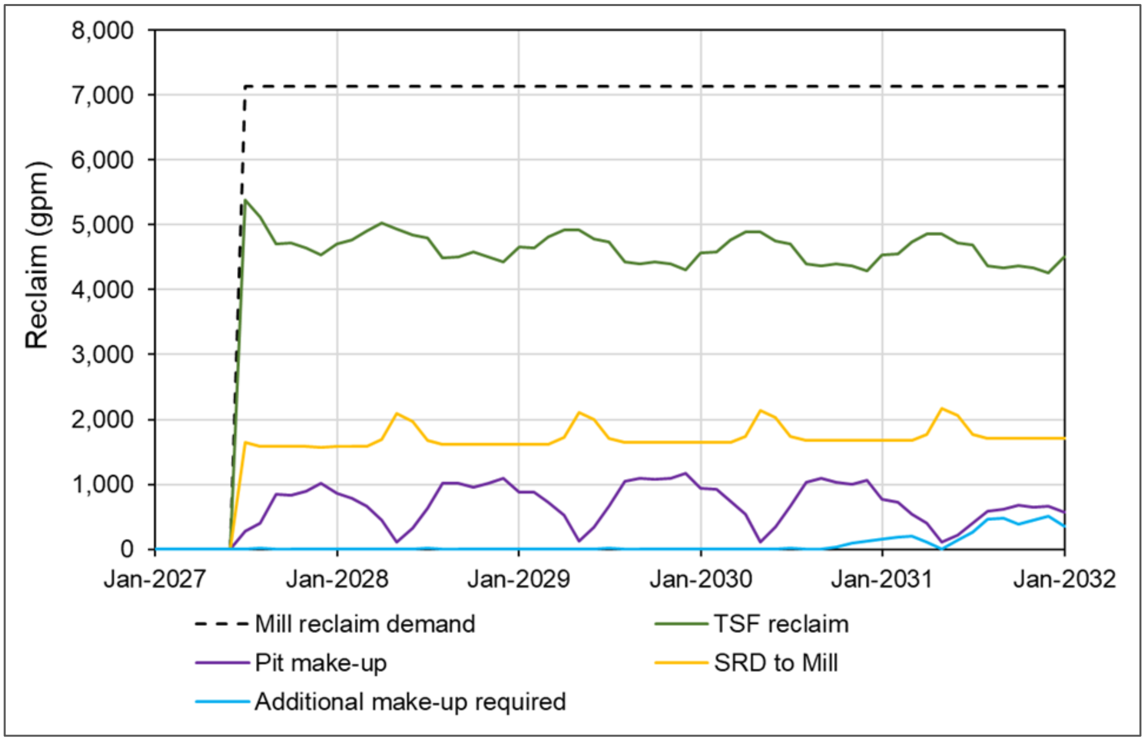


Period 1 results incorporate discharge to Outfall 004, up to 800 gpm, beginning November 2022. Following milling restart, simulated discharge includes an average 730 gpm make-up water for milling and discharge to Outfall 005 up to 1,000 gpm. Capacity limitations for Outfall 005 were provided by Centerra. Specific infrastructure design details to support 005 discharge, including the construction of a second Cherry Creek Pipeline, conveyance to the Thompson Creek Pipeline, and associated upgrades to the existing 005 outfall and Salmon River diffusor will be further developed as the Project advances.

### *Period 2 – Early Operations*

Period 2 evaluates water demand and storage during mill operation after the pit has been dewatered for the early stages of mine life for the existing pit shell and tailings storage facility. Mill reclaim demands are typically met by on-site water sources (Figure 18-9). Additional periodic make-up requirements from the Salmon River are approximately 400 gpm consistent with historical operations.

**Figure 18-9 WBM Period 2 results – Base Case mill reclaim and make-up water sources**



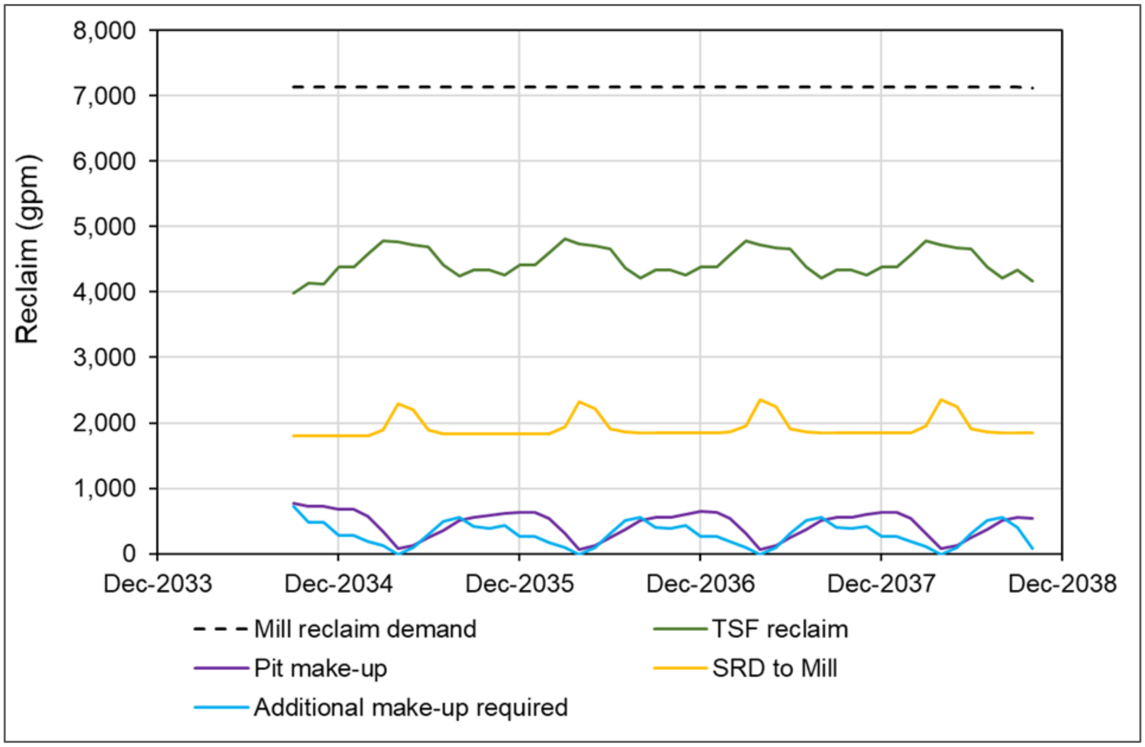
Period 2 model results are sensitive to variable climate and uncertainty with respect to groundwater inflows to the pit. For water surplus conditions, the water balance indicates that water will accumulate in the pit during spring runoff, consistent with previous operations. Noting the timing of these events coincides with spring runoff, the development of pit bottom advancements should be timed accordingly.

Excess water that seasonally accumulates in the pit will normally be consumed by mill operations over time, consistent with previous operations. During these periodic events mill make-up water demands would be met by withdrawals from the pit and would negate additional make-up water demands. Opportunities to manage the excess water include discharging treated water via Outfalls 004 and 005 and using the TSF for temporary water storage.

### *Period 3 -EOM Operations*

Period 3 evaluates water demand and storage during mill operation after the pit has been dewatered for the LOM pit shell and TSF. The LOM mine plan evaluated for this period corresponds to the end of mine development for the Phase VIII mine plan. The WBM includes groundwater fluxes from the updated numerical groundwater model and reflect simulated inflows to the pit with a base of 6,100 ft amsl. Simulated groundwater fluxes are higher than inputs used in the Phase VIII EIS and were applied to be conservative with regards to managing potential excess water in the pit during operations. Consistent with Period 2 results, mill reclaim demands are typically met by on-site water sources (Figure 18-10). Periodic additional make-up requirements from the Salmon River are on average approximately 300 gpm and peak at 600 gpm. Increased TSF seepage to the SRD is estimated to reach 1,970 gpm due to the higher TSF pond elevation and reduces reclaim and make-up water demands from other sources.

**Figure 18-10 WBM Period 3 results – Base Case mill reclaim and make-up water sources**



As per Period 2, the water balance is sensitive to variability in climate and groundwater inflows to the pit. For water surplus conditions, excess water that cannot be managed through infrastructure limitations on permitted discharges (e.g., 004 and 005) may require temporary storage in the pit, which could impact the timing for ore extraction from the base of the pit. Median WBM results suggest that annually between April and August, discharge via Outfalls 004 and 005 is required to shed excess water that accumulates in the pit. It is assumed that this excess water is sent through the WTP prior to discharge. During freshet, approximately 3.6 million ft3 of water accumulates in the pit (median result of 23 model realisations) for the model assumptions on inflows to the pit. Management opportunities for this potential outcome should be assessed further as the Project is advanced and throughout operations and may be mitigated through other means of water storage, water management, and/or ore stockpiling. As stated previously, opportunities to manage excess water include discharging treated water via Outfall 004 and 005, using the TSF for temporary water storage, and by stockpiling ore prior to freshet to limit mining activities during freshet yet maintain plant operation.

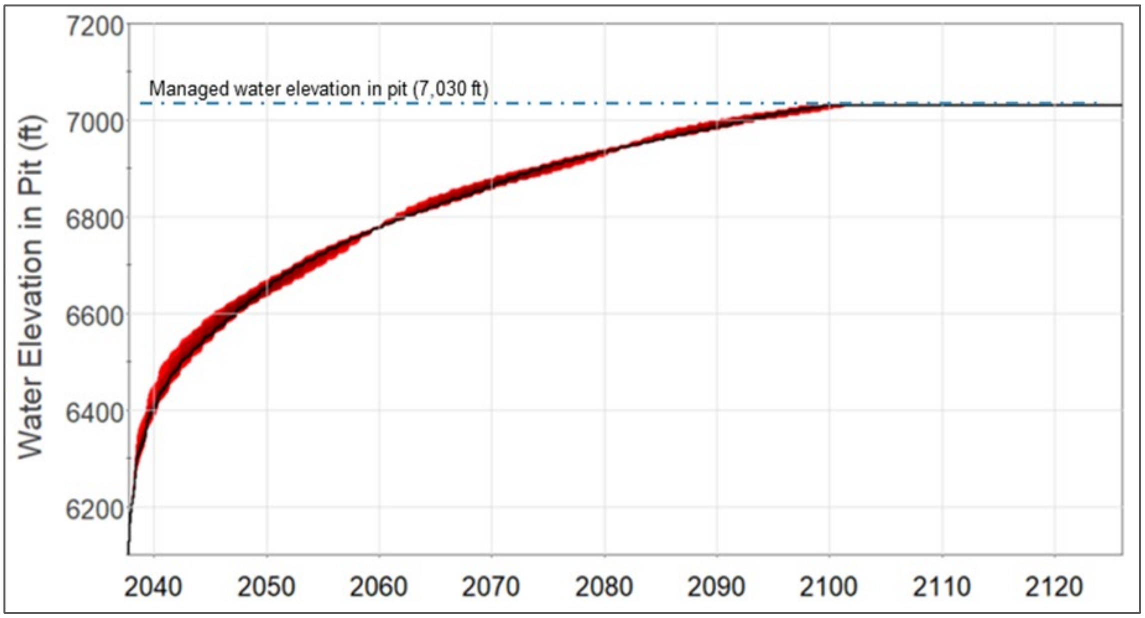
### *Peroid 4 – Post-closure Pit Filling*

The post-closure pit flooding scenario assumes that the final managed water elevation in the pit will be 7,030 ft amsl to prevent water from discharging through the historical adit in the pit high wall at 7,040 ft amsl. Up to the managed water elevation, the storage volume in the EOM pit, corresponding to the Phase VIII mine plan, is approximately 3,570 million ft$^3$.

Groundwater flux into the pit for the post-closure scenario relies upon fluxes derived from groundwater modelling. Post-closure, seepage collected at the toe of the Buckskin and Pat Hughes WRSFs is assumed to be routed through the pit via the WTP and not discharge via Outfall 001 or 002. In addition, the WBM conservatively assumes reclaim from the SRD is not pumped back to the pit during period 4.

Post-closure scenario model results indicate that the median duration for the pit to flood to the final managed elevation of 7,030 ft amsl is on the order of 60 years (2038 to ~2100). The time to fill is in line with 2011 model estimates of 70 years for the Phase VIII pit (3,772 million ft3). Consistent with the Phase VIII EIS, the updated groundwater model identifies the potential for groundwater seepage from the flooded pit to discharge to Thompson Creek. Although estimated discharge rates are low (~100 gpm), the potential for this to occur emphasizes the importance of sending mine water through the WTP prior to discharge to the pit to maintain flooded pit water quality consistent with previous operations.

**Figure 18-11 WBM Period 4 results – Base Case post-closure pit flooding (7,030 ft-asl)**



# 19 MARKET STUDIES AND CONTRACTS

## 19.1 Products

A primary molybdenum deposit, the TCM has produced molybdenite concentrates in seven phases dating back to 1983. The Phase VIII mine plan is expected to produce a similar concentrate that is also of exceptionally high quality relative to the molybdenite concentrates produced as a co-product at copper mines. For typical market uses, the TCM concentrate requires no additional cleaning processes (such as leaching) and there are no impurities that would attract a penalty or price discount. The TCM concentrate typically contains over 55% molybdenum and can be shipped to and processed at the wholly owned roasting facility at Langeloth, Pennsylvania or sold to a third-party roasting facility.

## 19.2 Contracts

Molybdenite concentrates are sold globally by producing mines under both contract and spot terms. Pricing for contract arrangements is typically determined by reference to specified published prices during the applicable quotation periods, less any discounts in line with industry standards depending on the quality of the concentrate. No contractual commercial or agency arrangements for TCM molybdenite concentrates are in place currently.

TCM also assumes it will resume production of HPM, a product that was historically produced at TCM. Currently, no contracts exist for the sale of HPM.

