Technical Report

on the

Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada

NAD83 UTM Zone 17N 473,000 m E; 5,141,800 m N
LATITUDE 46° 25.8’ N, LONGITUDE 81° 21.1’ W

Prepared for:

Magna Mining Inc.
1300 Kelly Lake Road
Sudbury, Ontario
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SGS Project # 20316-01

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1 SUMMARY

SGS Geological Services Inc. ("SGS") was contracted by Magna Mining Inc., ("Magna" or the "Company") to complete an updated Preliminary Economic Assessment ("PEA") for the Crean Hill Project ("Crean Hill" or "Project") and prepare a National Instrument 43-101 ("NI 43-101") Technical Report written in support of the updated PEA.

Magna Mining is an exploration and development company focused on nickel, copper and PGM projects in the Sudbury Region of Ontario, Canada. The Company's flagship assets are the past producing Shakespeare and Crean Hill Mines. The Shakespeare Mine is a feasibility stage project which has major permits for the construction of a 4,500 tonne per day open pit mine, processing plant and tailings storage facility and is surrounded by a contiguous 180 km^2 prospective land package. Crean Hill is a past producing nickel, copper and PGM mine with a technical report dated July 2023. Magna's common shares are listed on the Toronto Stock Exchange Venture Exchange ("TSX-V") under the symbol "NICU". Their current business address is 1300 Kelly Lake Road Sudbury, Ontario P3E 5P4.

The current report is authored by Allan Armitage, Ph.D., P. Geo., ("Armitage"), William van Breugel, P.Eng. ("Breugel"), Johnny Canosa, P.Eng. ("Canosa"), and Henri Gouin, P.Eng. ("Gouin") of SGS and Dominic Fragomeni, P.Eng. ("Fragomeni") of Frago-Met Solutions Ltd. ("Frago-Met") (collectively, the "Authors"). The Authors are independent Qualified Persons as defined by NI 43-101 and are responsible for all sections of this report.

The current PEA is based on an updated Mineral Resource Estimate ("MRE"). The reporting of the updated MRE complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects. The classification of the updated MRE is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions) and adhere as best as possible to the 2019 CIM Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines (2019 CIM Guidelines). Armitage is responsible for the current Crean Hill MRE.

The current Technical Report will be used by Magna in fulfillment of their continuing disclosure requirements under Canadian securities laws, including National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101"). This Technical Report is written in support of an updated PEA completed for Magna.

1.1 Property Description, Location, Access, and Physiography

The Crean Hill Project property is located in Denison Township within the City of Greater Sudbury, Ontario, Canada, approximately 30 km southwest of downtown Sudbury. The property is centered at approximately 46° 25.8' N latitude, 81° 21.1' W longitude (473,000 m E, 5,141,800 m N in NAD83 UTM Zone 17N).

The site is easily accessible by road throughout the year via Regional Road 4; north off of Highway 17 to Crean Hill Road.

The Project is a historical mine site with a filed closure plan from the MENDM. Approximately 20.4 Mt of ore was extracted from Crean Hill during its operating lifespan. Following closure in 2002, the site surface infrastructure was removed to prepare for site remediation, including the headframe, backfill plant and other buildings, fixed mining infrastructure, power lines, and rail lines. Since then, significant decommissioning work has been undertaken, including the following:

- Shafts, raises, and other openings to surface were capped with concrete.
- Waste rock was relocated to the Crean Hill Main Site Open Pit and Ellen No. 2 Pit.
- Crean Hill Main Site Open Pit was capped with clay, contoured, revegetated, and fenced.
- Disturbed areas were vegetated.
- The former mine landfill was capped, and a seepage barrier was installed.

1.2 History

The Crean Hill deposit was first discovered in 1885 and production was first reported in 1906. From 1906 to 2002 the site was subject to sporadic production and exploration by various operators. During this period, approximately 20 million tonnes of ore were produced at an average grade of 1.31% Ni and 1.09% Cu.

The existing Crean Hill underground mine workings have been flooded since operations ceased in 2002. The original shaft was approximately 2,000 ft deep to just below the 2000 Level (2000L) and was later deepened to just below the 4000L (approximately 4,180 ft below surface). The shaft is understood to have been equipped with five compartments (two skips, a cage, a counterweight, and services/ladderway). The historic sublevels in the upper mine above 2000L were spaced at approximately 200 ft intervals and developed from the shaft as track drifts. There was no internal ramp system connecting the levels. In the upper levels, the shrinkage stoping mining method was used, and stopes are assumed by the QP to be left open or partially backfilled with unconsolidated waste rock. Below 2000L, the primary mining method was Vertical Retreat Mining (VRM) also known as Vertical Crater Retreat (VCR), with sublevel spacing ranging from approximately 250 to 300 ft and no internal ramp system. The VRM stopes were mined as primaries and secondaries with hydraulic sandfill used to fill the voids. The 4000L area included a crusher and conveyor to the shaft loading pocket. The existing lateral development excavations outside the historic stopes are assumed by the QP to be accessible, however all previous underground infrastructure is assumed by the QP to be not available.

1.3 Geological Setting and Mineralization

Ni-Cu-Platinum Group Elements (PGE) deposits in Sudbury occur within the Sudbury Structure that formed as a result of a major early Proterozoic meteorite impact 1,850 million years ago (Ames and Farrow, 2007). The Sudbury Structure straddles the unconformity between Archean gneisses and plutons of the Superior Province and overlying Paleoproterozoic Huronian supra-crustal rocks of the Southern Province. It is geographically divided into the North, South, and East Ranges and comprises four geologic domains. The Property is in the South Range of the Sudbury Igneous Complex (SIC). The main mass of the South Range SIC consists of a lower unit of the quartz-rich norite. Stratigraphically above is the Green Norite with irregular bodies of Brown Norite followed by the Quartz Gabbro then the Granophrye layers. There is a magmatic breccia called Sublayer found at the basal contact of the main mass in embayment and trough structures. The footwall (FW) to the SIC South Range is the Southern Province. The geology can roughly be divided into the Early Proterozoic (~2,450 Ma) Murray and Creighton Granite Plutons and Huronian Supergroup (2,250 to 2,460 Ma) mafic and felsic volcanic and sedimentary rocks. The Creighton and Murray Plutons are intrusive into older Huronian volcanic and sedimentary rocks, mostly of the Elsie Mountain and Stobie Formations.

The South Range of the SIC and adjacent Huronian rocks, for the most part, dip vertically or steeply north or south. Stratigraphic tops generally face south, away from the SIC and toward the Grenville Front. The South Range Shear zone and Creighton and Murray faults are the result of the deformation events that have shaped the present-day South Range. The age of the deformation which has resulted in the current sub-vertical orientation of the Huronian rocks has not been definitively established. The metasedimentary rocks are interbedded sparingly with mafic volcanic flows of the Elsie Mountain Formation and commonly with volcanic rocks of the Stobie Formation. Many of these interflow metasedimentary rocks are sulphide-bearing. The sulphides are dominantly pyrrhotite with minor amounts of pyrite and trace chalcopyrite. South Range footwall rocks are cut by several small diabase and gabbroic intrusions that are often difficult to distinguish in the field. These include Matachewan dykes, Nipissing intrusions, quartz diabase (trap dykes), and Olivine Diabase. Both the quartz diabase and olivine diabase dykes are younger than the SIC. The Archean and early Proterozoic basement rocks are all crosscut by Sudbury Breccia. There are several main types of mineral deposits in the Sudbury area:

- Contact deposits, including massive sulphide consisting of nickel, copper, cobalt, platinum, palladium, and gold mineralization along the lower contact of the SIC, both within the contact sublayer and in the immediately adjacent Footwall Breccia.

- Footwall deposits, including sulphide veins and stringers containing copper, nickel, platinum, palladium, and gold in the brecciated footwall rocks beneath the SIC.
- Structurally and/or hydrothermally remobilized sulphide nickel, copper, cobalt, platinum, palladium, and gold mineralization.
- Offset dyke deposits, including massive sulphide consisting of nickel, copper, cobalt, platinum, palladium, and gold mineralization associated with brecciated and inclusion bearing phases (IQD) of the quartz diorite offset dykes (QD).
- Hybrid type deposits representing combinations of the above.

The Property straddles the South Range of the SIC approximately 30 km southwest of Sudbury, in Denison Township. From 1906-2002 a total of 20,370,000 tonnes of ore grading 1.09% Cu, 1.31% Ni, 1.56 g/t TPM (total precious metals) was produced from the Main, Intermediate and 9400 zones. The Property hosts part of a large trough structure at the base of SIC which contains several previously mined ore deposits including Crean Hill Main Orebody, Crean Hill Intermediate Orebody, Crean Hill West (9400) Orebody, Ellen Mine, and Lockerby Mine, each sitting in embayments within the larger trough. The embayments largely control the distribution of Ni-Cu mineralization. Much of the historic mining activity on the property exploited Contact Type deposits. Mineralization includes blebby to massive accumulations of sulphide, including pyrrhotite > chalcopyrite > pentlandite concentrated within embayment depressions along the base of the SIC, both within the contact sublayer and in the immediately adjacent FW Breccia.

A significant portion of the mineralization, such as the 109 FW (footwall) Zone, the 101 FW Zone, and part of the 9400 Zone, are hosted in the footwall rocks. The host rocks are dominated by metamorphosed basalt (historically mapped and logged as greenschist), but also include gabbro, andesite, rhyolite, and sedimentary units (arkosic quartzite and meta-pelite) of the Huronian supergroup, Elsie Mountain Formation. Minor lithologies include olivine diabase, quartz diabase (trap dykes), granite, schist, amphibolite, and Sudbury Breccia in the footwall, and quartzose norite at the SIC contact. The main mineralized zones from east to west are as follows:

- Main
- 109 FW
- Intermediate
- 101 FW
- 99 Zone
- 9400

1.4 Exploration and Drilling

A total of 4,009 drillholes totalling 515,664 m (1,691,812 ft)—make up the Crean Hill drillhole dataset prior to Magna acquiring the property in late 2022.

Since its acquisition of the Crean Hill property in November 2022, Magna nearly continuously completed diamond drilling within the Crean Hill property. As of the date of this report, drilling has focused on defining continuity and grade of mineralization (within the current mineral resources), and expansion of the known mineralized zones. More recently in 2024 exploration and drilling efforts have focused on the footwall environment. Magna has completed 130 surface diamond drill holes for a total of 28,439 m of drilling between November 2022 and April 2024. The results of the diamond drilling completed by Magna to date have been considered in the geological interpretation, and assay results have incorporated into the current MRE.

1.5 Mineral Processing, Metallurgical Testing and Recovery Methods

The deposit is made up of the remnants of the historic mine operations of Crean Hill and extensions into the FW adjacent to the historic mining. The geometallurgical types typical in the Sudbury Basin are represented in the deposit. Less than 5% of the mineralization consists of FW and LSHPM material identified in the 109 FW and adjoining the historic deposits.
The 109 FW material has been the subject of numerous historical evaluations. More recently in 2023, Magna commissioned a third party mineral processing lab to create 4 composite samples representing variable head grade and subsequently tested and measured mineralogy and flotation response using the Clarabelle Mill lab scale procedure.

The Contact mineralization is similar to other contact ores in the Sudbury Basin. The Contact style mineralization at Crean Hill represents >95% of the mineralization, is contained in extensions and remnants over several discrete zones of the Ni mine. Contact mineralization had not been thoroughly reported in historical testing. More recently in 2023, Magna commissioned a third-party lab to create 9 composite samples of Contact mineralization representing a range of head grades and mineralogy from the various Contact zones. Along with the 109FW samples, the lab performed a variability program to measure the mineralogy and lab scale flotation response using the Clarabelle Mill lab scale procedure.

The results of this program were used to further understand the mineralogy and flotation response and ultimately develop feed grade versus metal recovery equations for both Contact and Footwall mineralization.

The results of both historical and recent test programs for both 109FW and Contact style mineralization are summarized in this report.

Magna has entered into a Definitive Off-Take Agreement with Vale Base Metals for the Advanced Exploration (AdEx) portion of the Crean Hill Project (See Magna Press Release March 27 2024). Under the Agreement AdEx Contact mineralization would be sampled, weighed and shipped to Vale's Clarabelle Mill in Sudbury for processing. This includes material from the Main, Intermediate, 9400, 9400 Footwall and 101 Footwall zones. The 109 Footwall zone is excluded from the Agreement as Magna wishes to explore options to improve metal recovery.

The Contact mineralization recovery approach discussed in this report is based on metal recovery equations as a function of head grade that were developed through lab scale testing of the Contact mineralization. Milling, smelting/refining treatment terms were negotiated by Magna and Vale Base Metals. These equations and treatment terms are included in the Definitive Off-Take Agreement with Vale Base Metals.

The Contact mineralization metal recovery in the mill is therefore a very predictable parameter in the project economics and a function of sampled and measured head grade.

The 109FW recovery approach in this report is based on metal recovery equations developed through various lab scale programs as a function of head grade. The equations are used to predict both Base Case and Optimized metallurgical performance that are projected with process changes to the concentrator process. Magna has entered into an agreement with Glencore to process a ~20,000 tonne bulk sample through its Strathcona Mill in Sudbury, Ontario. (See Magna Press Release June 4, 2024). The bulk sample test has been completed and data analysis is in progress. Further data analysis, evaluation using indicative smelting terms and follow up lab scale testing will further inform the metal recovery opportunities and business case analysis for the mining of 109FW mineralization.

1.6 Mineral Resource Estimate

Completion of the updated mineral resource estimates (MREs) for the Crean Hill project involved the assessment of a drill hole database, which included all data for surface drilling completed through to the effective date of this report, as well as three-dimensional (3D) mineral resource models (resource domains), 3D models of all mined-out areas (open pit and underground), 3D models of cross-cutting dykes, a recent topographic surface, and available written reports.

The Inverse Distance Squared (ID^2) calculation method restricted to mineralized domains, and utilizing dynamic anisotropy search orientations was used to interpolate grades for Ni (%), Cu (%), Co (%), Pt (g/t), Pd (g/t), Au (g/t) and Ag (g/t into block models.

The current MRE takes into consideration that the Projects deposits would be mined by underground mining methods.

The reporting of the MRE for Crean Hill complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects (2016). The classification of the MREs is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions).

1.6.1 Mineral Resource Statement

The current underground MRE for the Crean Hill deposit is presented in Table 1-1.

Table 1-1 Crean Hill Project Underground Mineral Resource Estimate, April 15, 2024

Cut-off Grade	Tonnes	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	NiEq %
Indicated								
1.1% NiEq	18,444,000	0.87	1.01	0.035	0.98	1.12	0.37	1.96
Inferred								
1.1% NiEq	989,000	0.53	0.70	0.026	0.98	1.66	0.29	1.56

The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au, a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.

Crean Hill Property Mineral Resource Estimate Notes:

(1) *The effective date of the Crean Hill Property Mineral Resource Estimate (MRE) is April 15, 2024. This is the close out date for the final mineral resource models and mine out models (as-builts)*

(2) *Allan Armitage, Ph.D., P. Geo. of SGS Geological Services is an independent Qualified Person as defined by NI 43-101 101 and is responsible for the current Crean Hill MRE. Armitage conducted multiple site visits to the Crean Hill Property including on May 25-26, 2022, July 25, 2023, July 02, 2024, and July 25, 2024.*

(3) *The classification of the current MRE into Indicated and Inferred mineral resources is consistent with current 2014 CIM Definition Standards - For Mineral Resources and Mineral Reserves.*

(4) *All figures are rounded to reflect the relative accuracy of the estimate and numbers may not add due to rounding.*

(5) *The mineral resource is presented undiluted and in situ, constrained by 3D grade control resource models, and are considered to have reasonable prospects for eventual economic extraction. The mineral resource is exclusive of mined out material.*

(6) *Mineral resources which are not mineral reserves do not have demonstrated economic viability. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that most Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

(7) *The Crean Hill mineral resource estimate is based on a validated drill hole database which includes data from 3,892 surface and underground diamond drill holes completed between 1951 and March 2024 and totals 475,773 m. The resource database totals 98,757 assay intervals, representing 197,536 m of data.*

(8) *The mineral resource estimate is based on a three-dimensional ("3D") resource model of the main mineralization and a broader dilution envelope. 3D models of mined out areas were used to exclude mined out material from the current MRE.*

(9) *Grades for Ni, Cu, Co, Pt, Pd, Ag and Au are estimated for each mineralization domain using ~2.0 m capped composites assigned to that domain. To generate grade within the blocks, the inverse distance squared (ID^2) interpolation method was used for all domains.*

(10) *Specific gravity values were assigned to each block based on a regression formula defined by a database of 32,592 samples. SG=(0.2057xNi%+2.88).*

(11) *Based on the size, shape, and orientation of the Crean Hill Deposit, it is envisioned that the deposits may be mined using both bulk and selective mining methods including Longhole Stoping and Mechanized Cut and Fill (MCAF) (mining methods that have long been utilized in the Sudbury region). The MRE is reported at a base case cut-off grade of 1.10% NiEq. The mineral resource grade blocks are quantified above the base case cut-off grade and within the constraining mineralized wireframes (considered mineable shapes).*

(12) *The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au (Ag is not considered), a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.*

(13) *The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.*

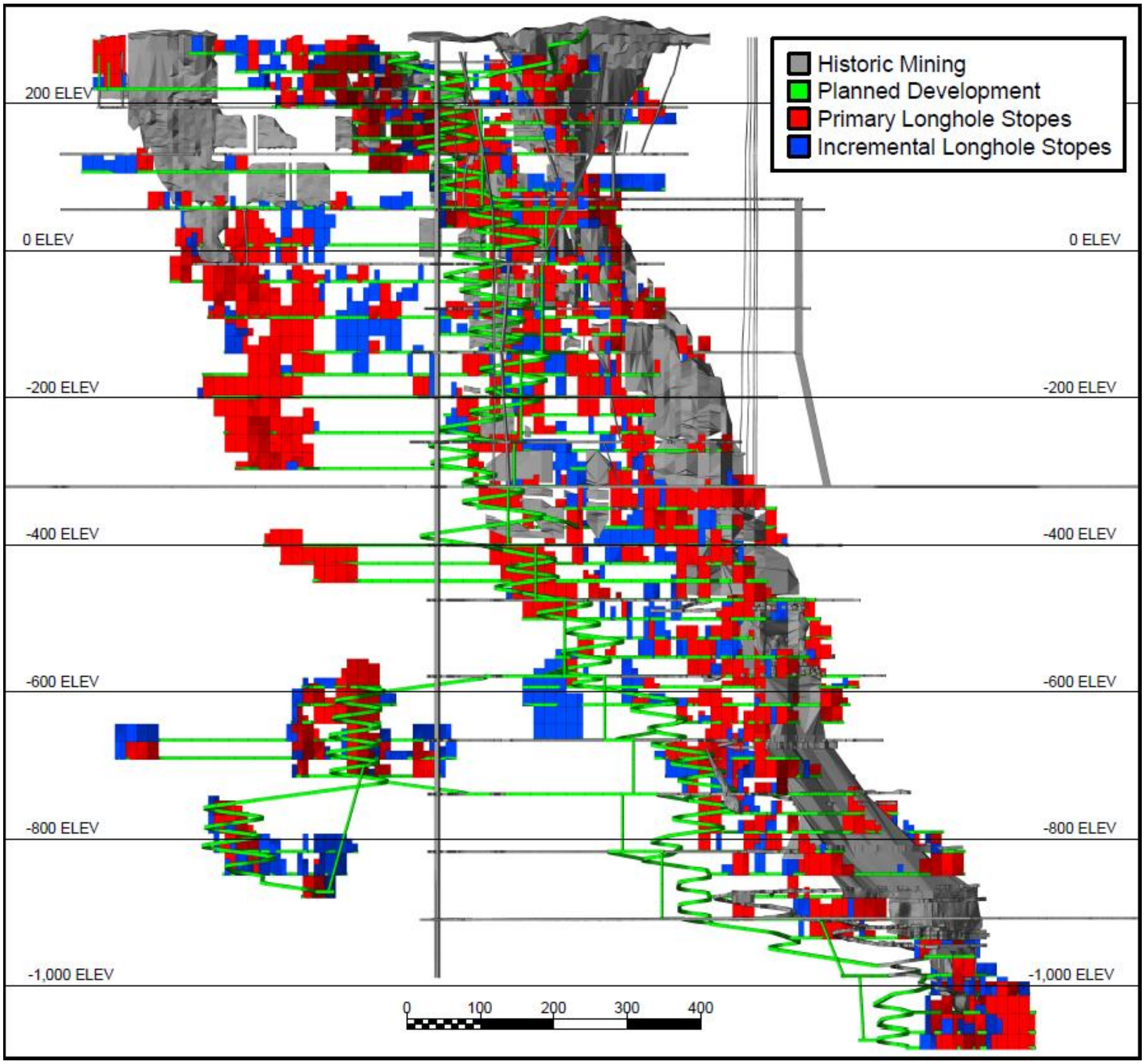
1.7 Mining Methods

The Crean Hill mine site underwent multiple phases of open-pit and underground mining until operations ceased in 2002. Since then, the site has been flooded, and all surface infrastructure dismantled. The mineral resource for the current project is centered around the existing historical underground excavations. The sub-vertical, vein-type deposit extends approximately 700 m along an east-west axis and reaches a maximum depth of around 1,370 m (level 4,500) below surface, with a thickness ranging between 2.0 m and 30 m, the typical thickness being 4.0 m.

The selected mining method for this study is longitudinal longhole stoping with high-density hydraulic backfill. Sublevels will be spaced based on the elevation of existing sublevels wherever feasible, with a target spacing of approximately 25 m. All material extracted above the 2,000 level will be hauled to the surface using a fleet of 40T underground trucks via the ramp. Material extracted below the 2,000 level will be hauled to the 2,000 level and then hoisted to the surface via the shaft, at a rate of 2,200 tonnes per day when the mine reaches full production.

Figure 1-1 provides a longitudinal view looking north, illustrating the extent of the underground development.

Figure 1-1 Underground Mine Design



Production is scheduled to begin in mid-2026, with the target production rate of 2,200 tonnes per day expected by 2028. The mine life is 13.5 years, extending to mid-2039. An estimated 1.3 Mt of mineralized material will be recovered through development, and 9.4 Mt through stoping, for a total of 10.7 Mt at an NSR of $240.

The diluted and mining-recovered production quantities are summarized in Table 1-2.

Table 1-2 Diluted and Mining-Recovered Production Quantities

Item	Unit	Grand Total	AdEx	Production Feed		Total Production
				Primary	Incremental	
Resource Mined	t	10,746,509	57,903	7,996,761	2,691,845	10,688,606
NSR	$/t	240	291	258	148	240
NiEq Cut-Off Grade	%	-	1.20	1.20	0.90	-
Ni Grade	%	0.83	1.42	0.92	0.56	0.83
Cu Grade	%	0.72	0.63	0.79	0.50	0.72
Co Grade	%	0.03	0.05	0.03	0.02	0.03
Pt Grade	g/t	0.91	0.40	1.01	0.63	0.91
Pd Grade	g/t	1.04	0.27	1.16	0.70	1.04
Au Grade	g/t	0.34	0.11	0.38	0.21	0.34

1.8 Project Infrastructure

The Crean Hill Project is a former operating mine site with existing infrastructure such as year-round access, nearby electrical power line grid, and available water sources. The mineralized material will be hauled to a milling facility with a Definitive Off-Take agreement with Vale base Metals at an approximate distance of 36 km via Crean Hill Road, Number 4 Road (Fairbank Lake Rd), and Trans Canada Hwy 17. This haul road will be suitable for use by heavy haulage trucks, with a provision for regular road maintenance. The Project will have access to leading mining industry service providers, suppliers and supply chains, and labor markets available in Sudbury and surrounding communities.

The infrastructure required for the Crean Hill Project will include:

- Portal and The Shaft Rehabilitation.
- Waste Dump expansion.
- Backfill Plant.
- Sampling Tower.
- Overall water management plan.
- Water management structures.
- Electrical site reticulation and.
- Warehouse, offices, facilities, weighing scale, and other services.

The mineralized material from underground will be transported to Vale's Clarabelle mill in Sudbury for processing.

The following describes the surface facilities required for the mining operations:

- The portal area will include clearing/grubbing and stripping the overburden for drilling and blasting to “collar in” the ramp.
- The surface fan/heater installation is located on high ground. The ventilation raises collar elbow is also outfitted with a man door airlock system to access the raise manway compartment. An electrical building is required to house the fan starters or 600-volt variable frequency drives.

- The surface sampling tower complex including the mineralized and low-grade stockpile area is located north of the portal area. At the portal area, additional facilities shall be installed such as a storage bunker, water supply tank, compressor house, mineralized stockpile, fuel, and generator (stand-by).
- A warehouse and storage building will be in the dry/shop/storage building/shop/office complex, near the shaft. A laydown area will be prepared adjacent to the warehouse to accommodate the storage of such items as pipes, ventilation ducting, and electrical cable.
- Mine supervision and engineering will be in the dry/shop/warehouse/office complex. Part of this complex will house a safety conference room, shifter wickets, dry, and engineering offices.
- A modular portable 40-person mine dry will be installed initially, with office space for mine rescue, supervision, engineering, meeting room, tag in/out board, lunchroom, washroom facilities, first aid, etc.
- A septic field will be used for sewage containment with regular pump-out as required. Minimal primary warehouse facilities will be maintained on-site in a portable trailer, or prefabricated structure, with miscellaneous cold storage in additional “containers”. For each modular building, “C” cans will be provided for survey equipment, and accessories, etc.
- A 40-foot shipping container shelter dome and cover equipped with a crane shall be located near the shaft covering an area of 12 m X 18 m. The containers could be used for warm storage for equipment, materials, and supplies.
- Dedicated storage tanks will be provided on the surface for diesel fuel and propane requirements. Magna is planning to install on-site 2 X 30,000-gal propane tanks. The suppliers will directly fill these tanks. Other items further outlined in this section of the report include compressors, ventilation fans/heaters, and electrical switchgear/transformers.
- The surface facilities also include the upper west retention pond and retention pond dam, a settling pond and filter berm, a polishing pond and dam, and site access roads. An existing powder magazine is located north of the mineralized stockpile.
- A 24-hour manned security gate with a weighing scale and parking facility.

1.9 Market Studies and Contracts

No project-specific marketing studies were undertaken for the PEA. The PEA considers the sale of mined mineralized resource from the Crean Hill mine to a third-party mill within trucking distance in the surrounding area.

The Company is planning the Advanced Exploration (AdEx) program, and it is anticipated that mineralized material recovered from this program will be processed under negotiated terms for milling and smelter processing. The economic analysis in this PEA is based on the terms of this negotiated agreement.

1.10 Environmental Studies, Permitting and Social or Community Impact

The Crean Hill Project is located at the west end of the historic Sudbury mining camp, which has hosted mining and processing for over a century. The Crean Hill Mine on the property operated from 1906 to 2002. Magna acquired partial mining rights to the property in 2022 and has undertaken early exploration activities and economic evaluation work.

On February 29, 2024, Magna received confirmation that the amended Closure Plan for the Crean Hill Project had been filed with the Ontario Ministry of Mines. This allows Magna to move forward with an advanced exploration plan, which includes a surface bulk sample and the development of a ramp from the surface to perform test mining in the 101 Footwall, 109 Footwall, and Intermediate mineralized zones. The tonnage of the mineralized rock from the surface and underground test mining is outlined as 400,000 tonnes.

Magna has also applied for a Permit to Take Water (PTTW) to the Ministry of Environment, Conservation and Parks (MECP). In September 2023, Magna received comments back from the MECP on the application, amendments to the application were made in October and December 2023. Magna received confirmation that the Permit to Take Water has been approved by the Ministry of Environment, Conservation and Parks (MECP). This is the final permit required to enable dewatering of the existing mine workings and allow Magna to move forward with their advanced exploration plan, including a surface bulk sample and development of a ramp from the surface to perform test mining in the 101 Footwall, 109 Footwall and Intermediate Zones.

1.11 Capital and Operating Costs

The cost estimate for this PEA was conducted to achieve an accuracy of +/- 40%. Costs are categorized into 3 areas:

- Pre-Production Capital
- Sustaining Capital
- Operating Costs

Capital costs for the project are summarized in Table 1-3 below.

Table 1-3 Capital Costs for the Crean Hill Project

Item	Units	Pre-Production (Initial Capital)	Production (Sustaining Capital)	Total Capital Cost
Development	M$CAD	12.8	143.5	156.3
Infrastructure	M$CAD	14.5	58.7	73.1
G&A and Indirects	M$CAD	0.4	4.8	5.2
Closure	M$CAD	-	5.8	5.8
Total Capital Cost	M$CAD	**27.7**	**212.8**	**240.5**

Operating costs for the project assume owner operated mining and on site crushing / sampling with haulage to a local mill.

Operating costs for the life of mine are summarized in Table 1-4.

Table 1-4 Operating Costs for the Life of Mine

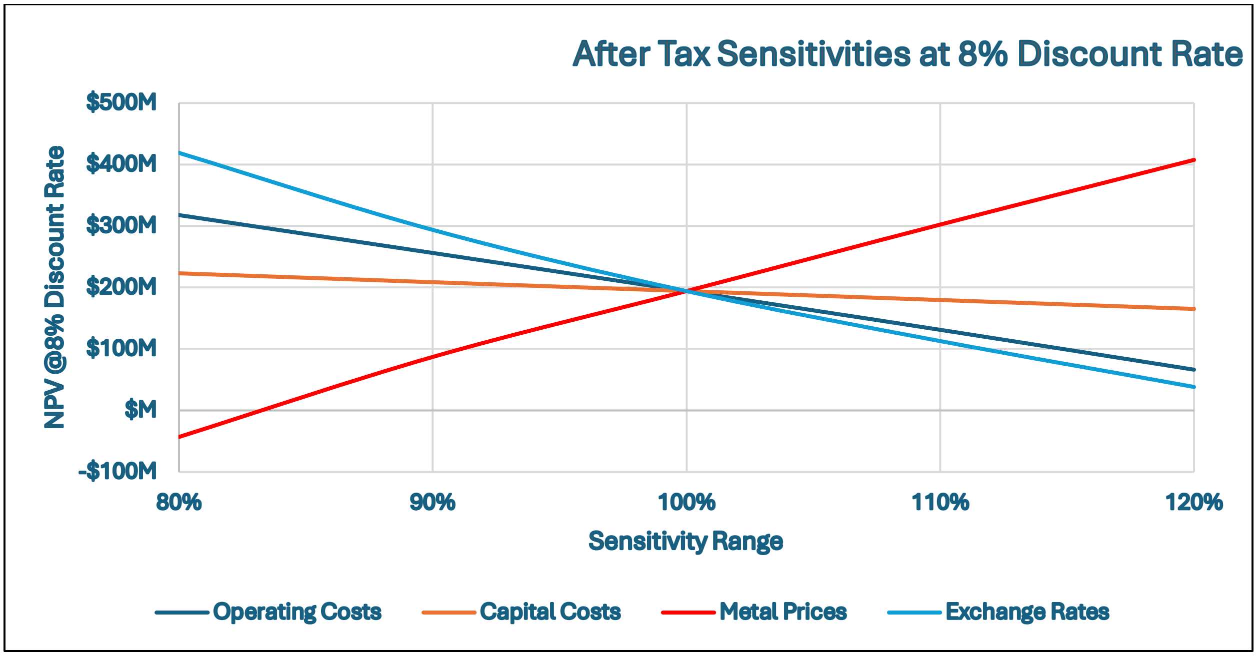
Item	Units	Pre-Production	Production	Operating Cost Per Resource Tonne Mined ($/T)
Mining	M$CAD	40.3	894.7	**$87.47**
Crushing, Sampling, Haulage and Processing	M$CAD	17.3	635.7	**$61.09**
G&A	M$CAD	5.3	93.	**$9.19**
Total Operating Costs	M$CAD	**62.9**	**1623.3**	**$157.75**

1.12 Economic Analysis

The Crean Hill Project provides a potential pre-tax net present value (NPV) of $265.3M with an IRR of 142% and a post-tax NPV of $194.1M and an IRR of 129%. The discount rate used for this project is 8%.

The project is sensitive to metal prices and USD:CAD exchange rates, somewhat less sensitive to operating costs and relatively insensitive to capital costs.

Figure 1-2 After Tax Sensitivities at 8% Discount Rate



1.13 Interpretation and Conclusions

The metallurgical testing for the Contact mineralization has produced a set of feed grade versus recovery equations and supports the recoveries used in this report. The material is similar to other Sudbury Basin Contact material and the AdEx Contact production is expected to be processed as per the Definitive Off-Take Agreement with Vale Base Metals. (See Magna Press Release March 27, 2024).

The lab scale metallurgical testing for 109FW mineralization has produced a set of preliminary Base Case and Optimized recovery equations and support the recoveries used in this report. A 20,000-tonne bulk sample has been mined and processed at Glencore's Strathcona Mill. (See Magna Press Release June 4, 2024). The results from the bulk sample test and subsequent lab scale testing will determine the business case for continued mining and processing of 109FW material.

The Crean Hill Project PEA displays robust economics with low initial capital, a very short payback period and high capital efficiency.

1.14 Recommendations

Based on the results of the historical and recent testing completed at the time of publication of this report, the following are recommended:

1. To complete the evaluation of enhancing value and selling 109FW mineralization to an existing mining company.

The 109FW concentrator performance requires optimization when considering a sales agreement with a local mining company. Further testwork could enhance performance and define practical process changes to enhance the economics of Magna's 109FW deposit.

a. Complete the Glencore Strathcona Mill bulk sample processing and data analysis of daily/shift production accounting of metal recovery and concentrate grade.
b. From the production samples collected during the bulk sample processing, execute a testing program to assess the amenability of gravity separation, impact of finer primary grinding and PGM specific reagents on base and PGM recovery.
    a. The follow up Phase 2 and 3 test programs has been estimated at $205,000 and will take 6 months to complete.
c. Assess the economics considering recovery improvements and capital costs of required mill modifications.
d. Based on these results, perform a business case analysis.

2. The Definitive Vale – Crean Hill Off Take Agreement is sufficiently advanced with metal recovery equations defined for Contact AdEx production. This will allow Magna to evaluate the minable resource, tonnes and metal grades, capital and operating costs of mining, sampling, processing and other costs of opening of the Crean Hill Mine – Contact Zones.

   No further testing of Contact mineralization is required in advance of the AdEx. AdEx drilling and sampling should however focus some attention to Rh (rhodium) as a potential source of revenue for Magna Mining. Further evaluation of the LOM mining zones and expected grades and mineralogy defined during the AdEx may prompt further testing if sufficiently different from the range of sample grades and mineralogy tested in 2023 testing Program. It is expected that a similar approach would be used to define the feed grade versus recovery relationships required.

3. For both Contact and Footwall mineralization, further evaluate ore sorting economics based on typical capital/operating costs, projected base and PGM recovery and mass rejection rates including potential impact on concentrate grade versus metal recovery performance. If favorable, proceed with a full-scale test run through a production scale ore sorter unit.

The company is currently planning an advanced exploration program (AdEx) to de-risk the project and assess mining conditions. Following this program, it is recommended to move the project to the pre-feasibility stage. Table 1-5 provides the recommended task and estimated costs for a PFS program.

Table 1-5 Budget Proposal for Crean Hill Preliminary Feasibility Study (Mining & Infrastructure)

Underground Mine Design and Infrastructure	PFS Estimated Cost ($ CAN)
• Geotechnical and Hydrogeological Considerations	1,600,000-2,600,000
• Investigate the condition of the existing shaft	
• Complete desktop trade-off studies	
• Advance mine designs and schedules	
• Reserves estimate	
• Advance surface and underground infrastructure designs	
Underground Facilities	
Mine Mobile Equipment Maintenance, Communications	
Logistics/Supplies Handling, Ventilation & Compressed Air/Processed Water	
• Cost estimates and financial analysis	
• NI 43-101 Technical Report	

2 INTRODUCTION

SGS Geological Services Inc. ("SGS") was contracted by Magna Mining Inc., ("Magna" or the "Company") to complete an updated Preliminary Economic Assessment ("PEA") for the Crean Hill Project ("Crean Hill" or "Project") and prepare a National Instrument 43-101 ("NI 43-101") Technical Report written in support of the updated PEA.

Magna Mining is an exploration and development company focused on nickel, copper and PGM projects in the Sudbury Region of Ontario, Canada. The Company's flagship assets are the past producing Shakespeare and Crean Hill Mines. The Shakespeare Mine is a feasibility stage project which has major permits for the construction of a 4,500 tonne per day open pit mine, processing plant and tailings storage facility and is surrounded by a contiguous 180 km^2 prospective land package. Crean Hill is a past producing nickel, copper and PGM mine with a technical report dated July 2023. Magna's common shares are listed on the Toronto Stock Exchange Venture Exchange ("TSX-V") under the symbol "NICU". Their current business address is 1300 Kelly Lake Road Sudbury, Ontario P3E 5P4.

The current report is authored by Allan Armitage, Ph.D., P. Geo., ("Armitage"), William van Breugel, P.Eng. ("Breugel"), Johnny Canosa, P.Eng. ("Canosa"), and Henri Gouin, P.Eng. ("Gouin") of SGS and Dominic Fragomeni, P.Eng. ("Fragomeni") of Frago-Met Solutions Ltd. ("Frago-Met") (collectively, the "Authors"). The Authors are independent Qualified Persons as defined by NI 43-101 and are responsible for all sections of this report.

The current PEA is based on an updated Mineral Resource Estimate ("MRE"). The reporting of the updated MRE complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects. The classification of the updated MRE is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions) and adhere as best as possible to the 2019 CIM Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines (2019 CIM Guidelines). Armitage is responsible for the current Crean Hill MRE.

The current Technical Report will be used by Magna in fulfillment of their continuing disclosure requirements under Canadian securities laws, including National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101"). This Technical Report is written in support of an updated PEA completed for Magna.

2.1 Sources of Information

In preparing the current updated PEA and the current technical report, the Authors utilized a digital database, provided to the Author by Magna, and miscellaneous published and internal technical reports provided by Magna. All background information regarding the Property has been sourced from previous technical reports and revised or updated as required.

- *The Property was the subject of a previous technical report by Stantec Consulting Ltd. in 2023 titled "NI 43-101 Technical Report, Preliminary Economic Assessment of the Crean Hill Project, Sudbury, Ontario, Canada" Prepared for Magna Mining Inc. and Issued September 13, 2023, effective July 31, 2023.*
- *The Property was the subject of a previous technical report by SGS in 2022 titled "Mineral Resource Estimate Update for the Denison Ni-Cu-PGE Sulphide Deposit, Denison Project, Sudbury, Ontario Canada" Prepared for Magna Mining Inc. dated December 14, 2022, and with an effective date of August 19, 2022.*

Information regarding the Property accessibility, climate, local resources, infrastructure, and physiography, exploration history, previous mineral resource estimates, regional property geology, deposit type, recent exploration and drilling, metallurgical test work, and sample preparation, analyses, and security for previous drill programs (Sections 5-13) have been sourced from the recent internal technical reports and updated where required. The Authors believe the information used to prepare the current Technical Report is valid and appropriate considering the status of the Project and the purpose of the Technical Report.

The Authors have carefully reviewed all digital data and Property information and assumes that all information and technical documents reviewed and listed in the "References" are accurate and complete in all material aspects. Information regarding the property exploration history, previous mineral resource estimates, regional property geology, deposit type, recent exploration and drilling, metallurgical test work, and sample preparation, analyses, and security for previous drill programs (Sections 5-13) have been sourced from previous technical reports.

The Author believes the information used to prepare the current Technical Report is valid and appropriate considering the status of the Property and the purpose of the Technical Report. By virtue of the Author's technical review of the Project, the Author affirms that the work program and recommendations presented herein are in accordance with current NI 43-101 requirements (2014) and the MRE follow CIM Standards on Mineral Resources and Reserves – Definitions and Guidelines (2016) ("CIM Definition Standards").

2.2 Site Visit

2.2.1 Geology Qualified Person

Armitage personally inspected the Property on May 25, 2022, accompanied by Jason Jessup, CEO & Director of Magna, David King Senior Vice President, Exploration and Geoscience for Magna, and Dave Smith, Senior Geologist for Wallbridge Mining Company Ltd. Armitage completed a tour of the historical mine site including the area of the shafts and raises, previous open pit and waste dump. The Author visited a number of outcrops to review the geology and various styles of mineralization, rock sample and channel sample locations, and recent and historical drill sites.

On May 26, Armitage was able to visit the Project's core storage facility in Sudbury (Wallbridge core storage facility), accompanied by David King and Dave Smith. Armitage examined a number of selected mineralized core intervals from recent diamond drill holes from the Project. Armitage examined assay certificates and assays were examined against the drill core mineralized zones. All core boxes were well labelled and properly stored in core racks outside, with a number of significant drill intercepts stored on core racks inside. Sample numbers for recent drill holes were written on the core and it was possible to validate sample intervals and confirm the presence of mineralization in witness half-core samples from the mineralized zones.

Armitage completed additional site visits to the Property on July 25, 2023, July 2, 2024, and July 25, 2024, including to Magna's core logging facilities in Sudbury and to the Crean Hill Site. Recent site visits were accompanied by Dave King.

During the 2023-2024 site visits, Armitage examined selected mineralized core intervals from recently completed diamond drill holes from the Property by Magna. Armitage examined accompanying drill logs and assay certificates and assays were examined against the drill core mineralized zones. Armitage reviewed Magna's core sampling, QA/QC and core security procedures. Core boxes for drill holes reviewed are properly stored in the warehouse, easily accessible and well labelled. Sample tags are present in the boxes, and it was possible to validate sample numbers and confirm the presence of mineralization in witness half-core samples from the mineralized zones.

As drilling and core logging was in progress during the time of the 2023 and 2024 site visits, Armitage had the opportunity to review and discuss the entire path of the drill core, from the drill rig to the logging and sampling facility and finally to the laboratory. Armitage is of the opinion that current protocols in place, as have been described and documented by Magna and follow current industry best practices.