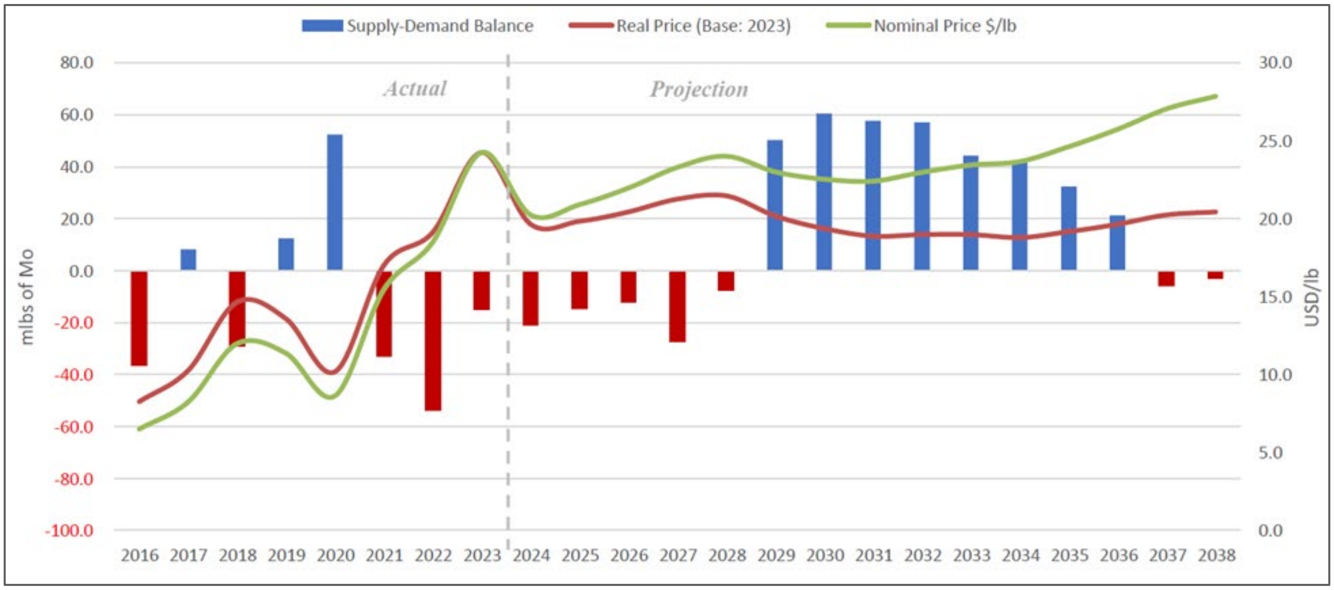
## 19.3 Market Studies and Commodity Price Projections

The standard molybdenum price is based on contained molybdenum in molybdenum oxide product suitable for metallurgical markets, with reference made to a published reference price. The molybdenum market is more opaque than other metals such as gold and copper, with very few banks and firms forecasting long-term molybdenum prices. TCM commissions work from the CPM Group on an ongoing basis for an independent Molybdenum Market Outlook and an in-depth overview on supply and demand for the metal. The most recent CPM Group projection of market balance and long-term pricing is noted in Figure 19-1.

The CPM Group forecasts real molybdenum prices to average about US$20/lb from the expected start date of TCM production onwards. Current published spot molybdenum prices are approximately US$20/lb. For the purposes of project economics, a molybdenum price of US$20/lb has been assumed for all years.

CPM Group and others note that global molybdenum supply is and will continue to be in deficit to global demand, supporting near-term strong price forecasts. Per CPM Group, the most critical factors influencing the supply-demand balance in the coming years is the decline of production in Chile, with its impact on the molybdenum market expected to be far greater than the impact of slowing steel production, countered by the apparent ability of Chinese primary molybdenum mines to react quickly to favorable market conditions (though China remains a net importer overall, even at US$20 market pricing). CPM Group conservatively forecasts in Figure 19-1 that mine expansions and new projects nearing production (including the TCM) will shift the market to surplus if all the forecasted projects meet their estimated timelines.

**Figure 19-1 CPM Group's projection of market balance and long-term pricing**



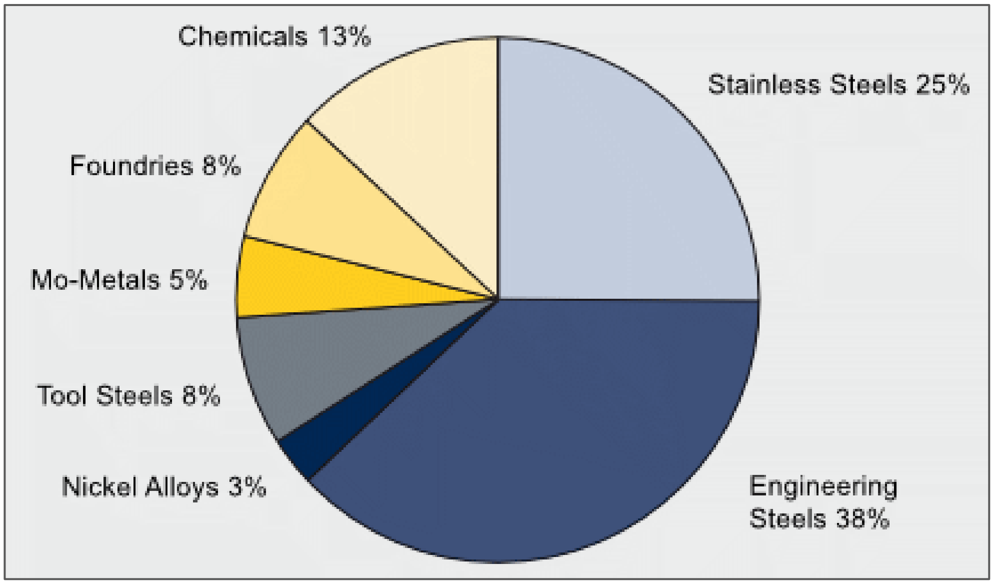
About 75% of worldwide molybdenum supply is produced as a by-product of copper mining. Fluctuations in copper mining can result in molybdenum supply being disconnected from molybdenum demand in the market, and thus can cause significant price volatility.

Molybdenum supply can fluctuate widely due to changes in major factors such as Chinese production and import/export decisions, Chilean declining ore grades, geopolitical risks, and the timing of development of new mines. Outside of China, there are only two primary molybdenum mines currently in production and, except for Thompson Creek, the cost to bring other primary molybdenum deposits into production supply is very significant, in most cases in the range of US$1 billion or more.

Molybdenum demand can fluctuate widely as well, due to changes in major molybdenum markets such as oil and gas, construction, and others. Demand for molybdenum from steel production is projected to grow slowly in future years and any increase in growth rates will only exacerbate the molybdenum deficit. Market demand fluctuations may arise from, for example, a reversal of the current slowdown in the Chinese economy and/or an end to the Russian-Ukraine war. Also, re-tooling of the oil and gas infrastructure to bring new sources of energy supply into Europe would be an important driver of molybdenum demand. As another demand driver example, green technologies, especially wind, geothermal and the emerging hydrogen energy segment, are reliant on molybdenum for its strength and anti-corrosion properties.

Global molybdenum usage is outlined in Figure 19-2, provided by the International Molybdenum Association (IMOA) Molybdenum Market Information (imoa.info).

Figure 19-2 Global molybdenum usage



# 20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL, OR COMMUNITY, IMPACT

## 20.1 Existing Conditions

The TCM is located within the mountainous terrain of Custer County, south central Idaho, bounded by Thompson Creek to the west and south and Paasasikwana Naokwaide to the east. Steep mountainous terrain bounds the project area to the north and divides the Thompson and Paasasikwana Naokwaide drainages. Thompson and Paasasikwana Naokwaide flow into the Salmon River approximately four miles south of the Project.

The TCM facilities include an open pit, TSF, two WRSFs, a mill/concentrator, a water treatment plant, and ancillary facilities. The mine pit is located at an elevation of approximately 8,000 ft-amsl on a ridge between Buckskin Creek and Pat Hughes Creek in the Thompson Creek watershed. The TSF is located to the east of the mine in the Bruno Creek drainage, which is tributary to Paasasikwana Naokwaide. The mill is on a saddle between the Thompson Creek and Paasasikwana Naokwaide drainages.

The mine previously operated under a Plan of Operations which detailed activities through the end of the Phase VII extraction. At the completion of Phase VII, the cumulative surface disturbance of the mine was 2,191 acres on private land, 451 acres on land administered by the BLM, and 181 acres administered by the USFS. Since December 2014, the mine has operated on care and maintenance, except for slow stripping of Phase VIII overburden on private property, which ceased in August 2015. The mill continued to treat molybdenum concentrates purchased from other mines until August 2022. This included impurity removal and production of HPM.

The site has undergone no significant change to the area of disturbance since 2015. A Modified Mine Plan of Operations consistent with the ROD (BLM 2015) (MMPO), was accepted in early 2022 which detailed the Phase VIII operations: expansion of the open pit, and expansion of the WRSFs and TSF. The additional surface disturbance from Phase VIII will be on approximately 110 acres of private land, 200 acres of BLM-administered land, and 185 acres of USFS land. The Phase VIII Reclamation Plan and Cost Estimate was accepted in May 2023, allowing initiation of Phase 8 early works activities in November 2023. In December 2023, TCM submitted a MMPO for the Thompson Creek Phase VIII Mine Plan of Operations to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback subject to a minor update to the reclamation plan.

## 20.2 Project Permitting

Site operations are overseen by four government agencies, who are members of the Interagency Task Force (IATF), that hold bonds for closure of various operational areas:

- The Idaho Department of Lands (IDL) regulates mining operations and reclamation standards and holds the reclamation bond for mine operations on privately owned lands (majority of the site).
- The Idaho Department of Water Resources (IDWR) regulates the tailing dam and holds the closure bond for the single tailing dam on site. IDWR also authorizes water rights.

- BLM and USFS who oversee mining and hold bonds for federal lands.

In addition, the US Army Corps of Engineers has authority to issue 404 permits for discharge of dredged or fill materials into waters of the US under the Clean Water Act, and Idaho Department of Environmental Quality (IDEQ) is responsible for certifying that activities that may result in discharges into waters within Idaho will comply with the applicable provisions of the Clean Water Act and State Water Quality Standards. Other permits of note are the Conditional Use Permit for Solid Waste Management Site approval from the District Seven Health Department and the Stream Channel Alteration Permit and Dam Impoundment Plan approval from the IDWR.

TCM operates under the following permits, licenses, and limits.

### 20.2.1 Plan of Operation Permit

In approximately 2011, TCM submitted an Amended Plan of Operation which presented multiple alternatives for Phase VIII mining that would expand the area of the WRSFs and TSF and extend the life of the mine for eight years (Pioneer, 2017). An EIS was developed by the BLM and the USFS, with support from the IDWR and IDL, to evaluate the environmental impacts for each of the proposed alternatives (BLM, 2015). Final RODs for the mine expansion were approved on August 11, 2016, by the BLM (BLM, 2017) and USFS (USFS, 2017) for portions of the MMPO under jurisdiction of these federal agencies, which included 19 terms and conditions to be met prior to final approval of the MMPO. The Phase VIII expansion was considered conditionally approved at that time pending completion of the conditions, and resubmission of the MMPO.

TCM submitted the MMPO to Federal agencies in September 2021 which was evaluated and subsequently accepted by the BLM and USFS (February 28, 2022, and March 7, 2022, respectively) as a Minor Modification to the approved Plan of Operation. The MMPO contains details for mineral extraction during the final phase of mining, presents the means and methods for expanding the area of the WRSFs and TSF and extends the life of the mine for Phase VIII.

In December 2023, TCM submitted a MMPO for the Thompson Creek Phase VIII Mine Plan of Operations to include additional acreage for the pit highwall layback. In July 2024 TCM received approval for the pit highwall layback subject to a minor update to the reclamation plan. TCM intends to submit an updated Phase VIII Mine Plan of Operations following the completion of the LOM plan. An initial internal environmental effects assessment has been completed for the current LOM plan and concluded no significant environmental impacts are expected to occur. All permit change requests will be performed in collaboration with the IATF.

### 20.2.2 Water Rights

Industrial water rights for TCM operations are authorized by IDWR under the following water right numbers:

- 72-7573 – Buckskin Creek, Pat Hughes Creek, Salmon River, Spring (20.89 cfs)
- 72-16728 – Bruno Creek (9.62 cfs)
- 72-7414 – Groundwater (1.11 cfs)

- 72-7257 – Groundwater, Surface Water Runoff (1.5 cfs)
- 72-7193 – Groundwater (3.17 cfs).

Water rights are also authorized for various domestic, irrigation, and stock water uses by TCM. No new water rights are required for the Phase VIII mine plan.

### 20.2.3 Clean Water Act Section 404 Permit

The discharge of fill materials into jurisdictional waters or wetlands is regulated in accordance with The Clean Water Act Section 404 permit. The US Army Corps of Engineers issued a 404 Permit (NWW-2008-579) which authorizes Phase VIII of the mining operations. The following work is authorized under the permit:

- Bruno Creek, West Fork Bruno and two unnamed tributaries to Bruno Creek:
  - Discharge 520.2 $yd^3$ of tailings slurry and fill into 3,215 linear feet (0.29 acre) of stream channel including a small 0.026 acre in-channel pond.
  - Fill 0.21 acre of wetlands (0.201 acre forested; 0.007 acre emergent) to expand the existing tailings pond and reclaim at end of mine life.
- Mill Creek:
  - Discharge 511.8 $yd^3$ of fill material into 4,307 linear feet of stream channel (0.29 acre) of emergent wetlands to expand the existing tailings pond and reclaim at end of mine life.
- Pat Hughes Creek:
  - Discharge 457.6 $yd^3$ of rockfill material into 3,029 linear feet of stream channel (0.27 acre) and 0.26 acre of emergent wetlands to expand the existing rock waste dump.
- Paasasikwana Naokwaide:
  - Discharge 5 $yd^3$ of dirt fill and fiber rolls along 100 linear feet of the left descending bank to repair bank damaged by erosion. This work is part of the mitigation proposed to compensate for project impacts related to the expansion of the mine and reclamation activities associated with the tailing pond upon closure.

Approximately 3.39 acres of wetlands and 10,641 linear feet of stream channels were identified within the proposed expansion area (HDR, 2015). Of the 3.39 acres of wetlands, 2.93 acres of wetlands are located along Mill Creek. The remaining 0.46 acres of wetlands are small discontinuous areas along Pat Hughes Creek and Bruno Creek and its tributaries. The study area has no expansive wetlands due to the steep slopes and V-shaped drainages.

The mitigation measures pertaining to this permit will be initiated once mining operations resume with the Phase VIII expansion project (HDR, 2015). TCM proposes to mitigate for wetland and stream impacts associated with the Phase VIII mine expansion by restoring wetlands along Paasasikwana Naokwaide, protecting streambanks from livestock damage associated with bank caving, vegetation impacts, and erosion along streambanks, and stabilizing a short segment of eroded streambank along Paasasikwana Naokwaide.

The proposed mitigation along Paasasikwana Naokwaide would include fencing along approximately 10,000 linear feet of streambank on TCM property. New Fencing would be tied in with land along Paasasikwana Naokwaide that is already fenced. Any future grazing in that area will be controlled and monitored to protect vegetation communities and water quality along Paasasikwana Naokwaide.

No changes to this authorization are expected for the  Phase VIII mine plan.

### 20.2.4 Idaho Pollutant Discharge Elimination System Permit

In July 2019, IDEQ assumed responsibility for issuance of industrial discharge permits in Idaho and enforcement of the IPDES permit under delegated authority from US EPA, Region 10. The current industrial discharge permit (IPDES Permit ID-002540-2) expired on January 29, 2007. An application for renewal of the permit was submitted and received by the USEPA on July 31, 2006. This submittal was determined to be timely and complete. TCM received notification from US EPA that if the permit was not reissued by the permit expiration date, the permit would automatically be extended administratively until the permit is renewed. To date, the permit has not been renewed and according to IDEQ’s Permit Issuance Plan the Thompson Creek IPDES permit is in the queue, but a permit writer has not been assigned indicating IDEQ has no plan to begin working on this permit throughout 2024. This poses no risk to current or future operations as it is an administrative delay. No changes are expected to the water permit for the feasibility mine plan mine plan. The permit extension discussed above does not pose any risk to the current or future operations.

The following is a brief discussion of each outfall:

- Outfall 001 – located on Thompson Creek and originates at the base of the lower Buckskin WRSF.
- Outfall 002 – located on Thompson Creek and originates at the base of the Pat Hughes WRSF.
- Outfall 003 – located on Paasasikwana Naokwaide (the monitoring point is located on Bruno Creek); however, the primary source of water discharged through this outfall is stormwater runoff from the mine access road.
- Outfall 004 – located on Paasasikwana Naokwaide a short distance upstream from the confluence with Bruno Creek (outfall 003) and is currently being used to discharge pit water.
- Outfall 005 – located downstream of the confluence of Thompson Creek and the Salmon River and will be used after closure to discharge water to the Salmon River.

### 20.2.5 Air Quality Permit

TCM holds an Air Quality Permit to Construct Permit No. P-2013.0014. This permit was issued on May 28, 2014. The permit includes a list of all regulated sources with descriptions of the process, emission controls and emission limits, operating, monitoring and recordkeeping requirements, fugitive emission and odor controls, visible emission, open burning, hazardous air pollutants and diesel fuel sulfur content limitations along with recordkeeping and reporting requirements for the entire facility. Any changes to the primary equipment or exceedance of the throughputs identified in the Air Permit would require a permit modification. No changes to this authorization are expected for the 2024 Phase VIII mine plan.

## 20.3 Waste Disposal, Monitoring and Water Management

The Interim Management Plan provides an overview of the water management efforts while the facility is in interim operations (TCMC, 2017). Impacted site water includes seepage from beneath the Pat Hughes and Buckskin WRSFs and tailings underdrain water. All the impacted water is pumped in existing pipelines to the existing water treatment plant via the Thompson Creek Pipeline/Cherry Creek pump station (for the Pat Hughes/Buckskin water) and the SRD pump station (for the tailings drain water). The treatment plant provides lime neutralization, clarification and filtration at 8 µm prior to consumptive use at site (pump gland seal, heat exchange, milling/grinding, leach circuits, etc.). Impacted water in surplus to consumptive use is accumulated in the pit. Because the Cherry Creek Transfer Station and SRD pump stations continue to operate during interim operations, they require ongoing maintenance, which is performed by TCM. The pumping stations are inspected daily during the maintenance period.

When the site re-initiates operations, water stored in the open pit will be pumped to the mill for use as process water, evaporated, discharged to the receiving waters via one or more permitted outfalls or to the TSF for storage and subsequent use as process water. The Water Management Plan (Lorax, 2024) describes the operational and post closure water management development, which will continue to contain mine impacted water, but will include utilization of pit water and tailing reclaim water in Phase VIII operations, and pit infilling and water treatment upgrades for post-closure. Because the maintenance period lasted for more than two years before Phase VIII operations begin, discharge off site is necessary and will utilize IPDES outfalls 004 and 005 in compliance with the IPDES permit conditions for TCM.

### 20.3.1 Waste Disposal

A Best Management Practices Plan was developed to ensure that all potential wastes were identified, managed and properly disposed according to environmental regulations (TCM, 2021). TCM conducts periodic inspections and submits annual regulatory reports on waste management practices. All hazardous waste is shipped offsite for disposal. The TCM landfill is permitted through the District Seven Health Department as a private disposal facility for solid waste generated at the mine and mill. The landfill or solid waste management site is located within the overburden of the Pat Hughes WRSF lifts.

Waste rock disposal related to the WRSF and TSF are discussed in Items 16 and 18.

## 20.4 Environmental Monitoring

Environmental monitoring at the TCM began in late 1970 to define baseline physical, chemical and biological conditions; continued in 1981 with approval of a monitoring plan as part of the NEPA process (including evaluation of the mine’s EIS, and issuance of a ROD); and has resulted in the current Consolidated Environmental Monitoring Program which was developed in 1997. The Consolidated Environmental Monitoring Program incorporated monitoring requirements to address various operational and regulatory changes, including potential for acid rock drainage (ARD), changes in status of threatened and endangered species protection, and new NDPES discharge points (in accordance with NDPES permit #ID-002540-2).

The current Consolidated Environmental Monitoring Program is comprised of: Biological Monitoring, Air Emission Compliance Monitoring, Discharge Permit Monitoring, Structural and Dam Safety Monitoring, Water Quality Monitoring and Data Validation, Mine Waste Monitoring, Formal Reporting of Environmental Monitoring Program Data and Analyses, and Water Quantity Monitoring (TCMC, 2002).

The following sections include a summary of the monitoring programs and results to date, with the exception of Structural and Dam Safety Monitoring which are detailed in Item 18.

### 20.4.1 Biological Monitoring

Discharge from the TCM area reports to the upper Salmon River sub-basin including its main tributaries, Thompson Creek and Paasasikwana Naokwaide. Biological monitoring has been conducted since 1980. Biological surveys are conducted to collect data on total numbers and diversity of species of fish populations (at stations on Thompson Creek and Paasasikwana Naokwaide only), benthic macroinvertebrate species, and periphyton. Monitoring locations include:

- Six stations on Thompson Creek – three stations upstream and three stations downstream of the mine.
- Three stations on Paasasikwana Naokwaide – one station upstream of both the TCM and historical Redbird Mine, one station upstream of TCM operations but downstream and adjacent to historical Redbird Mine; and one station downstream of the TCM discharges (current and future) including stormwater discharge.
- Four stations on Salmon River – one station upstream of the confluence of Thompson Creek, and one station downstream of the confluence of Paasasikwana Naokwaide. Two additional stations were added to the monitoring locations in 2017 which bracket the mixing zone associated with outfall 005 (upstream and downstream).

In addition, bioaccumulation monitoring is conducted at five sites on Thompson Creek to assess selenium in sediments, fine particulate organic matter, benthic macroinvertebrates, and fish. Data are compared between upstream and downstream locations and between monitoring years to assess annual trends.

Results of the 2023 biological monitoring and historical trends reported in GEI (2024) indicate the following:

- Benthic macroinvertebrates – Thompson Creek, Paasasikwana Naokwaide and Salmon River support healthy diverse communities of numerous species including sensitive species of mayflies and stoneflies. Macroinvertebrate data collected from Thompson Creek in 2022 demonstrate that TCM activities have not negatively impacted the Thompson Creek, Paasasikwana Naokwaide and Salmon River macroinvertebrate community. An absence of significant differences between the reference and non-reference sites; and overall increasing trends and/or stable conditions with respect to density and number of taxa also indicate no impact from TCM activities.
- Fish – The long-term data indicate that both Thompson Creek and Paasasikwana Naokwaide continue to support healthy, sustaining populations of trout. Water quality is sufficient in both streams to support multiple age-classes of trout and sculpins. However, sculpin populations have

experienced notable declines at all sites on Thompson Creek and Paasasikwana Naokwaide in recent years, including reference sites upstream of mining activities, with statistically significant declining relationships at many sites. The reasons for these decreasing trends are not known but the occurrence at both reference and downstream sites suggests a regional factor or factors affecting both Thompson Creek and Paasasikwana Naokwaide.

- Periphyton – No increasing or decreasing trends in periphyton density was apparent at either of the Salmon River sites over time. Numbers of taxa have not followed any significant trend at Site SR-3 but have increased at Site SR-1 over time. Mean values for these two metrics were not statistically different between these two sites over time, suggesting that conditions remain similar and support similar periphyton communities since sampling began. These results indicate TCMC activities are having no adverse impacts on Salmon River periphyton. In many years, the abundance of the diatom A. *minutissima* indicates scouring or some other disturbance is occurring in the Salmon River; however, during 2023, the abundance of A. *minutissima* was moderately low, indicating a lack of notable disturbance at these sites.
- Selenium bioaccumulation – Selenium was present in measurable concentrations in all components from all study sites in 2023, including upstream reference sites, demonstrating the background presence of selenium throughout Thompson Creek. Selenium levels in fine particulate organic matter (FPOM) and benthic macroinvertebrates from all sites were below regulatory thresholds. Elevated tissue selenium levels in both sculpin and one site for trout (above regulatory threshold) indicate selenium bioaccumulation is occurring on Thompson Creek. Sculpin densities at sites throughout the Thompson Creek drainage have declined since 2014, including at the reference sites. It is unclear whether this is related to selenium concentrations or another basin-wide factor. Healthy trout populations have been observed and continue to inhabit Thompson Creek over the past 43 years. The favorable fish community metrics suggest the Thompson Creek trout population is not adversely affected by selenium and that bioaccumulation of selenium currently poses little risk to trout populations in Thompson Creek.

### 20.4.2 Air Emission Compliance Monitoring

The State of Idaho Permit to Operate an Air Contaminant Source (Permit to Construct converts to Operating Permit after performance testing is completed) requires air emissions from all point sources (and fugitive dust from the TSF) to be monitored on daily, weekly, and monthly bases, in accordance with the air emission permit (P-2013.0014). All records are kept on site for five years as required for annual air quality inspections.

### 20.4.3 Discharge Permit Monitoring

IPDES discharge permit ID-00254902 regulates effluent discharge from outfalls 001 and 002 to Thompson Creek, outfall 003 to Bruno Creek, outfall 004 to Paasasikwana Naokwaide and outfall 005 to the Salmon River. Outfall 002 and outfall 005 currently do not discharge. Outfall 001 discharges seasonally during freshet runoff. Discharge of pit water from outfall 004 was initiated in November 2022 to facilitate dewatering of the pit to facilitate Phase VIII restart. Outfall 005 may be utilized for pit dewatering as well.

The details of analysis and frequency of monitoring of outfalls while discharging in accordance with the IDPES permit is as follows:

- All permitted outfalls are monitored for flow on a continuous basis.
- Monthly grab sampling for cadmium, copper, lead, mercury, selenium, and zinc; and weekly or quarterly grab sampling for hardness (as $CaCO_3$) and TSS at outfalls 001 and 002.
- Monthly grab sampling for cadmium, copper, lead, mercury, zinc, hardness (as $CaCO_3$), and TSS at outfall 003.
- Weekly composite sampling for cadmium, copper, lead, mercury, zinc, hardness (as $CaCO_3$) and TSS at outfalls 004 and 005.
- Weekly (outfalls 001, 002 and 003), and daily (outfalls 004 and 005) measurement of pH.
- Other parameters that are not regulated by IDPES limitations (e.g. temperature, turbidity, molybdenum, chromium, silver) are analyzed at some of the outfalls at varying frequency.

The discharge quality is regulated by effluent limitations in accordance with the IDPES, including maximum daily and average monthly discharge values, which are applicable based on the average monthly flow in respective receiving water bodies. The outfall flow rates are recorded continuously and reported monthly in Discharge Monitoring Reports submitted to IDEQ. For example, a higher limitation corresponds to low flow for respective flow rates as follows:

- A flow rate of 7 cfs is set for Thompson Creek (for outfalls 001 and 002), above or below which determines the effluent limitation
- A flow rate of 50 cfs is set for Paasasikwana Naokwaide (for outfall 004), above or below which determines the effluent limitation
- A flow rate of 2,000 cfs is set for Salmon River (for outfall 005), above or below which determines the effluent limitation.