The Author participated in a field tour of the Property area including visits to several outcrops to review the local Geology, the drill, and recent drill sites. All areas were easily accessible by road.

As a result of the 2022 - 2024 site visits, Armitage was able to become familiar with current conditions on the Property, was able to observe and gain an understanding of the geology and various styles mineralization, was able to verify past and current work done and, on that basis, is able to review and recommend to Magna an appropriate exploration or development program.

Armitage considers the 2024 site visits current, per Section 6.2 of NI 43-101CP. To the Authors knowledge there is no new material scientific or technical information about the Property since the last personal inspection. The technical report contains all material information about the Property.

2.2.2 Geology Qualified Person

On May 13, 2024, Henri Gouin visited the Project site with James Kellestine, Magna's Chief Mining Engineer. During the site visit, they examined outcrops, reviewed mineralization styles, and assessed the historic capped workings, waste rock piles, potential portal locations, and existing infrastructure.

2.2.3 Mining Qualified Person

On July 15, 2024, Dominic Fragomeni visited the project site with David King, Magna's Senior Vice President, Exploration and Geoscience, James Kellestine, Magna's Chief Mining Engineer and Mynyr Hoxha, Magna's Vice President, Mines Geology. During the visit, they reviewed the general site plan and the surface exposure of the 109FW mineralization scheduled for bulk sample mining.

On July 29, 2024, and August 1, 2024, Dominic Fragomeni visited the site with Mynyr Hoxha to develop and finalize and stockpile plan for the bulk sample mining of 109FW.

2.3 Units of Measure

Units used in the report are metric units unless otherwise noted. Monetary units are in Canadian dollars (CAD$) unless otherwise stated.

2.4 Effective Date

The Effective Date of the current MRE is April 15, 2024.

2.5 Qualified Persons

This technical report is authored by SGS Geological Services Inc. The following QPs have contributed to sections of this technical report related to their areas of expertise. Through their education, membership to a recognized professional association, and relevant work experience, they are all independent QPs as defined by NI 43-101.

- Allan Armitage, Ph.D., P.Geo. – SGS Canada Inc. (Geology, Exploration, Drilling, Sample Preparation Drilling and Security, Data Verification, Mineral Resource Estimates).
- William van Breugel, P.Eng. – SGS Canada Inc. (Market Studies and Contracts, Capital and Operating Costs, Economic Analysis, Other Relevant Data and Information).
- Johnny Canosa, P.Eng. – SGS Canada Inc. (Project Infrastructure and Environmental Studies, Permitting and Social or Community Impact).
- Henri Gouin, P.Eng. – SGS Canada Inc. (Mining Methods).
- Dominic Fragomeni, P.Eng. – Frago-Met Solutions Ltd. (Mineral Processing and Metallurgical Testing and Recovery Methods).

The QPs' responsibilities are summarized in Table 2-1.

Table 2-1 QPs' responsibilities

Company	QP	Site Visit	Responsibility
SGS	Allan Armitage	May 25-26, 2022 July 25, 2023 July 2, 2024 July 25, 2024	Geology, Exploration, Drilling, Sample Preparation Drilling and Security, Data Verification, Mineral Resource Estimates Section 2 to 12, 14 Parts of Section 1, 25, 26, 27
SGS	William van Breugel	-	Market Studies and Contracts, Capital and Operating Costs, Economic Analysis, Other Relevant Data and Information Sections 19, 21, 22 and 24 Parts of Section 1, 3, 25, 26, 27
SGS	Johnny Canosa	-	Project Infrastructure and Environmental Studies, Permitting and Social or Community Impact Sections 18 and 20 Parts of Section 1, 3, 25, 26, 27
SGS	Henri Gouin	May 13, 2024	Mining Methods Section 16 Parts of Section 1, 2, 12, 25, 26, 27
Frago-Met Solutions Ltd.	Dominic Fragomeni	July 15, 2024 July 29, 2024 Aug 1, 2024	Mineral Processing and Metallurgical Testing and Recovery Methods Sections 13 and 17 Parts of Section 1, 2, 3, 12, 18, 25, 26, 27

2.6 Units and Abbreviations

All units of measurement used in this technical report are in metric. All currency is in US dollars (US$), unless otherwise noted.

Table 2-2 List of Abbreviations

$	Dollar sign	m^2	Square metres
%	Percent sign	m^3	Cubic meters
°	Degree	masl	Metres above sea level
°C	Degree Celsius	mm	millimetre
°F	Degree Fahrenheit	mm^2	square millimetre
µm	micron	mm^3	cubic millimetre
AA	Atomic absorption	Moz	Million troy ounces
Ag	Silver	MRE	Mineral Resource Estimate
AgEq	Silver equivalent	Mt	Million tonnes
Au	Gold	NAD 83	North American Datum of 1983
Az	Azimuth	mTW	metres true width
CAD$	Canadian dollar	NI	National Instrument
CAF	Cut and fill mining	NN	Nearest Neighbor
cm	centimetre	NQ	Drill core size (4.8 cm in diameter)
cm^2	square centimetre	NSR	Net smelter return
cm^3	cubic centimetre	oz	Ounce
Cu	Copper	OK	Ordinary kriging
DDH	Diamond drill hole	Pb	Lead
ft	Feet	ppb	Parts per billion
ft^2	Square feet	ppm	Parts per million
ft^3	Cubic feet	QA	Quality Assurance
g	Grams	QC	Quality Control
GEMS	Geovia GEMS 6.8.3 Desktop	QP	Qualified Person
g/t or gpt	Grams per Tonne	RC	Reverse circulation drilling
GPS	Global Positioning System	RQD	Rock quality designation
Ha	Hectares	SD	Standard Deviation
HQ	Drill core size (6.3 cm in diameter)	SG	Specific Gravity
ICP	Induced coupled plasma	SLS	Sub-level stoping
ID^2	Inverse distance weighting to the power of two	t.oz	Troy ounce (31.1035 grams)
ID^3	Inverse distance weighting to the power of three	Ton	Short Ton
kg	Kilograms	Zn	Zinc
km	Kilometres	Tonnes or T	Metric tonnes
km^2	Square kilometre	TPM	Total Platinum Minerals
kt	Kilo tonnes	US$	US Dollar
m	Metres	µm	Micron
		UTM	Universal Transverse Mercator

3 RELIANCE ON OTHER EXPERTS

The Qualified Person's opinions, estimates, and conclusions in this Preliminary Economic Assessment are based on information available at the time of preparation of this technical report, including data, reports, and other information supplied by Magna Mining Inc. (Magna). Where information was not available, reasonable assumptions and qualifications were made as described in this report.

- Mr. William van Breugel has relied upon information provided by Magna with respect to Base case metal pricing, power supply, ventilation designs and backfill systems.
- Mr. Willian van Breugel has relied upon information provided by Magna related to potential toll milling and third-party smelting arrangements.
- Mr. Johnny Canosa has relied upon information provided by the Magna regarding environmental studies, permitting, and social or community impact.
- Mr. Dominic Fragomeni has relied on information provided by Magna regarding the application of recovery models and contract terms in the overall economic analysis.

3.1 Ownership, Mineral Tenure, and Surface Rights

Final verification of information concerning Property status and ownership, which are presented in Section 4 below, have been provided to Armitage by Magna. The Property status and ownership has not changed since the last Technical Report. The Author only reviewed the land tenure in a preliminary fashion and has not independently verified the legal status or ownership of the Property or any underlying agreements or obligations attached to ownership of the Property. However, the Author has no reason to doubt that the title situation is other than what is presented in this technical report (Section 4). The Author is not qualified to express any legal opinion with respect to Property titles or current ownership.

3.2 Historic Mine Workings

Information on the historic mine workings was provided by Magna in the form of electronic data files. The completeness and accuracy of the historic mine workings is used in the mineral resource estimate discussed in Item 14 and the Underground mine design discussed in Item 16.

3.3 Environmental and Permitting

Information on environmental and permitting was provided by Magna. The information was relied on by SGS and discussed in Item 20.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Crean Hill Project property is located in Denison Township within the City of Greater Sudbury, Ontario, Canada, approximately 30 km southwest of downtown Sudbury (refer to Figure 4-1and Figure 4-2). The property is centered at approximately 46° 25.8' N latitude, 81° 21.1' W longitude (473,000 m E, 5,141,800 m N in NAD83 UTM Zone 17N).

Figure 4-1 Project Location on Map of Ontario

4.2 Mineral Disposition and Tenure Rights

The Crean Hill Project property is an area of patented surface and mining rights, consisting of approximately 255.9 ha. It is located within the southern half of Lots 3, 4, and 5, and parts of the northern half of Lots 3, 4, and 5 of Concession 5, Denison Township, District of Sudbury. The area is parts 1 through 16 on registered plan 53R – 21031, filed with the Land Titles Division of Sudbury, as shown in Figure 4-3.

Magna holds the mining rights from the top of the existing concrete capped Shaft #2 (former historic Crean Hill Mine production shaft) to a depth of 4,500 ft (1371.6 m). Vale Canada Limited (Vale) continues to hold all Mining Rights below 4,500 ft, from the top of the concrete capped Shaft #2.

The property is subject to surface easements as described in PIN No. 73382-0487(LT), PIN No. 73382-0537(LT) and PIN No. 73382-550(LT), and as represented on the survey plan 53R – 21031.

The property is legally described as follows:

- PIN No. 73382-0487(LT) being PCL 450 SEC SWS; Nl / 2 LT 3 CON 5 Denison except L Tl 6817; Greater Sudbury; subject to an easement as in SD202334.
- PIN No. 73382-0537(LT) being PCL 428 SEC SWS; Nl / 2 LT 4-5 CON 5 Denison; SIT D422; Greater Sudbury.

PIN No. 73382-550(L T) being LT 1-6 CON 4 Denison; S 1 / 2 LT 3-5 CON 5 Denison; SIT S48617, S62072, S63396, S89248; Greater Sudbury.

Figure 4-2 Property Location on Sudbury Area Map

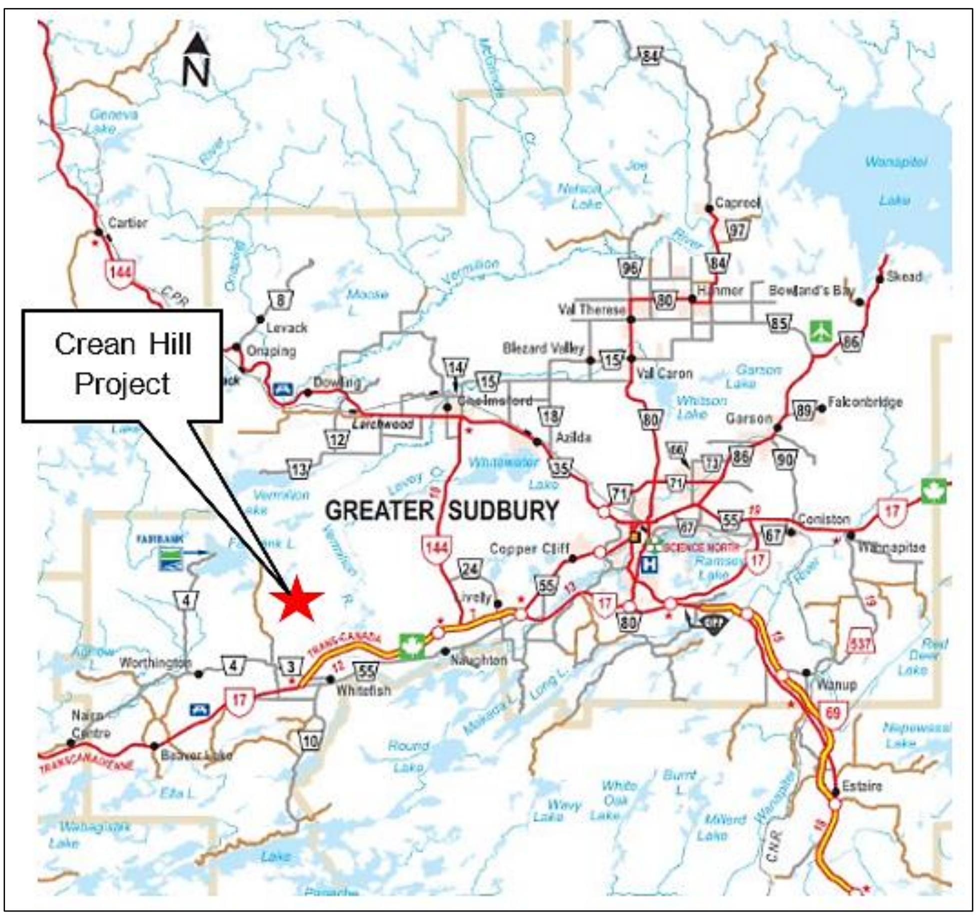
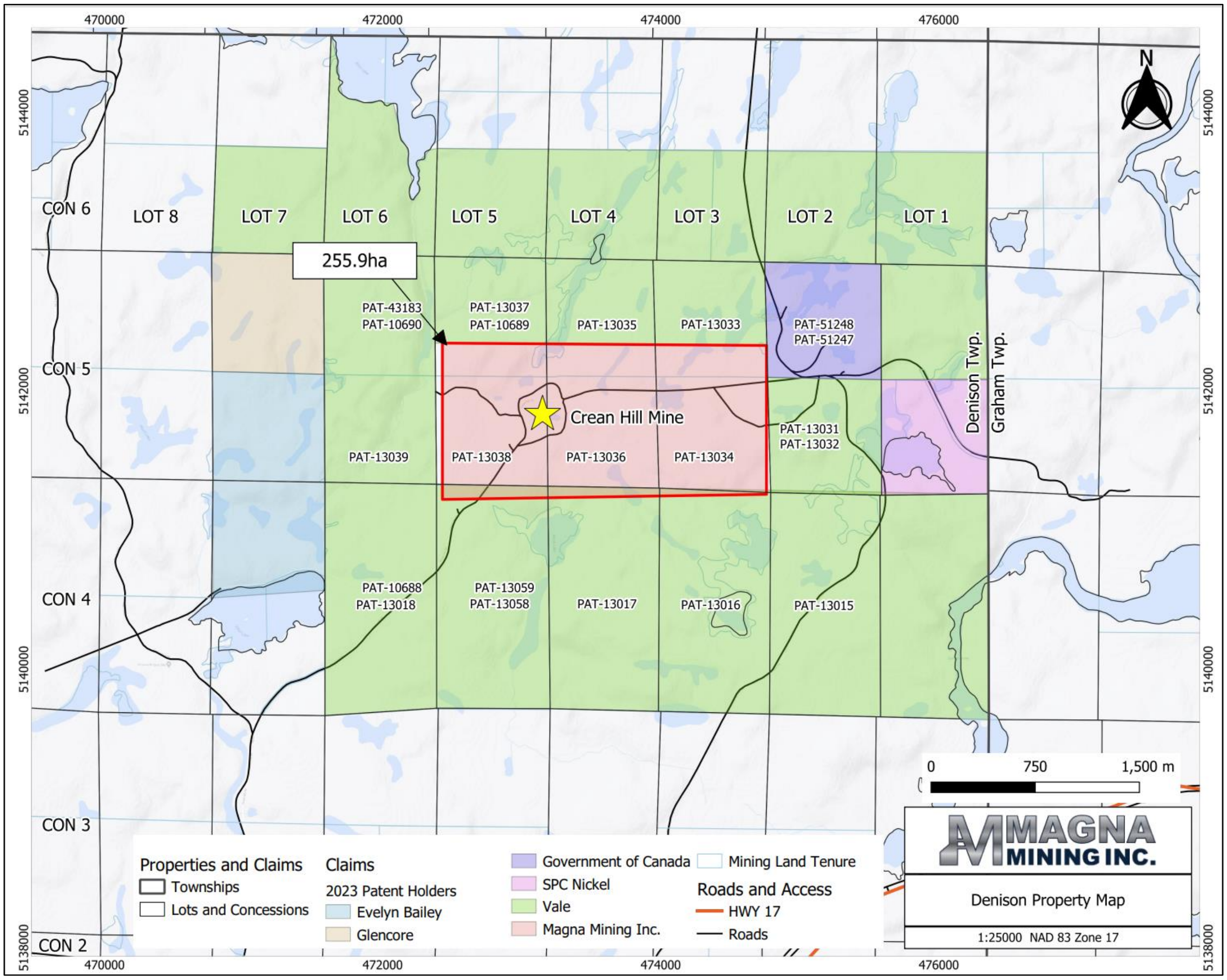


Figure 4-3 Crean Hill Land Tenure



4.3 Underlying Agreements

The Crean Hill Project is wholly owned and controlled by Lonmin Canada Inc. (Loncan, a subsidiary of Magna) as of July 2018, when the joint venture between Lonmin (Loncan's predecessor) and Vale was cancelled. The joint venture was established in 2005 with the intent of exploring multiple Vale properties for low-sulfide, high-PGE-Au mineralization, as it was believed they hosted significant exploration potential. These properties included Capre, Denison (Crean Hill), Levack North, McKim, Trillabelle, and Wisner.

Vale reserves a three-percent Net Smelter Return royalty from the sale or other disposition of any metals or non-metallic minerals, or other materials mined, produced, or otherwise recovered from the Revised Property (or any waste rock or tailings derived from the Revised Property). This royalty is on, in accordance with, and subject to the terms set out in the Royalty Agreement.

From and after the completion of the Beneficial Transfer, Loncan will have the right to reasonable access to, egress from, and use of (such right to access and egress subject to certain terms and conditions set forth in this Agreement and the Ancillary Agreements) such parts of the Surface Rights and other adjoining surface rights of Vale. This may be reasonably required from time to time by Loncan, and reasonably agreed to by Vale Canada, to permit early exploration, advanced exploration, and mine operations to be conducted by Loncan or its agents in or on the Revised Property.

Vale reserves and has the right to access, upgrade (if required), operate, and use the Crean Hill Mine surface and underground infrastructure (for persons and vehicles, and with or without tools, equipment and machinery) in the event of a decision by Vale to conduct any early exploration, advanced exploration, or development or mine operations in the future on, in, or under the property or any other adjacent or proximate property of Vale Canada (including below the Crean Hill Cut-off Depth). This must be subject to and in accordance with a Crean Hill Mine access agreement, which must be negotiated in good faith and entered between Vale and Loncan at that time. The agreement must consider the relative existing and proposed operations and facilities of each Vale and Loncan on, in, under, or adjacent or proximate to the Revised Denison Property and the property, and such other matters as are reasonably relevant at that time.

Loncan must first offer Vale the right to process and / or purchase the output mined by Loncan from the Revised Property before offering a contract on market terms with a third party to process and / or purchase material.

The Author is not aware of any other underlying agreements relevant to the property.

4.4 Magna Acquisition of Loncan

On 16 August 2022, Magna announced it had entered into a definitive share purchase agreement (the Purchase Agreement) to acquire 100% of Loncan, including the Denison (Crean Hill) Project and the past producing Crean Hill Ni-Cu-PGE mine.

On 7 November 2022, Magna announced that it has closed the acquisition of Loncan, including the Denison Project and the past producing Crean Hill Ni-Cu-PGE mine. This was pursuant to a share purchase agreement dated 15 August 2022 between the Corporation, Loncan, and each of the shareholders of Loncan and Sibanye UK Limited, as shareholder representatives.

Under the terms of the Purchase Agreement, Magna acquired 100% of the issued and outstanding shares of Loncan—whose core asset is the Denison Project—in exchange for an aggregate purchase price of $16 million. The purchase price was comprised of a closing payment of $13 million in cash (the First Payment) and a deferred payment of $3 million (the Deferred Payment), payable pro rata to each shareholder of Loncan (the Vendors).

The Deferred Payment is payable on or before the 12-month anniversary of the closing of the acquisition. The Corporation will use commercially reasonable efforts to settle the Deferred Payment in cash, but may settle the Deferred Payment in common shares of the Corporation priced at the time of issue, in accordance with the rules of the TSX-V.

As ongoing security pending the settlement of the Deferred Payment, the Corporation has granted a pledge of the shares of Loncan in favour of the Vendors. The Corporation inherited Loncan's existing commercial arrangements with Vale, including access rights and certain net smelter return royalties. Other arrangements, including Loncan's joint venture arrangements with Wallbridge Mining Company Limited, terminated concurrently with the completion of the acquisition.

4.5 Ontario Permits and Authorization

The Ontario Mining Act regulations require exploration plans and permits, with graduated requirements for early exploration activities of low to moderate impact undertaken on mining claims, mining leases, and licences of occupation. Exploration plans and permits are not required on patented mining claims.

As the property is on patented land, exploration plan and permit applications under the Mining Act are not required by Ontario's Ministry of Energy, Northern Development and Mines (MENDM), for exploration and advanced exploration work. The property is also considered an active mining area, where any mining activities that fit within the current closure plan may commence without additional permitting.

The Author is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the exploration work recommended for the property.

4.6 Environmental Considerations

The Project is a historical mine site with a filed closure plan from the MENDM. Approximately 20.4 Mt of ore was extracted from Crean Hill during its operating lifespan. Following closure in 2002, the site surface infrastructure was removed to prepare for site remediation, including the headframe, backfill plant and other buildings, fixed mining infrastructure, power lines, and rail lines. Since then, significant decommissioning work has been undertaken, including the following:

- Shafts, raises, and other openings to surface were capped with concrete.
- Waste rock was relocated to the Crean Hill Main Site Open Pit and Ellen No. 2 Pit.
- Crean Hill Main Site Open Pit was capped with clay, contoured, revegetated, and fenced.
- Disturbed areas were vegetated.
- The former mine landfill was capped, and a seepage barrier was installed.

The Author is not aware of any environmental liabilities related to the historic operation that are the responsibility of Magna.

As far as the Author is aware, the environmental liabilities related to the Project, if any, are negligible.

4.7 Other Relevant Factors

The Author is unaware of any other significant factors and risks that may affect access, title, or the right, or ability to perform exploration work recommended for the Property.

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

5.1 Accessibility

The region in which the property is located is serviced by Highway 17—a component of the Trans-Canada Highway Network—and the Sudbury Regional Airport, which has daily regional flights to Thunder Bay, Toronto, Timmins, and Ottawa.

The Crean Hill Project is located 7 km north of Highway 17, and approximately 28 km southwest of the City of Greater Sudbury, Ontario, Canada. It is within the southern half of Lot 5, Concession 5 of Denison Township.

Existing established all-season roads are available to transport materials, equipment, and personnel to and from the site. The site is easily accessible by road throughout the year via Regional Road 4; north off of Highway 17 to Crean Hill Road. Figure 5-1 indicates the location of the Crean Hill Project in the western portion of the City of Greater Sudbury, and Figure 5-2 shows a more detailed view of the site and nearby infrastructure.

Figure 5-1 Location of Crean Hill within the City of Greater Sudbury

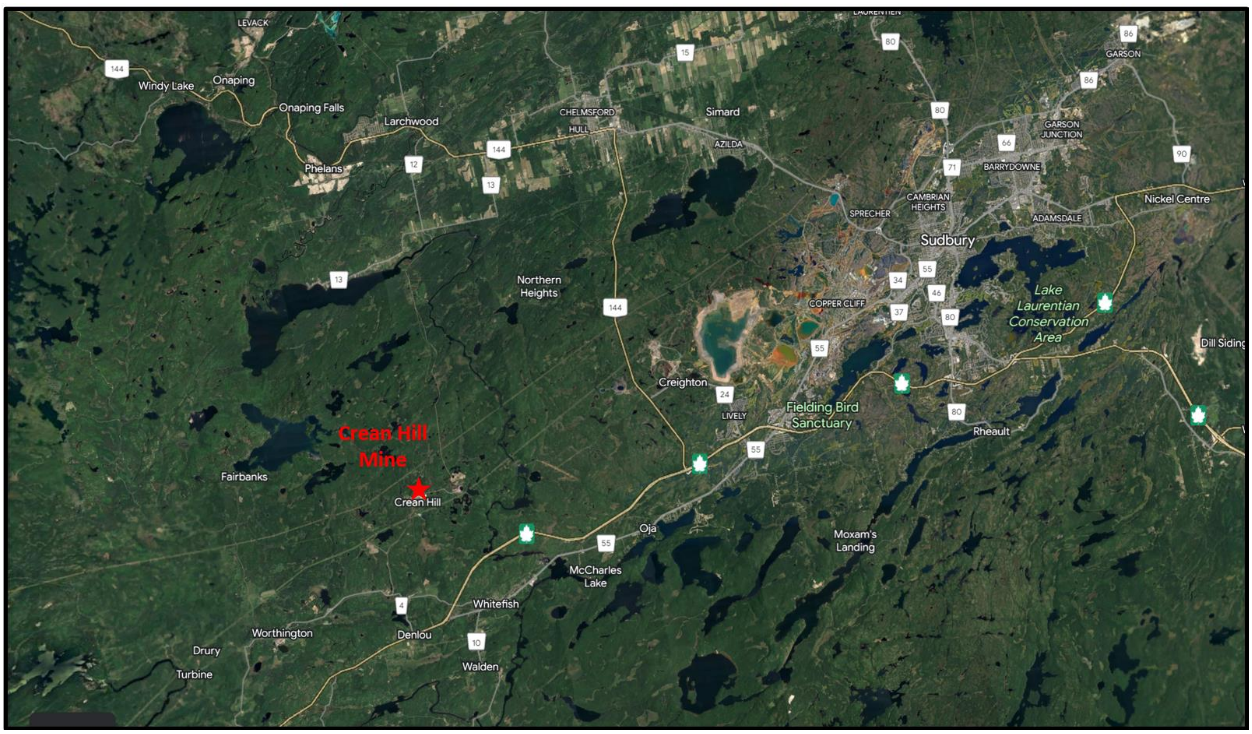
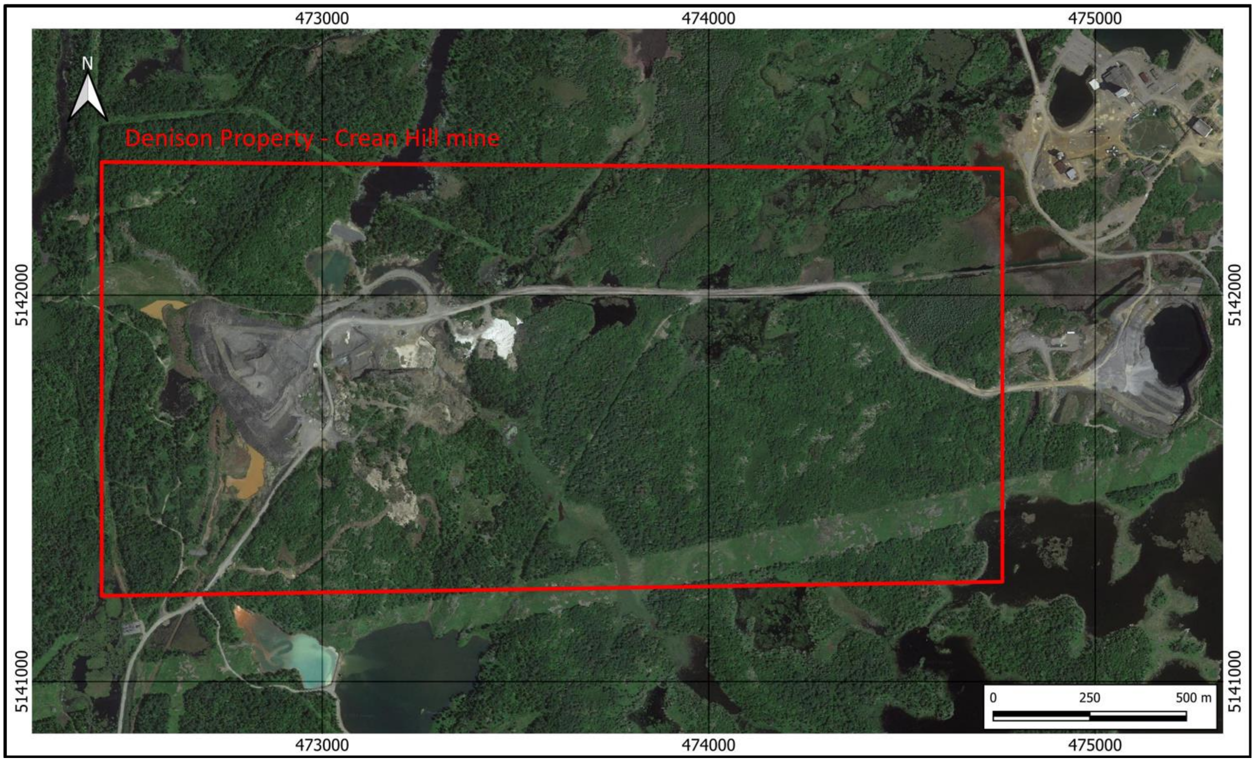


Figure 5-2 Site Map – Denison Property



5.2 Local Resources and Infrastructure

The City of Greater Sudbury is a major mining and manufacturing centre that has industry leading service providers, equipment suppliers and supply chains, and labour. The region has the infrastructure and technical resources to support any exploration and development work for the Project.

A 230-kV transmission line passes south of the property. A 115-kV transmission line passes at the western edge of the property with a substation at the property boundary.

Water is abundant in the region and can be sourced from nearby lakes and rivers to support exploration and mining activities.

There are areas within the property boundaries as well as other nearby sites to establish waste rock stockpiles.

5.3 Climate

The active weather station closest to the project site is located at the Sudbury Airport, approximately 45 km northeast of the site. The climate in the region is typical Canadian Shield summers and winters, with daily average temperatures averaging from 19°C in the summer to -13°C in the winter. Precipitation comes in the form of 30 to 63 cm of snow per month in the winter (263 cm annual average), and 77 to 101 mm of rain per month in the summer (676 mm annual average) (http://en.climate-data.org).

Exploration and mining activities can be conducted year-round with appropriate measures to manage snow and cold weather during the winter months (generally November through March) and precipitation from April through October. Severe cold snaps (<-15deg.C) do not last long and typically last under 1 week.

Winters are not considered severe and summer months provides excellent weather to enjoy multiple leisure activities and sports outdoors. The climate in Sudbury follows a definite winter-spring-summer-fall cycle.

5.4 Physiography

The property lies at a mean elevation of about 290 masl (metres above sea level). Relief is moderate and typical of Precambrian Shield topography.

6 HISTORY

The history on the property dates to 1885 when the mineralization was discovered by Francis Crean. The Project was subjected to sporadic exploration and production between 1906 and 2024 by various operators, including Magna Mining Inc.

6.1 Property History

Historical exploration activities on the Property are summarized in Table 6-1.

Table 6-1 Historical Exploration Activities completed at the Crean Hill Property

Year(s)	Company	Activity
1885	Francis Charles Crean	Discovered the Crean Hill deposit.
1906–1918	Canadian Copper Company	First production from the Crean Hill open pit and underground mining began at a rate of 300 tonnes / day. A total of 1.15 million tonnes at 2.07% Ni and 2.35% Cu was produced.
1918	Inco Limited	The property was transferred to the International Nickel Company (INCO).
1919	Inco Limited	Crean Hill Mine was closed.
1938	Inco Limited	Surface exploration drilling
1950	Inco Limited	The Crean Hill underground workings were dewatered, and underground diamond drilling commenced.
1954	Inco Limited	Airborne electromagnetic (EM) and magnetic surveys were carried out as part of the 1954 regional geophysical program.
1956–1957	Inco Limited	The Crean Hill No. 2 Shaft was collared and sunk to a depth of 2,116 ft (645 m).
1958	Inco Limited	Crean Hill development of No 2 Shaft was completed and the mine was subsequently closed.
1965- 1971	Inco Limited	Crean Hill development recommenced, and production reached a rate of 3,860 tonnes / day. No. 2 Shaft was extended to a depth of 4,180 ft (1,274 m). A total of 10.5 million tonnes at 1.05%Ni, 0.89%Cu, and 1.47 g/t PGE-Au was produced underground with an additional 1.1 million tonnes at 0.73% Ni and 0.56% Cu produced from the open pit.
1972 - 1978	Inco Limited	Crean Hill Mine was closed and re-opened again as development work continued until 1978 and then closed.
1983 - 1986	Inco Limited	Drilled 45 holes totalling 15,436 ft (4,705 m) in the immediate vicinity of the Vermilion Mine site. The program intersected erratically distributed Cu-Ni-PGE mineralization. Magnetometer and electromagnetic (EM) Very Low Frequency (VLF) surveys were completed over the property.
1984	Inco Limited	Surface mapping on 800 ft (244 m) spaced lines was completed on the Denison property, focusing on Cu and Ni.
1985	Inco Limited	Geophysical work included induced polarization (IP) and VLF surveys on select areas of interest outlined in the 1984 mapping.
1986	Inco Limited	Surface diamond drilling was completed to test the Crean Hill Ni and Cu-PGE- Au targets.
1987	Inco Limited	Crean Hill Mine was reopened.

Year(s)	Company	Activity
1989	Inco Limited	A shallow drill program was conducted in the footwall side of the deposit south of the Crean Hill Main orebody to test the potential for precious metals enrichment. No significant new zones of mineralization were encountered. Shallow drilling was also conducted in the Ellen environment immediately to the east of Crean Hill and up-dip from the Glencore Lockerby Mine.
1993	Inco Limited	Borehole EM surveys were completed in three Crean Hill underground drillholes testing the down-plunge continuity of the known Ni zone. Two exploration drillholes were completed to test the contact environment below the 5,000-ft level, between the Crean Hill and Lockerby mines. No significant mineralization was encountered at the contact or in the adjacent footwall rocks.
1997	Inco Limited	Nine existing surface Ni-Cu target drillholes were surveyed with UTEM-4.
1998	Inco Limited	Main Zone Ni-Cu grab samples from the Crean Hill 3,840–3,980-ft (1,170–1,213-m) levels were submitted for mineralogical analysis. Five additional samples, from each of the two composite mill test samples from the 2,550–2,800-ft (777–853-m) and the 3,840–3,980-ft (1,170–1,213-m) levels, were also analyzed.
1999	Inco Limited	Two Vermilion surface drillholes were surveyed using UTEM-4.
2001	Inco Limited	A resource estimate for the Crean Hill 9400 Zone was completed. A 9400 Zone exploration drilling program was started late in the year. One hole was completed with no significant intersections.
2002	Inco Limited	Between 1987 and 2002, a total of 7.62 million tonnes at 1.25%Cu, 1.64%Ni, and 2.14 g/t PGE-Au were produced from the Crean Hill Main, Intermediate, and West orebodies. A drill program consisting of 3,406 ft (1,038 m) of BQ core from ten underground 1,000-ft (305-m) level drillholes, and 7,260 ft (2,212 m) of NQ core from four surface holes, was completed to confirm and explore for extensions of the Crean Hill 9400 Zone. The mine was subsequently closed and decommissioned.
2003	Inco Limited	In 2003, the Lonmin-Vale Joint Venture was initiated, and their focus included the Denison property, specifically searching for platinum group metals (PGM). Property scale mapping and sampling were conducted to establish a detailed lithological and structural map. Surface UTEM and IP surveys were conducted. Five boreholes were surveyed with borehole UTEM-4 and 14 holes were surveyed with down-hole IP (0.125 Hz).
2005	Inco Limited	The 2005 drill program consisted of 18 holes totalling 18,720 ft (5,706 m), testing the depth extensions of the known Vermillion mineralization, the strike and plunge extensions of the Crean Hill 9400 Zone, and MIM Distributed Acquisition System (MIMDAS) IP chargeability anomalies in the near surface environment.
2006	Inco Limited	The mapping and sampling program was continued and included a focus on the Vermillion Mine area. A total of 165 grab samples was collected for geochemical and thin section analysis, yielding numerous anomalous PGE-Au occurrences, all of which are located within a corridor approximately 80 m south of the Sudbury Igneous Complex (SIC) contact. Most notably, these showings are centered around the west flank of the main Crean Hill embayment, the west flank of the eastern embayment, and the area immediately south of the Beeper Zone. The 2006 drilling program, totalling 20,098 ft (6,126 m) was directed at investigating the strike and plunge extensions of the Crean Hill 9400 and 109 Zones, the depth extension of the Glencore Beeper Zone onto the

Year(s)	Company	Activity
		Denison property, the up-plunge extension of the 8800 Zone, and the footwall potential of the Eastern Embayment.
2006	Vale Canada	CVRD of Brazil acquires Inco for an all-cash offering of $17 billion. Company rebranded as CVRD Inco.
2007	Vale Canada	Company rebranded as Vale Inco then Vale Canada. A limited amount of mapping was carried out around the Vermillion deposit with an emphasis on structure. Numerous down-hole borehole UTEM surveys were conducted on recently drilled holes within the 9400 and 8800 Zones. The 2007 drilling program, totalling 36,093 ft (11,001 m) was primarily directed at investigating the strike and plunge extensions of the Crean Hill 8800 and 9400 Zones. One borehole was completed and targeted the footwall potential of the Eastern Embayment. The understanding of the platinum-group elements (PGE) mineralizing systems at Denison was advanced.
2008	Vale Canada	A total of 19,705 ft (6,006 m) was drilled in 16 holes. The mineralized system was determined to extend from the 9400 Zone down-dip to the 99-Shaft Zone, but the tenor of mineralization, where tested, was determined to be sub-economic. The bottom of the 9400 Zone was also extended and better defined through additional drilling (9400 down-dip). The 101 Zone was tested along strike and down-dip. A new concept connecting the 101 Zone to the contact (101 Zone East Extension) was drill tested with positive results. A new concept was successfully drill tested in the footwall of the 109 Zone, resulting in the discovery of the 109 Footwall (FW) Zone. A total of 12 holes were UTEM surveyed in 2008, generating plates explained by known mineralization and mine workings. Optical televiewer survey on two boreholes in the 109 FW Zone confirmed orientation of mineralized features. The 9400 Zone Post Mining Designation (PMD) was updated to reflect the addition of the down-dip extension. The 8800 Zone Exploration Potential, last updated in 2006, was reduced in size to reflect the results of the 8800 Zone drilling conducted in 2007. A new zone, the 8800 contact Zone, discovered in the 2007 drilling.
2009	Vale Canada	The exploration program at the Denison property was primarily focused on follow-up to the late 2008 discovery of the 109 FW Zone. A total of 20,726 ft (6,317 m) was drilled in 29 holes. Drilling was directed toward defining the limits of the mineralized zone. A total of eight holes were surveyed by optical televiewer. There were no other geophysical surveys carried out at Denison in 2009. The 109 FW Zone was projected to surface, and the area was prospected. A 195 ft by 985 ft (60 m by 300 m) area was stripped, washed, mapped in detail, and channel sampled with numerous continuous Low Sulphide, High Precious Metal (LSHPM) results returned, confirming the continuity of the 109 FW Zone to surface.
2009	Vale Canada	Metallurgical test results, based on three 25-kg composite samples from a single hole, showed variable but favourable precious metal recoveries, generally in the high 70% to 80% range, assuming a standard flowsheet at Clarabelle Mill.
2010	Vale Canada	A total of 34,738 ft (10,588 m) was drilled in 58 drillholes, including the extension of two historical drillholes. Other advancements such as surface stripping, channel sampling, geophysical televiewer surveys (19 boreholes), geotechnical work, mineral resource modelling, and mineralogical and metallurgical studies were completed. The 109 FW mineral envelope was projected to surface, and the area was stripped,

Year(s)	Company	Activity
		and channel sampled, returning 32 samples >2.99 g/t total precious metals (TPM), and 8 samples >9.0 g/t TPM, with the highest grade sample assayed at 35.76 g/t TPM. In total, 291 channel samples were collected and assayed.
2011	Vale Canada	A total of 1,089 ft (332 m) was drilled in two boreholes. A conceptual target testing shallow potential PGM parallel to the 9400 Zone, called the 100 Zone, was tested. Lonmin fully vested in the joint venture in December 2011, earning a 50% interest in any declared LSHPM deposit on the Lonmin-Vale Joint Venture properties in the Sudbury Basin.
2012	Vale Canada	A total of 4,314 ft (1,315 m) was drilled, completing 12 boreholes, targeting the low-grade contact sulphide and potential LSHPM FW mineralization in the saddle zone, and geotechnical drilling in the highwall (HW) north of the existing Crean Hill pit. Drilling was suspended due to budget constraints. Acid rock drainage and prefeasibility studies were completed by Klohn Crippen Berger and Tetra Tech Wardrop, respectively.
2013	Vale Canada	No work was completed on the Denison property; all studies were suspended.
2014	Loncan	Lonmin Canada Inc, a wholly owned subsidiary of Lonmin Plc, became the operator of the Vale-Lonmin Joint Venture, including the Denison property. A total of 30,610 ft (9,330 m) was drilled in 43 holes, with the primary goal of increasing confidence in the 109 FW Zone. Three holes targeted the saddle zone between the 109 and 101 Zones. Geotechnical data and specific gravity (SG) data were collected from most boreholes. The previously saw-toothed shape of the mineral envelope along the plunge of the hinge (southern margin) was remodeled and smoothed out with the intersection of significant mineralization in previously existing gaps.
2015	Loncan	A total of 46,257 ft (14,099 m) was drilled in 34 holes as part of drill programs aimed at the 109 FW Zone and 9400 Zone. Drilling in both zones aimed to increase confidence by targeting areas of low drilling density. In the 109 FW Zone, boreholes with significant assay results were wedged to duplicate and triplicate the intersection at short distances to provide short-range grade variability data and to provide material for geometallurgical testing. Geotechnical data was collected from most boreholes and specific gravity data was collected from all boreholes.
2016	Loncan	A total of 23,261 ft (7,090 m) was drilled in 63 holes in drill programs at Denison. Drilling in the 109 FW Zone concentrated on collection of larger diameter core for geometallurgical testing. Thirteen boreholes targeted the 9400 Zone in areas of lower drilling density, and boreholes with significant assay results were wedged to duplicate and triplicate the intersection at a short distance to provide short-range grade variability data, and to provide material for geometallurgical testing. Geotechnical data was collected from most boreholes and specific gravity data was collected from all boreholes. The morphology of the 9400-area mineralization was re-interpreted as a tabular body that branches at the western margin, with highest TPM grades over largest widths seen at the intersection of the branches.
2017	Loncan	A total of 18,586 ft (5,665 m) was drilled in 16 boreholes, targeting the 9400 Zone and extensions of the 9400 Zone up-plunge, immediately west of the Crean Hill West Orebody, which was largely mined out. Drilling was subsequently curtailed due to budget constraints. Geotechnical data was collected from most boreholes and specific gravity data was collected from all boreholes. Both the 109 FW Zone and

Year(s)	Company	Activity
		9400 Zone were subject to mineralogical study by Cabri Consulting Inc., and a metallurgical study was completed on the 109 FW Zone by Blue Coast Research.
2018	Loncan	Vale Canada and Loncan agree to terminate the 2003 Joint Venture Agreement and sign the Denison Property Transfer and Development Agreement, whereby Vale Canada transferred 100% ownership of the Revised Denison Property to Loncan.
2019	Loncan	Loncan and Wallbridge Mining signed a definitive letter agreement whereby Lonmin Limited (a wholly owned subsidiary of Sibanye-Stillwater) appointed Wallbridge as operator of Loncan's advanced-stage Denison Property.
2022	Magna	In November 2022, Loncan was acquired by Magna Mining Inc. as a wholly owned subsidiary. Updated mineral resource estimate November 2022. Magna completed 2013 m of diamond drilling in 10 drillholes. Drilling was focused on the Intermediate Contact Zone, the 101 FW Zone, and the 109 FW Zone.
2023	Magna	92 diamond drillholes completed totalling 18,997 m of drilling. Magna completes Preliminary Economic Assessment (PEA) of the Crean Hill Project. Metallurgical testwork program ongoing.
2024*	Magna	28 diamond drillholes completed totalling 7,429 m to the April 15th, the effective date of the mineral resource estimate. Magna completes updated Preliminary Economic Assessment (PEA) of the Crean Hill Project. Definitive ore sales agreement signed for advanced exploration contact mineralization. 109 FW bulk sample completed and shipped to Strathcona mill for processing.