Toxicity monitoring is conducted for all outfalls in accordance with the IDPES permit. Acute whole effluent toxicity is analyzed from all outfalls annually in April (or following months if no discharge occurs at this time). Chronic whole effluent toxicity is analyzed annually from outfalls 001, 002, and quarterly from outfalls 004 and 005. Testing must coincide with the water quality monitoring of the respective receiving water body. Similar to flow rate-based effluent limitations as discussed above, the same flow rate cut-off values determine toxicity triggers, above and below which the trigger value is set.

In 2013–2014, outfall 001 and outfall 002 were diverted to the Thompson Creek Pipeline for water treatment. Results of the 2023 discharge water quality monitoring are reported in MineraLogic (2024) in addition to trend analysis for site drainage and outfall 003. Findings in that report indicate that the water quality of outfall 003 is in compliance with the IDPES permit. The pH and alkalinity of this stream indicate this drainage is non-acidic. Dissolved metals concentrations appear to be decreasing throughout the monitoring period. Sulfate and conductivity have been increasing throughout the monitoring period and indicate oxidation of sulfides within the waste rock or tailings, however, do not pose a water quality concern at the observed concentrations.

Trend analysis (data obtained from 2001 to 2023) for drainage water quality at locations above outfall 001 (Buckskin Creek) and above outfall 002 (Pat Hughes Creek) indicates alkaline pH and increasing alkalinity; and a marginal increasing trend in selenium concentration for outfall 002 over the last two years while outfall 001 is showing a decrease (MineraLogic, 2024). Selenium concentrations will continue to be monitored closely by TCM on Buckskin Creek and in receiving waterbodies. Historical trends of increasing concentrations in aluminum, iron and zinc at Pat Hughes Creek resulted in a change to the water management system which effectively captured all seepage from Buckskin waste rock and diverted it to the mill. Trend analysis for the Pat Hughes toe seep indicates an increase of all metals, conductivity, major ions, and acidity, and a decrease in pH and alkalinity throughout the monitoring period (MineraLogic, 2024). All seepage from the Pat Hughes toe will continue to be captured and managed by TCM, with no surface or groundwater flow occurring from the seep.

### 20.4.4 Water Quality Monitoring and Data Validation

Water quality is monitored in the receiving environment in accordance with the IDPES permit at the following locations and monitoring frequency:

- Paasasikwana Naokwaide drainage (SQ2, SQ3) – quarterly
- Salmon River (SR1, SR3) – quarterly when there is no discharge, and monthly when discharge occurs from outfalls 004 and 005
- Thompson Creek drainage (TC1, TC2, TC3, TC4) – quarterly.

The results of monitoring are compared to the chronic criteria concentration defined by the State of Idaho water quality criteria for chronic protection of aquatic life. If the chronic criteria is exceeded, sampling must increase to provide a four-day average concentration which is based on at least one grab sample per day for four consecutive days. Sampling to provide four-day averages is required to continue until this value is below respective criteria. The details of analysis in accordance with the IDPES is as follows:

- Dissolved metals (cadmium, copper, lead, and zinc) and total metals (mercury and molybdenum) – all monitoring stations
- Dissolved chromium and dissolved silver – Paasasikwana Naokwaide and Salmon River stations
- Dissolved selenium – Thompson Creek and Salmon River stations
- TSS, pH, temperature, turbidity, hardness and dissolved oxygen – all monitoring stations.

Water quality samples are collected quarterly based on hydrological conditions of peak flow, spring peak flow, summer low flow, and fall low flow conditions. Sampling is conducted in accordance with Section I.C1 of the IPDES Permit. Air and water temperature as well as dissolved oxygen are measured instream, in the field at the time of sample collection. Samples are collected, preserved and transported in accordance with the IPDES Permit and are submitted to an accredited laboratory for analysis.

Results of the 2023 water quality monitoring and trend analysis (data obtained from 2001 to 2023) indicate that no in-stream chronic water quality parameters were exceeded and all analyses were in compliance with Idaho in-stream water quality criteria (MineraLogic, 2024). Concentrations of molybdenum were slightly higher at downstream compared to upstream stations in both Thompson Creek and Paasasikwana Naokwaide. A past occurrence of elevated selenium concentrations above the in-stream chronic criteria in Thompson Creek resulted in a change in permitted sampling frequency of selenium from quarterly to monthly. Monthly sampling of selenium will be continued in Thompson Creek despite no repeat exceedances of the selenium chronic criteria in the past six years.

Furthermore, in addition to the regulated parameters listed above, samples are analyzed for conductivity and air temperature; and one or more of the following parameters as detailed in the Consolidated Environmental Monitoring Program: alkalinity, hardness, total dissolved solids, total suspended solids, acidity, carbonate-bicarbonate, cadmium, copper, iron, lead, zinc, selenium, aluminum, arsenic, barium, calcium, magnesium, manganese, mercury, molybdenum, sulfate, chloride, nitrate, nickel, phosphate, sodium, and/or sulfide.

Nineteen groundwater wells are monitored bi-annually for the same suite of parameters as for surface water. Depth to water level is measured using a well sounding probe before water samples are collected. Conductivity, temperature and pH are measured using a flow cell.

Results of groundwater monitoring for 2023 and historical trends reported in MineraLogic (2024) indicate that groundwaters are neutral to slightly alkaline, with excess alkalinity. An increase in concentrations of some metals at PW-8 and PW-9 monitoring wells may indicate flow from the west fork of Pat Hughes Creek, beneath a portion of the Pat Hughes waste rock facility. MineraLogic (2024) water quality data for years 2000 through 2023 show that the TCM management activities have controlled the loading below Pat Hughes. TCMC should continue to monitor the Pat Hughes toe seep and to ensure that those flows are entirely contained and actively managed.

Two potable water wells are monitored, with samples taken from designated fixtures, after allowing water to run for 2–3 minutes. The quality of water is evaluated based on drinking water standards for workers at the mine site. The potable water wells are monitored at the following locations:

- CON-1 Concentrator Well #1 which supplies the administration building, the analytical lab and the concentrator
- CRU-1 Crusher Well #1 which supplies all facilities at the crusher site, maintenance shops and change house.

Sediment sampling has been conducted at the site since 1996 at four stations that coincide with the surface water monitoring stations on Paasasikwana Naokwaide and Thompson Creek. The sediment stations are as follows: SQ-3 and SQ-2 are on Paasasikwana Naokwaide upstream and downstream of TCM, respectively; and TC-4 and TC-1 are on Thompson Creek upstream and downstream of TCM, respectively. The objective of sediment sampling is to compare the composition of fine sediment with respect to spawning conditions for salmonids, and to evaluate the effect of mining on metal-loading on aquatic species.

Results of sediment monitoring reported in EnviroNet (2024) indicate that based on fine particle sediment accumulation in Paasasikwana Naokwaide and Thompson Creek do not exceed the threshold for which salmonid fry survival and spawning may become adversely affected (<15–20%). Further, there is no consistent statistical evidence (across parameters or over time) that downstream locations for either Thompson or Paasasikwana Naokwaide are less favorable versus upstream locations to salmonid fry survival, due to TCM activities beyond the natural variability of the water systems analyzed.

### Mine Waste Monitoring

Management of waste rock as it is mined and placed in the WRSFs is discussed in Item 16. The management approach classifies the waste rock as either NAG (Type I) or PAG (Type II) on the basis of visual assessments supplemented by geochemical testing. Geochemical testing includes acid base accounting (ABA), acid neutralizing potential, total sulfur, and pyrite sulfur. The neutralizing potential and sulfur analyses conducted on waste rock are confirmed through use of the laboratory QAQC measures described below.

Laboratory and analytical QAQC is performed using a certified reference material as calibration standards for all instrumentation used in analysis of ABA; site-specific reference materials for three standard waste materials representing high-, mid- and low-sulfur content; method duplicates for every batch of samples (maximum of 20 samples per batch) are collected by the laboratory; and nine splits of seven samples are submitted to a third-party laboratory for confirmation analysis (e.g. three samples analyzed at the mine laboratory, and three samples are sent to two third-party laboratories). TCM collects all QAQC data in a database for internal and external waste rock classification to provide tabulation of results and statistical analysis which are provided in quarterly internal QAQC reports (TCMC, 2002).

### Mine Water Balance

Industrial water rights held by TCM are subject to challenge or forfeiture if not supported by proof of use. TCM therefore maintains detailed records of the water management system including volumes of water used by the mine and seasons of use. Periodically, this documentation is provided to the appropriate agencies, to prove and maintain established water rights for the mine.

TCM developed and maintains a detailed water balance of the inflows and outflows to the tailings facility. Information on TSF and WRSF water inflow and outflows, pit water levels, water storage, and treated flows is used to track the operational management of water and to develop a post-mining water management plan.

Phase VIII early works mine activities were initiated on November 1, 2023, and the water level in the pit as of December 31, 2023 was 6,760.5 ft-amsl containing approximately 406,000,000 $ft^3$ of water.

During the fall of 1999, water quality issues were discovered with the water that emanates from the Pat Hughes WRSF toe. A collection system made of a bentonite cut-off wall and concrete collecting box was installed at the dump toe ensuring the water draining from the Pat Hughes dump toe is collected and transferred to the Thompson Creek Pipeline. The Thompson Creek Pipeline delivers water to the Cherry Creek booster station where the water is then pumped to water management facilities including water treatment plant throughput for use in the mill.

The Pat Hughes underflow, Buckskin outfall 001, and the Pat Hughes outfall 002 were delivered to Cherry Creek pump station for subsequent throughput at the water treatment plant for use in the mill during 2022, with exception of outfall 001 which was discharged to Thompson Creek for a period beginning on May 1 until July 11 when discharge ceased. In 2023, 162,000,000 gallons of water was diverted into the Thompson Creek Pipeline. In 2023, the TCM water treatment plant treated 160,000,000 gallons of water.

### 20.4.5 Formal Reporting of Environmental Monitoring Data and Analyses Program

Formal reporting is conducted to verify that the TCM water quality management and environmental monitoring plans are successful in providing environmental protection with respect to mining and mineral concentration in Idaho. The seven annual monitoring reports issued by TCM are summarized as follows, including to whom the report is submitted (in brackets) and the publication frequency:

- Best Management Practices Plan (to USEPA and IDEQ) – annually
- Environmental and Reclamation Activities Report (to IATF) – annually
- Water Quality Report (to IDEQ and IATF) – annually
- Aquatic Biological Conditions Report (to IATF) – annually
- Waste Rock Dump Report (to IATF) – annually
- Sediment Report (to IATF) – annually
- Tailings Impoundment Operation and Dam Safety Monitoring Report (to IDWR, Dam Safety and IATF) – annually.

## 20.5 Water Management

Mine water management is discussed in Item 16.8 and site water management in Item 18.2.2.

## 20.6 Social or Community Requirements

The mine disturbance is not impacting private or tribal lands, nor would the Phase VIII Mine Plan expansion. Concern from conservation groups and the Nez Perce tribe have been focused on protection of water quality in the streams near the site that are tributary to the Salmon River. Other comments received to date related to the Phase VIII mine operations have been related to a proposed land exchange which has since been terminated. Various permitting applications require public comment periods which allow comments from stakeholders as well as conservation groups.

No other social or community requirements have been identified that will affect the implementation of the Phase VIII expansion, and TCM continues to work with the IATF and other stakeholders to address input and concerns on a regular basis.

## 20.7 Mine Closure Requirements

The TCM was placed in care and maintenance in December 2014 when the last of the Phase VII ore was concentrated in the mill facilities. TCM has received acceptance of the recently (September 2021) submitted MMPO from the USFS and BLM. This MMPO was reviewed for NEPA adequacy, commensurate with the Term and Conditions of the EIS ROD relative to Selected/Preferred Alternative (M2). Both Federal agencies issued correspondence accepting the MMPO as a Minor Modification of the existing Mine Plan (effectively approving implementation of Phase VIII Mine Plan). Execution of the approved MMPO adds approximately 13 years of operations to the LOM.

Mine closure requirements following implementation of the Phase VIII expansion are detailed in the Final Phase VIII Reclamation Plan (Pioneer, 2023) and the Post Closure Water Treatment Plan (WET, 2017). The Phase VIII Reclamation Plan and Cost Estimate received final approval from the IATF on May 9, 2023, and includes all closure elements and costs except water treatment costs, which are detailed in the Water Treatment Plan.

The current reclamation bond, based on the Phase VIII Reclamation Plan (Pioneer, 2023), was compiled based on agency ownership of final disturbed acreages at the end of Phase VIII mine operation. The current total reclamation bond, which does not include the water treatment costs, is $105.6 million. The Reclamation Plan prepared by Pioneer (2023) includes details of the planned Phase VIII expansion and also does not include water treatment. Water treatment capital costs including water treatment infrastructure (piping, pumping, and water treatment plant) are estimated at approximately $13.6 million, with operating costs estimated at approximately US$0.5 to $1.7 million per year, depending on the closure phase. The reclamation construction is anticipated to be completed in five years from completion of Phase VIII and site monitoring would continue for an additional 11 years.

An additional 120 acres of TCM land and 376 acres of federal lands would be disturbed during Phase VIII mining operations. Under the Phase VIII final reclamation plan, some infrastructure (access roads, power lines, pipeline for discharge, pump system backup power generators and enclosure, etc.) would be left in place to support the water treatment plant operations after closure.

The reclamation goals include long-term land stabilization measures to ensure public safety and reduce the potential for erosion to protect water quality and promote wildlife habitat. The post-mining land use objective is to support a variety of wildlife habitats, similar to those which occur in the undisturbed areas adjacent to the mine including:

- Sagebrush grasslands/woodlands habitat
- Rocky slope habitat
- Riparian habitat.

Closure activities included in the Phase VIII Reclamation Plan (Pioneer, 2023) of material significance are summarized below. WRSF and TSF reclamation closure details are presented in detail in Items 16.5 and 18.2, respectively.