6.2 Summary of Historical Production

The Crean Hill Mine operated from 1906 to 2002 primarily under the ownership of INCO; historical production during this period is summarized in Table 6-2.

Table 6-2 Summary of Historical Production from the Crean Hill Mine, 1906 to 2002

Period	Type	Tonnes (M)	Ni%	Cu%	PGE-Au (g/t)
1906–1918	Open Pit and Underground	1.15	2.07	2.35	
1965–1971	Underground	10.5	1.05	0.89	1.47
1965–1971	Open Pit	1.10	0.73	0.56	
1987–2002	Underground	7.62	1.64	1.25	2.14
Total	**–**	**20.37**	**1.31**	**1.09**	**1.56**

Production was from the Main, Intermediate, and West (9400) zones, and focused on the Sudbury Igneous Complex (SIC) contact nickel-copper mineralization.

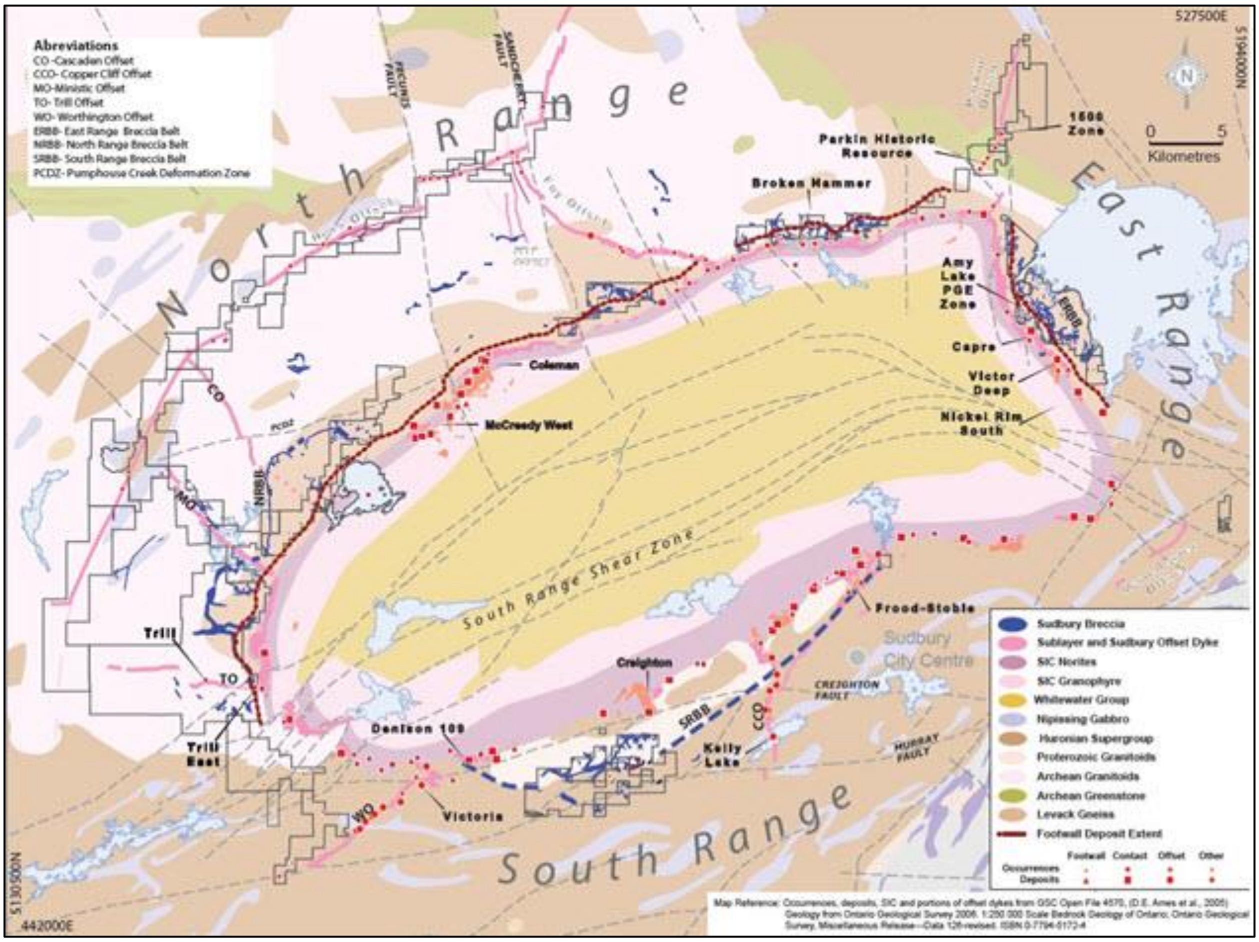
7 GEOLOGICAL SETTING AND MINERALIZATION

The description of the geological setting and mineralization of the property in this section is sourced from SRK (2020), WSP (2020), and any other references therein.

7.1 Regional Stratigraphy

The accepted theory derived from volumes of data and study for the genesis of Ni-Cu-PGE deposits in Sudbury occur within the Sudbury Structure formed because of a major Early Proterozoic meteorite impact 1,850 million years ago (Ames and Farrow, 2007). The Sudbury Structure straddles the unconformity between Archean gneisses and plutons of the Superior Province and overlying Paleoproterozoic Huronian supra-crustal rocks of the Southern Province. It is geographically divided into the North, South, and East Ranges, as shown in Figure 7-1.

Figure 7-1 Simplified Regional Geology (Ames and Farrow, 2007)



The Sudbury Structure comprises four geologic domains:

- The Sudbury Igneous Complex (SIC) occurs as a 60 km by 27 km elliptical bowl-shaped body that formed from a meteorite impact melt sheet. It consists of a basal xenolithic norite breccia (contact sublayer) overlain by norite, quartz-gabbro, and granophyre. It has historically been referred to as the Nickel-Bearing Irruptive, the Sudbury Nickel Irruptive, and the Nickel Irruptive.
- Concentric and radial dykes of diorite, granodiorite, and quartz diorite.

- The FW to the SIC contains a zone, up to 80 km wide, of Archean and Proterozoic rocks that are fractured, brecciated (i.e., Sudbury breccia), and locally partially melted (e.g., Late Granite Breccia) or recrystallized due to the meteorite impact and subsequent emplacement of the SIC.
- The SIC is overlain by the Whitewater Group, comprising of fall-back impact debris forming super-crustal breccia of the Onaping Formation and the overlying basin-fill sedimentary rocks of the Onwatin and Chelmsford Formations.

The Crean Hill property is in the South Range of the SIC. The main mass of the South Range SIC consists of a lower unit of the quartz-rich norite. Stratigraphically above is the green norite with irregular bodies of brown norite, followed by the quartz gabbro and then the granophrye layers (Lightfoot, 2016).

A magmatic breccia—called the sublayer—is found at the basal contact of the main mass in embayment and trough structures.

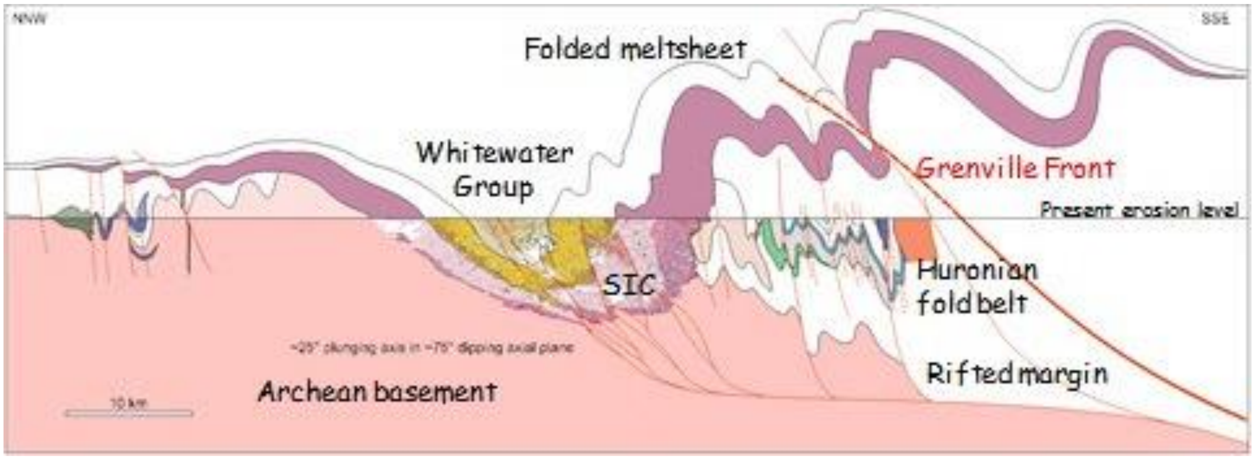
The footwall (FW) to the SIC South Range is the Southern Province. The geology can roughly be divided into the Early Proterozoic (~2,450 Ma) Murray and Creighton Granite Plutons and Huronian Supergroup (2,250 to 2,460 Ma) mafic and felsic volcanic and sedimentary rocks. In ascending stratigraphic order, the rock formations present are:

- Elsie Mountain (mafic volcanic and some interflow sedimentary rocks)
- Stobie (mafic volcanic and sedimentary rocks)
- Copper Cliff (felsic volcanic rocks)
- McKim (argillitic and arenaceous rocks)
- Ramsey Lake (arenaceous and conglomeratic rocks)
- Pecors (argillitic and arenaceous rocks)
- Mississagi (sub-arkose and arkosic sedimentary rocks)

The Creighton and Murray Plutons are intrusive into older Huronian volcanic and sedimentary rocks, mostly of the Elsie Mountain and Stobie Formations.

The South Range of the SIC and adjacent Huronian rocks, for the most part, dip vertically or steeply north or south. Stratigraphic tops generally face south away from the SIC and toward the Grenville Front. The South Range Shear zone and Creighton and Murray faults are the manifestation of the deformation events that have shaped the present-day South Range (refer to Figure 7-1 and Figure 7-2) (Bleeker et al. 2014).

Figure 7-2 Cross-Section Illustration of the Conceptual Deformation of the SIC (looking east) (Bleeker et al., 2014)



The age of the deformation, which has resulted in the current sub-vertical orientation of the Huronian rocks, has not been definitively established. The metasedimentary rocks are interbedded sparingly with mafic volcanic flows of the Elsie Mountain Formation and commonly with volcanic rocks of the Stobie Formation. Many of these interflow metasedimentary rocks are sulphide bearing. The sulphides are dominantly pyrrhotite, with minor amounts of pyrite and trace chalcopyrite.

South Range FW rocks are cut by several small diabase and gabbroic intrusions that are often difficult to distinguish in the field. These include Matachewan dykes, Nipissing intrusions, quartz diabase (trap dykes), and Olivine Diabase. Both the quartz diabase and olivine diabase dykes are younger than the SIC. The Archean and early Proterozoic basement rocks are all crosscut by Sudbury Breccia.

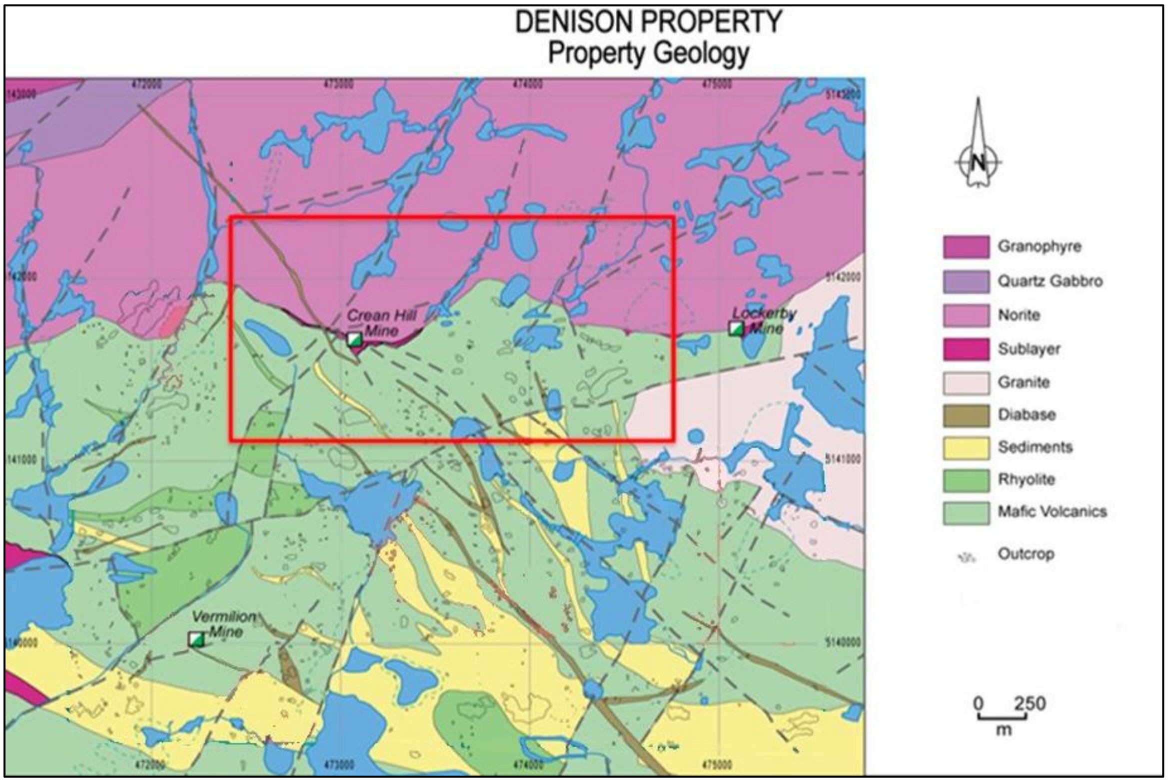
7.2 Property Geology

The property straddles the South Range of the SIC, approximately 30 km southwest of Sudbury, in Denison Township. From 1906-2002 a total of 20,370,000 tonnes of ore grading 1.09% Cu, 1.31% Ni, 1.56 g/t TPM was produced from the Main, Intermediate and 9400 zones.

The property hosts part of a large trough structure at the base of SIC, which contains a number of previously mined ore deposits including Crean Hill Main Orebody, Crean Hill Intermediate Orebody, Crean Hill West Orebody, Ellen Mine, and Lockerby Mine, each sitting in embayments (terraces) within the larger trough. The embayments largely control the distribution of Ni-Cu mineralization.

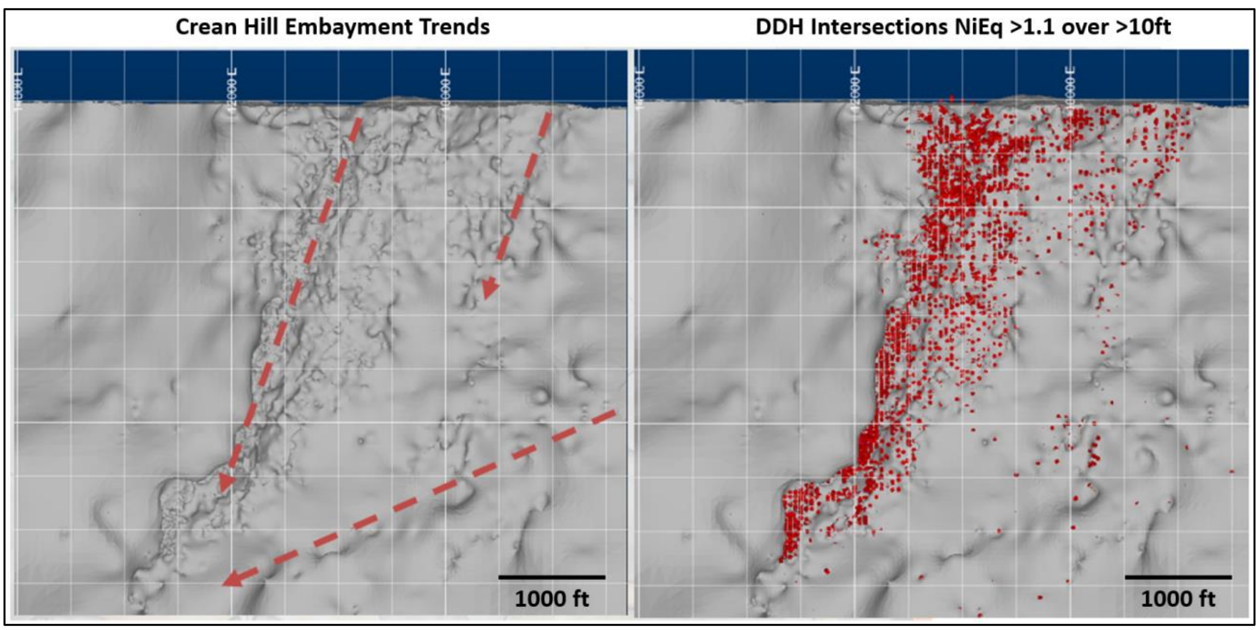
Additional embayments in the SIC containing significant Ni-Cu sulphide mineralization may be present at Crean Hill, in different orientations to the Main Zone embayment (refer to Figure 7-4).

Figure 7-3 Denison Property Geology (Modified from Baker et al., 2015)



In the Creighton deposit (13 km along strike east of Crean Hill), at least three orientations of embayments are present: the steep plunging 400 embayment, the moderate east plunging 402 (Gertrude West) embayment, and the moderate west plunging 403 embayment.

Figure 7-4 Crean Hill Long Section (looking south) with SIC Contact in Grey and Arrows Displaying the Embayment Trends at Denison



The strike of the SIC contact ranges from 120° at surface to 80°, and the dip varies from steeply dipping to the north at surface through vertical, to steeply dipping over-turned to south at the lower depths. The contact between the SIC and the FW is very often sheared. Shearing and brittle faulting also occur within the FW, as well as local significant alteration (Baker et. al. 2015 and 2017).

A significant portion of the mineralization, such as the 109 FW Zones, the 101 Zone, and part of the 9400 Zone, are hosted in the FW rocks. The host rocks are dominated by metamorphosed basalt (historically mapped and logged as greenschist), but also include gabbro, andesite, rhyolite, and sedimentary units (arkosic quartzite and meta-pelite) of the Huronian Supergroup, Elsie Mountain Formation (Card et al., 1977). Minor lithologies include olivine diabase, quartz diabase (trap dykes), granite, schist, amphibolite, and Sudbury Breccia in the FW, and quartzose norite at the SIC contact.

Though the distribution of much of the mineralization in controlled by embayments, additional structural settings and controls may be present. The association between shear zones and Ni-Cu sulphide orebodies is common in the South Range of the Sudbury basin, with Ni-Cu sulphide orebodies in the Creighton and Garson deposits associated with large shear zones. The splays of the Crean Hill (Victoria) shear zone can be traced from through the 9400 orebody and into the Crean Hill Main open pit, and appear to be associated with Ni-Cu sulphide mineralization at each.

At Crean Hill, the intersection between the Crean Hill shear zone and SIC is sub-parallel to the trend and plunge of the Crean Hill embayment, suggesting the Crean Hill shear zone may have controlled the formation of the embayment (SRK, 2006). The shear zones are associated with zones of alteration. In the western upper quadrant of the 9400 Zone mineral envelope, a wide zone of significant talc alteration is observed, affecting all rock types except olivine diabase and quartz diabase (trap dyke) (Baker, 2017).

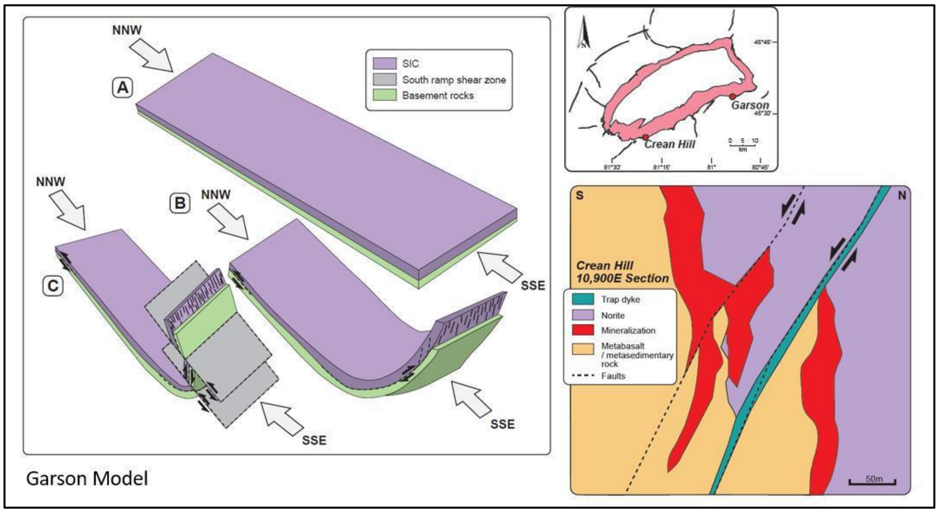
The Crean Hill shear zone may also control the distribution of PGE mineralization away from the Crean Hill embayment. In the South Range, for example, the Crean Hill, Creighton, Garson, Falconbridge, and Thayer Lindsey deposits all display shear zone controls on Ni-Cu sulphide mineralization. If the distribution of Ni-Cu sulphide mineralization is controlled by shear zones, it can be expected that the distribution of PGE mineralization may also be controlled by the shear zones. The PGE mineralization may be distributed within the shear zones along strike from the Ni-Cu sulphide mineralization, rather than directly into the deposit's FW. This is observed in the Garson deposit, with high tenor PGE mineralization observed in shear zones in the Garson ramp area, along strike from the main shear zone hosted Ni-Cu sulphide ores.

Two variably developed shear structures have also been observed along the limbs of the 109 FW Zone and are interpreted to form the pathway for mineralization of the FW; not as discrete mineralized features but rather as a route into the FW for migrating metals. The shears locally appear as chlorite and talc altered zones of metabasalt with strong foliation. The level of alteration is variable, with the extreme end member being very soft, heavily talc-altered beige intervals up to 30 cm, which have been encountered twice in drilling. Many intervals through the interpreted shears appear unaffected, with only typical levels of quartz-carbonate veining and alteration characteristic of the FW rocks (Baker, 2015).

There is one main fault in the immediate area of the 109 FW: a shallow fault striking 100° and dipping 25° south. This fault is comprised of two or more anastomosing horizons, where core is broken up along poorly healed joints, with local chlorite rich gouge horizons, bleached core, and locally significant quartz-carbonate veining. Locally, there are void spaces within the fault which are reported to have caused the abandonment of one hole in a previous drilling campaign. There is no offset of the 109 HW or 109 FW zones through this fault horizon; it appears to be a zone of weakness and alteration with no apparent offset. There is also no apparent trend in terms of enrichment or depletion of the 109 FW Zone mineralization due to the fault (Baker, 2015).

Sectional interpretations at Crean Hill are consistent with imbricate reverse fault slices stacked north over south. Figure 7-5 shows the evolution of the SIC at Garson.

Figure 7-5 Evolution of the SIC at Garson (Lightfoot, 2016)



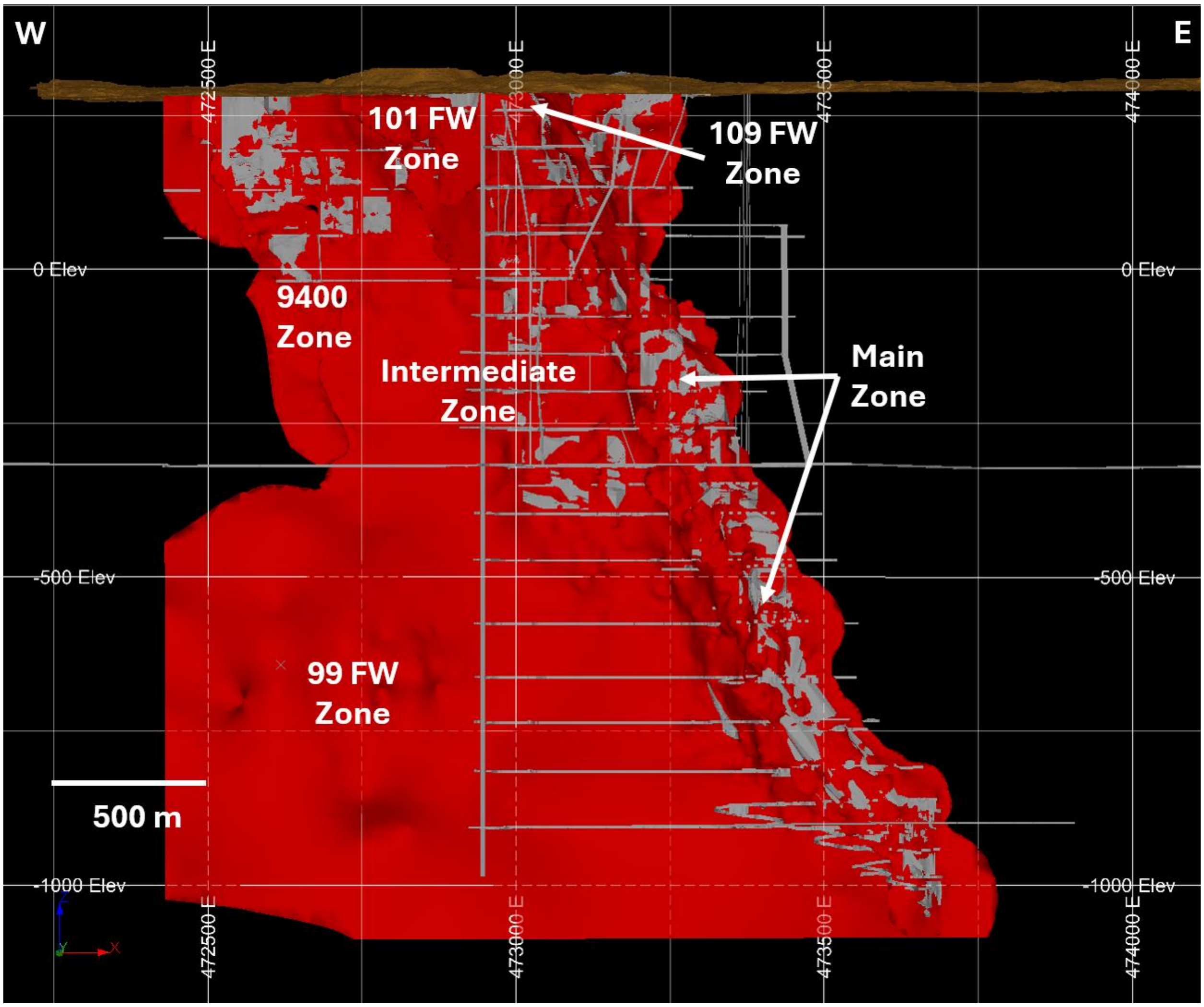
A similar, but not identical, model may apply at Crean Hill (Lightfoot, 2016). Many structures have a west-east trend and run close to the base of the SIC (e.g., the Victoria Shear which appears to have a dextral reverse motion), and there may also be splays of the Cliff Lake Fault (which typically exhibits south over north thrusting through much of the South Range, except where the basal contact is very steep). It is unclear to what extent the structures deformed / displaced the mineralization versus provided a pathway for the mineralization to follow (Lightfoot, 2017).

7.3 Mineralization

The main mineralized zones from east to west (refer to Figure 7-6) are as follows:

- Main
- 109 FW
- Intermediate
- 101 FW
- 99 Zone
- 9400

Figure 7-6 Isometric View Looking North: Main Denison Deposit Models.



7.3.1 9400 Zone

The 9400 Zone mineral envelope, as currently defined, is 1,970 ft (600 m) in depth extent, up to 820 ft (250 m) in strike length, and ranges from 10 ft to 130 ft (3 m to 39 m) thick. The envelope extends from 10,470 ft elevation down to 8,500 ft elevation, or from 450 ft to 2,460 ft (150 to 750 m) below surface.

The zone occurs primarily down-dip of the historic Crean Hill West Orebody, as well as mineralization to the west of the mined stopes. It is a tabular body that curves to the south at depth, and thickens from east to west, branching into two to three apophyses at the western margin of the zone. The Ni-Cu rich and PGM poor eastern part of the 9400 Zone is in contact with the SIC, trending obliquely away from the contact into the FW to the west. Mineralization at the eastern part consists mostly of semi-massive to massive Contact-style pyrrhotite, pentlandite, and chalcopyrite.

Toward the west, into the FW, the PM grades increase whereas the Ni and Cu grades decrease. Here, the sulphide mineralization occurs as stringers, fracture-controlled within quartz / carbonate veins, disseminations within the host rock, and disseminations within quartz / amphibole veins / patches that are interpreted to be partial melts. The majority of the 9400 Zone is composed of this type of FW mineralization. FW sulphide mineralization is dominated by chalcopyrite and pyrrhotite. Other minor sulphide/arsenide minerals include pentlandite, pyrite, gersdorffite, and trace minerals identified primarily in thin section sphalerite, galena, bornite, chalcocite, cobaltite, sperrylite, michenerite, and merenskyite (Baker et al., 2017). This style of mineralization changes to the west, gradually becoming lower in sulphide and shifting to higher Pt, Pd, and Au grades.

While there is visual evidence of possible hydrothermal processes—including intimate spatial association of PM with alteration minerals seen in thin sections and the presence of structures that would allow for the movement of fluids and local pervasive alteration—there is no indication of a spatial fractionation process within the geochemical dataset, as might be expected if a secondary process took place. Rather, the low- and high-sulphide mineralization styles were likely emplaced into their current relative locations during a single mineralizing event (Lightfoot, 2017). The 9400 FW Ext Zone is interpreted to be a continuation of the 9400 Zone.

The FW rocks have been metamorphosed to greenschist and amphibolite facies. Locally, volcanic sections contain patches and veins of medium- to coarse-grained amphibole in a fine-grained quartz matrix. These are interpreted to be partial melts of FW lithologies due to contact metamorphism from the cooling SIC (Dressler, 1984). Common alteration styles include pervasive chlorite alteration of volcanic rocks, pervasive silicification of sedimentary rocks and rhyolites, and calcite +/- quartz +/- chlorite veins in the volcanic and sedimentary rocks. Less common alterations include pervasive talc and sericite alteration of sedimentary and volcanic rocks (Baker et al., 2017).

The low-sulphide Pt-Pd-Au style of mineralization was not well sampled in drilling prior to 2003. As a result, the upper half of 9400 Zone remains open to the west and to surface. The 9400 could also be considered open at depth as one possible interpretation of the 9400 Zone mineralized trend is that it extends into the 99 Zone at depth.

7.3.2 109 FW Zone

The Crean Hill 109 FW zone rests in the immediate FW of the main embayment structure, which hosted what was the Crean Hill Mine Main zone but now includes the 109 HW zone. There is little or no separation between the norite-hosted, semi-massive to massive mineralization of the 109 HW, and the much lower sulphide Pt-Pd-Au mineralization in the FW, hosted primarily in metabasalt (Figure 7-6).

The mineralization is often associated with partial-melt veinlets, thought to be a thermal effect from the emplacement of the SIC, and occurs with veinlets of chalcopyrite-pyrrhotite and local pentlandite near the SIC contact. Fine to 1-cm-thick quartz-carbonate veinlets are found throughout the deposit, often hosting pyrrhotite and local chalcopyrite. Fine disseminations and veinlets of gersdorffite are found locally.

Where present, metasediments and felsic metavolcanics are not as prospective as the metabasalt unit. The deposit has the morphology of an open fold with thin limbs and a thickened axial hinge in the FW of the apex of the Crean Hill embayment. However, the deposit is understood to be located by two shears running parallel to the limbs, concentrating a PGE-Au mineralization halo around the contact mineralization. The mineralization is particularly concentrated in the hinge at the intersection of the two limb shears.

Mineralization can be extremely low in sulphide toward the FW margin of its known envelope. The mineralization is not necessarily hosted in noticeably sheared rock, but rather the sheared areas define the mineralized corridors. The shearing may have prepared the host rock to receive—or acted as a conduit for—mineralizing fluids (Baker et al., 2015).

Because the low-sulphide Pt-Pd-Au style of mineralization was not well sampled in drilling prior to 2003, the 109 FW zoneone remains open below the current extent to depth, along within the FW to the Main zone.

7.3.3 Main Zone

The Main Zone remnants are the unmined Ni-Cu rich contact sulphide mineralization of the historic Main orebodies. They are concentrated at or near the base of the SIC or within embayment structures, and associated with sublayer norite and quartz-rich norite phase of the SIC. Generally, these zones become more Cu rich the further the mineralization is from the main contact mineralization. The main sulphide assemblages are massive to net-textured pyrrhotite, pentlandite, and chalcopyrite mineralization, where pentlandite is the main Ni-bearing mineral, and chalcopyrite is the main Cu-bearing mineral.

7.3.4 101 Zones

The 101 Zones have been modeled as narrow mineralized structures extending out from the SIC contact from near surface to approximately 400 m depth and up to 200 m southwest, perhaps exploiting weakness along lithological contact in the footwall rocks. The orientation and metal ratios are curious for this zone. Unlike most of the mineralized zones which are near parallel to the SIC contact or following identified embayment trends, the strike orientation of the 101 Zones is oblique to the main mineralized trend. Also peculiar is the high Ni/Cu of the zone despite extending so far into the footwall. The 101 Zones remain partially open along to the southwest to depth.

7.3.5 99 FW Zone

The 99 FW Zone has been modeled as three sub-parallel mineralized zones, are oriented sub-parallel to the SIC contact, and have a strike extent of over 1,800 m and a depth extent of over 700 m within the Property boundary. The largest and most continuous of the three zones is located at the SIC basal contact and two smaller zones are interpreted to be within the footwall. The thickest part of these zones has been interpreted to be plunging shallowly to southeast along a secondary embayment structure. There is a lower confidence in the interpretation of the 99 FW Zone because of the limited number of drillhole intercepts and the high angle at which the drilling completed was oriented relative to the zones.

8 DEPOSIT TYPES

The description of the deposit model for the property in this section is sourced from SRK (2020) and any other references therein.

Historical production over the past 125 years, plus current reserves in the Sudbury mining districts, have been estimated at approximately 1.6 billion tonnes of ore, containing over 60 million ounces of PGM plus Au, over 11 million tonnes of Ni, and over 10.8 million tonnes of Cu (Lightfoot and Farrow, 2002; Eckstrand and Hulbert, 2007; Ames and Farrow, 2007; Lightfoot, 2016).

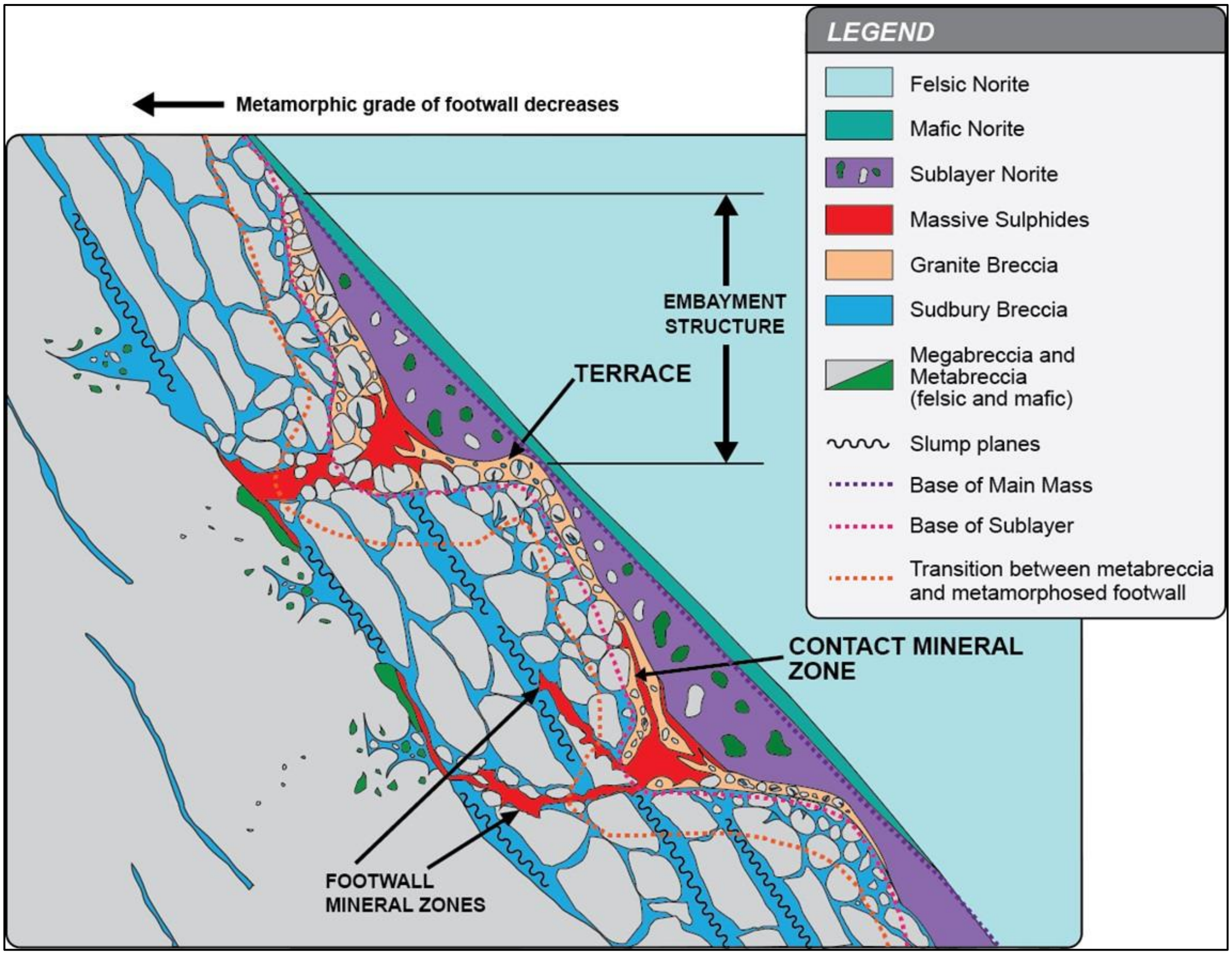
There are several main types of mineral deposits in the Sudbury area:

- Contact deposits, including massive sulphide consisting of Ni, Cu, Co, Pt, Pd, and Au mineralization along the lower contact of the SIC, both within the contact sublayer and in the immediately adjacent FW Breccia.
- FW deposits, including sulphide veins and stringers containing Cu, Ni, Pt, Pd, and Au, in the brecciated FW rocks beneath the SIC.
- Structurally and/or hydrothermally remobilized sulphide Ni, Cu, Co, Pt, Pd, and Au mineralization.
- Offset dyke deposits, including massive sulphide consisting of Ni, Cu, Co, Pt, Pd, and Au mineralization associated with brecciated and inclusion-bearing phases of the quartz diorite (QD) offset dykes (i.e., inclusion-rich quartz diorite [IQD]).
- Hybrid type deposits representing combinations of the above.

Figure 8-1 shows a cross-section through the SIC contact on the north range, illustrating the host environments for contact and FW mineralization (Lightfoot, 2016).

Deposits of the Crean Hill Project include Contact Type and Footwall Type deposits (see below).

Figure 8-1 Cross-section through the SIC Contact on the North Range (Lightfoot, 2016)



8.1 Contact Type Deposits

Much of the historic mining activity on the property exploited the first type of deposit mentioned, which are contact type deposits. Mineralization includes blebby to massive accumulations of sulphide, including pyrrhotite > chalcopyrite > pentlandite concentrated within embayment depressions along the base of the SIC, both within the contact sublayer and in the immediately adjacent FW Breccia (though FW Breccia is more prevalent in the North and East Ranges; refer to Figure 8-1).

The massive and semi-massive accumulations of sulphide are strongly conductive and borehole electromagnetics (BHEM) is used routinely on all drillholes of significant depth. Generally, current BHEM technology can detect an off-hole conductor about the same distance as the median dimension of that conductor, with several practical caveats. Maximum effectiveness requires strong coupling between the loop configuration and the conductor.

8.2 Footwall Type Deposits

Examples of recent FW deposit discoveries in the region include the Crean Hill 109 FW Zone, parts of the 9400 Zone, McCreedy East FW deposits at Vale's Coleman Mine (the 148, 153, and 170 orebodies), the

FW orebodies at Glencore's Nickel Rim South Mine, and the FW deposits at Vale's Victor and Capre development projects.

Mineralization includes networks of one to ten metre sized massive sulphide veins, stockworks of smaller cm to m sized sulphide veinlets, and low sulphide alteration zones with weak sulphide disseminations, including chalcopyrite > pentlandite ± pyrrhotite, millerite, cubanite, bornite, and pyrite. FW deposits are often hosted by Sudbury Breccia structures.

Low sulphide High Grade Precious Metals ("LSHPM") is a relatively new classification of mineralization in Sudbury (Farrow et al., 2005; Péntek et al., 2008; Tuba et al., 2010; Kjarsgaard & Ames, 2010). LSHPM mineralization has been identified as follows in three geological settings:

- Fine-grained specks in FW shears, such as those observed in the 109 FW and 9400 Zones at Crean Hill.
- Fine-grained specks, disseminations, and narrow discontinuous fracture fillings in Sudbury Breccia and adjacent wall rocks in the 109 FW and 9400 Zones at Denison, and at several occurrences in the North Range and East Range of the Sudbury Structure.
- Fine disseminations and specks in QD dykes, lenses, and pods.

The LSHPM mineralization at Crean Hill exhibits a close spatial relationship to the more massive contact-related Ni-Cu sulphide ores at the base of the SIC. This relationship results in the greatest concentration of LSHPM mineralization occurring adjacent to the largest concentration and highest tenor massive sulphide occupying the Cran Hill embayment structure (Lightfoot, 2017).

Sulphide veins within FW deposits are variably conductive and chargeable. Airborne, ground, and Bore Hole Electro Magnetic (BHEM)—as well as ground and borehole DCIP surveys—can be effective in directly detecting the sulphide veins. However, due to the potentially small physical size of individual conductive veins and the low-sulphide nature of some of the PGE-rich FW deposits, the detectable distance of geophysical techniques may be limited. Exploration requires careful geological mapping to understand structural controls, drilling, and extensive sampling, and recognize SIC-related partial melting features and hydrothermal alteration styles associated with FW systems.

8.3 Structurally and/or Hydrothermally Remobilized Mineralization

In some deposits, sulphide has been remobilized into shear zones and related structural traps. Important examples of this type of deposit include those at Garson, Falconbridge, Falconbridge East, and Creighton mines. Several mineralized trends at Cran Hill mimic the underlying shear fabric; because of this, these trends may fall under this deposit type. However, it is unclear whether the mineralization has been remobilized or if the shear zones acted as ground preparation providing pathways for the magmatic melts to follow or is a combination of both without knowing the order of mineralization.

8.4 Offset Dyke Deposits

Though not identified at Crean Hill, the potential for the property to host offset dyke deposits exists. Examples of recent offset dyke deposit discoveries in the region include the Kelly Lake deposit within the Copper Cliff offset dyke, and the Totten and Victoria deposits within the Worthington offset dyke.

Mineralization includes massive and semi-massive accumulations of sulphide, including pyrrhotite > chalcopyrite > pentlandite. Sulphide accumulations are associated with and are known to concentrate in structural traps such as vertical or horizontal pinches or terminations in the dyke, bends in the dyke, splays/convergences of dyke branches, along the margins or within "pressure shadows" of large blocks caught up in the dyke, and at intersections of the offset dykes with coarse mafic intrusions in the wall rock. Increased PGEs are typically associated with more fractionated chalcopyrite rich zones within offset dyke deposits, which can extend from the dyke outwards into the surrounding country rock, into adjacent zones of Sudbury breccia, meta-breccia or anatexite.

These structural traps are largely controlled by the geology of the wall rock to the offset dykes (geological units, contacts, and structures). Understanding these wall rocks is crucial to developing and prioritizing drill targets below the depth of penetration of surface geophysics.

Geophysically, offset style deposits are similar to contact style deposits discussed in Section 8.1.

9 EXPLORATION

Since becoming operator of the JV in 2014, Loncan had not conducted any significant surface exploration on the property (SRK, 2020) and as of the effective date of this report, Magna has completed a UTEM 5 surface geophysical survey, 28,439 m of diamond drilling in 130 drill holes, several BHEM surveys, surface gravity, mapping, Surface Advanced Exploration, and bulk sampling on the Crean Hill property. Magna commenced exploration diamond drilling in late 2022 and drilling continues through 2024 (see Section 10) on the Property.

10 DRILLING

The drilling information in this section for previous owners of the property is sourced from WSP (2020). A total of 4,009 drillholes totalling 515,664 m (1,691,812 ft)—make up the Crean Hill drillhole dataset prior to Magna acquiring the property in late 2022. Table 10-1 summarizes the number of holes drilled and the total footage by year (WSP, 2020).

Since its acquisition of the Crean Hill property in November 2022, Magna nearly continuously completed diamond drilling within the Crean Hill property. As of the date of this report, drilling has focused on defining continuity and grade of mineralization (within the current mineral resources), and expansion of the known mineralized zones. More recently in 2024 exploration and drilling efforts have focused on the footwall environment. Magna has completed 130 surface diamond drill holes for a total of 28,439 m of drilling between November 2022 and April 2024. The results of the diamond drilling completed by Magna to date have been considered in the geological interpretation, and assay results have incorporated into the current mineral resource estimate.

Table 10-1 Summary of Property Diamond Drillholes by Year

Year	# of Holes	Total Metres
1901	154	11,300
1905	10	1,155
1906	9	899
1908	4	593
1909	4	225
1912	7	206
1915	14	278
1917	13	967
1918	20	1,886
1919	1	65
1937	16	4,773
1938	2	590
1945	14	3,343
1950	6	1,975
1951	40	2,800
1952	73	11,835
1953	69	14,457
1954	28	745
1957	78	6,933
1958	45	3,883
1959	118	12,339
1960	198	31,613
1961	49	8,076

Year	# of Holes	Total Metres
1962	7	2,830
1964	10	293
1965	25	2,680
1966	62	5,878
1967	54	8,962
1968	138	15,963
1969	121	12,178
1970	270	20,689
1971	226	15,701
1972	6	975
1975	98	13,068
1976	241	22,823
1977	236	23,766
1978	29	2,459
1983	20	2,864
1984	16	1,421
1986	18	3,005
1987	79	6,181
1988	34	3,130
1989	17	5,050
1990	99	8,234
1991	92	13,205
1992	110	17,031
1993	189	24,418
1994	158	15,581
1995	130	18,993
1996	95	12,116
1997	62	7,065
1998	33	4,801
1999	10	450
2001	2	557
2002	14	3,009
2004	2	20
2005	17	5,507

Year	# of Holes	Total Metres
2006	16	7,052
2007	21	14,157
2008	23	7,879
2009	30	6,819
2010	56	11,271
2011	3	447
2012	19	2,474
2014	40	8,646
2015	33	15,689
2016	58	13,165
2017	18	6,226
2022	10	2,013
2023	92	18,997
2024*	28	7,429
Total	**4,139**	**544,103**

*Up to April 15th, 2024

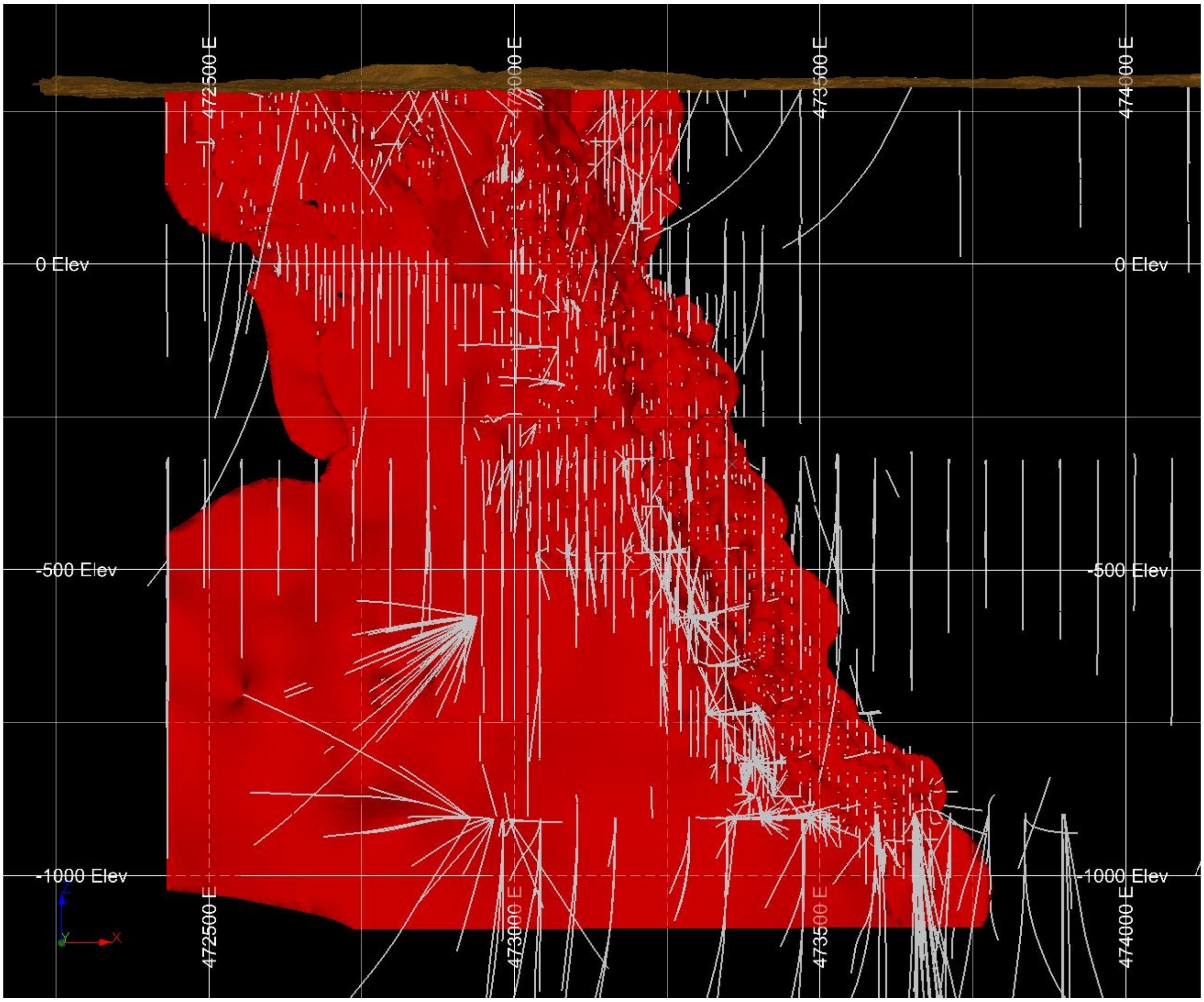
10.1 Vale and Locan Drilling

10.1.1 Vale Drilling

The diamond drilling by Vale and its predecessor companies dates back to 1906. Drilling equipment has evolved over this period from standard rods to wireline, and core sizes from EX, AQ, BQ, and NQ. The drilling by Vale was focused primarily on supporting the copper-nickel exploration and production at the Crean Hill Mine.

Historical drilling prior to the joint venture with Locan is shown in Figure 10-1. From 2005 until Loncan became the operator of the Project in 2014, the drilling was focused on the LSHPM, as shown in Figure 10-2. During this time, a total of 185 holes totalling 55,605 m (182,430 ft) was completed, of which 176 holes totalling 53,313 m (174,911 ft) targeted the LSHPM.

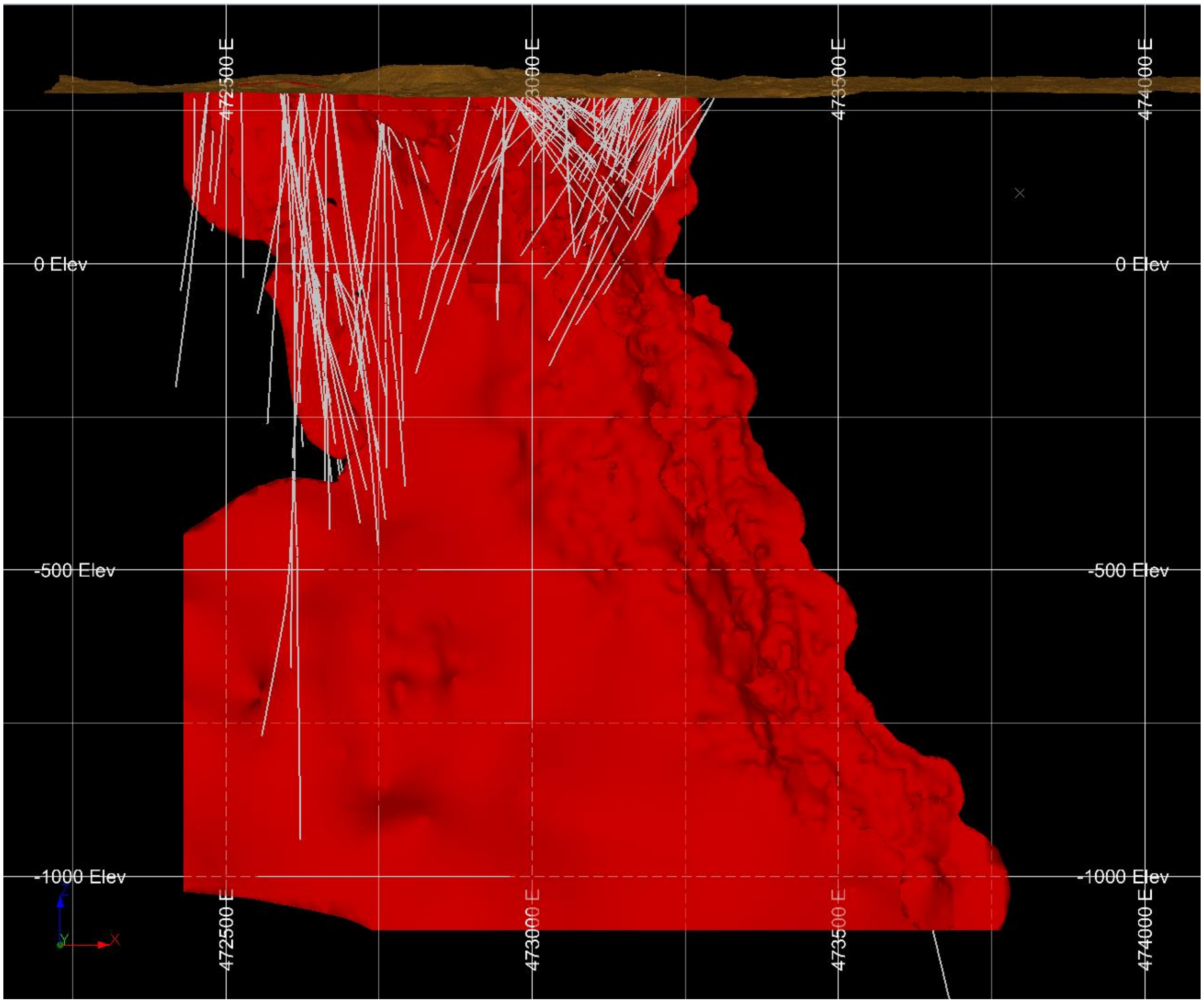
Figure 10-1 Isometric View Looking North: Distribution of Drill Holes Completed by Vale and its Predecessor within the Deposit Area (pre 2005)



Core recovery tended to be greater than 95%. Recovery losses tended to be near surface in fractured ground or near old underground workings.

The true thickness of core intersections was variable depending on whether the hole was collared on the hanging wall or footwall side of the mineralization and the dip of the hole.

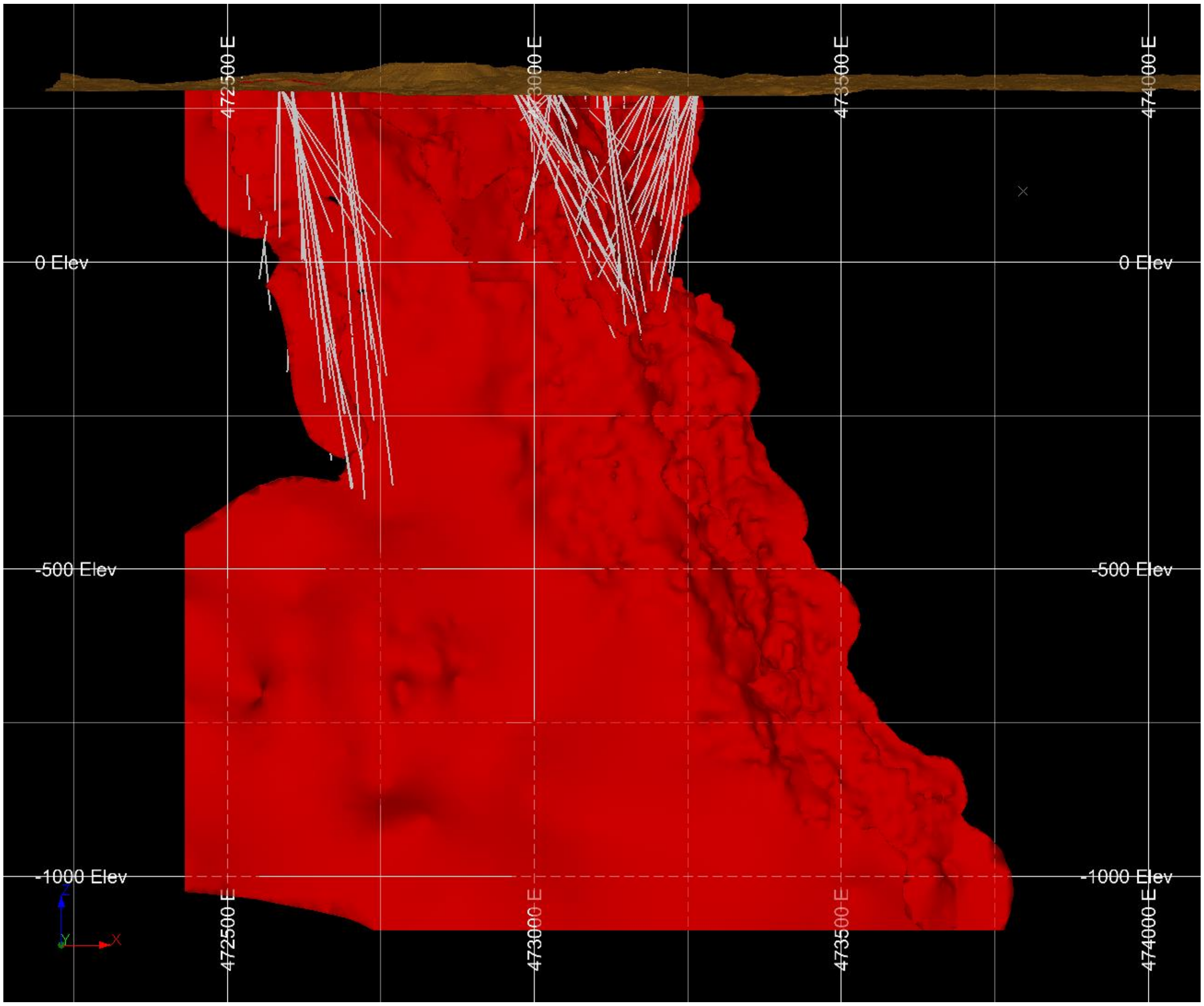
Figure 10-2 Isometric View Looking North: Distribution of Drill Holes Completed by Vale within the Deposit Area (2005–2014)



10.1.2 Locan Drilling

Loncan took over operatorship of the Project in 2014. A total 149 holes totalling 43,726 m (143,458 ft) were completed from 2014 to 2017, as shown in Figure 10-3.

Figure 10-3 Isometric View Looking North: Distribution of Drill Holes Completed by Loncan within the Deposit Area (2014–2017)



The drilling was completed by various drilling contractors using industry standard NQ wireline drill rigs. A small proportion of these holes may be outside the revised property boundary.

All the holes drilled by Loncan targeted the LSHPM material on the Project. Core recovery tended to be greater than 95%. Recovery losses tended to be near surface in fractured ground or in proximity to old underground workings.

The true thickness of core intersections was variable depending on whether the hole was collared on the hanging wall or footwall side of the mineralization and the dip of the hole.

10.1.3 Surveying

Collar

The earliest drilling programs on the Project used a mine grid to spot holes. The Mines Exploration Borehole System (MEBS), Vale's borehole database system, can convert the various Vale grids into a common coordinate system for export.

There is a risk of inaccuracies related to the earlier grid drilling data not matching true survey data; however, this risk was considered low for the purposes of resource estimation.

From 2000 onwards, drill collars were spotted in the field using a real-time differential GPS and surveyed again with the real-time differential GPS upon completion of the hole or program. Survey results from the GPS were completed in the mine grid coordinate or converted from UTM to mine grid.

Survey lines for underground boreholes were marked on the walls by the Vale survey department with front sights and back sights. A borehole layout was provided to the diamond driller with the hole ID, front sight / back sight, and the dip of the hole. Final collar locations were not surveyed after the completion of the boreholes.

Downhole

Various downhole survey methods were used over the Project life, as follows:

- Acid tests (no azimuth, dip only)
- Reflex
- Gyro
- North-seeking gyro

Acid tests were collected approximately every 30.5 m (100 ft) down the hole. Reflex, gyro, and north-seeking gyro surveys were conducted upon completion of the hole, resulting in continuous downhole survey readings approximately every 0.9 to 1.5 m (3 to 5 ft) down the hole.

Acid tests are inherently less accurate that the other methods mentioned here and should be avoided for future programs.

10.1.4 Core Delivery

Surface

Surface core was delivered to the Vale or Loncan core logging facility—depending on the program operator—by the diamond drillers or Vale core technician every weekday.

Underground

Drill core from underground was secured on pallets. Periodically, the pallets were transported by the Vale mine operations group to the shaft and hoisted to surface. The pallets were then delivered to the Vale core logging facility.

10.1.5 Core Logging

During the 2015–2017 Denison drilling program, diamond drill core was transported from the field at the Crean Hill Project to the Loncan core shack—a distance of about 30 km—by either company personnel or by a drill contractor. The core was inspected for continuity and the correct markings of depths, tagged, and then logged, and sample intervals were marked by Loncan geologists (WSP, 2020).

All borehole data from surface and underground drilling are stored in Vale's MEBS database. In addition, all boreholes drilled by Loncan exist as Excel® files exported from MEBS as a back-up record.

MEBS contains data for modern holes recorded directly in the system and holes that existed on the property before the database—which have been transcribed in the database—dating back to 1901. Old boreholes often have extremely short interval descriptions, if any. The borehole database used in this resource estimation was downloaded by Alexander (Sandy) Gibson of Vale on 27 April 2017, in Datamine Studio 3, using Vale Ontario Operation's scripts, which export data directly out of MEBS. The measured density data was manually merged with this dataset using the sample identification number as the key field.

Routine geological logging is conducted by suitably qualified geologists and geological technicians, and it is captured in MEBS. All logging is completed in imperial units, as per MEBS requirements. Rock and minor rock codes, Rock Quality Designation (RQD) angle (foliation or significant contact angle), sample number, ore code, estimated Ni + Cu grade, estimated percent sulphide, and a detailed description are recorded for each interval, where applicable, for each field. Additional data uploaded into MEBS includes core photos, geotechnical logs, and measured density data.

Earlier geological logging that pre-dates MEBS followed procedures which diverge in several respects from the existing current Loncan procedure. These differences are not expected to have a material impact on the integrity of the geological interpretation or understanding.

10.2 Magna Drilling 2022-2024

10.2.1 Drilling

Magna took over operatorship of the Project in 2022. A total 130 diamond drillholes totalling 28,439 m (93,280 ft) were completed from 2022 to April 2024 (Figure 10-4).

The drilling was completed by Bagone'an Drilling Inc. using NQ wireline drill rigs.

The majority of holes drilled by Magna targeted footwall-style mineralization with a lesser component targeting remnant zones along the contact. Core recovery tended to be greater than 95% with losses associated with fractured ground near surface or in proximity to historic underground workings and/or structures.

The true thickness of core intersections was variable depending on whether the hole was collared on the hanging wall or footwall side of the mineralization and the dip of the hole.

Initial results of the Magna drilling were presented in a previous technical report (Murphy et al., 2023). More recent drill results are presented in Table 10-2.

Figure 10-4 Isometric View Looking North: Distribution of Drill Holes Completed by Magna within the Deposit Area (2022-2024)

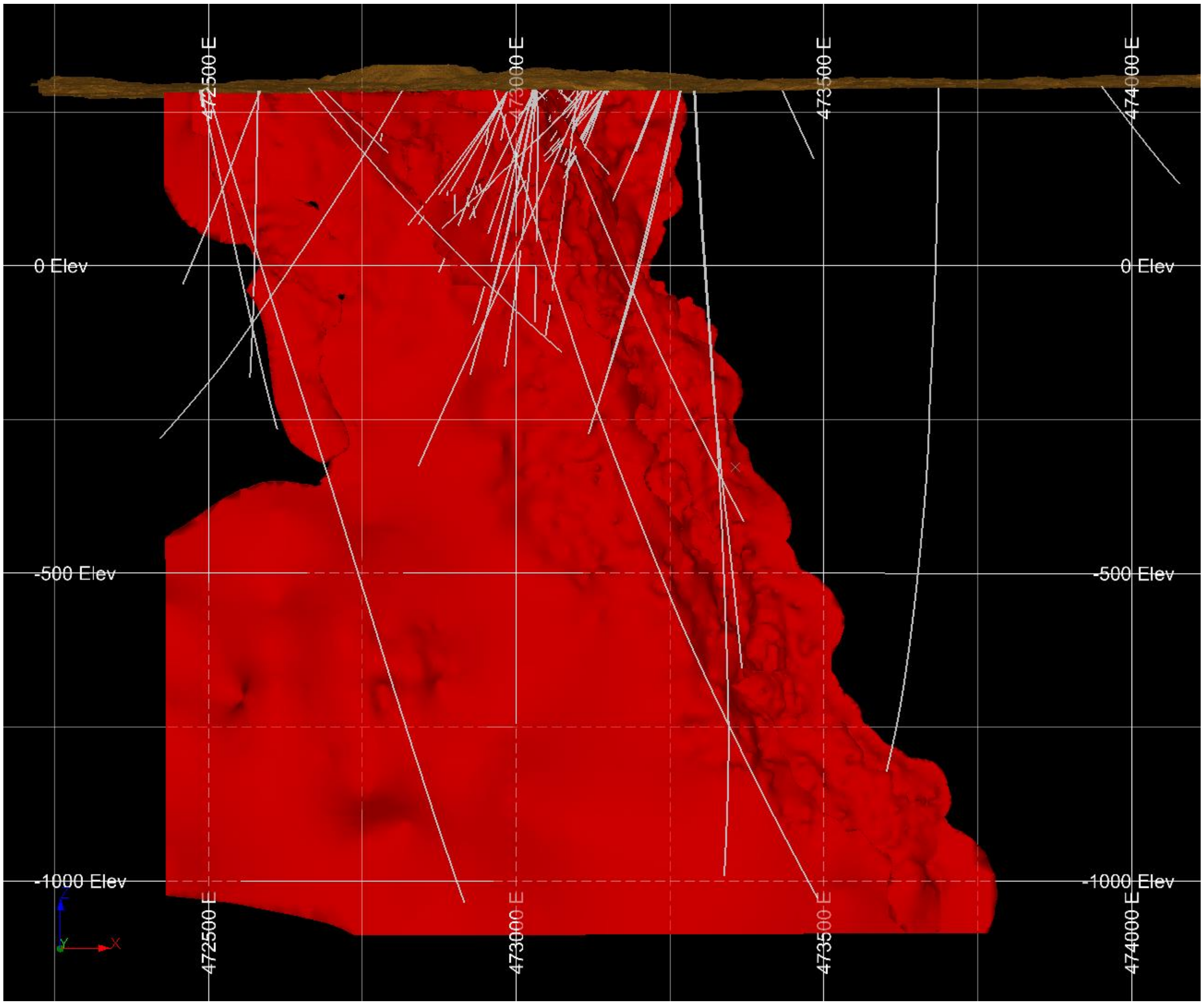


Table 10-2 Significant Drill Intercepts from the 2023 – 2024 Drilling by Magna (Up to April 15th, 2024)

Drillhole	Zone		From (m)	To (m)	Length (m)	Ni %	Cu %	Pt g/t	Pd g/t	Au g/t	TPM g/t
MCR-23-46	105 FW		453.1	458.2	5.1	0.2	1.1	1.3	4.2	0.7	6.3
		and	466.0	466.9	0.9	2.7	1.5	17.2	0.7	0.2	18.1
	Int		639.7	645.2	5.5	1.2	0.7	0.4	1.4	0.0	1.8
MCR-23-47	G2		*No Significant Values*								
MCR-23-049A	9400 FW		457.0	458.1	1.1	0.0	0.0	0.9	0.8	0.3	1.9
MCR-23-50	105 FW		448.4	453.1	4.8	1.1	0.6	2.9	0.8	0.6	4.3
		and	461.3	462.4	1.1	0.6	3.5	0.6	4.6	4.9	10.1
		and	469.6	470.3	0.8	0.2	1.0	0.3	6.0	2.2	8.6
		and	488.8	489.1	0.3	2.0	6.2	5.1	0.3	0.1	5.5

Drillhole	Zone		From (m)	To (m)	Length (m)	Ni %	Cu %	Pt g/t	Pd g/t	Au g/t	TPM g/t
		and	513.1	513.4	0.3	1.5	0.4	0.0	24.5	0.0	24.5
MCR-23-051	Int		94.8	111.4	16.6	0.6	0.6	0.4	0.1	0.1	0.6
	101 FW		119.9	121.5	1.6	1.4	1.1	0.4	0.2	0.1	0.7
		and	129.0	142.6	13.6	1.1	0.5	0.3	0.2	0.0	0.5
		and	148.3	151.1	2.9	1.2	1.7	0.2	0.9	0.2	1.2
		and	190.4	196.1	5.6	0.7	1.7	0.2	2.2	0.1	2.5
		and	206.3	207.5	1.3	2.5	3.8	6.3	0.7	0.1	7.1
		and	217.0	218.4	1.3	0.3	2.7	0.1	0.2	1.3	1.6
		and	220.8	222.8	2.0	2.9	0.4	0.3	0.2	0.7	1.2
		and	227.0	228.3	1.3	0.9	0.4	1.9	0.1	0.1	2.2
		and	234.6	237.0	2.4	2.8	8.7	0.0	0.3	0.6	0.9
MCR-23-52A			241.8	338.3	96.5	0.7	1.3	1.0	0.8	0.3	2.0
	109 FW		241.8	259.4	17.5	0.1	1.0	0.9	1.8	0.5	3.1
		Incl.	254.7	259.4	4.7	0.2	1.2	0.8	2.7	0.6	4.1
	Main		260.5	261.4	0.9	1.4	6.2	1.1	0.3	1.2	2.6
		and	263.0	278.0	15.0	1.2	1.1	1.0	0.5	0.3	1.8
		Incl.	267.0	273.4	6.4	2.2	0.5	0.8	0.6	0.1	1.5
		and	285.3	338.3	53.1	0.9	1.6	1.1	0.6	0.2	1.9
		Incl.	291.0	295.1	4.1	1.6	0.7	0.6	1.0	0.3	1.8
		and Incl.	322.8	338.3	15.5	1.2	2.5	2.2	0.7	0.2	3.1
MCR-23-54A	Int		76.9	116.7	39.7	0.6	0.7	0.4	0.1	0.2	0.7
	101 FW		126.5	130.2	3.7	4.1	0.4	0.4	0.3	0.1	0.7
		and	139.6	140.6	0.9	2.2	0.5	0.3	0.2	0.1	0.6
		and	148.5	149.8	1.3	0.5	0.1	1.0	1.5	7.4	9.9
		and	152.0	152.8	0.8	0.5	6.2	0.1	0.3	0.1	0.5
		and	158.2	158.6	0.4	1.8	1.0	0.0	1.0	0.1	1.2
MCR-24-060	109 FW		35.0	49.0	14.0	0.3	2.0	3.8	2.8	2.1	8.6
		Incl.	40.0	43.0	3.0	1.1	8.3	3.4	6.0	4.6	13.9
MCR-24-061	109 FW		60.1	74.8	14.7	0.6	1.0	5.0	2.6	2.0	9.5
		Incl.	62.1	65.0	2.9	1.6	3.4	5.4	4.4	2.8	12.5
		and	71.8	72.8	1.0	2.2	1.1	15.0	4.3	9.4	28.7
MCR-24-063	109 FW		77.0	90.7	13.7	0.2	0.7	5.1	1.7	1.2	8.0
		Incl.	80.0	80.9	0.9	0.5	3.2	3.5	5.5	5.2	14.1
			97.5	107.7	10.2	0.8	1.2	2.1	3.5	7.1	12.7
		Incl.	97.5	102.0	4.5	1.2	1.9	2.1	4.2	14.3	20.6
MCR-24-064	109 FW		77.0	85.0	8.0	0.3	0.3	6.5	3.4	2.1	12.0
		and	93.0	94.4	1.4	0.2	1.5	4.9	6.3	4.0	15.3
		and	96.7	104.7	8.0	0.1	0.2	1.7	1.5	1.0	4.1
MCR-24-065	109 FW		83.8	94.0	10.2	0.2	1.1	5.5	3.5	2.4	11.4
		Incl.	89.7	90.4	0.7	1.5	10.7	3.6	11.5	0.9	16.0

Drillhole	Zone		From (m)	To (m)	Length (m)	Ni %	Cu %	Pt g/t	Pd g/t	Au g/t	TPM g/t
			105.4	109.0	3.6	0.2	0.3	3.0	1.6	0.9	5.5
MCR-24-066	109 FW		87.0	104.4	17.4	0.1	0.2	3.0	1.5	1.0	5.5
		Incl.	99.0	103.0	4.0	0.2	0.4	5.7	3.1	2.1	11.0
			111.0	120.0	9.0	0.1	0.2	2.9	1.3	0.7	4.8
			130.0	134.0	4.0	0.0	0.0	3.2	1.4	0.8	5.4
MCR-24-068	109 FW		94.0	120.3	26.3	0.7	2.4	6.4	1.9	1.5	9.7
		Incl.	104.6	113.7	9.1	1.8	6.3	12.6	2.8	2.2	17.5
		Incl.	108.6	113.0	4.4	3.2	11.3	7.6	2.4	0.6	10.6
MCR-24-069	109 FW		119.5	148.0	28.5	0.3	0.3	6.6	2.7	1.5	10.7
		Incl.	119.5	127.3	7.8	0.9	0.2	16.3	6.2	2.8	25.3
		and	134.5	138.0	3.5	0.2	0.5	9.6	4.1	3.1	16.9
MCR-24-070	109 FW		106.0	107.0	1.0	0.2	0.3	28.3	4.0	3.2	35.5
		and	127.7	144.8	17.1	1.6	5.2	4.7	4.1	1.2	10.0
		Incl.	128.2	135.0	6.8	2.5	9.6	8.4	7.6	1.5	17.4
			139.0	142.6	3.6	1.8	5.8	2.2	2.6	0.9	5.7
MCR-24-071	109 FW		115.0	124.0	9.0	0.1	0.2	1.9	1.2	0.7	3.8
		and	128.0	131.0	3.0	0.1	0.2	2.4	2.4	1.7	6.5
MCR-24-072	109 FW		121.0	122.0	1.0	0.3	0.3	16.4	7.5	4.7	28.7
		and	131.0	133.5	2.4	0.0	0.1	3.2	0.8	0.6	4.6
MCR-24-073	109 FW		87.0	88.0	1.0	0.1	0.1	4.7	1.5	1.0	7.2
		and	105.0	106.0	1.0	0.1	0.2	4.2	2.5	1.1	7.8
MCR-24-074	109 FW		*No Significant Values*								
MCR-24-075	109 FW		98.6	99.0	0.4	0.2	0.4	24.2	11.2	3.6	39.0
		and	114.0	127.0	13.0	0.2	0.2	9.3	4.9	2.8	17.0
		and	135.0	138.0	3.0	0.3	0.2	18.2	9.3	5.5	32.9
		and	141.0	144.0	3.0	0.0	0.1	1.6	1.9	0.6	4.1
MCR-24-077	109 FW		96.0	129.0	33.0	0.1	0.2	6.6	2.5	1.5	10.6
		Incl.	107.0	122.0	15.0	0.1	0.2	11.8	4.0	2.4	18.2
		and	140.0	142.0	2.0	0.1	0.1	4.5	3.5	1.2	9.2
MCR-24-078	Int		103.0	117.0	14.0	0.4	0.6	0.2	0.1	0.1	0.4
MCR-24-079	109 FW		172.5	173.4	0.8	1.0	0.1	1.7	7.5	0.7	9.8
		and	187.5	189.7	2.2	0.7	0.2	0.2	13.5	0.2	14.0
MCR-24-080	109 FW		181.0	196.1	15.1	0.6	0.2	11.7	5.5	3.0	20.2
MCR-24-081	109 FW		135.8	136.4	0.6	0.0	0.2	9.0	1.7	1.5	12.2
		and	181.3	181.8	0.5	0.1	0.2	14.9	5.4	3.2	23.5
MCR-24-082	109 FW		162.1	168.5	6.4	2.6	0.7	2.5	6.7	4.0	13.2
MCR-24-083	109 FW		145.7	146.3	0.6	6.1	0.3	0.0	1.6	0.3	1.9
MCR-24-084A	109 FW		274.1	274.9	0.8	0.3	0.2	0.6	12.9	5.3	18.8
		and	303.6	304.0	0.3	1.2	0.2	0.0	7.0	2.5	9.6
MCR-24-085	109 FW		*No Significant Values*								

Drillhole	Zone		From (m)	To (m)	Length (m)	Ni %	Cu %	Pt g/t	Pd g/t	Au g/t	TPM g/t
MCR-24-087	109 FW		255.2	270.4	15.2	5.0	0.7	4.7	5.7	2.5	12.8
		Incl.	263.6	268.8	5.2	11.7	1.0	0.6	3.9	1.3	5.8
		and	255.8	261.5	5.7	1.2	0.8	7.9	9.3	4.9	22.1
MCB-24-029	109 FW		0.0	6.3	6.3	0.9	2.9	3.9	4.2	1.4	9.5
MCB-24-030	109 FW		0.0	5.4	5.4	0.4	0.4	2.9	2.5	0.7	6.1
		Incl.	4.4	5.4	0.9	1.9	0.7	9.1	9.5	1.0	19.7
MCB-24-031	109 FW		0.1	7.1	7.0	0.7	0.8	2.5	3.6	0.8	6.8
		Incl.	5.0	7.1	2.1	1.9	2.3	1.6	8.5	0.8	10.9
MCB-24-032	109 FW		1.0	11.0	10.0	0.1	0.2	3.3	1.6	0.9	5.9
MCB-24-033	109 FW		1.3	5.8	4.5	0.2	2.0	5.3	4.3	1.7	11.3
MCB-24-034	109 FW		0.0	4.0	4.0	0.0	0.1	1.9	0.6	0.3	2.8
MCB-24-035	109 FW		0.0	6.9	6.9	0.4	1.6	0.5	1.8	1.2	3.5
MCB-24-036	109 FW		1.0	4.6	3.6	0.1	0.7	0.8	1.1	0.6	2.4
		and	7.5	8.7	1.3	0.2	1.9	0.6	1.6	0.8	3.0
MCB-24-037	109 FW Surface		0.0	4.1	4.1	0.4	0.5	10.7	14.5	9.0	34.3
MCB-24-038	109 FW Surface		1.7	5.0	3.3	0.3	0.2	0.9	3.7	0.5	5.1
MCB-24-039	109 FW Surface		4.7	6.2	1.5	0.7	0.3	0.1	0.3	0.0	0.4
MCB-24-040	109 FW Surface		9.0	9.5	0.5	0.8	0.4	1.5	0.2	0.2	1.9
MCB-24-041	109 FW Surface		42.7	46.1	3.4	0.1	0.1	2.3	0.9	0.6	3.8
MCB-24-042	109 FW Surface		21.9	24.3	2.5	0.2	0.1	2.3	7.4	4.1	13.8
MCB-24-043	109 FW Surface		1.0	2.0	1.0	0.0	0.0	0.0	0.0	2.0	2.1
MCB-24-044	109 FW Surface		10.0	11.0	1.0	0.1	0.1	1.2	0.8	0.5	2.5
MCB-24-045	109 FW Surface		20.3	20.6	0.4	0.1	0.1	0.0	0.0	8.4	8.4
MCB-24-046	109 FW Surface		7.7	10.3	2.5	0.1	0.1	3.3	1.7	1.2	6.1
MCB-24-047	109 FW Surface		2.5	3.9	1.4	0.1	0.0	4.2	1.0	0.7	5.8
MCB-24-048	109 FW Surface		*No Significant Values*								
MCB-24-049	109 FW Surface		*No Significant Values*								
MCB-24-050	109 FW Surface		*No Significant Values*								
MCB-24-051	109 FW Surface		*No Significant Values*								
MCB-24-052	109 FW Surface		13.8	16.9	3.1	0.8	2.9	4.2	1.1	0.6	5.9
MCB-24-053	109 FW Surface		2.0	11.0	9.0	0.1	0.2	3.2	2.2	1.2	6.6
		Incl.	2.4	9.2	6.8	0.1	0.2	4.0	2.7	1.5	8.3
MCB-24-054	109 FW Surface		0.7	18.6	17.9	0.1	0.2	2.2	1.7	0.7	4.6
		Incl.	11.2	15.9	4.7	0.1	0.5	3.4	3.7	1.2	8.3

10.2.2 Surveying

Collar

Drill collars were spotted in the field using a differential global positioning system using UTM NAD 83 Zone 17N and were also resurveyed after drilling was completed to verify the location of the hole.