- Buckskin WRSF: Recontouring, application of volcanic growth media, scarifying and revegetation to achieve the post-mining land use of sagebrush, grassland/woodlands.

- Pat Hughes WRSF: Recontouring, capping with a multi-layer closure cover consisting of an 18-inch thick low-permeability layer, a 60-inch thermal layer, a 12-inch layer of grown media, and scarifying and revegetation to achieve the post-mining land use of sagebrush, grassland/woodlands.
- TSF surface:
  - Regrading the top surface of the TSF using piped whole inert tailing reverse impounded tailings gradient and create positive surface flow towards the eventual low spot in the southwest corner of the impoundment. The thickness of inert tailing would be at least 9 ft at the tailing surface.
  - Recontouring the final surface of the tailings surface, scarifying and revegetation to achieve the post-mining land use of sagebrush, grassland/woodlands.
  - Removing the Bruno Creek diversion structures and establishing a drainage channel across the TSF surface.
- Drainage and sediment control for the WRSFs and TSF to remain in place and stormwater channels established.
- Reclaiming all roads not required for post-reclamation water treatment and monitoring.
- Removal and demolition (as necessary) of foundation and building areas, equipment, fence, culvert, pipes, power lines, transformers, etc.
- Reclamation monitoring and maintenance.
- Post-reclamation monitoring will continue for the activities in Table 20-1 below, for the initial period (5 years) following cessation of mining, the interim period (years 6 through 10), post-reclamation, and long term.

**Table 20-1 Monitoring activities at closure**

| Monitoring | Initial (Years 1-5) | Interim (Years 6-10) | Post-reclamation (Years 11-15) | Long term (Years 16+) | Total years |
|---|---|---|---|---|---|
| Sediment sampling | X | | | | 5 |
| Aquatic biota habitat | X | X | X | X | 16+ |
| Surface water quality | X | X | X | X | 16+ |
| Groundwater quality | X | X | X | X | 16+ |
| Tailings geotechnical | X | X | X | | 15 |
| Tailings revegetation | X | X | | | 10 |
| Waste rock geotechnical | X | X | | | 10 |
| Waste rock revegetation | X | X | | | 10 |
| Other revegetation | X | X | | | 10 |
| Weed management | X | X | X | X | 15 |

The Post-Closure Water Treatment report includes the design and cost details for the post-closure water treatment infrastructure. The report was developed to support the Water Management Plan (Lorax, 2012). The Water Management Plan was developed to protect the surface and groundwater quality of the area after mining operations have ceased.

The Water Management Plan and treatment infrastructure are phased to include the Pit Infilling Phase and the Water Treatment Phase. The infrastructure includes water collection, conveyance, storage, and lime treatment. The Pit Infilling Phase relies on the existing infrastructure and the current lime-addition treatment system, and the Water Treatment Phase includes new infrastructure and treatment that will be required in the future. The Pit Infilling Phase will begin upon completion of Phase VIII mining, and the Water Treatment Phase will begin after reclamation is complete and pit infilling has reached an elevation required to submerge exposed intrusive rocks (but below the control elevation of 7,030 ft-amsl) and water treatment upgrades are needed to discharge clean water offsite to outfall 005.

The required infrastructure is currently in place to implement the Pit Infilling Phase of the Plan, including the lime addition system at the existing water treatment plant. Infrastructure includes pump stations conveying water impacted by the WRSFs via the Thompson Creek Pipeline and the tailings impoundment SRD through the existing return pipelines to the existing treatment plant.

The Post-Closure Water Treatment report includes a scope for new water treatment equipment including a lime addition system, coagulant and flocculant equipment, reaction tank(s), a clarifier, a filter, and appurtenant process and control equipment. This new equipment will be located near the existing Primary Crusher/Shop area at the mine. Therefore, no additional surface disturbance is anticipated for new infrastructure.

The capital cost of water treatment infrastructure is estimated as follows:

- Pit Infilling Phase, Years 1-5 (existing infrastructure maintenance only) – $91,000
- Water Treatment Phase, Year 31 (new water treatment plant, piping, and pump station) – $7.02 million
- Water Treatment Phase – 50-year replacement of treatment plant – $6.48 million.

The estimated annual operational cost summary is estimated as follows:

- Pit filling, Year 1: $427,000 per year
- Pit Filling, Years 2-15: $422,000 per year
- Pit Filling, Years 16-30: $953,000 per year
- Water Treatment, Years 31 forward: $1.66 million per year.

For bonding purposes, capital and operating costs were estimated in March 2017 US dollars by Water Engineering Technologies. Bonding for Long Term Water Management is held by BLM, totaling approximately $15.4 million, based on these costs.

The State of Idaho, Department of Water Resources holds an additional bond of approximately $13.9M for the TSF Buttress repairs and the Salmon Rover Electric Coop holds a bond of $1M for electricity provided to site. The bonding for the TSF Buttress may be returned once TCM begins operations and demonstrates the over steepened face is being corrected.

# 21 CAPITAL AND OPERATING COSTS

## 21.1 Overview

The estimated future capital and operating costs for Thompson Creek Mine ("The Project") discussed and tabulated below were developed by Centerra based on first principles cost models. Please refer to Section 22 for a detailed sensitivity analysis.

The total life-of-mine (LOM) costs are estimated at $2.2 billion, including $0.5 billion in capital expenditures and $1.7 billion in operating costs as detailed in Table 21-1 below.

**Table 21-1 LOM capital and operating cost**

| Cost summary (total LOM) | Total ($ million) |
|---|---|
| **Total capital costs** | **471** |
| **Operating costs**[1] | |
| Mining | 782 |
| Processing | 604 |
| Admin | 208 |
| Transportation | 29 |
| Treatment charges | 118 |
| **Total operating costs** | **1,741** |
| **TOTAL** | **2,212** |

[1] Operating costs exclude capitalized pre-production costs such as initial pre-stripping costs, which are included in capital costs.

## 21.2 Material Assumptions

The following material assumptions have been used in the LOM plans, economic analysis, and estimates of operating and capital costs:

- A molybdenum oxide price of $20.00/lb throughout the LOM plan
- Diesel fuel price assumption: $3.75/gallon delivered to site
- Electricity pre-assumption: $0.036/kWh.

## 21.3 Capital Costs

The LOM capital expenditures required to extract the Mineral Reserves are estimated at $471 million. This includes upfront capitalized pre-production stripping costs, equipment upgrades and replacements, and site facilities equipment, as shown in Table 21-2.

Table 21-2 LOM capital costs

| Capital categories | Initial capital cost (US$ million) | Sustaining capital cost (US$ million) | Total capital cost (US$ million) |
|---|---|---|---|
| **Pre-production costs capitalized** | | | |
| Capitalized pre-stripping costs | 213 | - | 213 |
| Capitalized mill and G&A costs | 50 | - | 50 |
| **Subtotal – Capitalized pre-production costs** | **263** | **-** | **263** |
| **Mining capital costs** | | | |
| Equipment rebuild and purchase costs | 20 | - | 20 |
| Other costs | 1 | - | 1 |
| Mine sustaining capital costs | - | 30 | 30 |
| **Subtotal – Mining capital** | **21** | **30** | **51** |
| **Mill and tailings capital costs** | | | |
| Mill initial capital costs | 73 | - | 73 |
| Tailings initial capital costs | 14 | - | 14 |
| Mill sustaining capital costs | - | 15 | 15 |
| Tailings sustaining capital costs | - | 24 | 24 |
| **Subtotal – Mill and tailings capital costs** | **87** | **39** | **126** |
| **G&A capital costs** | | | |
| G&A initial capital costs | 10 | - | 10 |
| G&A sustaining capital costs | - | 5 | 5 |
| **Subtotal – G&A capital costs** | **10** | **5** | **15** |
| **Initial capital costs contingency** | | | |
| Mine capital contingency | 1 | - | 1 |
| Tailings capital contingency | 1 | - | 1 |
| Mill capital contingency | 14 | - | 14 |
| **Subtotal – Initial capital costs contingency** | **16** | **-** | **16** |
| **TOTAL CAPITAL COSTS** | **397** | **74** | **471** |

The LOM capital build-up is based on first principles cost models and historical data; it also includes quotes for major capital equipment.

Capital pre-production stripping costs were estimated with reference to the mining cost unit rate informed by the costs incurred through the waste moving activities in the Early Works phase. The mining capital cost estimate assumes the refurbishment of the existing mining fleet, and the purchases of additional mining equipment. Major component rebuilds of the mining mobile fleet have been estimated based on expected operating hours per component. Mill capital cost was prepared by Hatch using current quotations received from reliable North America based vendors. All major equipment and components of the mill were inspected by subject matter experts from Hatch and relevant original equipment manufacturers. The capital estimate was structured using standard project assumptions and the findings from the original equipment manufacturers.

The capital expenditure estimates include contingencies of 15–20% of baseline costs and primarily relate to mill equipment purchases and rebuilds. Contingency is a monetary provision in the project capital to cover uncertainties or unforeseeable elements of time/cost within the scope and control of the project. Contingency typically covers the risk of cost increases resulting from lack of scope definition, lack of particular experience, omissions, under-estimation, technical problems, and non-specific schedule slippage. Scope changes and event-risk are specifically excluded from contingency.

## 21.4 Operating Costs Summary

Operating costs were developed from first principles, considering planned mine physicals, equipment hours, labor projections, consumables forecasts, other expected costs, and historical costs. This includes detailed estimates of personnel for all required roles and functions. Total LOM operating costs are summarized in Table 21-3.

**Table 21-3 Operating cost summary**

| LOM operating costs summary | $ millions | $/ton processed |
|---|---|---|
| Mining[1] | 782 | 6.28 |
| Processing[2] | 604 | 4.85 |
| G&A[3] | 208 | 1.67 |
| Transportation | 29 | 0.23 |
| Treatment charges | 118 | 0.95 |
| **Total operating costs** | **1,741** | **13.98** |

[1] Mining costs exclude pre-production stripping costs, which are capitalized. Mining costs are presented on a total basis before the allocation of costs to the deferred stripping capital of approximately $0.2 billion.

[2] Processing costs exclude capitalized pre-production costs and cover tailings and water management costs.

[3] Administrative costs exclude capitalized pre-production costs.

Over the life of mine, operating costs are projected to average approximately $13.98 per short ton of ore processed or $9.66 per molybdenum pound sold

## 21.5 Mine Operating Costs

Mine operating costs were estimated based on an owner-operated mine using first principal methodology for the mine plan and benchmarking with the exsiting operating costs during early working in 2024. Key inputs for the mining costs include labor, fuel, maintenance, tires, drill and blast consumables, and mine general costs. These costs are summarized in Table 21-4.

**Table 21-4 Mining costs**

| Mining LOM costs categories | $ millions[1] | $/ton[2] |
|---|---|---|
| Labor | 274 | 0.71 |
| Fuel | 184 | 0.48 |
| Maintenance | 125 | 0.32 |
| Tires | 52 | 0.14 |
| Explosives | 96 | 0.25 |
| Lubricants | 27 | 0.07 |
| Wear Parts | 16 | 0.04 |
| Miscellaneous | 8 | 0.02 |
| **Total** | **782** | **2.03** |

[1] Mining costs exclude pre-production stripping costs, which are capitalized. Mining costs are presented on a total basis before the allocation to deferred stripping capital during the production phase.

[2] Unit mining rate is based on ore and waste material mined (per short ton).

Open pit mining for the TCM will provide process plant feed at a nominal rate of 28,500 st/d.

Mining costs over the expected open pit LOM are projected to average approximately $2.03/st of material mined. The major mining costs include labor, fuel and maintenance. Total labor costs were estimated based on current labor rates and workforce levels with reference to historical trends and expectations for this size and complexity of operation. Fuel costs were built-up with reference to the expected consumption trends, size of the operating fleet and expected market price of diesel. Maintenance costs were built-up based on a first principles cost model with reference to historical maintenance costs and current costs incurred while mining as part of pre-stripping activities.

## 21.6 Processing Operating Costs

The processing cost estimates were derived using the projected average process plant feed rate of 28,500 tons per day. Main inputs for the processing costs include labor, electricity, grinding and reagents, and maintenance materials costs. These costs are summarized in Table 21-5.

**Table 21-5 Processing costs**

| Mill LOM costs categories | $ millions[1] | $/ton[2] |
|---|---|---|
| Mill labor | 115 | 0.92 |
| Electrical power | 100 | 0.80 |
| Grinding media | 91 | 0.73 |
| Reagents | 46 | 0.37 |
| Mill maintenance labor | 64 | 0.51 |
| Mill liners | 58 | 0.47 |
| Mill general costs | 37 | 0.30 |
| Maintenance parts | 93 | 0.75 |
| **Total** | **604** | **4.85** |

[1] Processing costs exclude capitalized pre-production costs and cover tailings and water management costs.

[2] Unit cost is calculated based on material processed (per short ton).

Consumable consumption rates and unit costs were based on comparable rates for similar operations. Plant maintenance has been factored in for mechanical, electrical and instrumentation together with an allowance for outside contractors to perform major shutdowns.

The total LOM unitized material processing costs over the expected open pit LOM are projected to average approximately $4.85/st processed. The major processing costs include labor, electrical power and grinding media. Total labor costs were estimated based on current labor rates and workforce levels with reference to historical trends and expectations for the size and complexity of the operation. Electrical power was estimated based on expected consumption and prevailing contract rates with the current utility provider. Grinding media costs were built-up with reference to expected consumption and cost per unit based on current market rates for grinding balls.

## 21.7 General and Administrative Costs

The G&A costs for the operation include all site support, insurance and general administration costs and cover items not included in the mining, processing, treatment, and transportation costs of the project. The G&A costs do not include allocation of corporate G&A, estimated at approximately $1.1 million per year. The G&A costs are presented in Table 21-6.