When collars were flagged front-sites and back-sites were put in and IMDEX's TN14 Gyrocompass was used to ensure accurate line-up of the drill prior to drilling. Line-ups were verified by the Project Geologist before drilling was started.

All historic data that was in mine grid was converted to UTM with several reference survey points to validate the accuracy of the conversion.

Downhole

Downhole surveys were completed using IMDEX's SPRINT-IQ and EZ-GYRO. Single shot tests were taken after casing and every 50m during drilling, followed by a continuous test with measurements every 3-5m once the hole was complete. All test data, as well as the TN14 line-ups were uploaded to IMDEX's HUB-IQ and reviewed by Magna's geologists.

10.2.3 Core Delivery

During the 2022-2024 Denison drilling program, diamond drill core was delivered to the Magna core shack on Kelly Lake Road from the field at the Crean Hill Project mostly by company personnel or on occasion by the drill contractor.

10.2.4 Core Logging

Once core was received at the core shack, it was inspected for continuity and the correct markings of depths and then quick logged before the logging process begins.

When the core gets placed on the bench to begin the logging process, it is pieced together, oriented, and marked with metre marks by technicians. Recovery and RQD is then measured, and box ends are measured, and boxes are tagged.

Routine geological logging is conducted by qualified geologists and core technicians, and it is captured in Magna's drillhole database using MX Deposit. All logging is completed in metric units including lithological units, rock quality data (RQD), structure (faults, shears, foliation, contacts etc.), sample data, estimated sulphide percent, and a detailed description of each interval. Core photos, survey data, and where required, specific gravity and magnetic susceptibility are also recorded in MX Deposit.

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Magna mining commenced diamond drilling on the Project in Q4 2022, and drilling continues as of the effective date of this report. Results of the Magna drilling up to April 24th, 2024, have been incorporated into the geological interpretation and resource estimate.

The information in this section regarding sample preparation, analyses, and security tasks completed by previous property operators is sourced from WSP (2020), and Baker and Hoffman (2015; 2017).

11.1 Magna Drilling 2022-2024

11.1.1 Core Sampling

Drill core sampling is guided by lithology, alteration, or visible mineralization. Although, with low sulphide mineralization on the property, sampling is often carried through the entirety of the expected mineralized interval with shoulder sampling on either side. Samples are taken with a maximum length is 1.5 m and the minimum of 0.30 m.

For the majority of the program, NQ core was drilled and split in half using a water-cooled saw, but some BQ and AQ drilling was completed in the areas of historic mining, in which whole-core sample was used. Samples are put into plastic bags with 10 bagged samples being placed into rice bags for transport to Swastika Laboratories in Kirkland Lake Ontario via Gardewine Transport for preparation and analysis.

11.1.2 Sample Preparation

Samples received by Swastika laboratory are processed using the following methods:

- Dry, crushed to 80% passing 10 mesh using low chrome steel jaw plates
- Rotary split
- Pulverize (to 90% passing -74 µm) using low chrome steel bowl sets for Au & multi element analysis.

To avoid sample contamination, technicians clean the crushers with limestone and clean the bowls with silica sand.

11.1.3 Analytical Method

Sample preparation and analysis are all completed at Swastika Laboratories in Swastika, Ontario using the following methods:

- Pulps submitted for analysis (weight of the aliquots is around 29.14 g (+/- 0.5 g) (1 assay per tonne). The grade is calculated with the contribution of each fraction weight.
- Au, Pt & Pd: lead bomb fire assay (FA) method is used to form a small bead, which is then digested using two acids (HCl & HNO_3). The grade is calculated with the contribution of each fraction weight by using Microwave Plasma Atomic Emission Spectroscopy (MP-AES).
- Ag, Cu, Ni and Co: approximately 0.5 g of sample is digested using two acids (HCl & HNO_3), then, samples are run using atomic absorption (AA). Core Sampling.

11.1.4 Quality Assurance and Quality Control Programs

Samples are submitted in batches of 50 with 5 QA/QC samples including, 2 certified reference materials (CRM's), 2 samples of blank material and 1 lab duplicate. Additional blanks and/or CRMs are inserted after high grade intervals to ensure contamination doesn't occur.

The Certified Reference Materials (CRMs) used on the Denison project from 2022-2024 are all Ni-Cu-Co-PGE standards obtained from Analytichem Canada Inc. including OREAS 680, 683, and 86.

OREAS 86 was prepared from Ni-Cu-Co ore grade drill core samples sourced from the Nova Mine in Western Australia. The CRM contains 1.23% Ni, 0.56% Cu, but is low in PGE's (<0.5 gpt).

OREAS 680 has been prepared from PGE-rich ore blended with barren gabbro-norite and high-grade copper and nickel ores. The PGE ore was sourced from the Dishaba mine located in the west of Limpopo province, South Africa. The barren gabbro-norite was sourced from the Late Cambrian Black Hill Norite Complex located 85km east of Adelaide, Australia. The high-grade nickel ores were sourced from the komatiite-hosted Prospero & Tapinos deposits within the Agnew-Wiluna portion of the Norseman-Wiluna greenstone belt, Western Australia. The high-grade copper ore was sourced from the Sepon copper deposit located in south-central Laos. The CRM contains 2.12% Ni, 0.90% Cu, and 0.78 gpt TPM.

OREAS 683 has been prepared from PGE ores blended with barren gabbro-norite. Similarly to OREAS 680, the PGE ores have also been sourced from the Dishaba mine, while the barren gabbro-norite was sourced from the Late Cambrian Black Hill Norite Complex. The CRM contains 0.12% Ni, 0.04% Cu, and 2.82 gpt TPM.

Upon receipt of the assay data from Swastika, the QAQC samples are reviewed prior to entry into the drillhole database to ensure all have passed. The QA/QC tolerances are based on the means and standard deviations of the round robin laboratory data for the individual OREAS standards. A QAQC failure is considered to be when any of the individual element assays for a standard sample in the batch exceeds the mean ±3SD threshold, or blanks exceed 250 ppm Ni, Cu, Co or 0.1 gpt Au, Pt, or Pd.

If a failure occurs, the 5 preceding and 5 succeeding to the reference material are rerun and compared with the original certificate. Once these results have been verified, they can be entered into the database.

11.2 Historic Core Sampling

The sampling of cores varied with the age and focus of the drilling program. Older Vale programs, particularly the underground programs focused on definition drilling, used whole core sampling. Surface exploration programs used a rock saw to cut the core in half, with one half of the core placed in sample bags with the appropriate sample tag, and the other half of the core returned to the core box.

Drill core sampling is guided by lithology, alteration, or visible mineralization. However, due to the nature of the low sulphide mineralization at Denison, sampling is routinely extended over the entire expected mineralized interval and extended to a wider buffer zone on either side. The sampling interval is continuous, with no gaps left where mineralization is perceived to be absent. The maximum sample length is 1.5 m (5 ft) and the minimum, 30 cm (12"). To facilitate compatibility of the data with Vale's MEBS program, marking, logging and sampling are done in imperial rather than metric units. Every effort is made so that that the sample sent to the laboratory is representative of the entire section of core; however, due to nugget effects and the heterogeneity that is common with this type of PGE mineralization, it is not guaranteed that an assay could be repeated. The half-core samples selected for assay are un-orientated. All samples are sealed (i.e., stapled) in individual, labelled plastic bags with a unique sample tag.

Cores are halved using a water-cooled diamond saw that is cleaned regularly to avoid sample-to-sample contamination. One half of each core is submitted to the lead laboratory—ALS Minerals in Sudbury—by Loncan staff for analysis; the other half is retained on outdoor, roofed core racks at the Loncan office at 129 Fielding Road in Lively, Ontario, as a representative sample or for possible re-sampling. Prior to dispatch to the sample analysis laboratory, each individual sample is weighed.

11.3 Historic Sample Preparation

Samples received by ALS laboratory are processed using the sample preparation package PREP-31, as follows:

- Sample is logged into tracking system and a bar code label is attached.
- Dry, crush (<5 kg) 70% passing -8 mesh (2 mm).
- Rotary split (250 g) using a Boyd rotary splitter.
- Pulverize (to 85% passing -75 µm).

At no time has an employee of Loncan been involved in the preparation of the samples.

After the samples are processed, the 250-g splits are then transported by ALS Minerals to their analytical facilities in Vancouver, British Columbia, via courier. Coarse and pulp rejects are retained at the Sudbury facility for a minimum period of six months; however, these are routinely collected by Loncan personnel for storage at the Loncan office facility.

11.4 Historic Analytical Method

Before 2013, all data was acquired by Vale. From 2013 onwards, the data was collected by both Vale and Loncan. The most recent data, from 1999 to 2017, was produced by the ALS Laboratories in Sudbury. ALS is an internationally recognized laboratory accredited by the Standards Council of Canada (SCC) for specific tests listed in ALS's Scopes of Accreditation, which conforms with CAN-P-1579: Requirements for the Accreditation of Mineral Analysis Testing Laboratories; and CAN-P-4E ISO/IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories. Armitage is independent of ALS.

The analytical assay methodology varied over time, as summarized in Table 11-1.

Table 11-1 Analytical Summary (WSP, 2020)

Period	Dates	Comments
1	Pre–1968	• Values of S (and therefore specific gravity [SG]) based on composite samples. During 2007–2008 all SG were re-calculated using Cu, Ni (and available S) for consistency. • Values of PGE + Au taken infrequently and based on composite samples. • Values of Co based on assay of combined Ni + Co and regression from Ni.
2	1968–1972	• All samples assayed for Cu, Ni, and Co. • PGE + Au and S (SG) as in Period 1 (Pre-1968).
3	1972–1974	• All samples assayed for Cu, Ni, Co, S, and Fe. • PGE + Au as in Period 1 (Pre-1968).
4	1974–1984	• All samples assayed for Cu, Ni, Co, S, and Fe. • Values of PGE + Au taken infrequently, but from individual samples. Values determined using arc-spark emission spectrography.
5	1984–1999	• All samples assayed for Cu, Ni, Co, S, and Fe. • Values of PGE + Au taken infrequently, but from individual samples. Values determined using DCP.
6	1999–Present	• All samples assayed for Cu, Ni, Co, S, Fe, PGE, and Au.

For analysis at ALS, samples underwent the proprietary PGM-ICP23 process, which involves fire assay with standard lead collection of a 30 g aliquot for Pt, Pd, and Au. This is followed by a combination of inductively coupled plasma mass spectrometry (ICP-MS) and inductively coupled atomic emission spectrometry (ICP-AES) to finish the samples.

Samples that exceed 10 g/t on any individual PGE are also run through the PGM-ICP27 process, which recalibrates the ICP-AES finish to accurately report values up to 100 g/t for the PGE. Samples are also analyzed for 33 trace elements and base metals (including Ni, Cu, Co, and Cr) using a four-acid (HNO_3-$HClO_4$-HF and HCl) near total digestion, and a combination of ICP-MS and ICP-AES (ME-ICP61 process). ICP-MS over-limits for the ME-ICP61 process are reanalyzed using HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES (ME-OG62 process).

In the event of visibly higher-grade mineralization, the preference is to analyze sample groups by submitting the samples directly for the analytical methods described for over-limits, with a specific sample tag prefix. These analytical methods, also referred to as High Grade/Ores Methods, are comprised of HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES.

In addition to High Grade/Ores Methods, sulphur is analyzed using Total Sulphur by LECO to accommodate the anticipated higher sulphur levels. ALS Minerals provides assay results to Loncan's Senior Manager, Exploration and Project Geologist via e-mail in MS Excel® format.

11.5 Historic Quality Assurance and Quality Control Programs

No additional QA/QC has been performed by Loncan on the data acquired by Vale because it was accepted that the Vale QA/QC protocol and system is MEBS was adequate. This included all data collected prior to Loncan becoming the property operator in 2014.

After borehole data has been finalized, only the MEBS administrator can make changes or re-classify them as available for changes to be made by another user. All the boreholes used in this estimate have been finalized in this manner. It has been accepted that all the Vale data has been assayed by an accredited laboratory that uses standard reference materials and strict internal QA/QC procedures, and that the data has been adequately reviewed by qualified individuals.

The Certified Reference Materials (CRMs) used on the Denison program from 2014 are PGM standards PGMS-24 and PGMS-25. Subsequently, in 2016, two additional standards—PGMS-27 and PGMS-28—were introduced to the QA/QC process due to the exhaustion of stocks of PGMS-24.

All CRMs were obtained from CDN Laboratories in Vancouver—the first two are sourced from Stillwater (specifically the J-M Reef), both are low Ni-Cu, one is low in 3E (PGMS-25; 2.7 g/t), and one is moderate in 3E (PGMS-24; 6.7 g/t). The second two were made available in 2016 and have a different provenance; PGMS-27 is sourced from the skarn-related Serra Pelada Au-PGE deposit in Brazil, with a moderate 3E grade of 8.09 g/t 3E; and PGMS-28 comes from the low-grade (3.45 g/t 3E) Platreef from the central section of the Bushveld Complex's Northern Limb. In PGMS-27, Au forms 65% of the precious metal assemblage, while it forms only 5% in PGMS-28.

Standards are supplied in batches of one hundred 50-g envelopes via courier from Vancouver. No separate Ni-Cu standards are used. Standards are inserted randomly in the sample order. Blank samples of quartz sand are also inserted in the sample order immediately after an expected high-grade PGE/Ni-Cu sample.

Upon receipt of the assay data from ALS, the samples representing CRMs, blanks, and sample duplicates are highlighted and compiled manually for inspection. Assay values are denominated in Avoirdupois ounces per short ton, and these are converted directly into metric grams per tonne using a conversion factor of 34.28657. The values are then imported into a separate MS Excel® monitoring sheet and plotted graphically.

The QA/QC tolerances and hurdles for the Project are based on the means and standard deviations of the round robin laboratory data for the individual PGMS standards. A batch failure is considered to be when any of the individual 3E assays for a standard sample in the batch exceeds the mean ±3SD threshold, or when more than one sample in a batch exceeds the mean ±2SD threshold on any of the 3E.

The MS Excel® monitoring sheet is conditionally formatted on a True or False basis for each individual precious metal, such that a failure to meet the 3SD criterion is flagged as a False entry and highlighted. The assay values are plotted together on a time-ordered scatter plot graph for each individual envelope with the round robin laboratory data—on which the accepted mean and variance values for the standard are based.

11.6 2014–2015 Drill Programs

11.6.1 Borehole Core Sampling and Assay

In the 2014–2015 drilling campaign, core sampled outside the mineral envelope was sampled at 1.5-m intervals; core sampled within the FW and HW mineralization envelopes, and an approximate 10-m enclosing margin around the envelopes, was sampled at 1 m, except where a geological unit was narrower or to make up the length between a sample above and a geological contact. The minimum sample length was 30 cm (Baker and Hoffman, 2015).

Core was cut in half with a water-cooled saw. One half was placed into a sample bag with a bar-coded sample tag, and the other half was stored at the Lonmin office at 129 Fielding Road, Lively, Ontario, as a representative sample or for possible re-sampling.

Samples were weighed, placed in rice bags for transport, and delivered to ALS Chemex by Lonmin personnel.

11.6.2 Density Data

The majority of the dataset has no measured density values. In previous resource estimations, Vale applied the Alcock formula, as follows, to calculate SG based on assay results:

$$SG = 100 / (100 / 2.88 + 0.0166*Cu – 0.1077*Ni – 0.328*S)$$

This formula was developed for semi-massive- to massive-contact Ni-Cu sulphide deposits. The minimum value possible is 2.88 g/cc, which is known to be too high for some of the host rocks in the 109 FW Domain. A comparison of measured to calculated values revealed the calculated value for felsic rock types (i.e., rhyolite and siliceous metasediment) was approximately 5% too high; for mafic rock types (i.e., metabasalt) the calculated values were approximately 3% too low. There are 4,545 measured values that were logged in the borehole database prior to data capture, a subset of which fell within the mineral envelope.

SG data was collected during the 2014–2015 drilling campaign for most samples in a buffer adjacent to the mineral envelope by measuring the dry and submerged weight. The first several boreholes of this campaign were processed prior to acquiring the SG equipment. Each sample was allowed to fully dry after being cut, weighed on top of the balance, placed in a mesh basket suspended from a free-hanging hook below the balance, and weighed submerged in water. The water was kept at approximately 20°C using a heater/agitator. SG was calculated using the following formula, where 0.998 is a factor to account for the density of water at 20°C:

SG = Dry weight / (Dry weight – Wet weight) * 0.998

Where 0.998 is a factor to account for the density of water at 20°C.

The balance was checked with reference weights, and a reference rock sample had its SG determined prior to each day of SG determinations to produce high quality data. Data was checked for values below 2.5, with one value removed from the dataset.

Vale also collected SG data using the same method. No information was provided on any QA/QC performed for the Vale dataset, but it assumed that the data collected is adequate for use in the resource estimation. Two values below 2.5 were removed from the dataset.

11.6.3 Data Management

All borehole data from surface and underground drilling are stored in Vale's MEBS database. In addition, all boreholes drilled in the 2014–2015 campaign exist as MS Excel® files exported from MEBS to serve as back-up records.

Data—including core photos, geotechnical logs, and SG data—have been uploaded into MEBS, and copies from the 2014–2015 campaign are retained. Copies from all previous drilling campaigns since the inception of the joint venture have been obtained from Vale.

MEBS contains data from holes logged directly in the system and holes that existed before the database, dating back to 1901 on the Denison Property. The lithology descriptions for older holes often do not correspond with modern nomenclature.

11.6.4 2014–2015 Borehole Assay QA/QC

All samples were weighed before submitting to ALS Chemex and were re-weighed by ALS upon receipt. All samples were reviewed for consistent weights to identify sample switches. No sample swaps have been identified to date.

All assay data has been reviewed in MEBS's internal QA/QC system to identify samples with weights different from those expected (based on sample length and density calculated using the Alcock formula, as outlined in Section 11.5), and to identify sulphide and grade estimates inconsistent with assay results. This routine allows for identification of any blanks or standards that have had sample numbers erroneously entered in place of a core sample, and sample swaps.

A change request routine allows any required changes to be made by the MEBS administrator and records that the change has been made. All corrections requested were completed prior to finalizing holes in the 2014–2015 drilling campaign. No sample swaps were identified with this routine in the 2014–2015 drilling campaign.

Blind CRMs—referred to as standards—and field silica blanks were included in sample runs, and submitted on the basis that the minimum oven batch size at the lab is in the range of 20 to 24 samples. Standard procedure is to include in each batch one CRM, one blank sample, and one sample duplicate, which is two quarter cores from the same half core sample. The CRM was inserted randomly into the batch, while the blank sample was placed in sequence immediately after where the highest PGM grade was expected. The position of the sample duplicate was random. The sample book used to track the samples was in the standard Vale format, using their numbering system to allow for easy integration of assay results into their borehole database.

The ALS Canadian analytical laboratories are accredited by the SCC for specific tests listed in ALS's Scopes of Accreditation, which conforms with CAN-P-1579: Requirements for the Accreditation of Mineral Analysis Testing Laboratories; and CAN-P-4E ISO/IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories.

Becoming ISO-accredited involves detailed, on-site audits to evaluate ALS's quality management system and verify the technical competence of methods and personnel. This technical verification includes the requirement for successful participation in inter-laboratory proficiency testing programs and full method validation.

At ALS Minerals, received samples are checked against requisition documents prior to being dried, weighed, and then crushed to 70% passing -2mm. They are then Boyd rotary split to 250 g, and this is pulverized and split to better than 85% passing 75 microns. The 250-g splits are then transported by ALS Minerals to their analytical facilities in Vancouver, British Columbia via courier. Coarse and pulp rejects are retained at the Sudbury facility for a minimum period of six months; however, these are routinely collected by Lonmin personnel for storage at the Lonmin office facility.

For routine analysis at ALS, samples undergo the proprietary PGM-ICP23 process, which involves fire assay with standard lead collection of a 30-g aliquot for Pt, Pd, and Au. This is followed by a combination of ICP-MS and ICP-AES to finish the samples.

Samples that exceed 10 g/t on any individual PGE are also run through the PGM-ICP27 process, which recalibrates the ICP-AES finish to accurately report values up to 100 g/t for the PGE. Samples are also analyzed for 33 trace elements and base metals (including Ni, Cu, Co, and Cr) using a four-acid (HNO_3-$HClO_4$-HF and HCl) near total digestion, and a combination of ICP-MS and ICP-AES (ME-ICP61 process). ICP-MS over-limits for the ME-ICP61 process are reanalyzed using HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES (ME-OG62 process).

In the event of visibly higher-grade mineralization, the preference is to analyze sample groups by submitting the samples directly for the analytical methods described for over-limits, with a specific sample tag prefix. These analytical methods, also referred to as High Grade/Ores Methods, are comprised of HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES.

In addition to High Grade/Ores Methods, sulphur is analyzed using Total Sulphur by LECO to accommodate the anticipated higher sulphur levels. ALS Minerals provides assay results to Loncan's Senior Manager, Exploration and Project Geologist via e-mail in MS Excel® format.

Assay results are also provided to Vale's MEBS administrator through their online Webtrieve service, which allows direct importing into their MEBS database.

The Certified Reference Materials (CRMs) used on the Denison program since 2014 are PGM standards PGMS-24 and PGMS-25 obtained from CDN Laboratories in Vancouver—these are sourced from Stillwater (specifically the J-M Reef), both are low Ni-Cu, one is low in 3E (PGMS-25; 2.7 g/t), and one is moderate in 3E (PGMS-24; 6.7 g/t).

Standards are supplied in batches of one hundred 50-g envelopes via courier from Vancouver. No separate Ni-Cu standards are used. Standards are inserted randomly in the sample order. Blank samples of quartz sand are also inserted in the sample order immediately after an expected high-grade PGE/Ni-Cu sample.

Upon receipt of the assay data from ALS, the samples representing CRMs, blanks, and sample duplicates are highlighted and compiled manually for inspection. Assay values are denominated in Avoirdupois ounces per short ton, and these are converted directly into metric grams per tonne using a conversion factor of 34.28657. The values are then imported into a separate MS Excel® monitoring sheet and plotted graphically.

The QA/QC tolerances and hurdles for the Project are based on the means and standard deviations of the round robin laboratory data for the individual PGMS standards. A batch failure is considered to be when any of the individual 3E assays for a standard sample in the batch exceeds the mean ±3SD threshold, or when more than one sample in a batch exceeds the mean ±2SD threshold on any of the 3E.

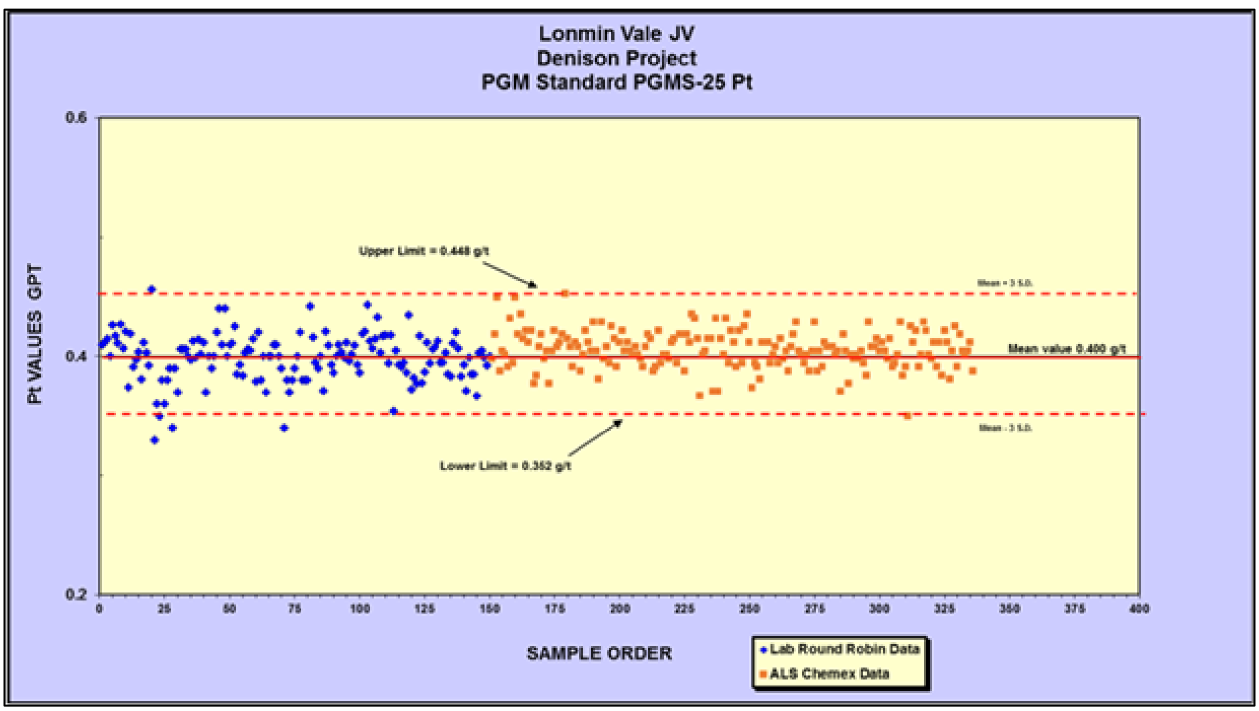
The MS Excel® monitoring sheet is conditionally formatted on a True or False basis for each individual precious metal, such that a failure to meet the 3SD criterion is flagged as a False entry and highlighted; Figure 11-1 represents an example.

Figure 11-1 Example of Tracking Spreadsheet for Certified Reference Material Samples (Baker and Hoffman, 2015)

	LAB DATA							
84			LAB	LAB	LAB	CHECK	CHECK	CHECK
85	Sample	Lab	ALS Chemex	ALS Chemex	ALS Chemex			
86	#	Work #	g/t Au	g/t Pt	g/t Pd	Au	Pt	Pd
87	R318096	SD14126271	0.463	0.398	1.841	TRUE	TRUE	TRUE
88	R318122	SD14126271	0.483	0.418	1.906	TRUE	TRUE	TRUE
89	R318185	SD14126271	0.483	0.449	1.875	TRUE	FALSE	TRUE
90	R318207	SD14128040	0.535	0.387	1.862	TRUE	TRUE	TRUE
91	R318266	SD14128040	0.463	0.405	1.869	TRUE	TRUE	TRUE
92	R318333	SD14129804	0.477	0.401	1.886	TRUE	TRUE	TRUE
93	R318359	SD14129804	0.470	0.391	1.858	TRUE	TRUE	TRUE
94	R318379	SD14131095	0.482	0.432	1.817	TRUE	TRUE	TRUE
95	R318453	SD14131095	0.459	0.394	1.851	TRUE	TRUE	TRUE
96	MG219087	SD14130901	0.504	0.449	1.917	TRUE	FALSE	TRUE
97	MG219105	SD14130901	0.518	0.418	1.869	TRUE	TRUE	TRUE
98	MG219127	SD14130901	0.501	0.435	1.917	TRUE	TRUE	TRUE
99	MG219193	SD14135517	0.513	0.415	1.910	TRUE	TRUE	TRUE
100	MG219231	SD14135517	0.495	0.422	1.917	TRUE	TRUE	TRUE
101	MG219277	SD14135517	0.499	0.411	1.882	TRUE	TRUE	TRUE
102	MG219297	SD14135517	0.490	0.422	1.810	TRUE	TRUE	TRUE
103	MG219312	SD14138433	0.492	0.377	1.814	TRUE	TRUE	TRUE

The assay values are plotted together on a time-ordered scatter plot graph for each individual envelope with the round robin laboratory data—on which the accepted mean and variance values for the standard are based. The graph (as shown in Figure 11-2) displays an envelope bounded by the *mean + 3SD* and *mean – 3SD* thresholds, and failures lie outside of that envelope.

Figure 11-2 Example of Tracking Graph for Certified Reference Material Samples Showing Mean and Threshold Envelope (Baker and Hoffman, 2015)



The graphs serve to show any overall and between-batch bias for each of the elements in each of the standards, as well as the overall precision. As of the date of this report, there is a small positive variance for each of the individual 3E relative to the round-robin means, but no discernable trend with time. The precision in the ALS data is generally better than that of many of the round-robin labs used to compile the standards.

A batch failure would necessitate repeat assay of the entire batch, from coarse reject stage, with new control samples. For blank sample values, batch failure is more subjective, and a failure ceiling value has not been set—very occasionally there have been instances of blank values returning up to 0.24 g/t 3E, but it is likely that values had been carry over from the previous high-grade sample in the prep stage. In these instances, the lab was notified of the issue. Both blank and standard sample insertion also serve to highlight any mix-ups in transferring sample tags from the received bags through the wet and dry lab processes. As of the date of this report, there have been no such instances.

ALS has its own internal QA/QC program, which is reported in the assay certificates sent to Lonmin, but it is not accounted for in determination of batch acceptance or failure. For geochemical and fire assays, ALS expects to achieve an accuracy percentage of ±10% (of the concentration), ±1 Detection Limit (DL) for duplicate analyses, in-house standards, and client-submitted standards when conducting routine geochemical analyses for gold and base metals. These limits apply at—or greater than—fifty times the limit of detection. For samples containing coarse gold, native silver, or copper, precision limits on duplicate analyses can exceed ±10% (of the concentration).

For grade analysis, ALS expects to achieve an accuracy percentage of ±5% (of the concentration), ±1 DL for duplicate analyses, in-house standards, and client-submitted standards. These limits apply at fifty times the limit of detection. As in the case of routine geochemical analyses, samples containing native silver or copper are less likely to meet the expected precision levels for grade analysis.

11.7 2016–2017 Drill Programs

11.7.1 Borehole Core Sampling and Assay

For the 2015–2017 drilling campaign, core that was sampled outside the confines of the mineral envelope was sampled at 5 ft (1.5 m) lengths; core sampled within the mineral envelopes and the immediately surrounding 30 ft (10 m) was sampled at 3.3 ft (1 m) lengths (Baker and Hoffman, 2017). Exceptions occurred where a geological unit was narrow (i.e., less than 3.3 ft), or to make up the length between a sample above and a geological contact. The minimum sample length is 30 cm (6 in).

Core was cut in half with a water-cooled saw. One half was placed into a sample bag with a bar-coded sample tag, and the other half was stored at the Lonmin office at 129 Fielding Road, Lively, Ontario, as a representative sample or for possible re-sampling.

Samples were weighed, placed in plastic bags, grouped together in rice bags for transport, and delivered to ALS Chemex by Lonmin personnel.

11.7.2 Density Data

All diamond drill core from the 2015–2017 drilling campaign sourced from within the expected intersection of the mineral envelope was subject to SG measurement. This was completed by measuring dry and submerged sample weights. Each sample was allowed to fully dry after being cut, was weighed on top of the balance, placed in a mesh basket suspended from a free-hanging hook below the balance, and weighed submerged in water. The water was kept at approximately 20°C using a heater/agitator. Density was calculated using the following formula, where 0.998 is a factor to account for the lower density of water at 20°C:

Density = Dry weight / (Dry weight – Wet weight) * 0.998

The balance was checked with reference weights, and a reference rock sample had SG determined prior to each day of SG determinations to produce high quality data.

Several 2015–2017 drilling campaign samples within the mineral envelope do not have SG measurements because where they were sourced from was not—at the time—expected lie within the mineral envelope. For these samples and all historical data, a regression was applied in Vale's MEBS database to calculate an estimated density. The Alcock formula, as follows, was used to calculate density based on assay results for all samples where Cu, Ni, and S assays are available:

Density = 100 / (100 / 2.88 + 0.0166*%Cu – 0.1077*%Ni – 0.328*%S)

For samples drilled before 1968, for which only Cu and Ni are available, the following formula was used:

Density = 2.80 + 0.02*%Cu + 0.20*%Ni

These formulae were developed for semi-massive to massive contact Ni-Cu sulphide deposits. They are known to underestimate the density of most felsic rocks and overestimate the density of most mafic rock types outside the SIC The lowest possible values from the Alcock and pre-1968 formulae are 2.88 and 2.80 g/cc, respectively—too high for the felsic FW lithologies. The formulae also underestimate the density of mafic rocks. As a result, there is little correlation between calculated values up to 3.00 g/cc and measured values. Sulphide contributes more significantly to the density of samples.

There are 1,805 measured density values that were merged into the borehole database, a subset of which lie within the mineral envelope. A new density field for use in block modelling was added to the borehole dataset, where measured density overrides calculated density, if available. As the bulk of the 9400 Zone is hosted by mafic rocks, the density used in this grade model and the resulting tonnage could be biased lower. As highlighted in the exploratory data analysis, a revised density calculation could be used in the future to improve this bias. This was not applied in the current resource estimation as the revised density calculation was developed after the bulk of this mineral resource estimation was complete.

A density of 3.01 g/cc has been assigned to the Olivine Diabase dykes, which is both the median and mean value of 57 measured values for the unit in the 9400 Zone area. The stopes are all assumed to be filled with rock fill because rock fill was recovered each time a stope was encountered. The stopes are assumed to be approximately two-thirds rock fill and one-third void space, and were assigned a density of 2.00 g/cc. Other mine workings (i.e., air raises, drifts, and escape ways) are assumed to be void space and have been assigned a density of 0.

11.7.3 Data Management

All borehole data from surface and underground drilling are stored in Vale's MEBS database. In addition, all boreholes drilled in the 2015–2017 campaign exist as MS Excel® files exported from MEBS to serve as back-up records.

Data—including core photos, geotechnical logs, and measured density data—are uploaded into MEBS, and copies from the 2015–2017 campaign are retained. Copies from all previous drilling campaigns since the inception of the joint venture have been obtained from Vale.

MEBS contains data from holes logged directly in the system and holes that existed previous to the database, dating back to 1901 on the Denison property. Old boreholes often have extremely short interval descriptions, if any. The borehole database used in this resource estimation was downloaded by Alexander (Sandy) Gibson of Vale on 27 April 2017 in Datamine Studio 3, using Vale Ontario Operation's scripts, which export data directly out of MEBS. The measured density data was manually merged with this dataset using the sample identification number as the key field.

11.7.4 2015 - 2017 Borehole Assays and QA/QC

During the 2015–2017 Denison drilling program, diamond drill core was transported from the Denison project site to the Lonmin core shack—a distance of about 30 km—by either company personnel or by the drill contractor. The core was inspected for continuity and the correct markings of depth; tagged; and then logged; sample intervals were marked by Lonmin geologists.

Cores were halved using a water-cooled diamond saw that was cleaned regularly to avoid sample-to-sample contamination. One half of each core was submitted to the lead laboratory—ALS Minerals in Sudbury—by Loncan staff for analysis; the other half was retained on outdoor, roofed core racks at the Loncan office at 129 Fielding Road in Lively, Ontario, as a representative sample or for possible re-sampling. Prior to dispatch to the sample analysis laboratory, each individual sample was weighed.

At Denison, two variable styles of mineralization are typically juxtaposed or located in proximity to each other, namely high sulphide (contact style mineralization) and low sulphide (FW style mineralization). Occasionally, stringer type mineralization is also developed. Drill core sampling is guided by lithology, alteration, or visible mineralization; however, due to the nature of the low-sulphide mineralization at Denison, sampling is routinely extended over the entire expected mineralized interval and extended to a wider buffer zone on either side. The sampling interval is continuous, with no gaps left where mineralization is perceived to be absent.

The maximum sample length is 5 ft (1.5 m), and the minimum sample length is 30 cm (6 in).

To make the data compatible with Vale's MEBS program, marking, logging, and sampling are recorded in imperial rather than metric units. Every reasonable effort is made so that that the sample sent to the laboratory is representative of the entire section of core; however, due to nugget effects and the heterogeneity that is common with this type of PGE mineralization, it is not guaranteed that an assay could be repeated. The half-core samples selected for assay are un-orientated. All samples are sealed (i.e., stapled) in individual, labelled plastic bags with a unique sample tag.

Blind CRMs—referred to as standards—and field silica blanks were included in sample runs, and submitted on the basis that the minimum oven batch size at the lab is in the range of 20 to 24 samples. Standard procedure is to include in each batch one CRM, one blank sample, and one sample duplicate, which is two quarter cores from the same half core sample. The CRM was inserted randomly into the batch, while the blank sample was placed in sequence immediately after where the highest PGM grade was expected. The position of the sample duplicate was random. The sample book used to track the samples was in the standard Vale format, using their numbering system to allow for easy integration of assay results into their borehole database.

In previous drilling campaigns, standards and blanks were inserted at a ratio of one blank and two standards per 100 samples. Crusher rejects were duplicated at the laboratory at a rate of three per 100 samples.

Samples are delivered by Lonmin personnel exclusively to ALS Minerals in Kelly Lake Road, Sudbury, Ontario. They are then booked in their Laboratory Information Management System (LIMS) and batched before entering their prep lab. Both blank and standard sample insertion also serve to highlight any mix-ups in transferring sample tags from the received bags through the wet and dry lab processes. A further check is a comparison of sample mass delivered versus sample mass recorded as being received at the lab.

The ALS Canadian analytical laboratories are accredited by the SCC for specific tests listed in ALS's Scopes of Accreditation, which conforms with CAN-P-1579: Requirements for the Accreditation of Mineral Analysis Testing Laboratories; and CAN-P-4E ISO/IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories.

Becoming ISO-accredited involves detailed, on-site audits to evaluate ALS's quality management system and verify the technical competence of methods and personnel. This technical verification includes the requirement for successful participation in inter-laboratory proficiency testing programs and full method validation.

At ALS Minerals, received samples are checked against requisition documents prior to being dried, weighed, and then crushed to 70% passing -2mm. They are then Boyd rotary split to 250 g, and this is pulverized and split to better than 85% passing 75 microns. The 250-g splits are then transported by ALS Minerals to their analytical facilities in Vancouver, British Columbia via courier. Coarse and pulp rejects are retained at the Sudbury facility for a minimum period of six months; however, these are routinely collected by Lonmin personnel for storage at the Lonmin office facility.

For routine analysis at ALS, samples undergo the proprietary PGM-ICP23 process, which involves fire assay with standard lead collection of a 30-g aliquot for Pt, Pd, and Au. This is followed by a combination of ICP-MS and ICP-AES to finish the samples.

Samples that exceed 10 g/t on any individual PGE are also run through the PGM-ICP27 process, which recalibrates the ICP-AES finish to accurately report values up to 100 g/t for the PGE. Samples are also analyzed for 33 trace elements and base metals (including Ni, Cu, Co, and Cr) using a four-acid (HNO_3-$HClO_4$-HF and HCl) near total digestion, and a combination of ICP-MS and ICP-AES (ME-ICP61 process). ICP-MS over-limits for the ME-ICP61 process are reanalyzed using HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES (ME-OG62 process).

In the event of visibly higher-grade mineralization, the preference is to analyze sample groups by submitting the samples directly for the analytical methods described for over-limits, with a specific sample tag prefix. These analytical methods, also referred to as High Grade/Ores Methods, are comprised of HF-HNO_3-$HClO_4$ acid digestion, HCl leach, and ICP-AES.

In addition to High Grade/Ores Methods, sulphur is analyzed using Total Sulphur by LECO to accommodate the anticipated higher sulphur levels. ALS Minerals provides assay results to Loncan's Senior Manager, Exploration and Project Geologist via e-mail in MS Excel® format.

The CRMs used on the Denison program from 2014 are PGM standards PGMS-24 and PGMS-25. Subsequently, in 2016, two additional standards—PGMS-27 and PGMS-28— were introduced to the QA/QC process due to the exhaustion of stocks of PGMS-24.

All CRMs were obtained from CDN Laboratories in Vancouver—the first two are sourced from Stillwater (specifically the J-M Reef), both are low Ni-Cu, one is low in 3E (PGMS-25; 2.7 g/t), and one is moderate in 3E (PGMS-24; 6.7 g/t). The second two were made available in 2016 and have a different provenance; PGMS-27 is sourced from the skarn-related Serra Pelada Au-PGE deposit in Brazil, with a moderate 3E grade of 8.09 g/t 3E; and PGMS-28 comes from the low-grade (3.45 g/t 3E) Platreef from the central section of the Bushveld Complex's Northern Limb. In PGMS-27, Au forms 65% of the precious metal assemblage, while it forms only 5% in PGMS-28.

Standards are supplied in batches of one hundred 50-g envelopes via courier from Vancouver. No separate Ni-Cu standards are used. Standards are inserted randomly in the sample order. Blank samples of quartz sand are also inserted in the sample order immediately after an expected high-grade PGE/Ni-Cu sample.

Upon receipt of the assay data from ALS, the samples representing CRMs, blanks, and sample duplicates are highlighted and compiled manually for inspection. Assay values are denominated in Avoirdupois ounces per short ton, and these are converted directly into metric grams per tonne using a conversion factor of 34.28657. The values are then imported into a separate MS Excel® monitoring sheet and plotted graphically.

The QA/QC tolerances and hurdles for the Project are based on the means and standard deviations of the round robin laboratory data for the individual PGMS standards. A batch failure is considered to be when any of the individual 3E assays for a standard sample in the batch exceeds the mean ±3SD threshold, or when more than one sample in a batch exceeds the mean ±2SD threshold on any of the 3E.

The MS Excel® monitoring sheet is conditionally formatted on a True or False basis for each individual precious metal, such that a failure to meet the 3SD criterion is flagged as a False entry and highlighted. The assay values are plotted together on a time-ordered scatter plot graph for each individual envelope with the round robin laboratory data—on which the accepted mean and variance values for the standard are based. The graph (as shown in Figure 11-2) displays an envelope bounded by the *mean + 3SD* and *mean – 3SD* thresholds, and failures lie outside of that envelope.

The graphs serve to show any overall and between-batch bias for each of the elements in each of the standards, as well as the overall precision. As of the date of this report, there is a small positive variance for each of the individual 3E relative to the round-robin means, but no discernable trend with time. The precision in the ALS data is generally better than that of many of the round-robin labs used to compile the standards.

A batch failure would necessitate repeat assay of the entire batch, from coarse reject stage, with new control samples. Since inception of the QA/QC protocol, there have been three element failures related to PGMS-24 (Au for all three) and three related to PGMS-25 (Au for one, Pt for two). The specific instrumentation or fusion runs containing these samples were identified and re-run for assay. In all cases, there were no significant differences between the original and repeat assays. The problem was attributed to difficulty in achieving fusion of the original CRM samples.

With the later introduction of the PGMS-27 and PGMS-28 CRMs, it became apparent that the precision on individual elements in PGMS-27 was low. While there have been no recorded failures on the mean ±3SD criterion, and fewer than ten reporting outside the mean +/- 2SD lines, the spread of data is significant. For PGMS-28, problems have been experienced with the Au assay which has a mean value of 0.193g/t in the round robin data. Given the proximity to the detection limit in a routine commercial lab fire assay, it is considered likely that the population for this element would be closer to lognormal rather than normal and that the upper and lower cut-offs that are selected based on a normal distribution are not appropriate. During the 2016/17 drilling program there were four failures on Au only in PGMS-28, two on the high side and two on the low side. In the first instance the surrounding ten samples in the containing batch were rerun without significant variance. Subsequently, the three other failed batches were examined and, as there were no significant values in the surrounding ten samples, no further action was taken beyond flagging of the data. There have been no failures on either Pt or Pd for this standard.

For blank sample values, failure is more subjective, and a failure ceiling value has not been set – early on in the program very occasionally there were instances of blank values returning up to 0.24 g/t 3E where it is likely there had been carry over from the previous high-grade sample in the prep stage. This issue became noticeably more apparent during 2016 with the inception of the Denison 109FW metallurgical drilling program where one third HQ core samples were being submitted instead of the normal one half core NQ. In these instances, a 3 kg plus high-grade sample was being crushed and followed by a 100 100-g quartz blank, with the effect that any carryover had a disproportionately high effect and was being magnified in the reported blank grade. Sporadic values of up to 0.695 g/t 3E were recorded in blank samples because of this. In these instances, the lab was notified of this issue—in all cases, the mass carryover from one sample to the next was within the contractually acceptable tolerances, which are set at a percentage.

From the beginning of 2016 until end of April 2017, a total of 8,786 samples were submitted for assay. These included 146 samples of standard PGMS-24, 176 of PGMS-25, 33 of PGMS-27, and 32 of PGMS-28, as well as 390 blank samples. QA/QC coverage is therefore 8.8%, which is close to the planned coverage of one standard plus one blank per nominal oven batch of 24 samples.

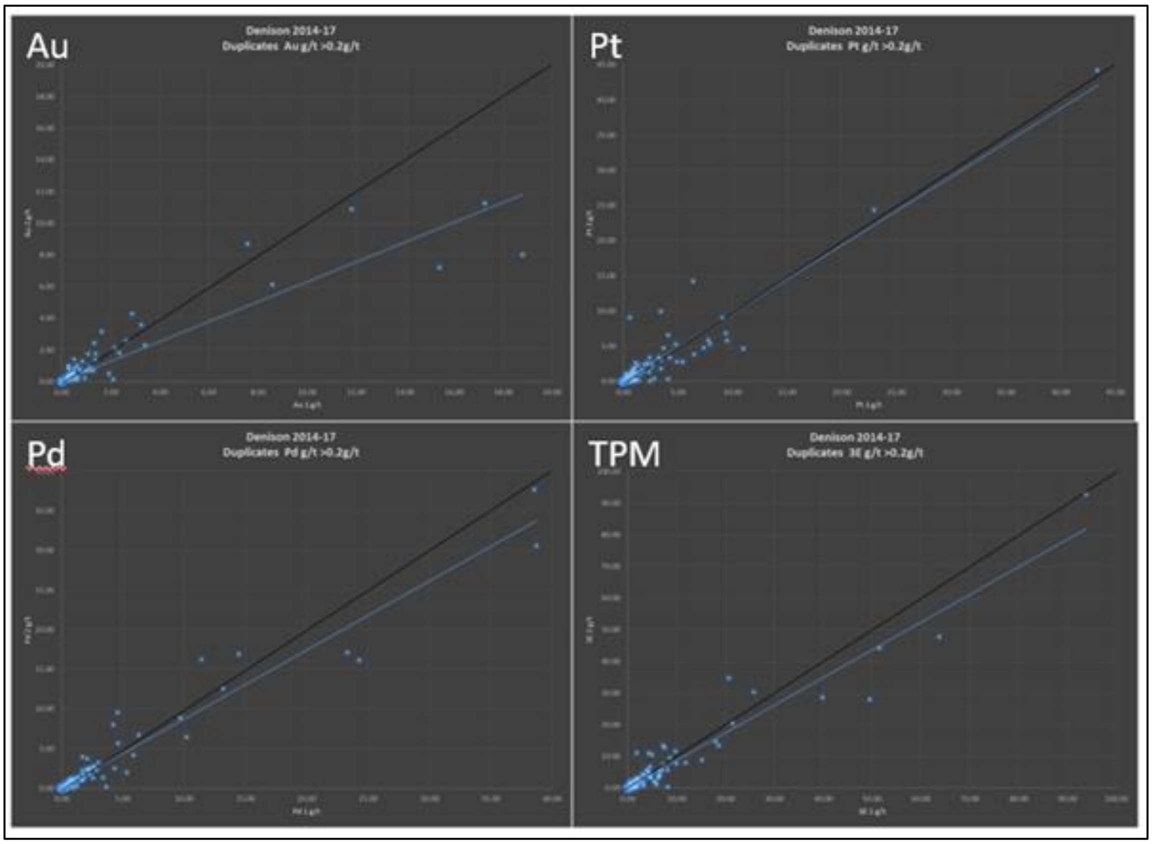
ALS has its own internal QA/QC program, which is reported in the assay certificates sent to Lonmin, but it is not accounted for in determination of batch acceptance or failure. For geochemical and fire assays, ALS expects to achieve an accuracy percentage of ±10% (of the concentration), ±1 Detection Limit (DL) for duplicate analyses, in-house standards, and client-submitted standards when conducting routine geochemical analyses for gold and base metals. These limits apply at—or greater than—fifty times the limit of detection. For samples containing coarse gold, native silver, or copper, precision limits on duplicate analyses can exceed ±10% (of the concentration).

For grade analysis, ALS expects to achieve an accuracy percentage of ±5% (of the concentration), ±1 DL for duplicate analyses, in-house standards, and client-submitted standards. These limits apply at fifty times the limit of detection. As in the case of routine geochemical analyses, samples containing native silver or copper are less likely to meet the expected precision levels for grade analysis.

Duplicate samples were submitted for the bulk of the 2015–2017 drilling campaign as a means of investigating the precision at ALS. As duplicates were submitted at the target rate of one per 24 samples spread evenly throughout each borehole, the bulk of the duplicated samples were low grade, making the precision analysis difficult. For this reason, duplicate sampling was discontinued toward the end of the drilling campaign.

Duplicate samples are plotted in Figure 11-3, with the first sample on the X axis and the second sample on the Y axis for all of the precious metals, as well as the combined TPM grade. Black lines represent 100% precision and blue lines represent linear regression.

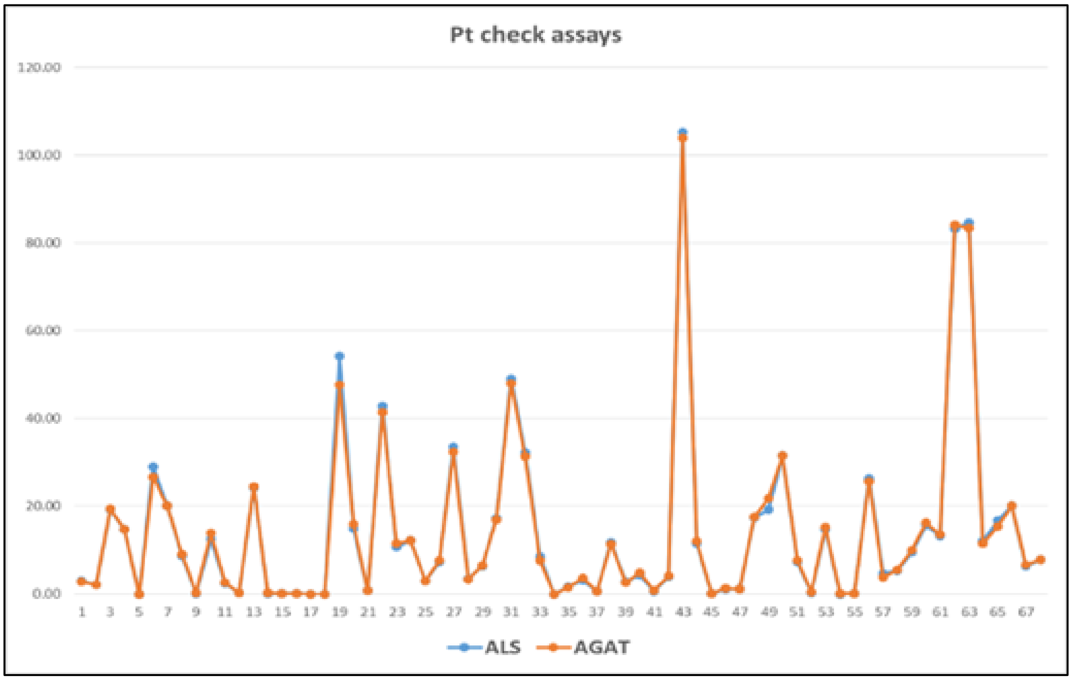
Figure 11-3 Duplicate Assay Analyses for Au, Pt, Pd, and TPM (Baker and Hoffman, 2017)



The linear regressions for Pd, TPM, and Pt are very close to the 100% precision line. The linear regression for Au shows the greatest deviation from 100% precision, due to five of the six Au samples over 6 g/t having higher grades in the first sample than the second, skewing the regression line downward.

The use of a third-party laboratory for routine check assays was investigated during 2016 as a means to investigate the slight—but consistent—positive bias seen in ALS CRM assays. The aim was to match ALS's methodology as closely as possible. AGAT Labs were selected, and a trial run of 68 variably high-grade channel sample pulps from a prospect on Denison was renumbered and submitted for analysis. The results returned from AGAT, as plotted in Figure 11-4, showed exceptional precision with respect to the corresponding ALS analyses, without exception.

Figure 11-4 Pt Check Assays on A Batch of 68 Pulps from AGAT (Orange) Overlain on Original ALS Assays (Blue) (Baker and Hoffman, 2017)



Unfortunately, AGAT closed their precious metal lab shortly after completion of this work and no replacement third-party lab has been chosen.

11.8 Qualified Person's Comments

It is the Author's opinion, based on a review of all possible information, that the sample preparation, analyses, and security used on the Project meet acceptable industry standards. The drill data can therefore be used for geological and resource modelling, and estimation of Indicated and Inferred mineral resource.

12 DATA VERIFICATION

The following section summarises the data verification procedures that were carried out and completed and documented by the Authors for this technical report, including verification of all drill data collected by Magna during their 2022 to 2024 drill programs.

12.1 Drill Sample Database

As part of the verification process, the Armitage reviewed all geological data and databases as well as past published and in-house technical reports.

Armitage conducted an independent verification of the assay data in the drill sample database. Armitage reviewed the assay database for errors, including overlaps and gapping in intervals and typographical errors in assay values. In general, the database was in good shape and no adjustments were required to be made to the assay values contained in the assay database.

Verifications were also carried out on drill hole locations, down hole surveys, lithology, SG, and topography information. Minor errors were noted and corrected during the validation process but have no material impact on the current MRE presented in the current report. The database is of sufficient quality to be used for the current MRE.

In addition, as described below, Armitage conducted multiple site visits to better evaluate the veracity of the data.

The Property is a past producing mine and is currently at an advanced stage of exploration. The project has had numerous studies completed, and has had numerous past authors complete site visits, data verification programs, and complete internal mineral resource estimates and mineral resource estimate reviews of various parts of the Deposit (Lonmin, Loncan, WSP and SRK). The Project has seen past production (open pit and underground). As such, the Author did not deem it necessary to collect check samples.

12.2 Metallurgical Test Work

The metallurgical testwork described in this report has been performed by established mining company mineral processing laboratories and commercial mineral processing laboratories using standard procedures in sample preparation, processing, testing and assaying. In some cases, replicate assays have been used along with mass and metal balance reconciliation to improve and establish confidence of results.

Laboratory scale procedures of production processing facilities have been reviewed by local mining companies and used to establish the relationships and equations included in the terms of agreements.

12.3 Site Visits

Armitage personally inspected the Property on May 25, 2022, accompanied by Jason Jessup, CEO & Director of Magna, David King Senior Vice President, Exploration and Geoscience for Magna, and Dave Smith, Senior Geologist for Wallbridge Mining Company Ltd. Armitage completed a tour of the historical mine site including the area of the shafts and raises, previous open pit and waste dump. The Author visited a number of outcrops to review the geology and various styles of mineralization, rock sample and channel sample locations, and recent and historical drill sites.

On May 26, Armitage was able to visit the Project's core storage facility in Sudbury (Wallbridge core storage facility), accompanied by David King and Dave Smith. Armitage examined a number of selected mineralized core intervals from recent diamond drill holes from the Project. Armitage examined assay certificates and assays were examined against the drill core mineralized zones. All core boxes were well labelled and properly stored in core racks outside, with a number of significant drill intercepts stored on core racks inside. Sample numbers for recent drill holes were written on the core and it was possible to validate sample intervals and confirm the presence of mineralization in witness half-core samples from the mineralized zones.

Armitage completed additional site visits to the Property on July 25, 2023, July 2, 2024, and July 25, 2024, including to Magna's core logging facilities in Sudbury and to the Crean Hill Site. Recent site visits were accompanied by Dave King.

During the 2023-2024 site visits, Armitage examined several selected mineralized core intervals from recently completed diamond drill holes from the Property by Magna. Armitage examined accompanying drill logs and assay certificates and assays were examined against the drill core mineralized zones. Armitage reviewed Magna's core sampling, QA/QC and core security procedures. Core boxes for drill holes reviewed are properly stored in the warehouse, easily accessible and well labelled. Sample tags are present in the boxes, and it was possible to validate sample numbers and confirm the presence of mineralization in witness half-core samples from the mineralized zones.

As drilling and core logging was in progress during the time of the 2023 and 2024 site visits, Armitage had the opportunity to review and discuss the entire path of the drill core, from the drill rig to the logging and sampling facility and finally to the laboratory. Armitage is of the opinion that current protocols in place, as have been described and documented by Magna and follow current industry best practices.

The Author participated in a field tour of the Property area including visits to several outcrops to review the local Geology, the drill, and recent drill sites. All areas were easily accessible by road.

As a result of the 2022 - 2024 site visits, Armitage was able to become familiar with current conditions on the Property, was able to observe and gain an understanding of the geology and various styles mineralization, was able to verify past and current work done and, on that basis, is able to review and recommend to Magna an appropriate exploration or development program.

Armitage considers the 2024 site visits current, per Section 6.2 of NI 43-101CP. To the Authors knowledge there is no new material scientific or technical information about the Property since the last personal inspection. The technical report contains all material information about the Property.

On May 13, 2024, Henri Gouin visited the Project site with James Kellestine, Magna's Chief Mining Engineer. During the site visit, they examined outcrops, reviewed mineralization styles, and assessed the historic capped workings, waste rock piles, potential portal locations, and existing infrastructure. Gouin considers the 2024 site visit current, per Section 6.2 of NI 43-101CP.

On July 15, 2024, Dominic Fragomeni visited the project site with David King, Magna's Senior Vice President, Exploration and Geoscience, James Kellestine, Magna's Chief Mining Engineer and Mynyr Hoxha, Magna's Vice President, Mines Geology.

During the visit, they reviewed the general site plan and the surface exposure of the 109FW mineralization scheduled for bulk sample mining. On July 29, 2024, and August 1, 2024, Dominic Fragomeni visited the site with Mynyr Hoxha to develop and finalize a stockpile plan for the bulk sample mining of 109FW.

12.4 Conclusion

All geological data has been reviewed and verified as being accurate to the extent possible, and to the extent possible, all geologic information was reviewed and confirmed. There were no significant or material errors or issues identified with the drill database. Based on a review of all possible information, Armitage is of the opinion that the database is of sufficient quality to be used for the current Indicated and Inferred MRE.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

The deposit is made up of the remnants of the historic mine operations of the Crean Hill Mine, and extensions into the FW adjacent to the historic mining. The geometallurgical types typical in the Sudbury Basin are represented in the deposit. Less than 5% of the mineralization consists of FW and LSHPM material identified in the 109 FW adjoining the historic deposits.

The 109 FW material has been the subject of numerous historical evaluations by Vale and Lonmin and more recently by Magna in 2023 and 2024. The historical results along with results from recent evaluations are discussed and updated in this section. The contact mineralization, which represents >95% of the mineralization, is contained in extensions and remnants of the Ni mines and represents contact type material. Contact mineralization is known to respond to flotation, and recovery of Ni is dependent on pyrrhotite content and mineralogy, other accessory minerals and the concentrate grade target specified. The contact mineralization of the resource had not been tested historically but was recently tested by Magna in 2023. The results of the 2023 Contact testing program are discussed in this section.

Vale performed some mineralogy and metallurgical test work on 109 FW material in 2009, 2010 and 2011. Lonmin completed more thorough quantitative mineralogy and additional metallurgical testing on additional material in 2016 to 2020. In 2023, Magna completed a mineralogy and flotation program on 4 x 109FW drill core composites and 9 drill core composite samples representing Contact mineralization. Magna also completed a metallurgical test program on a single sample of 109FW in 2024 prior to the bulk sample processing at Glencore's Strathcona Mill.

The following presentations, reports, and studies were source information for this section of the report:

1. 8-May-2009 – B. Vanden burg – Lonmin JV Denison 109FW Zone: Precious Metal Mineralogy Summary Borehole LM03060
2. 1-Jun-2010 – F.Ford et.al. - Vale Internal Report– Process Mineralogy of PGMs from Denison 109FW Zone Sample 1244
3. 31-May-2010 – A. Lee et. al. -Vale Internal Report – Phase 2 Metallurgical Evaluation of Denison PGM
4. 17-Jun-2010 – X. Manqui et.al. – Vale Internal Report– Mineralogy and Metallurgy of Denison PGM Ore
5. 11-Jul-2011 – A. Lee et. al. -Vale Internal Report – Denison 109 Zone MinMet 2011
6. 11-Jul 2017 – L. Cabri - Report 2017-03 - Precious Metal Deportment in Six Composite Samples from the Denison 9400 FW Zone
7. 11-Nov - 2016 – L. Cabri - Report 2016-03 - Precious Metal Deportment in Six Composite Samples from the Denison 109 FW Zone for Lonmin Canada
8. 26-Feb-2018 – A, Kelly - Blue Coast Research PJ5219 - Denison Prefeasibility Study
9. 29-Oct-2020 – A. Kelly - Blue Coast PJ5313 - Denison Project – Gravity Recovery and Flotation Optimization
10. 7-Apr-2022 – C, Gould et. al. - Vale- Technical Report Summary, Sudbury Property, Ontario Operations, Canada
11. 14-Dec-2022 – A. Armitage - SGS – Technical Report on the Mineral Resource Estimate for the Denison Deposit, Denison Project, Sudbury, Ontario Canada
12. 3-Nov-2023 – J. Laverne, J. Oliveira – XPS Report 502381.0 Crean Hill Characterisation Phase 1
13. Relevant SRK Reports referenced in the Section 27 References

13.2 Mineralogy

There have been several mineralogical evaluations completed for the 109 FW zone: in 2009, Vale completed 9 polished thin section analyses using optical and scanning electron microscopy designed to characterize the nature and mode of occurrence of the precious metal bearing mineral assemblages. In 2010 Vale conducted an internal mineralogy evaluation on a sample from the upper part of the FW (Sample 1206-2) and on a hole composite sample (Sample 1244). In 2016, Lonmin had six samples from the 109FW Zone (three from the upper zone representing lower sulphide material and three from the deeper zone with higher sulphide content) analyzed by Cabri Consulting Inc. An equivalent study was performed on 6 samples from the 9400 zone in 2017. A summary of results from the 109FW zone are shown in the table presented in Table 13-1.

Table 13-1 Summary of Modal Mineralogy for 109FW Zones (Compiled from Cabri and Vale Mineralogy Reports)

	2010 Sample - 109 Footwall	2016 Samples - 109 Footwall Zone	
	100127_Lonmin_1206-2	Avg. Upper Zone	Avg. Lower Zone
Pentlandite	1,1	1,1	1,6
Chalcopyrite	1,2	1,7	7,7
Pyrrhotite	2,9	1,7	11,1
Pyrite	0,1	0,1	0
Millerite	0		
Cubanite	0,01		
Bornite	0		
Sphalerite	0,03	0,1	0,1
Galena	0,001		
Gerdorffite	0,001	0,2	0,1
Niccolite/Maucherite	0	0	0
Ni Marcasite	0,3	0	
Total Sulphides	5,5	5,1	20,7
Olivine	0,01		
Orthopyroxene	0,01		
Clinopyroxene	1,77	0,58	0,2
Anphibole	37,8	29,94	25,18
Epidote	2,68	5,97	4,29
Chlorite	18,51	17,44	13,46
Biotite/Micas	4,23	5,49	5,25
Talc	0		
Serpentine	0		
Quartz	8,07	14,18	13,9
Plagioclase	16,1	15,94	12,72
Kspar	0,37		
Titanite	1,18	0,69	
Total Silicate	90,8	90,7	75,7
Apatite	0,63	0,52	0,46
Magnetite	0		
Hemitite	0,01		
Ilenite	1,71	1,6	1,48
Calcite	0,84	1,89	1,43
Slag Glass	0,16		
Other	0,17	0,23	
Total Phosphate, Oxide, Carb, other	3,75	4,18	3,6
TOTAL	100	100	100

The 2010 samples and the 2016 samples of the upper zone were consistent in terms of mineralogy. The 2010 sample of the 109 FW contained approximately 5.5% sulphides; 90.8% silicates; and 3.75% Fe-oxides, carbonates, and other minerals. The three 2016 upper zone samples from the 109FW Zone contained an average of 5.1% sulphides; 90.7% silicates; and 3.66% Fe-oxides, carbonates, and other minerals. The three 2016 lower zone samples were higher in sulphides, averaging 21% (mostly due to increased pyrrhotite); they therefore had correspondingly lower silicates, at 75%; and Fe-oxides, carbonates, and other minerals, at 3%.

Ni deportment was conducted on the 109FW Zone samples and results varied. The two economically recoverable minerals of pentlandite and gersdorffite contained 83.5% and 9% of the Ni, respectively. Pyrrhotite and marcasite contained 6% of the Ni, and silicates—primarily chlorites—contained 13% of the Ni. The Ni deportment will limit maximum Ni recovery from this material to 80%. There was negligible millerite, which would negatively impact the Cu-Ni separation efficiency, identified in any of the samples.

Liberation of the recoverable minerals in the 2016 material was good. The material was ground to an 80% passing size (i.e., P80) of between 75 and 100 µm, and the results were 78% liberation for pentlandite, 85% liberation for chalcopyrite, and 85% liberation for gersdorffite. These results meet the criteria for expected liberation required for flotation.

Precious metal deportment for Pt, Pd, and Au was also conducted on the samples from both the 109 FW and the 9400 Zone. Pt was identified in both studies; most of the Pt (i.e., >80%) occurred as part of the mineral sperrylite (PtAs2), and a small amount occurred as part of moncheite (Pt[Te,Bi]2). The 2016 report also identified up to 5% of the Pt to occur as part of gersdorffite (NiAsS), as a solid solution.

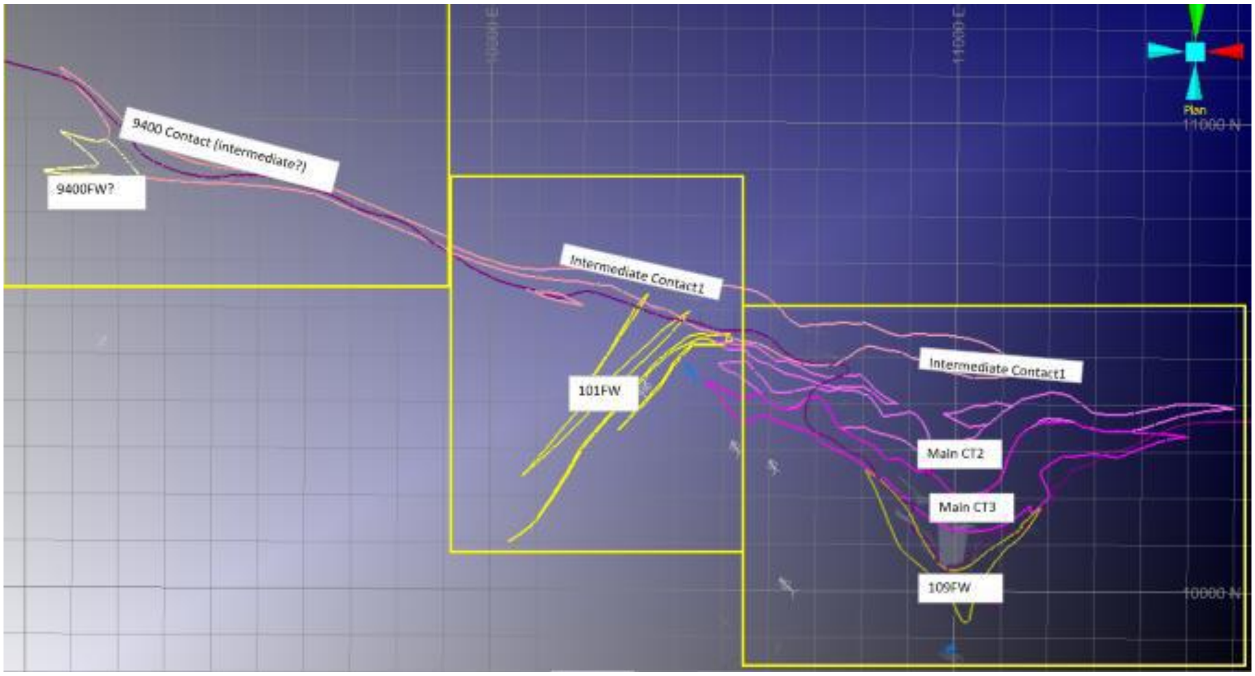
Pd was identified as occurring in the mineral michenerite ([Pd,Pt]BiTe). In the 109 FW Zone, Pd was almost entirely (i.e., 96%) associated with this mineral, whereas in the 9400 Zone, some samples carried up to 35% of the Pd in in gersdorffite (NiAsS), as a solid solution.

Au-bearing minerals were not commonly found and almost exclusively occurred as part of Electrum (Au,Ag) and native gold (Au>80%).

Precious metal bearing minerals were described as fine (in terms of size) in the 2016 evaluation and had a P80 of 23 µm.

In 2023, Magna Mining commissioned a test program where 13 variability composite samples were created from available drill core to capture grade and mineralogy variation across the deposit. The samples selected included Footwall zones (4 samples) and Contact zones (9 samples) across the resource and focus area. Where possible, multiple samples were created in each zone. A total of 263 intersections from 41 drill holes were selected to produce over 400 kg of sample material across the 13 composite samples. The intent of the sample collection and test program was to evaluate the flotation recovery as a function of feed grade and zone/mineralization type when processing through Vale's Clarabelle Mill. A plan view slice of the various zones is shown in Figure 13-1.

Figure 13-1 Plan View of Various Zones – Sampling Focus Area (Source XPS Crean Hill Characterisation Report – 2023



QEM-Scan mineralogy and select Microprobe analysis, grain size measurements and Ni deportment was performed on the samples.

The composite sample metal grades and QEMScan modal mineralogy is shown below in Table 13-2.

Table 13-2 QEMSCAN Mineralogy of 13 Variability Samples (Source – XPS Crean Hill Characterisation Report – 2023)

		109 FW1	109 FW2	109 FW3	109 FW4	101 FW1	101 FW2	9400 CT	9400 FW1	INT CT1	INT CT2	Main CT LG	Main CT2	Main CT3
Measured	*Cu (Chemical)*	*1.08*	*0.42*	*0.58*	*0.05*	*0.73*	*0.85*	*0.93*	*0.27*	*0.82*	*0.56*	*0.42*	*0.57*	*1.24*
	Ni (Chemical)	*0.42*	*0.15*	*0.39*	*0.06*	*2.08*	*1.22*	*1.23*	*0.52*	*0.83*	*0.64*	*0.38*	*0.54*	*1.74*
	S (Chemical)	*2.70*	*0.90*	*1.30*	*0.30*	*10.20*	*6.40*	*7.70*	*2.50*	*4.60*	*3.40*	*2.40*	*4.70*	*9.00*
	3E PGE	9.92	3.41	17.71	4.04	0.41	0.98	2.42	6.10	1.11	0.89	0.54	0.43	1.94
		109 FW1	109 FW2	109 FW3	109 FW4	101 FW1	101 FW2	9400 CT	9400 FW1	INT CT1	INT CT2	Main CT LG	Main CT2	Main CT3
	Chalcopyrite	3.26	1.73	2.13	0.12	2.55	2.66	3.00	1.12	2.61	2.33	1.50	1.76	4.04
	Pyrrhotite	0.94	0.42	0.89	0.39	20.46	12.08	15.29	5.93	3.58	4.88	4.55	9.66	18.87
	Pyrite	1.10	0.27	0.44	0.11	0.10	0.17	0.15	0.48	1.28	0.20	0.19	0.05	0.10
	Pentlandite	1.21	0.34	1.48	0.09	5.88	3.91	3.27	1.42	2.20	1.54	0.86	1.35	4.69
	Gersdorffite	0.04	0.04	0.02	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01
	Total Sulphide	6.55	2.79	4.96	0.72	29.00	18.83	21.71	8.96	9.68	8.95	7.11	12.81	27.71
	Quartz	9.03	10.93	14.83	12.53	5.51	25.28	10.36	14.06	16.53	13.26	18.59	9.34	13.41
	Feldspars	18.33	18.99	20.20	23.33	4.86	15.04	12.64	13.40	16.73	24.45	16.60	25.79	13.13
	Micas	5.91	2.41	4.60	5.90	8.08	14.99	3.55	10.83	32.70	9.71	9.18	7.54	6.70
	Chlorite	21.07	12.72	18.92	16.01	11.03	4.95	25.14	27.29	9.18	11.03	16.77	9.48	14.06
	Pyroxenes	0.42	0.17	0.16	0.13	2.33	0.17	0.57	0.11	0.26	0.29	0.33	0.28	0.23
	Amphiboles	27.14	40.10	24.42	31.48	36.22	17.90	19.32	12.07	7.25	22.38	21.81	28.31	19.44
	Epidote	4.33	6.21	7.17	4.68	0.77	0.93	2.25	7.44	1.89	7.05	5.63	4.80	2.31
	Titanite	0.81	1.19	1.08	1.29	0.19	0.26	0.59	0.61	0.31	0.46	0.73	0.41	0.44
	Magnetite	0.50	0.29	0.24	0.19	0.40	0.27	0.24	1.31	0.80	0.61	0.26	0.16	0.14
	Ilmenite	1.71	1.71	1.87	1.69	0.14	0.07	0.89	0.57	0.21	0.64	0.62	0.18	1.13
	Apatite	0.61	0.66	0.28	0.45	0.17	0.14	0.79	0.66	0.31	0.32	0.24	0.15	0.26
	Carbonates	1.80	1.24	0.81	1.22	1.03	0.62	1.65	1.17	3.47	0.48	1.22	0.55	0.55
	Other	1.79	0.59	0.44	0.39	0.27	0.56	0.29	1.52	0.68	0.36	0.91	0.20	0.51
	Total NSG	***93.45***	***97.20***	***95.03***	***99.28***	***70.99***	***81.17***	***78.29***	***91.04***	***90.32***	***91.05***	***92.89***	***87.19***	***72.28***
	Po/Pn	*0.78*	*1.24*	*0.60*	*4.12*	*3.48*	*3.09*	*4.67*	*4.18*	*1.63*	*3.18*	*5.28*	*7.17*	*4.02*

The sample selection was effective at capturing grade variation across the deposit with Ni grade varying from 0.06% in the 109FW zone to a high of 2.08% Ni in the 101FW zone. In general, sample base metal grade was the lowest in 109FW samples with total sulphide content averaging 3.8% versus 16.1% for the rest of the samples. PGE grades were highest in 109FW samples however and averaged 9 g/t 3E versus 1.7 g/t 3E for the other samples. The high base metal grades were accompanied by high pyrrhotite content in the 101FW1 sample. Despite being in the footwall, this zone carries high Ni and Cu grades, low PGE and high sulphide content contained in veins of chalcopyrite and pentlandite. The 9400FW sample has average Ni and Cu grades and higher PGE grades but also higher pyrrhotite content. Pyrite is present is very modest amounts and is highest in the INTCT1 sample at 1.3% and millerite was not identified. Po/Pn ratio averaged 1.7 in the 109FW samples and 4.1 for the remaining samples.

Generally, the mineralogy supports characterization of 109FW as a Footwall type and the balance of the samples consistent with Contact type mineralogy.

Ni deportment for the samples is shown in Table 13-3 below.

Table 13-3 Ni Deportment of Variability Samples (Source – XPS Crean Hill Characterization Report – 2023)

	Deportment	109 FW1	109 FW2	109 FW3	109 FW4	101 FW1	101 FW2	9400 CT	9400 FW1	INT CT1	INT CT2	Main CT LG	Main CT2	Main CT3
Ni Deportment (Normalised % Ni)	Pyrrhotite	1.79	2.34	1.54	4.86	9.35	8.47	11.98	10.46	4.30	8.09	12.20	16.63	10.63
	Pyrite	*0.151*	*0.107*	*0.052*	*0.090*	*0.000*	*0.007*	*0.007*	*0.054*	*0.102*	*0.022*	*0.033*	*0.005*	*0.004*
	Pentlandite	***85.05***	***68.20***	***90.19***	***41.07***	***88.51***	***89.75***	***84.51***	***82.18***	***90.42***	***86.06***	***76.74***	***77.31***	***87.36***
	Gersdorffite	***3.36***	***5.25***	***1.00***	***0.37***	***0.15***	***0.04***	***0.00***	***0.51***	***0.32***	***0.04***	***0.08***	***0.00***	***0.11***
	Micas	0.84	0.70	0.45	4.85	0.26	0.48	0.17	0.07	2.95	1.11	1.68	0.89	0.27
	Chlorite	5.37	9.27	4.16	24.88	0.60	0.41	2.34	5.42	1.36	2.23	5.39	1.96	0.95
	Pyroxenes	0.02	0.02	0.01	0.04	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
	Amphiboles	3.43	14.11	2.61	23.84	1.12	0.85	0.97	1.31	0.54	2.44	3.84	3.19	0.67
	Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Ni deportment in pentlandite averaged 81% and was lowest in the low Ni grade 109FW samples. Pyrrhotite can contain from 9-16% of the total Ni in Contact samples while Ni deportment averaged 2.6% in 109FW samples. Ni in chlorite averaged 11% in the 109FW samples versus 2.3% in the Contact samples including 101FW and 9400FW samples.

Pyrrhotite was 81-84% of the monoclinic variety in the Contact samples analyzed.

Limited PGM mineralogy was performed on the 109FW or the Contact type samples performed on the 13 samples.

13.3 Hardness and Grindability Testing

Hardness data is required to determine grinding energy requirements for achieving both the throughput and P80 product size necessary to achieve desired liberation. Hardness measurements were conducted for the 109 FW Zone in 2011, and additional samples were measured in 2016. The 2023 program also included Bond Ball Work index measurements on composite samples of 109FW (109FWBL), 101FW (101FWBL) and CNT (CTBL) samples.

In 2011, results for the 109 FW Zone were reported for crusher, semi-autogenous (SAG) mill, rod mill, and ball mill parameters.

For determining energy requirements for circuits consisting of SAG mills, the JKSimMet© A x b (unitless parameters derived from the JK drop test) is primarily used. The average A x b value of 23.1 was determined, which indicates that the rock is competent and rated as very hard relative to other materials. Bond work indexes are used for determining power requirements for rod and ball mills. The 2011 testing resulted in a Bond rod mill work index (RWi) of 18 kWh/t, and a Bond ball mill work index (BWi) of 16.2 kWh/t, which are both rated as hard compared to other materials. The crusher work index was reported as 11.7 kWh/thich is considered very hard.

Additional drill core from the 109 FW was tested in 2016. The sample was divided into an upper sample representing material from above 100 m in depth, and a lower sample representing material from below 100 m in depth. The RWi, BWi (at a closing size of 75 µm), and abrasion index (Ai) were determined for both of these samples. The upper sample was slightly harder than the lower sample, with a RWi of 19.1 kWh/t, a BWi of 19 kWh/t, and an Ai or 0.349. The lower sample—containing higher sulphides—was slightly softer, with a RWi of 17.4 kWh/t, a BWi of 16.6 kWh/t, and an Ai of 0.327.

The measurements indicate that the 109 FW material samples were all similar and rated very hard.

The 2023 Bond Ball Work Index measurements are shown below in Table 13-4.

Table 13-4 Bond Work Index Measurements (Source – XPS Crean Hill Characterisation Report – 2023)

Bond Ball Mill Grindability Test Results Summary							
Sample ID	Mesh of Grind	F_{80} (µm)	P_{80} (µm)	Gram per Revolution	Work Index (kWh/t)	Hardness Percentile	Category
101 FWBL	120	2,100	102	1.80	13.0	35	Moderately Soft
109 FWBL	120	2,294	98	1.14	18.1	86	Hard
CTBL	120	2,140	101	1.40	15.7	67	Moderately Hard

The 109FW (109FWBL) sample composite Bond Ball Work index was consistent with previous 109FW measurements at 18.1 kwh/t and was rated as hard versus other Footwall style mineralogy from the Sudbury Basin. As might be expected the higher sulphide content 101FW (101FWBL) sample composite was the softest at 13 kwh/t and the CNT (CTBL) composite was moderately hard at 15.7 kwh/t. In general, the 109FW samples are consistent with other Footwall style deposits in the basin as hard to very hard and 101FW and the CNT composite are typical of Contact style mineralogy.

13.4 Metallurgical Evaluations

Several metallurgical evaluations were conducted: Vale evaluated samples from the Denison 109 FW in 2010 and 2011 while Blue Coast performed an evaluation on a single composite in 2018.

In 2023, Magna commissioned a broader lab scale variability program using the Clarabelle Mill lab test procedure on 4 x 109FW samples and 9 x Contact zone samples.

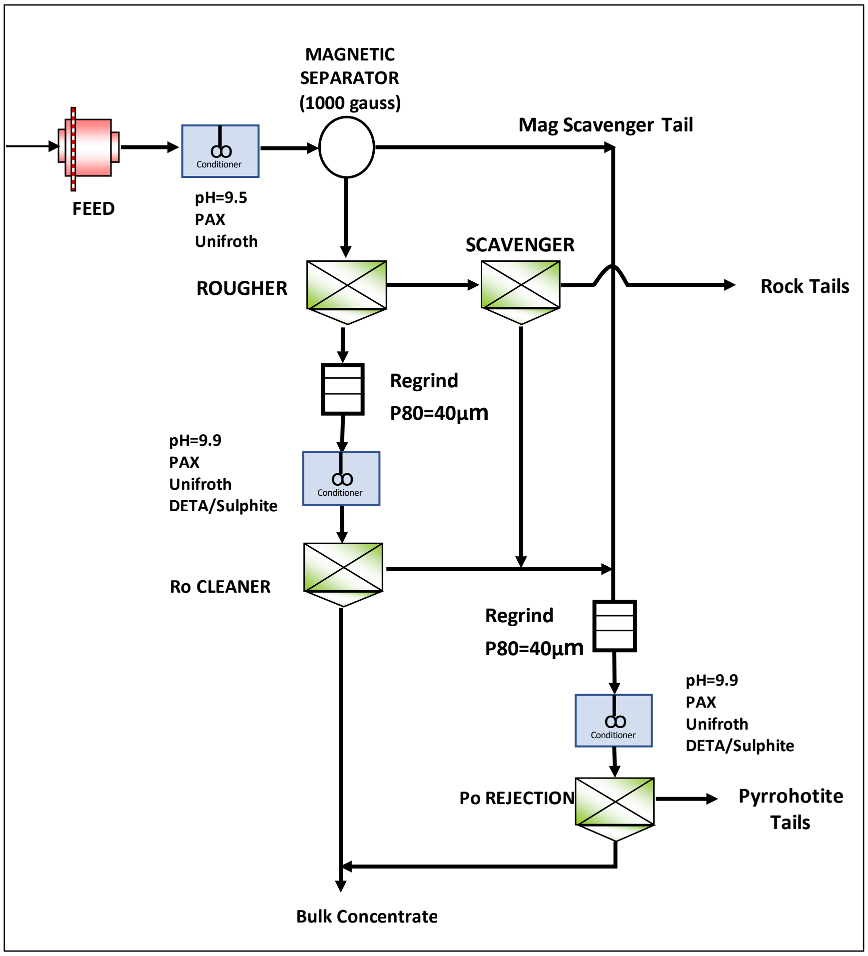
13.4.1 Evaluation of Denison 109 Footwall by Vale

The earliest test work on 109 FW was conducted by Vale. A series of tests were conducted on samples labelled 1206-1,1206-2, and 1206-3, representing the upper, middle, and lower section of drillhole LMO320. PGM liberation was highly variable however based on promising Pd, Pt, and Au recoveries using an MF2 flowsheet, a second phase of testing was initiated.