**Table 21-6 Administration costs**

| G&A LOM cost categories | \$ millions[1] | \$/ton[2] |
|---|---|---|
| G&A labor | 79 | 0.63 |
| Insurance, property taxes, permits and licenses | 59 | 0.47 |
| Third-party services | 36 | 0.29 |
| Reclamation bonding fees | 10 | 0.09 |
| Power and utilities | 8 | 0.06 |
| Freight and supplies | 4 | 0.04 |
| Employee training | 4 | 0.03 |
| Software and communications | 4 | 0.03 |
| Other | 4 | 0.03 |
| **Total** | **208** | **1.67** |

[1] Administrative costs exclude capitalized pre-production costs.

[2] Unit cost is calculated based on material processed (per short ton).

Administration costs over the expected open pit LOM are projected to average approximately $1.67/st. On an annual basis, the G&A costs are estimated to be approximately $17 million per year, or approximately $208 million for the LOM. The major administration costs include labor, insurance and property taxes, and third-party services. These costs were developed based on similar sized operations and past experience of TCM. Total labor costs were estimated based on current/expected future labor rates and projected required workforce levels with reference to historical trends. Insurance and property taxes were estimated based on prevailing rates with the current insurance providers and historical trends. Third-party service costs were estimated based on the projected scope of services required during the mine's operations and historical data, and mostly include professional consulting and employee transport to the site from surrounding towns. Reclamation bonding fees are based on current bonding requirements regarding existing reclamation obligations.

# 22 ECONOMIC ANALYSIS

## 22.1 LOM Processing

Table 22-1 on the following page provides an annual summary for the ore processing operation and resultant molybdenite concentrate production. Total ore processed in short tons aligns with the Mineral Reserve estimate.

**Table 22-1 Processing schedule**

| | Units[1] | Total[2] | 2024[3] | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mine production** | | | | | | | | | | | | | | | | | | |
| Ore mined | Mt | **124.5** | - | - | - | 7.8 | 20.4 | 17.8 | 17.1 | 8.8 | 4.2 | 1.8 | 20.0 | 19.3 | 7.2 | - | - | - |
| Waste mined | Mt | **386.2** | 4.9 | 50.0 | 48.0 | 44.2 | 36.5 | 33.2 | 27.9 | 28.2 | 52.8 | 38.2 | 16.7 | 4.9 | 0.8 | - | - | - |
| **Total mined** | **Mt** | **510.7** | **4.9** | **50.0** | **48.0** | **52.0** | **56.9** | **51.0** | **45.0** | **37.0** | **57.0** | **40.0** | **36.7** | **24.2** | **8.0** | **-** | **-** | **-** |
| Strip ratio | | **3.1** | - | - | - | 5.7 | 1.8 | 1.9 | 1.6 | 3.2 | 12.4 | 20.7 | 0.8 | 0.3 | 0.1 | - | - | - |
| **Processing** | | | | | | | | | | | | | | | | | | |
| Ore processed | Mt | **124.5** | - | - | - | 5.1 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 5.0 |
| Mo grade | % | **0.06** | - | - | - | 0.05 | 0.07 | 0.08 | 0.08 | 0.07 | 0.05 | 0.04 | 0.08 | 0.10 | 0.06 | 0.05 | 0.05 | 0.03 |
| Mo contained | Mlb | **161.0** | - | - | - | 5.3 | 13.7 | 15.9 | 16.1 | 15.1 | 10.9 | 8.9 | 17.3 | 20.8 | 13.5 | 10.3 | 10.3 | 2.9 |
| Mo recovery | % | **90.5** | **-** | **-** | **-** | 89.0 | 90.5 | 91.3 | 91.4 | 91.0 | 89.1 | 87.8 | 91.7 | 92.5 | 90.4 | 88.8 | 88.8 | 85.3 |
| **Mo recovered** | **Mlb** | **145.6** | **-** | **-** | **-** | **4.7** | **12.4** | **14.5** | **14.7** | **13.7** | **9.7** | **7.8** | **15.9** | **19.3** | **12.2** | **9.1** | **9.1** | **2.4** |

Notes:

- “Mo” stands for molybdenum oxide, “Mt” stands for millions of short (US) tons, “Mlb” stands for millions of molybdenum oxide pounds.
- Short (US) tons are converted to pounds at a rate of 2,000 pounds per ton.
- Totals may not sum precisely due to rounding.
- 2024 figures are shown for the period from September 1, 2024 to December 31, 2024.

## 22.2 Assumptions

The economic analysis of the project was performed using the following assumptions and basis:

- Economic assessment for the TCM is prepared on a stand-alone basis and does not include any integration with the Langeloth metallurgical plant (“Langeloth”).
- Pre-tax net cash flows for TCM include all operating, transport, treatment, capital and reclamation costs.
- Economic assessment of the project uses a discounted cash flow approach. Cash flows are taken to occur at the mid-year of each period. NPV is calculated by applying no discounting to 2024 cash flows and by discounting LOM cash flows from the year 2025 to the end of mine life to January 1, 2025, using 8% discount rate.
- Project economics are based on a valuation date of September 1, 2024.
- A price of $20/lb of molybdenum oxide is assumed throughout the LOM.
- All costs presented are in constant United States dollars as of Q2 2024 with no price inflation or escalation factors applied.
- Ore production is scheduled to begin in Q3 2027.
- Mine life is 16 years, including an initial four years of construction and waste stripping from years 2024 to 2027 and 12 years of production activities.
- Average annual molybdenum production during production years is 12 million pounds per year. All molybdenum produced by the mine is assumed to be sold in the same year it is produced.
- Working capital for TCM is assumed not to change significantly over the LOM and is not modeled in this economic analysis.
- No salvage values are assumed for the capital equipment at the end of mine life.
- Reclamation and closure costs for the site were estimated by an external consultant at a total of $202 million. Reclamation and closure activities will start progressively after the end of production in 2039, with the bulk of reclamation work to be completed by 2045, followed by ongoing tailings management costs and monitoring thereafter.
- Transportation costs for molybdenite concentrate shipments to Langeloth are estimated at $29 million over the LOM. Treatment costs at Langeloth are estimated at $118 million over the LOM. These costs include all processing and refining expenses necessary to convert the molybdenite concentrate into molybdenum oxide and other marketable products. The estimated costs for transportation to and treatment at Langeloth are based on current trucking quotes and current treatment costs at the facility, respectively.

## 22.3 Taxation

This section provides an overview of the taxes applicable to the project. TCM is subject to various taxation regimes at the state and federal levels. Taxes applicable to TCM are estimated on a standalone basis and are included in the economic analysis. The determination of taxes involves significant estimation and judgment, requiring a number of assumptions. The actual taxes payable will be subject to assessments by taxation authorities who may interpret tax legislation differently. The cash flow is based on management's best estimate of the probable outcome of these matters.

The combined state and federal tax liabilities are projected to be approximately $28 million over the life of the mine, which is incorporated into the LOM cash flow forecast and sensitivity analysis.

### 22.3.1 State Taxes

The State of Idaho imposes a Mine License Tax on the value of minerals extracted. As of the report date, the applicable tax rate is estimated to be 1% of the gross value of the extracted minerals. The gross value is derived from the market price of the minerals at the time of extraction, less costs related to mining, processing and transportation of ore mined as well as depletion deduction. The depletion deduction is based on the quantity of minerals extracted.

The TCM is subject to Idaho state corporate income tax. At the time of writing the report, the applicable tax rate is estimated to be approximately 5.7% of taxable income. Taxable income is calculated by deducting allowable expenses, depreciation, Mine License Tax expense, and other deductions from the gross income.

### 22.3.2 Federal Taxes

The mine is subject to the US federal corporate income tax. At the time of writing the report, the applicable tax rate is estimated to be 21% of taxable income. The taxable income is determined by deducting expenses, depreciation, and other permissible deductions from the gross income.

In addition, the TCM has loss carryforward balances from previous years, which are applied to reduce taxable income both for state and federal corporate income taxes in the current and future periods.

## 22.4 LOM Cash Flow Forecast

Total LOM undiscounted after-tax cash flows provided in Table 22-2 are estimated at $491 million. The mine is estimated to produce and sell 145.6 million pounds of molybdenum, with an average production cost of $9.66 per pound and all-in sustaining cost of $12.46 per pound. The all-in sustaining cost per molybdenum pound sold, which is a non-GAAP financial performance measure defined by the Company,includes operating costs, sustaining capital, the cash component of deferred stripping costs, and treatment costs. The after-tax NPV of the LOM cash flows at a discount rate of 8% is $185 million.

**Table 22-2 Cash flow summary**

| | Units[1] | Total[2] | 2024[3] | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mo sales | Mlb | **145.6** | - | - | - | 4.7 | 12.4 | 14.5 | 14.7 | 13.7 | 9.7 | 7.8 | 15.9 | 19.3 | 12.2 | 9.1 | 9.1 | 2.4 |
| Mo price | $/lb | **$20** | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 | $20 |
| Payability | % | **99%** | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% |
| **Revenue** | | | | | | | | | | | | | | | | | | |
| Mo revenue[4] | $ M | **2,933** | - | - | - | 95 | 249 | 292 | 297 | 277 | 195 | 157 | 320 | 388 | 245 | 184 | 184 | 49 |
| Treatment costs | $ M | **(118)** | - | - | - | (4) | (10) | (12) | (12) | (11) | (8) | (6) | (13) | (16) | (10) | (7) | (7) | (2) |
| **Net revenue** | **$ M** | **2,815** | **-** | **-** | **-** | **91** | **239** | **280** | **285** | **266** | **187** | **151** | **307** | **373** | **235** | **177** | **177** | **47** |
| **Outflows** | | | | | | | | | | | | | | | | | | |
| Mining[5] | $ M | **(782)** | - | - | - | (51) | (92) | (89) | (84) | (85) | (90) | (83) | (81) | (61) | (41) | (11) | (11) | (4) |
| Processing | $ M | **(604)** | - | - | - | (22) | (51) | (53) | (49) | (52) | (48) | (52) | (49) | (53) | (48) | (52) | (48) | (27) |
| G&A | $ M | **(208)** | - | - | - | (8) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (17) | (16) | (11) |
| Transportation | $ M | **(29)** | - | - | - | (1) | (2) | (3) | (3) | (3) | (2) | (2) | (3) | (4) | (2) | (2) | (2) | (0) |
| Capex | $ M | **(471)** | (36) | (133) | (164) | (70) | (6) | (4) | (4) | (31) | (4) | (4) | (7) | (4) | (3) | (1) | (0) | - |
| Reclamation | $ M | **(202)** | - | (1) | (1) | (1) | - | - | - | - | - | - | - | - | - | - | - | (200) |
| Taxes | $ M | **(28)** | - | - | - | (0) | (1) | (1) | (1) | (2) | (0) | - | (3) | (6) | (3) | (4) | (6) | (0) |
| **Total outflows** | **$ M** | **(2,324)** | **(36)** | **(134)** | **(164)** | **(155)** | **(168)** | **(166)** | **(158)** | **(189)** | **(163)** | **(157)** | **(161)** | **(145)** | **(116)** | **(86)** | **(83)** | **(243)** |
| **Net cash flow** | **$ M** | **491** | **(36)** | **(134)** | **(164)** | **(65)** | **72** | **114** | **127** | **77** | **25** | **(6)** | **146** | **228** | **120** | **91** | **93** | **(196)** |
| **NPV @ 8%** | **$ M** | **185** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

Notes:

[1] "Mo" stands for molybdenum oxide, "Mlb" stands for millions of molybdenum oxide pounds, "$/lb" stands for dollars per pound of molybdenum oxide, "$ M" stands for millions of United States dollars.

[2] Totals may not sum precisely due to rounding.

[3] 2024 figures are shown for the period from September 1, 2024 to December 31, 2024.

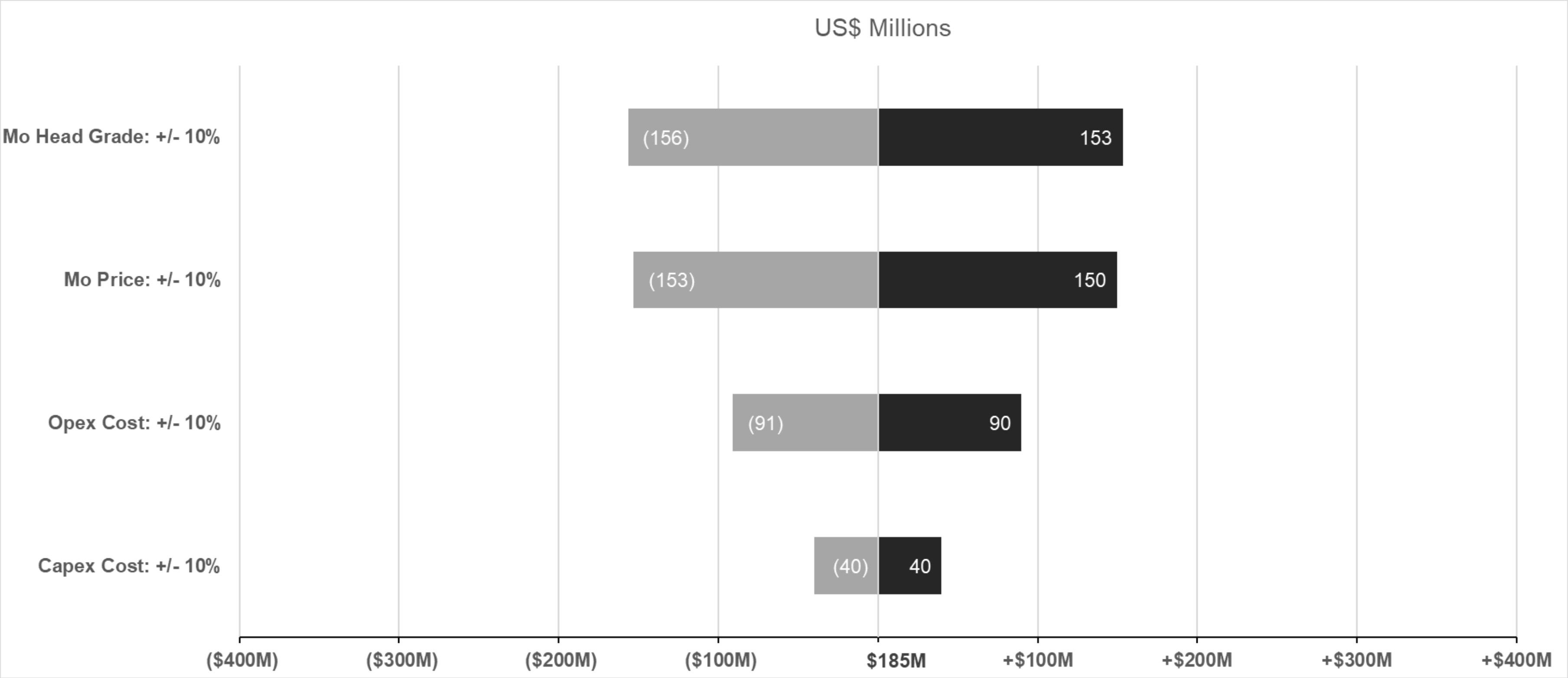
[4] It is estimated that approximately 4.7% of the recovered molybdenum pounds will be further refined and sold as high-performance molybdenum dissulfide (HPM). The molybdenum revenue projections include sales of HPM, which are estimated at approximately $185 million over the life of the mine, assuming an average realized price of $27 per pound.