The feed sample for the second phase was selected from two intervals of two holes, and labelled as Denison 1244, to be representative of the Denison 109 FW drillhole LMO320. The assay head sample averaged 0.21% Cu, 0.22% Ni, 0.77% S, 2.44 g/t Pd, 4.3 g/t Pt, and 1.31 g/t Au.

The response of the material was evaluated based on the Clarabelle Full Circuit Simulation (FCS), which was the standard test in 2010. This process is presented in Figure 13-2.

Figure 13-2 Vale Full Circuit Simulation (pre-2015) (Source: Crean Hill PEA – September 2023, XPS, 2023)



The program first evaluated a range of blends of Denison to Clarabelle feed, as follows:

- 100% Denison feed
- 50% Denison feed to 50% Clarabelle feed
- 25% Denison feed to 75% Clarabelle feed
- 100% Clarabelle feed

The results from the 100% Denison feed are shown in the table presented in Table 13-5.

Table 13-5 Results of 100% Denison 109 FW using Vale FCS Flowsheet (Source: Crean Hill PEA – September 2023, XPS, 2023)

Stream		Assay					Distribution (%)				
	Wt %	Cu (%)	Ni (%)	Pd g/t	Pt g/t	Au g/t	Cu	Ni	Pd	Pt	Au
Feed	100	0.21	0.22	2.38	4.30	1.31	100.0	100.0	100.0	100.0	100.0
Conc	2.4	6.85	4.65	43.00	84.90	19.40	79.6	51.6	44.1	48.2	36.6
Tails	97.6	0.04	0.11	1.36	2.28	0.85	20.4	48.4	55.9	51.8	63.7

In this series of testing, the distribution was approximately 44% Pd, 48% Pt, and 36% Au. Due to the low Cu+Ni grade of this sample, the concentrate grade produced was only 11.5% Cu+Ni. This is below the Clarabelle concentrate grade target. Blending with the higher Cu+Ni Clarabelle feed resulted in targeted concentrate grades, at similar Pd, Pt, and Au recoveries. The program also showed better recoveries at higher xanthate dosages.

The program tested a separate MF2 flowsheet with a finer grind of 64 µm and achieved higher Pd, Pt, and Au recoveries. The results were 62% Pd, 67% Pt, and 57% Au to a bulk concentrate of 9% Cu+Ni. It was not clear from the report how much of the added recovery was due to the finer grind versus the lower concentrate grade. To achieve this lower grade, the material would have to be processed on its own.

When processed as a blend with low Pd, Pt, and Au value contact ores, existing processing plants will target higher Cu+Ni concentrate grades, which would negatively impact the precious metal recovery.

In about 2012, Clarabelle updated their circuit to a new flotation configuration referred to as the challenging ore recovery (CORe) flow sheet.

Based on the change to the circuit, additional tests were conducted. The sample at a higher base metal grade for this phase was labelled 1335 and assayed 0.60% Cu, 0.34% Ni, 2.13% S, 2.26 g/t Pd, 3.06 g/t Pt, and 1.14 g/t Au.

To calibrate the recovery model for this material, Vale performed two duplicate flotation tests on samples ground at standard and coarse grind sizes. The Clarabelle process targets higher Cu+Ni concentrate grades, which are readily achieved with more typical and higher-grade Cu and Ni contact ores from the basin. The 109 FW, with its low Cu and Ni values, requires significantly more upgrading to achieve the higher Cu+Ni concentrate grade threshold. Achieving these higher grades negatively impacts metal recovery.

The standard ground test resulted in a 78% Ni recovery to higher Cu+Ni grade, and the coarse ground test achieved only 71% recovery. Similarly, based on the standard grind Pd, Pt, and Au, recoveries were reported at 72% Pt, 70% Pd, and 68% Au, for a mass pull of 4%. A 4% mass pull was required for the target Cu+Ni grade. Recoveries from the coarse grind were reported at 64% Pd, 72% Pt, and 68% Au for a mass pull of 4%. The sensitivity to grind size was observed in the program.

The Vale testing was focused on evaluating Denison 109 FW material's behaviour through the Clarabelle processing plant using their established grind, residence times, and flowsheet. They demonstrated that the Pt, Pd, and Au recoveries increased with mass pull; this is related to the Cu+Ni grade in the feed, and inversely related to Cu+Ni grade in the concentrate. The earlier work with sample 1244 had a Cu+Ni feed of 0.29% and a lower weight pull of 1.2% to achieve the desired Cu+Ni concentrate grade, and resulted in lower Pd, Pt, and Au recoveries. The later sample 1335, with a Cu+Ni feed of 0.94% Cu+Ni, required a 4.1% mass pull and achieved higher Pd, Pt, and Au recoveries.

13.4.2 Evaluation of Denison 109 Footwall by Blue Coast

Separation Using Flotation

Blue Coast conducted a metallurgical program on a composite prepared from Denison drill core at the direction of Micon International Ltd. The composite for the metallurgical testing was assayed in triplicate and averaged 0.755% Cu, 0.285% Ni, 2.29% S, 4.42 g/t Pd, 3.66 g/t Pt, and 1.67 g/t Au.

A series of tests were conducted to determine the effect of grind size on rougher flotation recovery of Pd, Pt, and Au. Based on the results presented in Table 13-6, a primary grind with a P80 of 60 µm was selected.

Table 13-6 Grind Sensitivity of Denison FW (Source: Blue Coast PJ5219 Report P.10; Table 10)

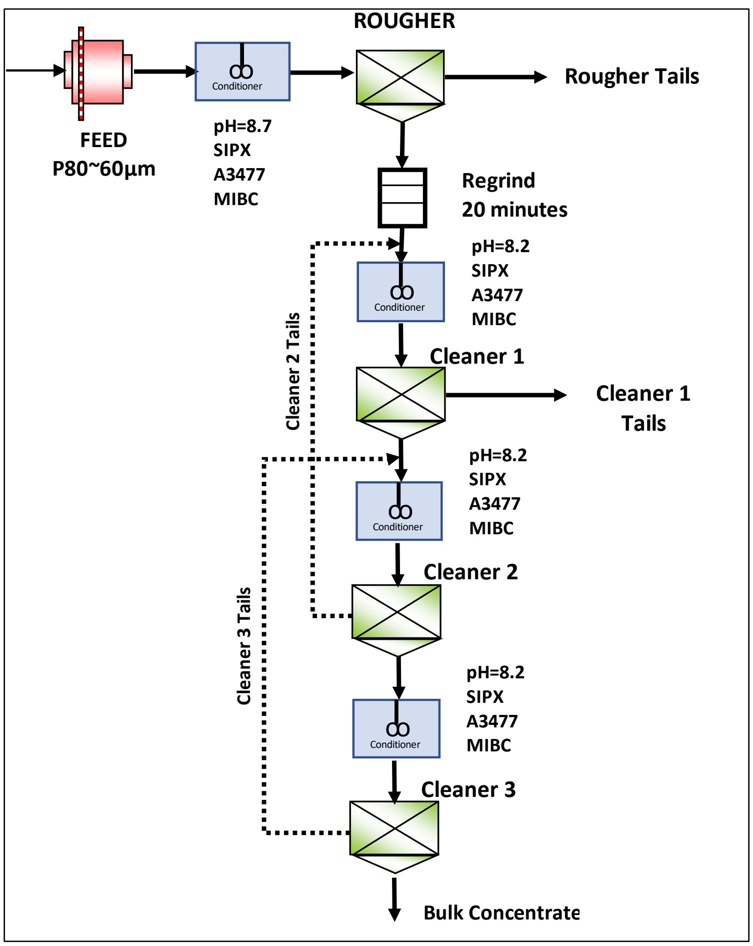
Test #	Grind P80 (µm)	Grade					Rougher Flotation Recovery (%)				
		Cu (%)	Ni (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu	Ni	Pd	Pt	Au
F-4	184	5.08	1.77	16.86	20.93	6.22	97.3	83.8	78	85.8	62.4
F-5	121	5.83	1.8	36.29	21.65	7.48	97.4	83.3	80	88.7	67.5
F-6	82	5.86	1.8	16.78	21.68	8.78	98.1	84.4	82	88.6	72.8
F-7	69	5.55	1.71	17.56	21.19	9.28	98.3	84.4	83.4	90.1	76.3
F-8	56	5.21	1.68	32.3	23.49	8.94	98.8	85.7	86.7	89.7	78.4

A series of tests were next conducted to screen collectors for flotation. Based on the tests, a dual collector system of sodium isobutyl xanthate (SIBX) and sodium diisobutyl dithiophosphate (A3477) were selected because they provided overall better Pt recovery.

After finalizing the rougher conditions, cleaner tests were performed, and rougher concentrate regrinding was evaluated. The conclusion of the cleaner study was a recommendation of 30 minutes of regrinding required to achieve a Cu+Ni concentrate grade of greater than 12%.

Based on this development work the circuit presented in Figure 13-3 was finalized for lock cycle tests (LCT).

Figure 13-3 LCT Flowsheet (Source: Blue Coast PJ5219 Report P.26; Table 14)



A LCT is used to simulate the conditions of a plant where internal streams are circulated. There were two LCTs performed, each containing six cycles; stability was achieved in both tests (refer to Table 13-7).

Table 13-7 LCT Results (Source: Blue Coast PJ5219 Report P.27/29; Table 12/14)

LCT-1

Stream		Assay						Distribution (%)					
	Wt %	Cu (%)	Ni (%)	S (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu	Ni	S	Pd	Pt	Au
Cleaner 3 Conc	7.8	9.87	2.92	23.50	40.70	41.70	14.90	98.3	80.8	81.5	85.8	87.7	77.1
Cleaner 1 Tails	9.3	0.06	0.17	4.11	1.26	2.53	0.78	0.8	5.4	16.8	3.1	6.3	4.8
Rougher Tails	82.9	0.01	0.05	0.04	0.49	0.27	0.33	1.0	13.8	1.6	11.0	6.0	18.1
Feed	100	0.79	0.28	2.25	3.70	3.71	1.51	100	100	100	100	100	100

LCT-2

Stream		Assay						Distribution (%)					
	Wt %	Cu (%)	Ni (%)	S (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu	Ni	S	Pd	Pt	Au
Cleaner 3 Conc	5.5	13.60	3.76	29.40	57.80	56.50	19.70	97.3	75.1	73.0	82.4	85.4	73.0
Cleaner 1 Tails	10.9	0.10	0.26	4.99	1.96	2.49	0.90	1.4	10.4	24.6	5.6	7.5	24.6
Rougher Tails	83.6	0.01	0.05	0.06	0.55	0.31	0.37	1.3	14.6	2.4	12.0	7.1	2.4
Feed	100	0.77	0.27	2.21	3.85	3.63	1.49	100	100	100	100	100	100

For LCT-2, the mass pull was reduced to achieve a higher concentrate grade. The test resulted in a final concentrate with a grade of 17.36% Cu+Ni, with marginally lower Cu recovery at 97%, and lower Ni recovery at 75%. Precious metal recoveries were also marginally lower, with 82% of the Pd, 85% of the Pt, and 73% of the Au.
These tests demonstrate the sensitivity of this material to concentrate grade. The higher the concentrate grade targeted for this material, the lower the recoveries achieved.

Gravity Separation Combined with Flotation

During the 2016 pre-feasibility study by Blue Coast, four gravity separation tests were conducted to determine if Pd, Pt, and Au recoveries could be improved compared to the flotation-only process. After processing the ground material through the Knelson concentrator, the Knelson reject was subject to flotation using the standard conditions. The results are presented in the table presented in Table 13-8.

Table 13-8 Gravity/Flotation Test Results (Source: Crean Hill PEA – September 2023, XPS, 2023)

			Grade					Distribution				
	Test #	Wt %	Cu %	Ni %	Pd g/t	Pt g/t	Au g/t	Cu	Ni	Pd	Pt	Au
Knelson Conc @ 57 μm Grind	*G-1*	*0.84*	*3.1*	*3.8*	*105.5*	*233.5*	*78.1*	*3.5*	*11.5*	*23.6*	*60.5*	*35.7*
Additional Rougher Conc.	*F-18*	*13.25*	*5.4*	*1.5*	*17.3*	*7.9*	*6.0*	*95.8*	*71.5*	*61.2*	*32.5*	*43.7*
Combined Grav/Flot Conc.		14.1	5.2	1.6	22.5	21.3	10.3	98.3	85.7	86.7	93.0	79.4
Flotation Only Rougher Conc.	F-8	14.1	5.5	1.7	23.5	32.3	8.9	98.8	85.7	86.7	89.7	78.4
Knelson Conc @ ~60 μm Grind	G-2	0.53	3.3	4.4	120.5	241.5	95.9	2.4	8.7	18.6	52.6	29.4
Additional Rougher Conc.	F-23	15.95	4.4	1.3	14.3	6.0	5.3	96.5	76.3	65.9	39.2	48.8
Combined Grav/Flot Conc.		16.5	4.4	1.4	17.7	13.6	8.2	98.9	85.0	84.5	91.7	78.3
Flotation Only Rougher Conc.	F-12	15.2	5.0	1.6	23.3	23.8	9.0	98.8	85.5	87.5	94.0	79.7
Knelson Conc @ ~100 μm Grind	*G-3*	*0.87*	*1.7*	*2.6*	*69.5*	*122.5*	*19.7*	*2.0*	*9.2*	*17.7*	*46.5*	*12.7*
Knelson Conc @ ~60 μm Grind		*0.89*	*3.9*	*3.7*	*45.8*	*44.7*	*14.4*	*4.8*	*13.1*	*11.9*	*17.2*	*9.5*
Additional Rougher Conc.	*F-24*	*15.32*	*4.4*	*1.1*	*12.8*	*4.3*	*4.9*	*92.1*	*68.5*	*57.5*	*28.7*	*55.9*
Combined Grav/Flot Conc.		17.1	4.2	1.3	17.4	12.4	6.2	98.9	90.7	87.0	92.4	78.0
Flotation Only Rougher Conc.	F-12	15.2	5.0	1.6	23.3	23.8	9.0	98.8	85.5	87.5	94.0	79.7
Knelson Conc @ ~60 μm Grind	G-4	0.95	3.5	3.9	106.0	216.0	61.2	4.4	13.6	24.8	61.6	32.3
Additional Cleaner 3 Conc.	F-28	7.13	9.7	2.6	33.6	14.3	11.0	96.5	68.7	59.1	30.7	43.6
Combined Grav/Flot Conc.		8.1	9.0	2.7	42.1	38.0	16.9	95.0	82.3	83.9	92.3	75.9
Flotation Only Cleaner 3 Conc.	F-20	7	10.5	3.3	45.9	38.2	14.2	97.4	81.9	81.6	85.5	70.2

The gravity combined with flotation resulted in very similar overall recoveries when compared to rougher flotation tests.

A decision was made in 2020 to advance the understanding of gravity separation through an Extended Gravity Recoverable Gold and PGE (EGRG+PGE) test. The test was conducted on the 2017 Denison 109 FW Master Composite.

A single EGRG+PGE test was conducted on a 10-kg sample of the Denison composite used in the 2017 study. An EGRG test involves the sequential processing of the same 10-kg feed sample at various grinds. The first pass through the Knelson is at a P80 of 850 µm, followed by a second pass after regrinding the first pass tails to a P80 of 250µm, and then a final pass after regrinding to a P80 of 75 µm. The results are shown in Table 13-9.

Table 13-9 Gravity Recoverable Gold and Precious Metal Test Results (Source: Crean Hill PEA – September 2023, XPS, 2023)

Product	Grind Size	Mass		Assay			Distribution (%)		
	P80 (µm)	(g)	(%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Pd	Pt	Au
Stage 1 Concentrate	850	99.3	0.51	126.3	408	59.2	16.4	57.1	16.6
Stage 2 Concentrate	250	87.1	0.45	77.4	88.8	18	8.8	10.9	4.4
Stage 3 Concentrate	75	101.5	0.52	78.4	63.5	24.8	10.4	9.1	7.1
Total Concentrate		**288**	**1.48**	**94.6**	**189.8**	**34.6**	**35.6**	**77.1**	**28.2**
Total Tailings		19139.4	98.5	2.57	0.85	1.32	64.4	22.9	71.8
Calculated Head		*19427.4*	*100.00*	*3.94*	*3.65*	*1.81*	*100.0*	*100.0*	*100.0*

The EGRG+PGE test work identified that Pt showed a very good gravity response, with 77% of the total Pt being potentially gravity recoverable. Gravity-recoverable Pd and gravity-recoverable Au values were lower, at 36% and 28%, respectively.

Nine additional gravity / flotation tests were conducted to simulate processing at the Redstone Mill in Timmins. The process followed is detailed in Figure 13-4 and the results obtained are presented in Table 13-10.

Figure 13-4 Gravity Concentrator + Flotation Flowsheet (Source: Blue Coast PJ5313 Report P.26; Figure 14)

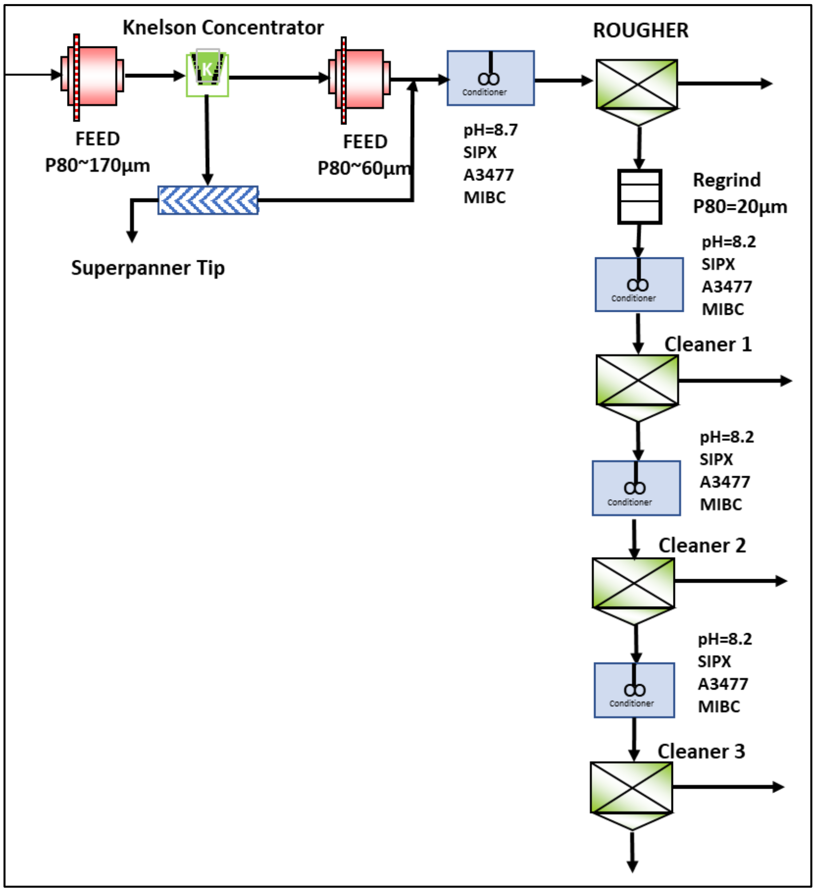


Table 13-10 Open Circuit Gravity/Flotation Test Results (Source: Crean Hill PEA – September 2023, XPS, 2023)

Test #	Knelson P80 (µm)	Flotation P80 (µm)	Regrind (min)	Concentrate Mass Pull (%)	Concentrate Grade Cu (%)	Ni (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Concentrate Recovery (%) Cu	Ni	Pd	Pt	Au
F-1	175			0.02			365	1551	76			2.7	17.3	1.1
		70	10	4.08	11.25	3.28	42.2	24.4	13.0	63.4	49.8	51.8	45.3	31.8
F-2	175			0.03			851	2843	375			7.1	32.5	7.3
		69	20	6.57	10.90	3.32	40.7	20.8	14.3	95.2	76.8	76.8	54.1	63.6
F-3	175			0.03			940	2658	130			8.6	36.6	7.4
		69	22	6.51	11.39	3.25	42.3	19.3	14.6	95.1	75.0	73.0	49.8	61.7
F-4	175			0.01			821	5188	605			3.0	28.0	5.6
		68	22	5.99	10.56	3.04	40.1	19.7	12.9	85.6	68.1	70.1	50.9	57.2
F-5	175			0.18			342	1230	226			16.4	59.1	23.4
		75	22	6.73	11.35	3.25	37.4	18.3	13.5	94.8	76.0	66.2	32.5	51.7
F-6	67			0.15			280	907	211			10.7	46.4	17.4
		67	22	6.57	11.19	3.31	42.9	20.2	13.9	94.9	81.9	71.3	40.7	49.9
F-7	175			0.53			161	342	80			22.6	60.7	25.4
		68	22	6.49	11.57	3.18	35.7	13.5	13.0	94.6	70.8	61.9	29.6	51.3
F-8	67			0.19			354	945	321			17.9	61.9	33.8
		67	22	6.70	10.38	3.11	37.7	12.7	12.2	95.8	76.1	66.8	29.1	45.0
F-9	67			0.21			289	812	207			15.6	58.9	26.3
		67	23	6.71	9.73	2.75	37.3	13.0	11.4	91.3	71.7	65.8	30.7	47.3

Using the EGRG+PGE test results, a modelling exercise was conducted by FLSmidth Knelson. The modelling demonstrated that the recovery is highest when centrifugal concentrators are installed within the circulating load of the finer ball mill with a P80 of 60 µm. FLSmidth recommended installation of a Knelson Concentrator to enhance PGE-Au recovery. The modelling indicated that for a proposed 35 t/d, an Knelson model XD20 could treat 28% of the secondary cyclone underflow and recover 1,500 kg/d containing 10% of the Pd, 36% of the Pt, and 14% of the Au.

A simulation was conducted based on this finding and application of the LCT results from the previous study to the remaining flotation feed. The results of the simulation, presented in Table 13-11 - when compared to the actual LCT result achieved - did not result in an improvement in overall Pd, Pt, or Au recovery for this sample, containing 8 g/t combined Pd+Pt+Au.

Table 13-11 Simulation of Gravity Separation Results Compared to LCT-2 Results (Source: Blue Coast PJ5313 Report P.22; Table 14)

Stream	Mass flow		Grade					Rougher Flotation Recovery (%)				
	(dmt/h)	(%)	Cu (%)	Ni (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Cu	Ni	Pd	Pt	Au
Mill Feed	35	100	0.76	0.27	3.94	3.65	1.64	100.0	100.0	100.0	100.0	100.0
Gravity Concentrate	0.06	0.18	2.98	4.61	221	736	128	0.7	3	10	36	14
Flotation Feed	34.94	99.82	0.76	0.27	3.55	2.34	1.41	99.3	97.0	90.0	64.0	86.0
Rougher Concentrate	5.60	16.00	4.66	1.38	19.14	12.06	6.84	98.3	80.5	77.7	52.9	67.2
Cleaner Concentrate	1.93	5.50	13.34	3.82	51.31	31.81	16.88	96.6	76.4	71.6	47.9	56.7
Grav/Clnr Conc. Combined	1.99	5.68	13.01	3.84	56.64	53.95	20.38	97.3	79.4	81.6	83.9	70.6
LCT-2 Concentrate (Baseline)		5.5	13.56	3.76	57.8	56.5	19.69	97.3	75.1	82.4	85.4	72.7

The simulation performed does not take into account the potential loss in fines recovery by overgrinding of PGM in a continuous, industrial scale grinding circuit. To evaluate this, further testing is needed using industrial scale grinding circuits using size-by-size gravity and flotation recovery data. (This testing is proposed on samples collected during the bulk sample test discussed in Section 13.8 and recommended in Section 13.9.) The PGM mineralogy, grain sizes and mineral associations are variable and could also lead to recovery gains not identified by testing and evaluating the one composite sample.

Elemental Scan and Deleterious Elements

Elemental scans were initially performed on the LCT-2 Concentrate, as shown in Table 13-12.

Table 13-12 Elemental Scan of LCT-2 Concentrate (Source: Blue Coast PJ5219 Report P.30; Table 16)

Analyte Symbol	Units	Analysis	LCT Assay	Analyte Symbol	Units	Analysis	LCT Assay
Ag	ppm	>100		Na	%	0.24	
Au	g/t		19.7	Nb	ppm	2.8	
Al	%	1.29		Nd	ppm	6.2	
Al2O3	%	2.55		Ni	%	>5000	0.0376
As	ppm	2670		Pb	ppm	1490	
B	ppm	<1		Pd	g/t		57.8
Ba	ppm	33		Pr	ppm	1.5	
Be	ppm	0.4		Pt	g/t		56.5
Bi	ppm	222		Rb	ppm	9	
Ca	%	0.94		Re	ppm	0.103	
Ce	ppm	13.9		S	%		0.294
Co	ppm	>500		Sb	ppm	4.2	
Cr	ppm	100		Sc	ppm	8	
Cs	ppm	0.4		SiO2	%	7.84	
Cu	ppm	>10000	13.6%	Se	ppm	177	
Dy	ppm	1.1		Sm	ppm	1.1	
Er	ppm	0.7		Sn	ppm	11	
Eu	ppm	0.37		Sr	ppm	35	
Fe	%	31.6		Ta	ppm	0.2	
Ga	ppm	3.7		Tb	ppm	0.2	
Gd	ppm	1.3		Te	ppm	130	
Hf	ppm	0.6		Th	ppm	3.1	
Hg	ppb	<10		TiO2	%	0.226	
Ho	ppm	0.3		Tl	ppm	2.76	
In	ppm	3.9		Tm	ppm	0.1	
K	%	0.13		U	ppm	1	
La	ppm	7.4		V	ppm	43	
Li	ppm	5.4		W	ppm	1	
Lu	ppm	0.1		Y	ppm	<1	
Mg	%	0.61		Yb	ppm	0.8	
MgO	%	1.09%		Zn	ppm	8580	
Mn	ppm	332		Zr	ppm	38	
Mo	ppm	34		LOI	%	12.15	

There were no elements identified that would impact the ability of the concentrate to be processed at a smelter. The only element that may be penalized is arsenic (As), at 2,670 ppm, which is close to the 2,500 ppm threshold. Subsequent discussions with prospective smelters did not result in any penalties being included in indicative terms at the concentrate tonnages projected.

A subsequent program evaluated the potential of gravity recoverable concentrate. Samples of open circuit flotation cleaner concentrate and gravity concentrates were also analyzed. The results are presented in Table 13-13.

Table 13-13 Elemental Scan of Flotation and Gravity Concentrates (Source: Blue Coast PJ5313 Report P.19/20; Table 12/13)

Analyte Symbol	Units	F-6 Flot Conc	F-7 Flot Conc	F-8 Flot Conc	F-9 Flot Conc	F-8 Grav Tip	F-9 Grav Tip
Ag	ppm	82.41	82.24	81.44	75.88	440.99	242.38
Au	g/t	13.9	13	12.2	11.4	944.7	320.6
Al	%	1.31	1.35	1.28	1.72	2.83	2.24
As	ppm	2741.61	2021.39	2701.55	2489.05	24001.29	21041.79
Ba	ppm	92.88	104.04	98.75	114.22	101.01	79.14
Be	ppm	<0.2	<0.2	<0.2	<0.2	9.81	9.29
Bi	ppm	157.54	163.59	141.81	145.26	979.38	702.9
Ca	%	0.84	0.95	0.72	1.17	1.73	1.14
Co	ppm	1415.46	1218.12	1357.7	1411.16	4199.69	3651.32
Cr	ppm	636.41	626.02	618.85	564.65	137	103.18
Cu	%	11.9	11.57	10.67	9.73	3.05	3.09
Fe	%	38.68	40.07	41.22	36.53	30.99	33.96
Ga	ppm	31.49	33.58	31.29	32.2	<100	<100
Hf	ppm	<20	<20	<20	<20	<100	<100
Hg	ppm	<20	<20	<20	<20		
In	ppm	<3	<3	<3	<3	<100	<100
K	%	0.14	0.15	0.14	0.18	0.2	0.16
Li	ppm	7.03	6.97	6.55	9.21	<10	<10
Mg	%	0.49	0.47	0.43	0.61	1.34	1.04
Mn	ppm	361.19	353.35	347.09	412.41	2136.14	1898.23
Mo	ppm	52.67	51.76	52.79	46.69	<5	<5
Na	%	0.51	0.63	0.57	0.68	<.05	<.05
Nb	ppm	<10	<10	<10	<10	<50	<50
Ni	%	3.31	3.18	3.11	2.75	4.98	4.56
P	%	0.09	0.09	0.08	0.1	0.07	0.06
Pb	ppm	1009.54	997.9	982.22	973.13	5243.23	3867.21
Pd	g/t	42.9	35.7	37.7	37.3	354.2	288.6
Pt	g/t	20.2	13.5	12.7	13	944.7	812.3
Rb	ppm	<20	<20	<20	<20	<100	<100
Re	ppm	<20	<20	<20	<20	<100	<100
S	%	27.59	27.59	27.85	25.67	15.81	16.26
Sb	ppm	29.41	22.07	24.91	24.38	84	62.49
Se	ppm	163.49	154.67	155.21	150.94	119.3	143.87
Sn	ppm	10.27	<10	<10	10.66	<50	<50
Sr	ppm	39.27	43.32	39.93	50.23	39.09	22.5
Ta	ppm	21.63	18.8	21.58	19.11	<50	<50
Te	ppm	155.39	148.06	132.89	127.53	938.85	719.98
Ti	%	0.12	0.11	0.11	0.14	2.83	2.61
Tl	ppm	4.86	2.96	5.27	4.75	<10	<10
V	ppm	41.6	38.94	38.16	50.32	138.49	110.65
W	ppm	<10	<10	<10	<10	87	<50
Zn	ppm	7905.03	7887.02	7644.36	7315.21	2017.48	1962.1
Zr	ppm	57.57	64.08	60.91	68.11	159.08	129.49

The flotation concentrates elemental analysis compared well with the LCT-2 results, with no elements at levels that would impact their ability to be processed at a smelter. As with the LCT, As averaged around the threshold value of 2,500 ppm although no penalties were included in indicative terms received.

The samples from the gravity concentrate tip were elevated in Pt, Pd, and Au, and therefore had elevated levels of As at over 2%, and levels of Bi and Te of nearly 1,000 ppm, which are the components of the precious metal minerals. This concentrate mass is very small; therefore, this material would either be a specialty product for a smelter, or it would be re-combined with the flotation concentrate for treatment at a smelter. Once recombined with the concentrate, the elemental concentrations would be similar to the LCT-2 analysis.

13.5 Mineral Sensing and Sorting

Preconcentrating using ore sorting to reduce the amount of material that would have to be trucked and processed was evaluated by SRK in 2020.

This pre-concentration opportunity was not specifically re-evaluated in this 2024 Updated PEA.

For ore sorting to be feasible, the mineralization must be heterogeneous to differentiate valuable versus reject material. SRK used an NSR methodology to evaluate the heterogeneity of a deposit based on drill core data. Using 2020 NSR data, each drill core interval was compared against a 20-ft composite (based on the expected bench height).

The distribution of NSR of the sample interval versus the composite was then compared to assess its heterogeneity. In material contained in the resource above cut-off grade, 45.5% of the sample intervals were identified of having an NSR value of less than $45/tonne. The value of $45/tonne was selected as minimum value required as it is the estimated cost to truck and process one tonne of material. For material outside the resource, because it is below the cut-off grade, 30.6% of the intervals were identified as having an NSR value of greater than the $45/tonne required to process. This distribution indicated the potential for sorting either waste or resource material and justified advancing to testing.

To evaluate whether the ore sorting technologies available could separate the high and low NSR value material, specimens which displayed heterogeneity in NSR were selected from drill core and sent to Steinert GmbH facilities in Kentucky. 160 specimens were selected across six samples (20 from within the resource cut-off grade, and 30 from outside the resource cut-off grade.) Samples were tested using induction, x-ray transmission (XRT), and lasers (the last for particle sizing to assist the other techniques). Steinert established that the best results were a proprietary simulation that used all three of the technologies.

The samples were then shipped to ALS Global's testing laboratory in Kamloops, BC, for assay of precious metals and multi-element induced couple plasma mass spectroscopy (ICP). Results are shown in the table presented in Table 13-14.

Table 13-14 Test Results of Specimens Evaluated at Steinert GmbH (Source: Crean Hill PEA – September 2023, XPS, 2023)

Denison Specimens within Resource as defined by Cut-Off Grade

Stream	Count		Assay						Distribution %					
	Number	%	Cu %	Ni %	S %	Pd g/t	Pt g/t	Au g/t	Cu	Ni	S	Pd	Pt	Au
Product	28	70	1.86	0.89	4.12	7.69	5.04	2.88	98.2	97.1	98.6	98.7	96.5	97.5
Waste	12	30	0.08	0.06	0.14	0.24	0.42	0.17	1.8	2.9	1.4	1.3	3.2	2.5
Feed	40	100	1.33	0.64	2.92	5.45	3.66	2.06	100	100	100	100	99.7	100

Denison Specimens outside Resource as defined by Cut-Off Grade

Stream	Count		Assay						Distribution %					
	Number	%	Cu %	Ni %	S %	Pd g/t	Pt g/t	Au g/t	Cu	Ni	S	Pd	Pt	Au
Product	41	34.2	0.33	0.08	0.51	0.56	1.14	0.39	74.2	63.6	73.7	81.7	87.1	81.1
Waste	79	65.8	0.06	0.02	0.1	0.06	0.09	0.05	25.8	36.4	26.3	18.3	12.9	18.9
Feed	120	100	0.15	0.05	0.24	0.23	0.45	0.16	100	100	100	100	100	100

Approximately 96% of the Au, Pt, Pd, Cu, and Ni metals are contained in 70% of the mass, indicating that 30% of the mass may be rejected with limited loss of metal. In sub-cut-off material, 34% of the mass contains 74% of the Cu, 64% of the Ni, and over 80% of the PGM. If pre-concentration can be applied to the sub-cut-off grade material, the opportunity exists to extract additional value.

To determine obtainable separations and evaluate the potential economic benefit of preconcentration, piloting of a suitable bulk sample for evaluation of rejection rates and recovery, along with estimates of capital and operating costs, are required.

13.6 Evaluation of Tailings Reactivity

The potential of acid drainage from process tailings were initially evaluated by Blue Coast using acid base accounting (ABA) and net acid generation (NAG) tests. A composite representing the process tailings was produced by bending the rougher and cleaner one tails from LCT-2 in the appropriate ratio. The results of these tests are shown in the tables presented in Table 13-15 and Table 13-16.

Table 13-15 ABA Test Results (Source: Blue Coast PJ5219 Report P.36; Table 23)

Sample Source	Neutralizing Potential (NP) (kg $CaCO_3$/t)	MPA (kg $CaCO_3$/t)	NNP (kg $CaCO_3$/t)	Paste pH
LCT-2 Combined Tails	49	17.8	31	7.9

Table 13-16 NAG Test Results (Source: Blue Coast PJ5219 Report P.36; Table 24)

Sample Source	Net Acid Generation @ pH 4.5 (kg H_2SO_4/t)	Net Acid Generation @ pH 7.0 (kg H_2SO_4/t))	pH
LCT-2 Combined Tails	<0.01	<0.01	10.2

A shake flask extraction test was also performed to evaluate the potential of mobilization of metals contained in the tails at neutral pH. A separate tails sample was mixed at a distilled water to tails ratio of 3:1 and was allowed to react for 24 hours. The filtrate extracted from this test was analyzed using ICP. The analysis of the leachate is presented in Table 13-17.

Table 13-17 Shake Flask Metal Mobilization Test Results (Source: Blue Coast PJ5219 Report P.36; Table 25)

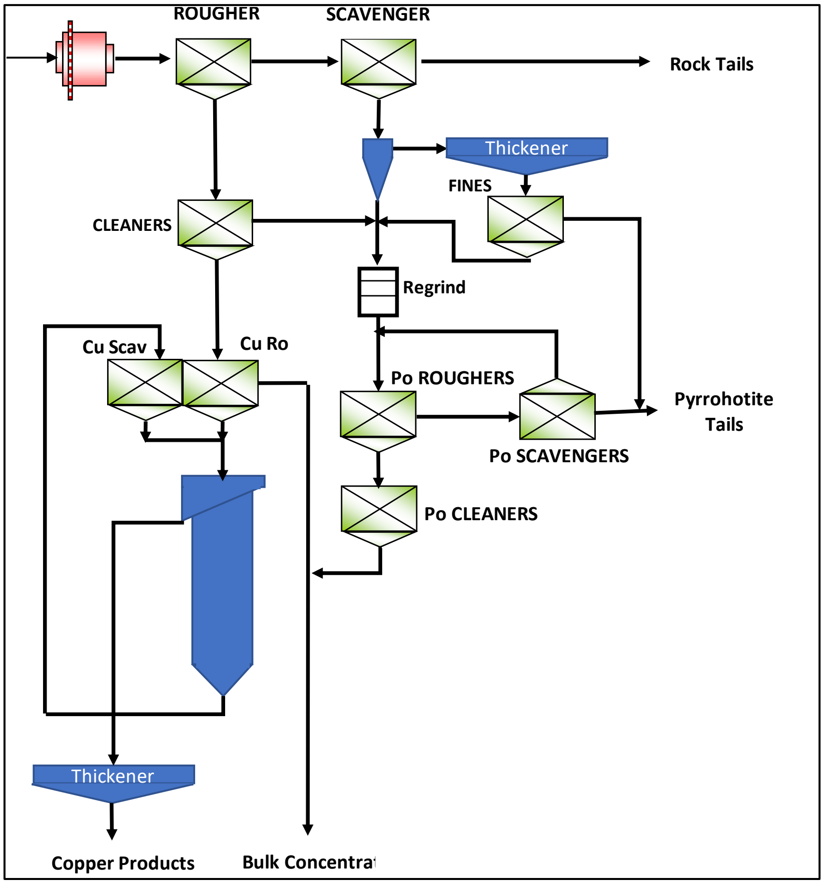
Element Symbol	Units	Concentration
Ag	mg/L	<0.000050
Al	mg/L	0.132
Ar	mg/L	0.0363
B	mg/L	0.022
Ba	mg/L	0.0067
Be	mg/L	<0.00050
Bi	mg/L	<0.00050
Ca	mg/L	21.0
Cd	mg/L	<0.000050
Co	mg/L	0.0017
Cr	mg/L	<0.00050
Cu	mg/L	<0.0010
Fe	mg/L	<0.030
Hg	mg/L	<0.000050
K	mg/L	7.81
Li	mg/L	<0.0050
Mg	mg/L	2.99
Mn	mg/L	0.00278
Mo	mg/L	0.0282
Na	mg/L	4.65
Ni	mg/L	0.00664
P	mg/L	<0.30
Pb	mg/L	<0.00010
Sb	mg/L	0.00108
Se	mg/L	0.00160
Si	mg/L	1.63
Sn	mg/L	<0.00050
Sr	mg/L	0.0591
Ti	mg/L	<0.010
Tl	mg/L	<0.00010
U	mg/L	0.000027
V	mg/L	<0.0010
Zn	mg/L	<0.010

The ABA test and the NAG test indicate that the tailings from the process are unlikely to generate acid, and the shake flask extraction tests indicate that that the contained metals have a low level of mobility at neutral pH.

13.7 Vale Clarabelle Mill

Magna has entered into a Definitive Off-Take Agreement with Vale Base Metals for the Advanced Exploration (AdEx) portion of the Crean Hill Project (See Magna Press Release March 27 2024). Under the (AdEx) Contact mineralization would be sampled, weighed and shipped to Vale's Clarabelle Mill in Sudbury for processing. This includes material from the Main, Intermediate, 9400, 9400 Footwall and 101 Footwall zones. The 109 Footwall zone is excluded from the Agreement. Vale's Clarabelle Mill processing plant flowsheet is shown in Figure 13-5.

Figure 13-5 Vale Clarabelle Process (Source: Vale 2021 Technical Report Figure 14-3; P158)



In advance of negotiating the Definitive Off-Take Agreement with Vale Base Metals and along with the mineralogy and hardness testing discussed in the previous sections, Magna completed an extensive test program using the 13 representative samples (4 x 109FW and 9 x Contact Style) of varying grades and mineralogy from the Crean Hill deposit.

The samples of drill core were composited to produce grade variability as shown in Table 13-18 below. As described in section 13.2, the 109FW samples had the lower base metal but highest PGM grades. Sulphur content was lowest in 109FW due the lower Ni and Cu sulphide and Pyrrhotite content. As and Pb was generally higher in 109FW due to higher PGM grades and also the presence of Gersdorffite while Rh was absent in 109FW and reached as high as 240 ppb in the Main CT3 sample.