[5] Includes all mining costs incurred during the production phase regardless of accounting classification.

## 22.5 Sensitivity Analysis

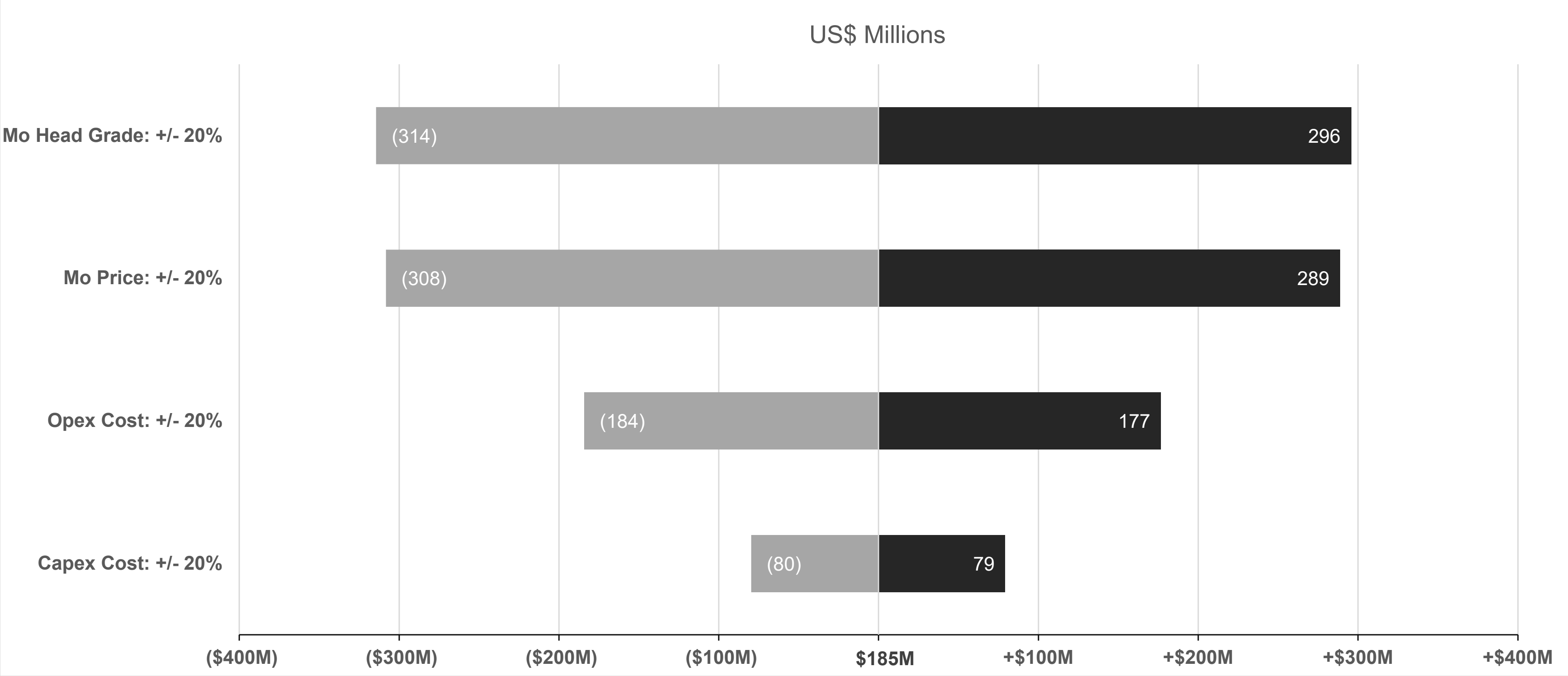
Figure 22-1 and Figure 22-2 provide NPV sensitivities at a 8% discount rate for the various parameters for ±10% and ±20% changes from the base case valuation. The highest sensitivity is to the molybdenum ore head grade, with capital costs being the least sensitive parameter.

**Figure 22-1 Changes to $NPV_{8\%}$ for 10% changes in model inputs**



[1] Capital costs exclude stripping costs incurred during production phase, which are included in operating costs.

**Figure 22-2 Changes to NPV$_{8\%}$ for 20% changes in model inputs**



[1] Capital costs exclude stripping costs incurred during production phase, which are included in operating costs.

**Table 22-3: NPV sensitivity to discount rates**

| | Discount Rates | | | |
|---|---|---|---|---|
| | **0%** | **5%** | **8%** | **10%** |
| **NPV (US$ M)** | $491 | $307 | $185 | $120 |

# 23 ADJACENT PROPERTIES

There are no adjacent properties relevant to the assessment of the project.

# 24 OTHER RELEVANT DATA AND INFORMATION

There are no additional relevant data or information that should be included in this Technical Report.

# 25 INTERPRETATION AND CONCLUSIONS

Based on the information contained herein, the QPs, as authors of this Technical Report, offer the following interpretations and conclusions, including potential risks and opportunities.

## 25.1 Interpretations and Conclusions

### 25.1.1 Geology and Mineral Resource Estimate

The Mineral Resources were estimated in conformity with the widely accepted CIM Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines (CIM, Nov 2019). The Mineral Resource estimate may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent Mineral Resource estimates.

Exclusive of Mineral Reserves, the Mineral Resources at Thompson Creek comprise 5.5 million short tons of Measured Resources grading 0.059% Mo, 49.8 million short tons of Indicated Resources grading 0.057% Mo, and 11.6 million short tons of Inferred Resources grading 0.072% Mo.

The QP is confident in the classifications of the Mineral Resources and the estimated metal contained in the defined mineral deposit.

### 25.1.2 Mineral Reserves Estimate and Mining

The TCM mine is an economically viable open pit mining operation with a history of profitable mining and the Mineral Reserves can be profitably mined. The QP has included a Mineral Reserves statement in this report for the remaining mine life.

The existing mining fleet is appropriate for the planned mining rates for waste rock and ore. Some new equipment will augment refurbished vehicles to ensure production schedules can be met.

### 25.1.3 Metallurgy and Mineral Processing

Upon restart, the TCM plant will process mineralized material from the same deposit as previously mined. Metallurgical testwork has confirmed recovery of molybdenum will be consistent with historical operations. Additional tests have defined the SG of the individual mineralized lithologies, enabling more accurate mass determinations and reconciliations.

A review of historical performance indicates the plant can run at a steady state throughput rate of 1,290 short tons per hour, an average daily rate of 28,500 short tons per day and has a demonstrated maximum capacity of 38,000 short tons per day.

The plant is expected to operate at 92.0% availability, recover between 85.3% and 92.5% of molybdenum contained in the ore and deliver concentrate at a molybdenum grade range of 52.3% to 59.3%.

The QP concludes that the TCM processing plant has shown it can handle throughput rates and mineral recovery effectively. However, certain equipment and components require refurbishment, as some have had minimal to no use over the past decade. Assuming ore feed remains consistent with historical patterns, the plant is anticipated to meet its performance targets following refurbishment, recommissioning, and ramp-up.

### 25.1.4 Waste Rock and Tailings Storage

The two WRSFs are engineered structures designed for stability and to prevent the development of acidic water and runoff. A plan is in place to cover the piles with NAG Type I volcanic rock as a preventive measure after the cessation of mining.

The Phase VIII design for the TSF has received regulatory approval and is intended to accommodate tailings produced during the remaining LOM. The TSF has sufficient capacity remaining for 94 million tons of tailings to reach the ultimate design grades, plus additional capacity for excess tailings to help reach closure grades across the impoundment surface.

Continued raising of the sand dam after mill restart will require increased on-specification sand recovery from tailings cyclone operations to produce sufficient volumes of dam construction material. A historical deficit in sand production has resulted in over-steepened areas that remain on the dam face during the current temporary shutdown, with the mid-valley portion of the dam out-slope lower in elevation and steeper than its intended configuration.

WSP (2024a) conducted a thermal evaluation to assess whether the annual cyclone sand deposition season could be lengthened without significant risk of creating permanently frozen zones or lenses within the sand dam for the purpose of increasing sand volumes for dam construction. Additionally, Paterson and Cooke (2023) analyzed the fixed cyclone station in combination with historical tailings properties to evaluate the achievable range of on-specification sand recovery. Based on findings from these two evaluations, TCM intends to operate the fixed cyclone station for nine months out of each year, with a target sand recovery of 60% and an assumed availability of 85% after mill restart until the sand dam is fully constructed.

WSP (2024b) carried out detailed tailings deposition modeling for this period on annual timesteps based on the updated cyclone operation criteria. Sand deposition near the dam toe is prioritized in the first three years after mill restart to address the sand deficit and enhance dam stability as quickly as feasible. A change from historical sand deposition practices will be needed to deliver sand to areas lower on the dam face and to deposit it in paddocks. Design work to enable tailings placement in this way is in progress.

Seepage and stability analyses were conducted by WSP (2024b) for each annual timestep based on the output geometry from the deposition modeling. The results from the seepage and stability modeling indicate a static stability FS of at least 1.5 for each annual timestep. Additionally, it is likely that estimated deformations from the MCE will be reduced to tolerable levels within the first three to four years after mill restart.

### 25.1.5 Water Management

Base Case water balance model results have been segmented and are summarized below for the four periods or mine phases:

- Period 1 – Pit dewatering
- Period 2 – Early operations
- Period 3 – EOM operations
- Period 4 – Post-closure, pit flooding.

**Period 1**

Base Case results indicate that the water elevation in the pit will require approximately 3.3 to 5.2 years following the start of processing to be drawn down to the current base (floor) of the pit. At the upper end of the time range, this duration could impact mining operations if additional capacity to dewater the pit were not enacted (e.g. increasing the discharge capacity at outfall 004 or 005, initiating discharge via 005 prior to 2027). Approximately one million $ft^3$ (7.5 million US gallons) of residual pit water will be retained in the pit sump following dewatering.

**Period 2**

Period 2 model results are sensitive to variable climate and uncertainty with respect to groundwater inflows to the pit (Lorax, 2024b). Under water surplus conditions, the water balance model indicates that water will accumulate in the pit during spring runoff, consistent with previous operations. Opportunities to manage excess water include discharging treated water via outfalls 004 and 005 and using the TSF for temporary water storage.

**Period 3**

As per Period 2, the water balance is sensitive to variability in climate and groundwater inflows to the pit. Under water surplus conditions, excess water that cannot be managed through infrastructure limitations on permitted discharges (e.g. 004 and 005) may require temporary storage in the pit which could impact the timing for ore extraction from the base of the pit. Median WBM results suggest that annually between approximately April and August, discharge via outfalls 004 and 005 is required to shed excess water that accumulates in the pit. It is assumed that this excess water is sent through the water treatment plant prior to discharging via outfalls 004 or 005.

**Period 4**

The post-closure pit flooding scenario assumes that the final managed water elevation in the pit will be 7,030 ft-asl to prevent water from discharging through the historical adit in the pit highwall at 7,040 ft-asl (Lorax, 2011h). Up to the managed water elevation, the storage volume in the EOM pit, corresponding to the 2024 feasibility study mine plan, is estimated at ~3,570 million $ft^3$ (26.7 B US Gallons). Post-closure scenario model results indicate that the median duration for the pit to flood to the final managed elevation (7,030 ft-amsl) is on the order of 60 years. Consistent with the Phase VIII EIS, the updated groundwater model (Lorax, 2024b) identifies the potential for groundwater seepage from the flooded pit to discharge to Thompson Creek.

### 25.1.6 Environment, Permitting and Community

A study has indicated that post-closure water treatment will require new water treatment equipment including a lime addition system, coagulant and flocculant equipment, reaction tank(s), a clarifier, a filter, and appurtenant process and control equipment.

The capital cost of post-closure water treatment infrastructure is estimated as follows:

- Pit Infilling Phase, Years 1–5 (existing infrastructure maintenance only) – $91,000
- Water Treatment Phase, Year 31 (new water treatment plant, piping, and pump station) – $7.02 million
- Water Treatment Phase – 50-year replacement of treatment plant – $6.48 million.

The estimated annual operational cost summary is estimated as follows:

- Pit flooding, Year 1: $427,000 per year
- Pit flooding, Years 2–15: $422,000 per year
- Pit flooding, Years 16–30: $953,000 per year
- Water treatment, Years 31 forward: $1.66 million per year.

All required permits and authorization for the TCM are currently in place to mine Phase VIII, including closure plans and all necessary environmental compliance approvals. Since the receipt of approval for a MMPO in 2024, permits and authorizations include an additional pit highwall layback, subject to a minor update to the reclamation plan.

### 25.1.7 Capital and Operating Cost Estimates

Initial capital investment of $397 million has been estimated to return the TCM to operations. Total capital for the LOM is $471 million.

Operating costs are estimated to average $13.98/st over the 16-year LOM.

### 25.1.8 Economic Analysis

The economic analysis based on the results of the feasibility study indicate a positive net cash flow and positive after-tax $NPV_{8\%}$ of $185 million. The mine is most sensitive to variations in molybdenum head grade and secondarily to fluctuations in the price of molybdenum.

## 25.2 Risks and Opportunities

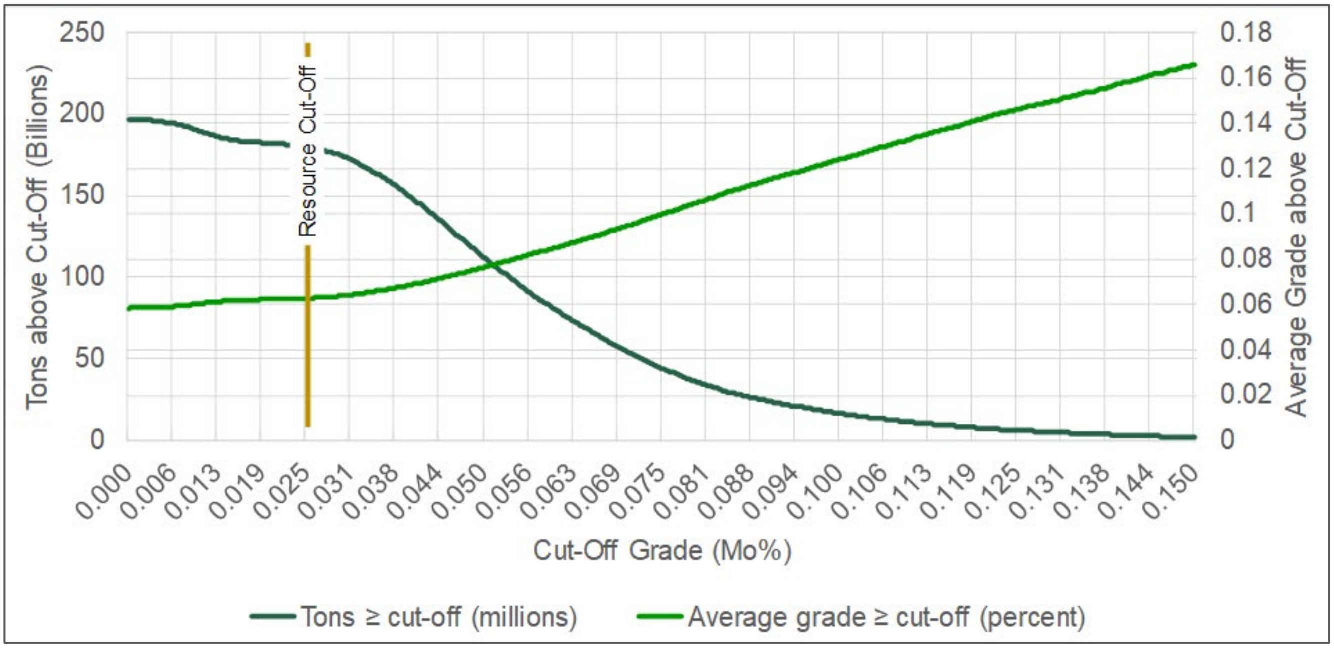
### 25.2.1 Geology, Mineralization and Mineral Resources

Mineral Resources may be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socioeconomic, and other factors.

Mineral Resources may be affected by further infill and exploration drilling, which may result in increases or decreases in subsequent Mineral Resource estimates.

A grade-tonnage curve considering only Measured and Indicated Mineral Resources, inclusive of Mineral Reserves, is presented in Figure 25-1. The grade-tonnage curves illustrate the sensitivity of the Thompson Creek deposit to different cut-off grades within the conceptual pit shape.

**Figure 25-1 Molybdenum grade-tonnage curve of Measured and Indicated Mineral Resources (inclusive of Mineral Reserves)**



### 25.2.2 Mineral Reserves and Mining

The dump designs used in the reporting of this Mineral Reserve will require permit adjustment and approval to enable completion. In the US, there is no guarantee that a permit adjustment will be granted nor any guarantee as to the level of study required to support such a review. Because of this, there is a risk that permit adjustments may delay the project for several years.

Conclusions based on future drilling indicating adverse changes in assumptions such as weaker rock characteristics, unfavorable geologic structure, and/or variations in pore pressures could result in an increase in required depressurization and/or a decrease in the design slope angles, particularly in the north wall.

The lead time and infrastructure needed to achieve required depressurization targets may preclude practical time and cost constraints. This would require flattening of slope angles in the north wall.

For slope design sectors controlled by bench-scale stability (S1, N4, E1, W1), optimal mining practices (drilling, blasting, and scaling) could allow for increases in slope angle.

There is upside potential in reviewing the current permits and adjusting the closure requirements for the operations. Many of the legacy closure requirements could be mitigated or reduced through additional testwork or design updates.

### 25.2.3 Mineral Processing

Based on extensive historical data, the plant's design ensures minimal operational risk. Previous performance has consistently exceeded the planned throughput rate, indicating there is opportunity to increase the average annual processing rate.

### 25.2.4 Waste Rock and Tailings Storage

Portions of the downstream face of the TSF dam are steeper than stipulated in the design as a result of a deposition shortfall during previous operations. Regulatory authorities are aware of the situation and may demand faster mitigation.

Also, the variation from the TSF design results in reduced seismic stability for the structure, which increases instability risk in the event of a large earthquake and would not conform to dam design standards if left in present state.

There is an opportunity to operate the dam construction cyclone for longer periods of the year, increasing sand volumes and correcting the dam profile sooner.

If the pyrite removal circuit is not re-established, there is a risk of TSF sub-drain clogging.

Mounting water reclaim pumps on a barge on the TSF pond presents an opportunity for improved operability.

### 25.2.5 Water Management

Uncertainties regarding water quality to be addressed prior to operations restart include the following:

- Periodic surveys and water sampling of the flooded pit profile are recommended to confirm water quality parameters are within permit limits.
- Excess pit water sources have the potential to not meet outfall 004 or 005 requirements in the later stages of pit dewatering and/or after the pit has been dewatered and should be managed through the water treatment plant prior to discharge.
- Consistent with best management practices for source control, seepage collection systems and associated groundwater cut-off walls and connections to seepage collection pipelines should be maintained in the Pat Hughes and Buckskin Creek drainages to minimize contaminant loadings to Thompson Creek via groundwater pathways.

### 25.2.6 Capital and Operating Costs

The mine is constructed and therefore is exposed to minimal risk of variation in capital cost. Operating costs in the State of Idaho are largely known and predictable, with the largest risks being labor and energy cost escalations.

### 25.2.7 Economics

Being most sensitive to head grade, there is an opportunity to carefully manage feedstock to the processing plant for maximum profitability.

# 26 RECOMMENDATIONS

The following recommendations are provided by the various QP, segmented by subject matter. The cost to carry out the recommendations for additional work or studies has been accounted for in the future cost projections in the financial modal.

## 26.1 Mining and Pit Slope Stability

The following recommendations are made with respect to mining and pit slope stability:

- The site be evaluated prior to closure for “design for closure” opportunities that may reduce the closure liability for the property.
- Conduct geotechnical core drilling in upper portions of the slope in design sectors N2c and N3 to support sub-domaining of the Challis Volcanics unit.
- Conduct geotechnical core drilling in the N4 design sector to verify structural and rock quality at the toe of the LOM slope.
- Conduct a hydrogeologic testing campaign to measure aquifer properties.
- Construct a pit-scale FEFLOW groundwater model to confirm if the slope depressurization targets can be met with horizontal drains.
- Incorporate budget contingency for slope monitoring and management. Monitoring equipment should include prisms, an automated total station and a slope stability radar, at a minimum.

## 26.2 Tailings Storage

Recommendations pertaining to the TSF include the following:

- Continued raising of the sand dam after mill restart will require increased on-specification sand recovery from tailings cyclone operations to produce sufficient volumes of dam construction material. To that end, an assessment is currently underway to evaluate potential improvements to the existing cyclone system. Improvements should be identified with the objective of providing a high degree of confidence that the target sand recovery of 60% can be achieved. The chosen improvements should be implemented well in advance of mill restart.
- Upgrades to the sand distribution infrastructure and changes to historical practices are recommended to deliver sand to areas lower on the dam face and to deposit it in paddocks. Design work to enable tailings placement in this way is in progress and should be completed in time to implement the upgrades prior to mill restart. Sand deposition near the dam toe should be prioritized in the first three years after mill restart to address the existing sand deficit and enhance dam stability as quickly as feasible.
- The pyrite circuit in the mill, which was removed during the current temporary shutdown, should be re-established in advance of mill restart. This system is important for reducing the potential for subdrain system clogging.

- Replacement of the shore-mounted water reclaim pumps with barge-mounted pumps is recommended for improved operability.
- Installation of additional piezometers, slope inclinometers, and thermistor arrays is recommended to augment the current monitoring infrastructure in preparation for mill restart. It is expected that the number and locations of additional instruments will be determined later in 2024.
- TSF-related construction activities that should be completed prior to mill restart include installation of new subdrain systems, raising of the rock-toe dam, and construction of new tailings overflow ponds and a new sediment interceptor pond.
- Accumulated sediment should be removed from the seepage return pond prior to mill restart.

## 26.3 Water Management

Water quantity and associated discharge uncertainties with supporting recommendations to be addressed as the project advances through detailed design are identified below.

- Discharging pit water via the permitted outfall 005 (Salmon River) will be required to dewater the pit and has been assumed to commence by July 2027 at rates up to 1,000 gal/min. Operation of the 005 outfall will require the twinning of the Cherry Creek Pipeline from the booster tank to the Thompson Creek Pipeline. Infrastructure design, construction, and commissioning requirements will need to be detailed prior to discharging water via outfall 005.
- The periodic (seasonal) operation of outfalls 004 and 005 may be necessary during mill operations to address excess water associated with active pit dewatering or adverse climate conditions. It is assumed that mine water will be routed through the water treatment plant prior to discharge and to ensure that IPDES permit limits are met.
- Findings from the ongoing geotechnical and hydrogeological investigations to characterize hydraulic head distribution and material properties should be considered in the site-wide groundwater flow model (Lorax, 2024b) when available. This additional information is anticipated to constrain groundwater flux estimates to the pit for current conditions and when the pit has been dewatered. Alignment with pit stability and active dewatering field assessments, design, and groundwater modeling should be advanced to inform potential effects on the water balance for all phases of development and operations.
- The numerical groundwater model (Lorax, 2024b) utilized calibration data (i.e. piezometric heads and groundwater baseflow data) that identify important 3D flow processes and variability in hydraulic parameters. The development of a more detailed numerical groundwater model will require more data than is currently available.
- Any future modeling of the open pit should include data from investigations carried out by the mine and other consultants and should include water flow measurements as well as piezometric head data. Detailed records of water transfer to and from the pit and water levels in the flooded pit will be required to inform groundwater model updates. Additional geological data will also help constrain model hydrostratigraphy.

- The installation of new piezometers surrounding the pit is recommended and is planned for 2024. The piezometers should be continuously monitored with transducers to better understand the hydraulic head distribution at the mine, and to accurately evaluate the groundwater divide between the open pit and Thompson Creek. This will in turn inform estimates of potential offsite migration of solutes from the flooded pit.
- Once dewatered, the pit provides a critical reservoir to manage surge storage during operations which may impact pit bench development in the later stages of mine life. Surge storage requirements coincide with spring runoff, consistent with historical operations. The timing of pit bottom development should be planned accordingly.
- Detailed records of all management flows at site are recommended to be collected and maintained, including QAQC and routine (e.g. quarterly) manual verification of flow monitoring meters/totalizers (e.g. Cherry Creek Pipeline to water treatment plant feed tank, Cherry Creek Pipeline to sprinklers on the TSF beach, SRD reclaim to water treatment plant feed tank, SRD reclaim to sprinklers on TSF beach, water treatment plant discharge, TSF pond to sprinklers on TSF beach, outfalls 001, 003, 004 and 005). These records are recommended to support refined WBM development and to verify the pit water balance (i.e. inflows – outflows = change in storage).
- The WBM should be updated/revisited at regular intervals as required to inform ongoing operations (e.g. every three years). Model updates should consider additional monitoring data, records, and site investigations relevant to the pit water balance components (including groundwater) through dewatering and operations to inform management decisions.
- Potential effects from climate variability, including the more recent period of record (e.g. 2010 to present), were assessed and found to be within model uncertainty. Future assessments are recommended to use updated climate and streamflow inputs.
- Simulation results suggest the RIS and Hawks Nest diversion pipeline capacity (8 cfs) may be exceeded from time to time, resulting in overflow to the TSF impoundment. While these sporadic events are not material to the overall water balance, the function and capacity of the diversion system should be confirmed for these potential high-flow events.
- Discharges from pit dewatering are planned to be routed through the booster tank, which has a reported 1,000,000-gallon capacity. At peak pit dewatering discharge rates (4,000 gal/min), the booster tank will have limited residence time available (e.g. four hours). Contingency water management plans should be developed in the event of temporary mill shutdowns and pump maintenance.

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