Table 13-18 Magna Sample Summary (Source XPS Crean Hill Characterisation Report)

XPS Condensed Composite Name	Average Head Assay (Triplicate)									
	Cu	Ni	Cu + Ni	Fe	S	MgO	SiO_2	Co	Pb	As
	Weight %								ppm	
109 FW1	1.08	0.42	**1.50**	12.3	2.7	7.1	43.6	0.014	803	53
109 FW2	0.42	0.15	**0.57**	11.3	0.9	6.7	47.0	0.014	90	447
109 FW3	0.58	0.39	**0.97**	11.2	1.3	6.3	48.0	0.010	147	220
109 FW4	0.05	0.06	**0.11**	10.0	0.3	6.6	50.1	0.007	60	50
101 FW1	0.73	2.08	**2.81**	21.6	10.2	9.6	35.6	0.054	103	123
101 FW2	0.85	1.22	**2.07**	14.0	6.4	4.8	53.5	0.032	217	100
9400 FW1	0.27	0.52	**0.79**	12.0	2.5	5.3	44.3	0.018	77	187
9400 CT	0.93	1.23	**2.16**	20.1	7.7	7.0	38.2	0.040	70	33
INT CT1	0.82	0.83	**1.66**	14.1	4.6	5.7	43.8	0.027	380	170
INT CT2	0.56	0.64	**1.20**	12.3	3.4	5.7	49.1	0.022	77	23
MAIN CT2 LG	0.42	0.38	**0.80**	11.8	2.4	6.7	50.2	0.016	137	53
MAIN CT2	0.57	0.54	**1.12**	13.9	4.7	6.0	46.3	0.024	67	17
MAIN CT3	1.24	1.74	**2.98**	20.2	9.0	5.2	40.4	0.041	217	100

XPS Condensed Composite Name	Average Head Assay				
	Pt	Pd	Au	Ag	Rh
	ppm				(ppb)
109 FW1	5.02	2.97	1.93	19.20	<5
109 FW2	0.94	2.09	0.38	3.90	<5
109 FW3	9.70	4.72	3.28	9.40	<5
109 FW4	2.41	1.08	0.55	2.10	<5
101 FW1	0.11	0.18	0.12	2.20	192
101 FW2	0.72	0.11	0.15	3.70	135
9400 FW1	1.94	3.30	0.86	1.30	48
9400 CT	1.04	1.08	0.30	3.30	199
INT CT1	0.54	0.19	0.16	4.10	54
INT CT2	0.72	0.13	0.26	2.40	13
MAIN CT2 LG	0.27	0.21	0.07	2.80	37
MAIN CT2	0.25	0.11	0.08	2.30	39
MAIN CT3	1.03	0.45	0.46	5.40	240

The lab scale testing using the Vale flowsheet generated a series of concentrate grade versus metal recovery curves at varying head grade and mineralization type, 109FW and Contact. These test results were used to develop metal recovery predictions at the varying feed grades while producing a concentrate grade consistent with the Clarabelle Mill target.

The lower base metal feed grade 109FW samples were unable to achieve the desired concentrate grade produced by the mill. Generally, the other samples produced Ni recovery as a function of their head grade.

Along with individual testing of the 13 samples, 3 blend tests were performed combining varying ratios of Contact and 109FW samples to determine if any recovery synergies exist when processing blended materials. There was no clear advantage of blending versus separate processing of the Contact and 109FW mineralization other than the obvious improvement in grade/recovery by virtue of higher feed grades.

13.8 Metal Recovery

Contact Mineralization Recovery Estimates

Vale considered the test results from both 109FW and Contact mineralization as a potential feed. The Definitive Off-Take Agreement considered zones of Crean Hill Contact mineralization from the AdEx mine plan and excluded the 109FW Zone as Magna wanted to explore other processing options to improve recovery.

Using the test results, Vale proposed a series of feed grade versus metal recovery equations to be used to predict metal recovery from feed sample grades measured prior to processing through the Clarabelle Mill. The recovery equations are included in the Definitive Off-Take Agreement with Vale Base Metals. The predicted mill recovery from the test work was calculated at 80.5% Ni, 93.6% Cu and approximately 70% for Co, Pt, Pd, Au. These recoveries were established using Magna's internal (non NI 43-101) estimates of potentially minable grades for advanced exploration shown in Table 13-19.

Table 13-19 Advanced Exploration Estimated Grades

Metal	Grade*
Nickel	1.5%
Copper	1.0%
Total Precious Metals	
(Pt, Pd, Au)	1.0 g/t

*Non-NI 43-101 compliant internal estimate of potentially minable grades

Generally, overall mill recovery is a very predictable parameter in the project economics and strictly a function of sampled and measured feed grades of Crean Hill Mine Contact mineralization.

Along with mining target head grades, Magna will be responsible to produce a representative feed sample of each 2000 t lot that will be used to calculate the metal recovery at Clarabelle Mill using the equations. The description of the planned sample system and methods are described in Section 17 and 18.

The equations predicted recoveries (at Clarabelle Mill target concentrate grade) as a function of Crean Hill feed grade and were used to determine project nickel and copper concentrate smelting and refining treatment terms, which were negotiated and included in the Definitive Off-Take Agreement with Vale Base Metals. The predicted metal recovery equations and smelting/refining treatment terms are confidential and therefore not presented in the report. The resulting Net Smelter Return (NSR) from planned AdEx mine production was determined based on the projected mill recovery and accountability, mill/smelter/refining charges.

109FW Recovery Estimates

The Definitive Agreement with Vale Base Metals did not include the Crean Hill 109FW mineralization. Magna subsequently pursued several opportunities, including lab scale testing and optimization and ultimately bulk sample mining and milling of surface 109FW material. Magna reached a Toll Milling Agreement with Glencore Canada Corporation ("Glencore") (See Magna Press Release June 4 2024) for the processing of a ~20,000 t surface bulk sample of the 109 Footwall ("109FW") Zone at Glencore's Strathcona Mill.

At the time of writing this report, the bulk sample has been processed and data is being analyzed. This bulk sample will allow Magna to evaluate the processing and metal recovery at plant production scale and the samples collected will be used to test and optimize the metallurgical performance. In addition, the production run will allow for the reconciliation of the sampled feed grade against the resource estimate.

In advance of the bulk sample run and in order to assess the economics of the deposit, 7 test results from historical test programs on 109FW were used to assess the recovery over a range of head grades and at a lower concentrate grade target.

The initial analysis and model equations would be considered a Base Case recovery projection, prior to any process enhancements designed to maximize recovery of Ni, Cu and PGM from 109FW material.

The lab scale data was subjected to model fitting and minimum least squares regression to produce a Base Case feed grade versus recovery equations for Ni and Cu. PGM and Au recoveries projections were consistent with previous relationships developed and generally a ratio of Ni recovery.

The models describing the Base Case recovery relationships are shown in Table 13-20 below.

Table 13-20 Base Case 109FW Feed Grade/Recovery Relationships at 15% Ni+Cu Grade

	Base Case		
Metal	Recovery to Bulk conc at ~15% Ni+Cu Grade	Min Grade	Max Grade
Ni	85*(1-exp^(-4.424*NiHd))	0.04%	1.00%
Cu	96*(1-exp^(-5.900*CuHd))	0.06%	1.00%
Pt	Ni Rec * 0.9	1 ppm	11 ppm
Pd	Ni Rec * 0.9	1 ppm	5 ppm
Au	Ni Rec * 0.8	0.5 ppm	3 ppm
Ag	60	5 ppm	10 ppm
Mass Pull	5.378*Ni+CuHd		

The Base Case recovery projections described above are based on a standard, un-optimized flowsheet, operating at 15% Ni+Cu concentrate grade. As result, they do not represent the full potential of the lower sulphide, higher PGM 109FW material.

To predict the potential for improved recoveries from process changes identified in the various 109FW test programs, a set of Optimized projections were produced. The process changes considered include finer grind size, PGM specific reagents and gravity separation for improved PGM recovery. The recovery improvements added to the Base Case recoveries are described in Table 13-21 below.

Table 13-21 Optimization Parameters for 109FW

Metal	+%Rec from Base
Ni	4
Cu	2
Pt	9
Pd	9
Au	9
Ag	0
	0
Source	Historical Test Programs

These Optimized Projections are based on limited testwork from multiple programs and require more testing and analysis to confirm. One of the challenges in defining the full potential of gravity separation is the difference between a laboratory grinding mill and a full scale production mill in the production of fine PGM. The benefits of gravity separation result in removing the liberated PGM, specifically of Pt and Au prior to overgrinding in industrial grinding circuits. The variability in PGM mineralogy also presents challenges when attempting to select samples from limited sample inventory. Therefore, a combination of laboratory and plant testing is needed to fully quantify the benefits.

Furthermore, the optimized results would require capital and process/operating changes to the concentrator flowsheet to achieve. Therefore, these projections are presented to describe the potential at a PEA level and would need to be justified by further testwork and sound business case analysis.

An example of the Base Case and Optimized metal recoveries at 15% Ni+Cu concentrate grade for a typical 109FW feed sample is shown in the Table 13-22 below.

Table 13-22 Example of Base Case and optimized Recovery for 109FW

Metal	Feed Grade	Base Recovery to Bulk Conc at 15% Ni+Cu	Optimized Recovery to Bulk Conc at 15% Ni+Cu
%Ni	0.30	62.5	66.5
%Cu	0.60	93.2	95.2
Pt g/t	3.50	56.2	65.2
Pd g/t	4.00	56.2	65.2
Au g/t	1.20	50.0	59.0
Ag g/t	7.30	60	60
Mass Pull %		4.8	4.8

As with the Contact feed grade/recovery equations, the recovery projections as a function of head grade and were used to predict base case and optimized metal recovery from 109FW mine plans. Magna recently received various indicative smelting terms and payables for potential 109FW bulk and PGM concentrates. The predicted metal recoveries and indicative smelting terms/payables were used to calculate the Net Smelter Return (NSR) from planned mine production.

13.9 Recommendations

Based on the results of the historical and recent testing completed at the time of publication of this report, the following are recommended;

1. To complete the evaluation of enhancing value and selling 109FW mineralization to an existing mining company.

   The 109FW concentrator performance requires optimization when considering an sales agreement with a local mining company. Further testwork could enhance performance and define practical process changes to enhance the economics of Magna's 109FW deposit.

   a. Complete the Glencore Strathcona Mill bulk sample processing and data analysis of daily/shift production accounting of metal recovery and concentrate grade
   b. From the production samples collected during the bulk sample processing, execute a testing program to assess the amenability of gravity separation, impact of finer primary grinding and PGM specific reagents on base and PGM recovery.
   c. The follow up Phase 2 and 3 test programs has been estimated at $205,000 and will take 6 months to complete.
   d. Assess the economics considering recovery improvements and capital costs of required mill modifications.
   e. Based on these results, perform a business case analysis

2. The Definitive Vale – Crean Hill Off Take Agreement is sufficiently advanced with metal recovery equations defined for Contact AdEx production. This will allow Magna to evaluate the minable resource, tonnes and metal grades, capital and operating costs of mining, sampling, processing and other costs of opening of the Crean Hill Mine – Contact Zones.

No further testing of Contact mineralization is required in advance of the AdEx. AdEx drilling and sampling should however focus some attention to Rh (rhodium) as a potential source of revenue for Magna Mining. Further evaluation of the LOM mining zones and expected grades and mineralogy defined during the AdEx may prompt further testing if sufficiently different from the range of sample grades and mineralogy tested in 2023 program. It is expected that a similar approach would be used to define the feed grade versus recovery relationships required.

3. For both Contact and Footwall mineralization, further evaluate ore sorting economics based on typical capital/operating costs, base and PGM recovery and mass rejection rates including potential impact on concentrate grade versus metal recovery performance. If favorable, proceed with a full-scale test run through a production scale ore sorter unit.

14 MINERAL RESOURCE ESTIMATES

14.1 Introduction

Completion of the updated mineral resource estimates (MREs) for the Crean Hill project involved the assessment of a drill hole database, which included all data for surface drilling completed through to the effective date of this report, as well as three-dimensional (3D) mineral resource models (resource domains), 3D models of all mined-out areas (open pit and underground), 3D models of cross-cutting dykes, a recent topographic surface, and available written reports.

The Inverse Distance Squared (ID2) calculation method restricted to mineralized domains, and utilizing dynamic anisotropy search orientations was used to interpolate grades for Ni (%), Cu (%), Co (%), Pt (g/t), Pd (g/t), Au (g/t) and Ag (g/t) into block models.

Indicated and Inferred mineral resources are reported in the summary tables in Section 14.9.2. The current MRE takes into consideration that the Projects deposits would be mined by underground mining methods.

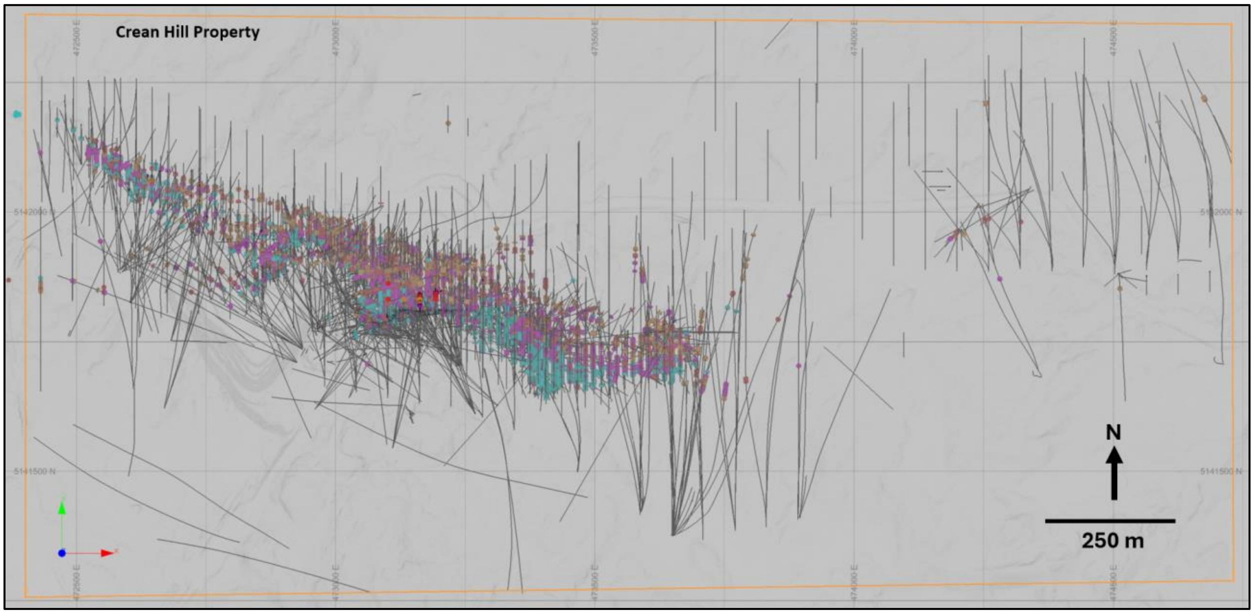
The reporting of the MRE for Crean Hill complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects (2016). The classification of the MREs is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions).

14.2 Drill Hole Database

To complete the MRE for the Property, a database comprising a series of comma delimited spreadsheets containing surface and underground drill hole information was used to construct a 3D de-surveyed drillhole database. Data were imported into Datamine Studio RM, v2.0.66.0 for statistical analysis, block modeling, and resource estimation. The database included hole location information (UTM NAD 83 coordinates, in m), survey data (final depth in m), assay data (from and to in m), lithology data, and specific gravity data. The data in the assay table included assays for Ni (%), Cu (%), Co (%), Pt (g/t), Pd (g/t), and Au (g/t), as well as Ag (g/t), Rh (ppm), S (%) and Fe (%). Note that not all assay samples had values for Pt, Pd, Au, Ag, or Rh. Ag and Rh were the least-analyzed elements and are not included in the MRE (see Section 14.5 for a summary of assay data).

The original database provided by Magna included data for 3,892 surface and underground drill holes, totalling 475,773 m, within the property boundary (Figure 14-1 and Figure 14-2). The database includes 98,757 assay intervals, totalling 197,536 m. The database was checked for typographical errors in drill hole locations, down-hole surveys, lithology, assay values, and supporting information on source of assay values. Overlaps and gapping in survey, lithology, and assay values in intervals were checked. Gaps in the assay sampling and unsampled elements were assigned a grade value of 0.001 for Ni, Cu, Co.

Figure 14-1 Longitudinal View Looking North – Distribution of Surface and Underground Drill Holes on the Crean Hill Property in UTM And 83 grid



14.3 Mineral Resource Modelling and Wireframing

Two wireframe solids were created for the mineral resource, a mineralization envelope based on a 0.75 % Nickel Equivelent (NiEq) cutoff, and a broader dilution envelope based on 0.15% NiEq cutoff. (Figure 14-3). Solids were developed in Leapfrog using a minimum 0.75% NiEq. No minimum thickness was applied, and all drillholes were referenced regardless of the date they were drilled. Adjustments were made to the solids to account for underground mapping. Due to the nature of mineralization, there are portions of the 0.75 % NiEq mineralized envelope that contain zones of lower grade mineralization however they are contiguous with the overall mineralization. Limited sporadic higher-grade mineralization exists outside of mineralized envelope and are included within the dilution envelope. With additional drilling, some areas of scattered mineralization may get incorporated into the mineral domains. The Crean Hill deposit generally strikes 85° to 110° and dips / plunges steeply southeast, with the exception of the 101 Zone which strikes at 40° and dips near vertical. The mineral domain extendd for roughly 1,500 m along strike and reach a maximum depth of 1,800 below surface. The mineralized zone is crosscut by late, unmineralized olivine diabase dykes and quartz diabase dykes (trap dykes) (Figure 14-4). The topographic digital terrain model was generated using LiDAR topographic data collected by Loncan.

Figure 14-2 Longitudinal View Looking North – Distribution of Surface and Underground Drill Holes on the Crean Hill Property in UTM And 83 grid

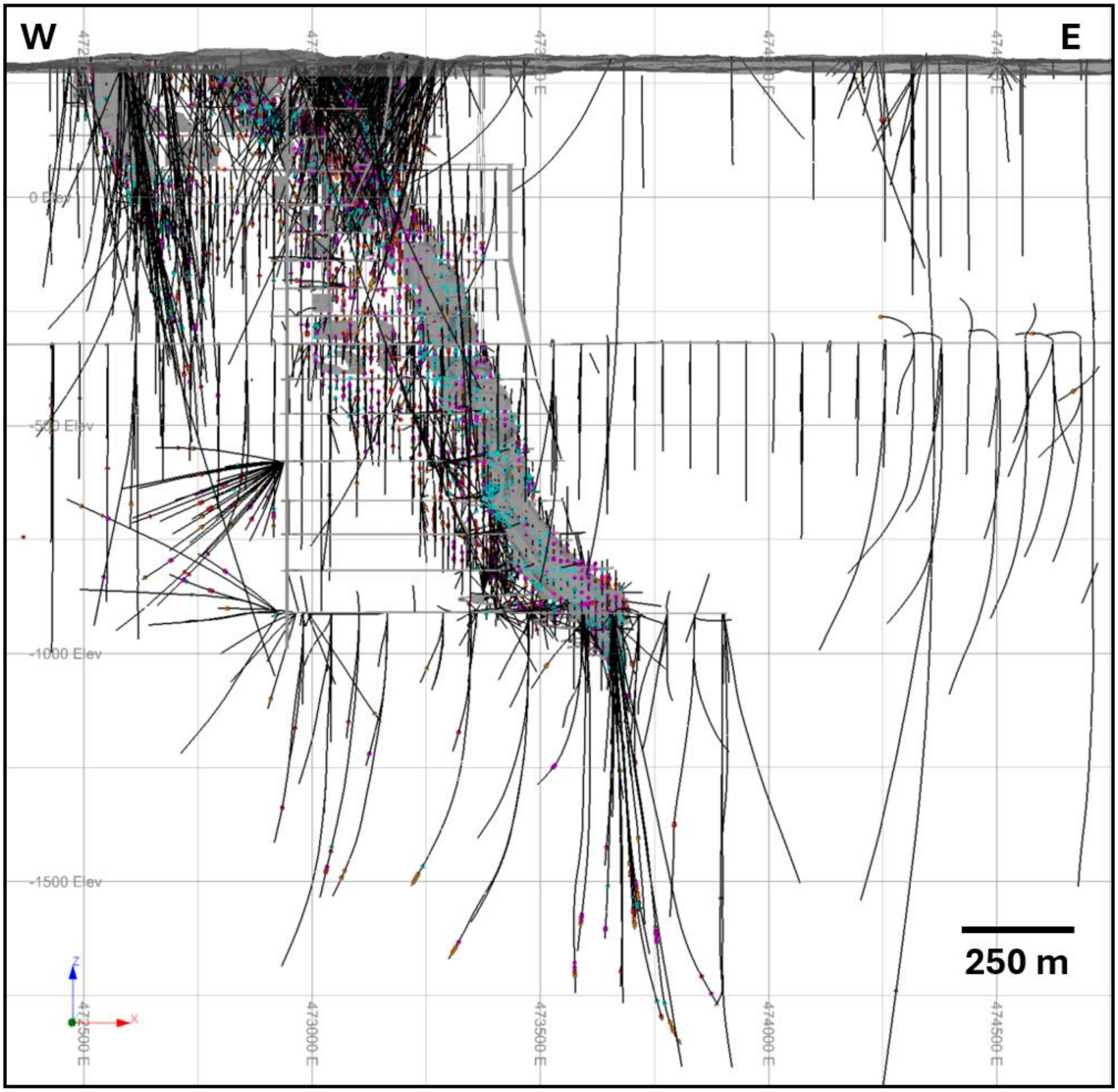


Figure 14-3 Longitudinal View Looking North – Wirerframe solids showing the 0.75% NiEq Mineralization Envelope and the 0.15% NiEq Dilution Envelope

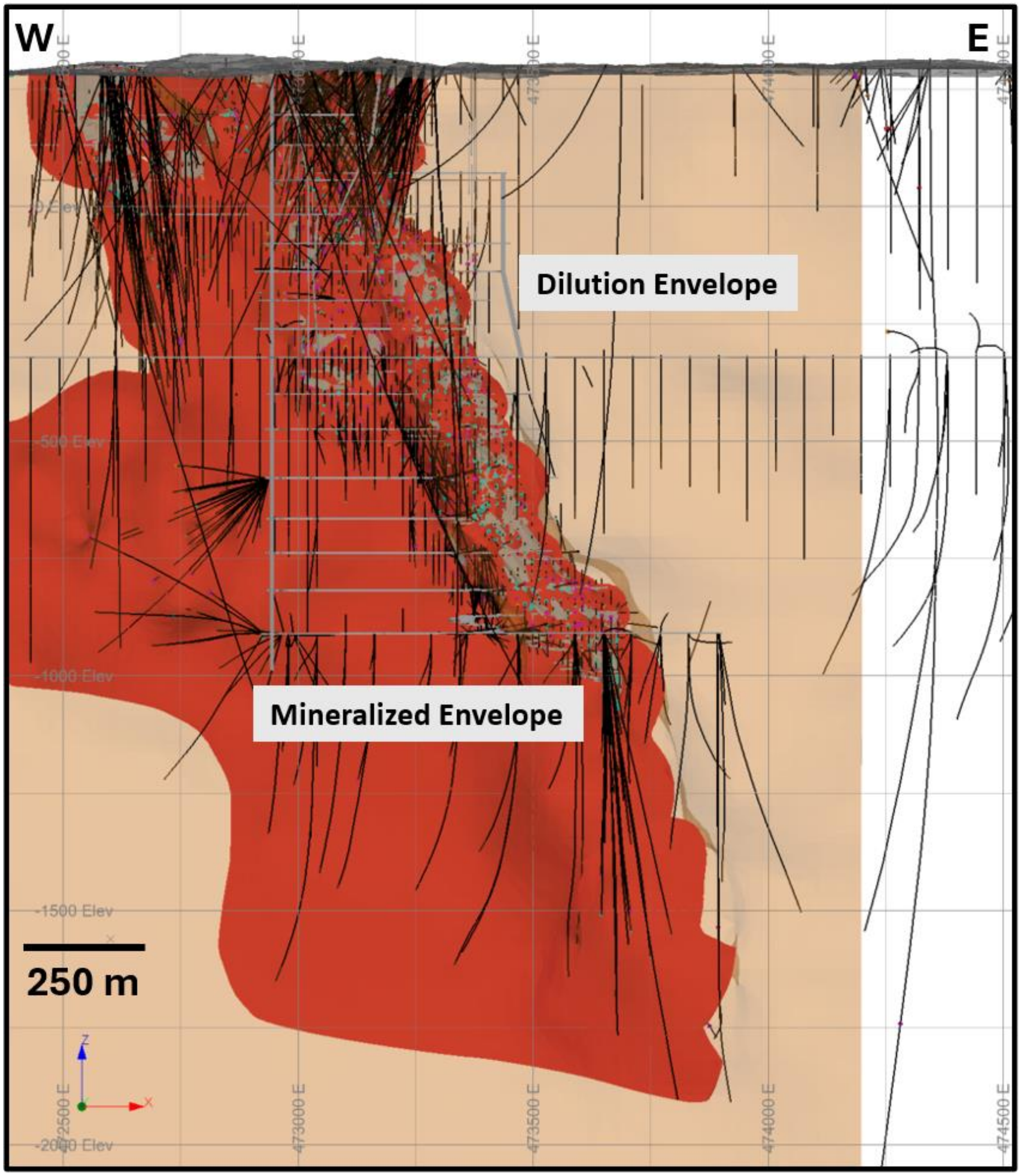
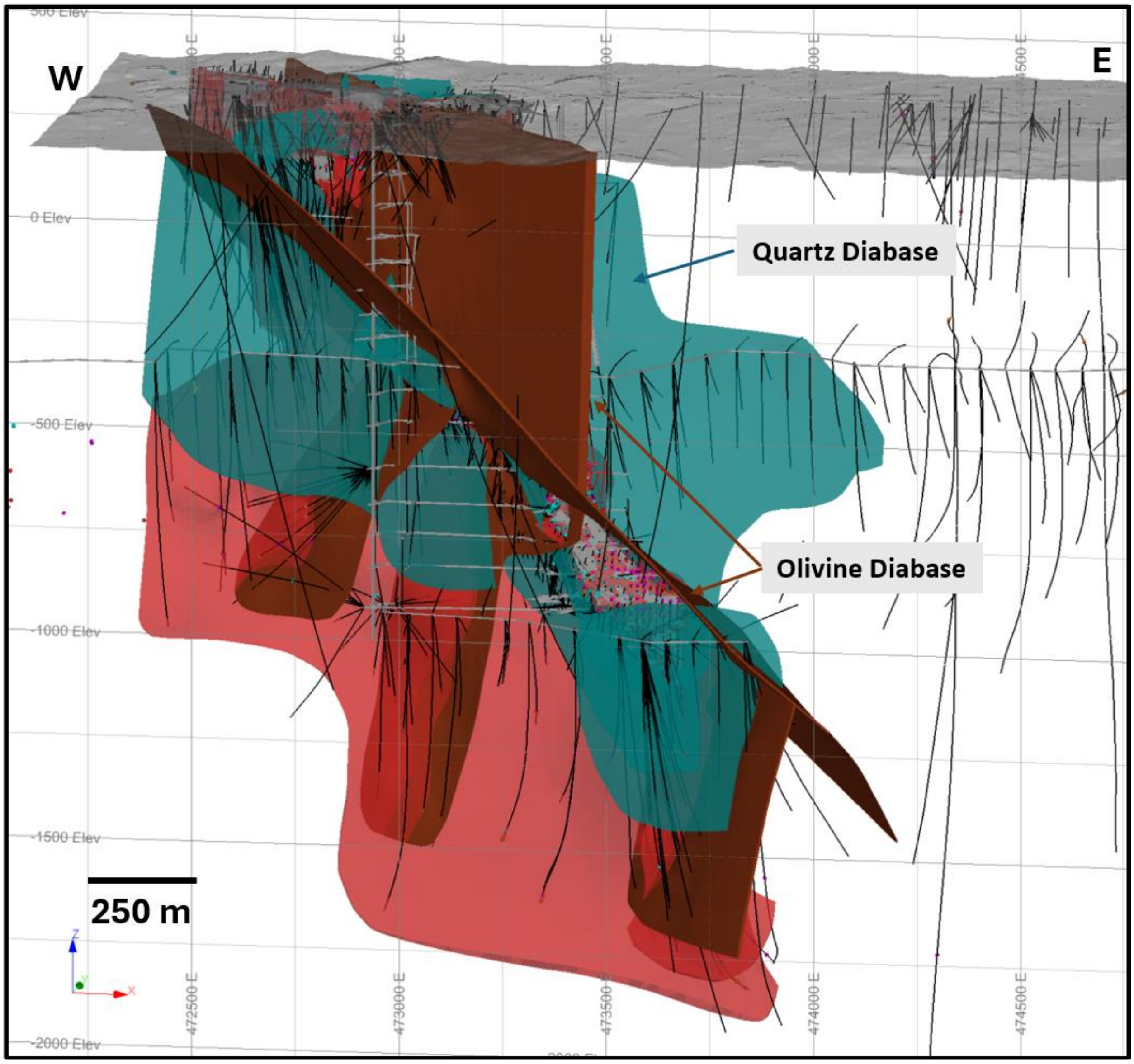


Figure 14-4 3D Oblique View Looking North – Wireframe Solids of the Olivine Diabase and Quartz Diabase dykes



14.4 Specific Gravity

Most diamond drill core samples completed by Loncan from 2015-2017 were subject to specific gravity measurement, by measuring dry and submerged sample weight (WSP, 2020). Each sample was allowed to dry fully after being cut and weighed on top of the balance. The sample was then placed in a mesh basket suspended from a free-hanging hook below the balance and weighed submerged in water. The water was kept at approximately 20°C using a heater / agitator. Specific gravity is calculated as follows: • SG = Dry weight / (Dry weight – Wet weight) × 0.998 Where 0.998 is a temperature correction for at water at 20°C. To ensure high-quality data, the balance was checked with reference weights prior to each day of density determinations, and a density determination was performed on a reference rock sample. For historical samples without SG measurements—which includes all historical data post-1968, SG was determined using an Alcock regression formula. Where Cu, Ni, and S assays were available, SG was calculated as follows: • SG = 100 / (100 / 2.88 + 0.0166 × %Cu - 0.1077 × %Ni - 0.328 × %S) For samples drilled before

1968 where only Cu and Ni assay results are available, SG was calculated as below: • SG = 2.80 + 0.02 × %Cu + 0.20 × %Ni. These formulae were developed for semi-massive to massive contact Ni-Cu sulphide deposits. For Magna Mining samples without SG measurements, SG was calculated based on the nickel grade using the formula SG=(0.2057*NI+2.88).

14.5 Compositing

The assay sample database available for the current resource estimate included 98,757 assay intervals, totalling 197,536 m. of drilling. Of this, 35,779 assays (70,017 m) occur within the deposit mineralized envelope based on the 0.75 % NiEq wireframe. Of the 35,779 assays, all had Ni, Cu and Co values; 23,775 had Pt, Pd, Au and Ag values. Unsampled Cu, Ni and Co intervals within the mineralized envelope wire frame were given a value of 0.001 and unsampled precious metals samples were left absent. A statistical analysis was performed on the assay data from within the mineralized domains. The average length of assay sample intervals is 6.81 ft (1.96 m). Sample intervals were composited into 2.0 m downhole intervals, beginning at the start of each drillhole, with no residual samples. The composites were extracted to point files for statistical analysis and capping studies and individual grades were capped appropriately. A total of 39,906, 2.0 m composites occur within the mineralized envelope wireframe model. A statistical analysis of the composite data from within the mineralized domains is presented in Table 14-1 and a comparison of un-capped verses capped composites is presented in Table 14-2. These values were used to interpolate grade into the resource blocks.

Table 14-1 Statistical Analysis of the 2.0 m Composite Data from within the Crean Hill Mineralized Domain

	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	Ag g/t
Average Sample Length	1.99						
Total Assay Samples	39,906	39,906	39,906	22,179	22,179	22,179	22,179
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	20.86	8.50	1.06	333.77	159.71	38.91	155.88
Mean	0.69	0.75	0.03	0.82	0.74	0.28	0.97
Variance	0.96	1.05	0.00	15.12	5.55	1.16	14.15
Coefficient of Variation	1.41	1.36	1.25	4.75	3.17	3.81	3.87
Standard Deviation	0.98	1.03	0.03	3.89	2.36	1.08	3.76

14.6 Grade Capping

A statistical analysis of the cumulative composite database within the deposit wireframe model (the "resource" population) was conducted to investigate the presence of high-grade outliers, which can have a disproportionately large influence on the average grade of a mineral deposit. High-grade outliers in the composite data were investigated using statistical data, histogram plots, and cumulative probability plots of the composite data. The statistical analysis was completed using Datamine Studio RM. After a review of the composites within the mineralized domain, it is the Author's opinion that minimal capping of high-grade composites to limit their influence during the grade estimation is necessary. Appropriate capping levels were chosen by metal and a summary of grade capping values within the mineralized domains is presented in Table 14-2. Capped composites are used for grade interpolation into the Crean Hill deposit block model.

Table 14-2 Capping Summary of the Crean Hill Mineralized Domain

Attribute	Capping Value	# Capped	Mean of Raw Composites	Mean of Capped Composites	CoV of Raw Composites	CoV of Capped Composites
Cu %	9.5	52	0.69	0.69	1.41	1.37
Ni %	7.5	3	0.75	0.75	1.36	1.36
Co %	0.2	36	0.03	0.03	1.25	1.21
Pt g/t	35	26	0.82	0.77	4.75	2.57
Pd g/t	35	13	0.74	0.73	3.17	2.43
Au g/t	19	21	0.28	0.28	3.81	3.37
Ag g/t	50	18	0.97	0.95	3.87	3.50

14.7 Block Model Parameters

The Crean Hill mineralized envelope and broader dilution envelope are used to constrain composite values chosen for interpolation, and the mineral blocks reported in the estimate of the Mineral Resource. A block model within UTM NAD 83 coordinate space with no rotation and block dimensions of 4.0 x 4.0 x 4.0 m in the x (east), y (north) and z (level) directions was created. Blocks were allowed to split to 0.5 m resolution to better honour the shape and volume of mineralized envelope. The block size was selected based on borehole spacing, composite length, the geometry of the mineralized domains, and the selected underground mining method. At the scale of the Denison deposit this provides a reasonable block size for discerning grade distribution, while still being large enough not to mislead when looking at higher cut-off grade distribution within the model. The model was intersected with surface topography to exclude blocks, or portions of blocks, that extend above the bedrock surface.

14.8 Grade Interpolation

Nickel, copper, cobalt, platinum, palladium and gold and silver were estimated for both the mineralized envelope and the dilution envelope in the Denison deposit. Blocks within each mineralized domain were interpolated using composites assigned to that domain. To generate grade within the blocks, the inverse distance squared (ID^2) interpolation method was used and dynamic anisotropy search orientation was utilized, based on the trend of mineralization within the overall mineralized envelope. Grade trends were based on a combination of surface and underground mapping within historical workings, and interpretation based on diamond drilling data. The search ellipse axes are generally oriented to reflect the observed preferential long axis (geological trend) of the vein structures and the observed trend of the mineralization down dip/down plunge. Three passes were used to interpolate grade into all of the blocks in the mineralized envelope. For Pass 1 the search ellipse size was set at 25 x 15 x 35 m in the X, Y, Z direction; for Pass 2 the search ellipse size for each domain was set at 50 x 30 x 70 m; for Pass 3 the search ellipse size was set at 75 x 45 x 105m. Grades were interpolated into blocks using a minimum of 6 and maximum of 10 composites for all passes and a maximum of 2 composites per drillhole. Within the mineralized envelope wireframe, blocks were classified as Indicated if they were populated with grade during Pass 1 and during Pass 2 of the interpolation procedure, and the Pass 3 search ellipse were classified as Inferred.

14.9 Mineral Resource Classification Parameters

The Mineral Resource Estimate presented in this Technical Report was prepared and disclosed in compliance with all current disclosure requirements for mineral resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects. The classification of the current Mineral Resource Estimate into Indicated and Inferred is consistent with current 2014 CIM Definition Standards - For Mineral Resources and Mineral Reserves, including the critical requirement that all mineral resources "have reasonable prospects for eventual economic extraction".

The current Mineral Resource is sub-divided, in order of increasing geological confidence, into Inferred and Indicated categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource. There are no Measured Mineral Resources reported.

A Mineral Resource is 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.

Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold or base metal deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.

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.

Indicated Mineral Resource

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource Estimate is of sufficient quality to support a Preliminary Feasibility Study which can serve as the basis for major development decisions.

Inferred Mineral Resource

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.

There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.

14.9.1 Reasonable Prospects of Eventual Economic Extraction

The general requirement that all Mineral Resources have “reasonable prospects for economic extraction” implies that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade considering extraction scenarios and processing recoveries. To meet this requirement, the Author considers that the Denison deposit mineralization is amenable for open pit and underground extraction.

To determine the quantities of material offering “reasonable prospects for economic extraction” by underground mining methods, reasonable mining assumptions to evaluate the proportions of the block model (Indicated and Inferred blocks) that could be “reasonably expected” to be mined from underground are used. Based on the size, shape and orientation of the Deposit, it is envisioned that the Deposit may be mined using the longhole open stoping mining method (a bulk mining method that has long been utilized in the Sudbury region). The underground parameters used, based on this mining method, are summarized in Table 14-3. Based on these parameters, a selected base case cut-off grade of 1.1% NiEq is used to determine the underground Mineral Resource Estimate for the Crean Hill deposit. The MRE is limited to the -1085 elevation at depth.

The reader is cautioned that the reporting of the underground resources is presented undiluted and in situ (no minimum thickness), constrained by continuous 3D wireframe models, and are considered to have reasonable prospects for eventual economic extraction. There are no underground mineral reserves reported at this time.

Table 14-3 Parameters Considered for Underground Base-case Cut-off Grade

Parameter SGS 2024	Value	Unit
Nickel Price	$8.50	US$ per pound
Copper Price	$3.75	US$ per pound
Cobalt Price	$17.00	US$ per pound
Platinum Price	$950.00	US$ per ounce
Palladium Price	$1,100.00	US$ per ounce
Gold Price	$1,950.00	US$ per ounce
Underground Mining Cost	$80.00	US$ per tonne mined
Transportation	$5.00	US$ per tonne milled
Processing Cost (incl. crushing)	$15.50	US$ per tonne milled
Treatment and Refining	$15.00	US$ per tonne milled
Underground General and Administrative	$7.00	US$ tonne of feed
Nickel Recovery	78	Percent (%)
Copper Recovery	95.5	Percent (%)
Cobalt Recovery	56	Percent (%)
Platinum Recovery	69.2	Percent (%)
Palladium Recovery	68	Percent (%)
Gold Recovery	67.7	Percent (%)
Mining loss/Dilution (underground)	10/10	Percent (%) / Percent (%)

14.9.2 Mineral Resource Statement

The current underground MRE for the Crean Hill deposit is presented in Table 14-4.

Highlights of the Crean Hill Property MRE are as follows (exclusive of mined material):

- The underground MRE includes, at a base-case cut-off grade of 1.1% NiEq, 18,444,000 tonnes grading 1.01% Ni, 0.87% Cu, 0.035% Co, 0.98 g/t Pt, 1.12 g/t Pd, 0.37 g/t Au in the Indicated category, and 989,000 tonnes grading 0.70% Ni, 0.53% Cu, 0.026% Co, 0.26 g/t Pt, 1.66 g/t Pd, 0.29 g/t Au in the Inferred category.

Table 14-4 Crean Hill Project Underground Mineral Resource Estimate, April 15, 2024

Cut-off Grade	Tonnes	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	NiEq %
Indicated								
1.1%	18,444,000	0.87	1.01	0.035	0.98	1.12	0.37	1.96
Inferred								
1.1%	989,000	0.53	0.70	0.026	0.98	1.66	0.29	1.56

The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au, a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.

Crean Hill Property Mineral Resource Estimate Notes:

(1) *The effective date of the Crean Hill Property Mineral Resource Estimate (MRE) is April 15, 2024. This is the close out date for the final mineral resource models and mine out models (as-builts)*

(2) *Allan Armitage, Ph.D., P. Geo. of SGS Geological Services is an independent Qualified Person as defined by NI 43-101 101 and is responsible for the current Crean Hill MRE. Armitage conducted multiple site visits to the Crean Hill Property including on May 25-26, 2022, July 25, 2023, July 02, 2024, and July 25, 2024.*

(3) *The classification of the current MRE into Indicated and Inferred mineral resources is consistent with current 2014 CIM Definition Standards - For Mineral Resources and Mineral Reserves.*

(4) *All figures are rounded to reflect the relative accuracy of the estimate and numbers may not add due to rounding.*

(5) *The mineral resource is presented undiluted and in situ, constrained by 3D grade control resource models, and are considered to have reasonable prospects for eventual economic extraction. The mineral resource is exclusive of mined out material.*

(6) *Mineral resources which are not mineral reserves do not have demonstrated economic viability. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that most Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

(7) *The Crean Hill mineral resource estimate is based on a validated drill hole database which includes data from 3,892 surface and underground diamond drill holes completed between 1951 and March 2024 and totals 475,773 m. The resource database totals 98,757 assay intervals, representing 197,536 m of data.*

(8) *The mineral resource estimate is based on a three-dimensional ("3D") resource model of the main mineralization and a broader dilution envelope. 3D models of mined out areas were used to exclude mined out material from the current MRE.*

(9) *Grades for Ni, Cu, Co, Pt, Pd, Ag and Au are estimated for each mineralization domain using ~2.0 m capped composites assigned to that domain. To generate grade within the blocks, the inverse distance squared (ID^2) interpolation method was used for all domains.*

(10) *Specific gravity values were assigned to each block based on a regression formula defined by a database of 32,592 samples. SG=(0.2057xNi%+2.88).*

(11) *Based on the size, shape, and orientation of the Crean Hill Deposit, it is envisioned that the deposits may be mined using both bulk and selective mining methods including Longhole Stoping and Mechanized Cut and Fill (MCAF) (mining methods that have long been utilized in the Sudbury region). The MRE is reported at a base case cut-off grade of 1.10% NiEq. The mineral resource grade blocks are quantified above the base case cut-off grade and within the constraining mineralized wireframes (considered mineable shapes).*

(12) *The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au (Ag is not considered), a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.*

(13) *The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.*

14.10 Model Validation and Sensitivity Analysis

Visual checks of block grades against the composite data and assay data on vertical section showed good correlation between block grades and drill intersections.

A comparison of the average capped composite grades and average assay grades with the average grades of all the blocks in the block model was completed and is presented in Table 14-5. The overall grades of the composites and blocks verses the assay data reflects the unsampled intervals being set to 0.001% before compositing, and distribution of diamond drilling within the higher-grade portions of the deposit.

The Crean Hill MRE has been estimated at a range of cut-off grades to demonstrate the sensitivity of the resource to cut-off grades (Table 14-6). The current MRE is reported at a base-case cut-off grade of 1.10 % NiEq (highlighted). Values in this table reported above and below the base case cut-off grades should not be misconstrued with a Mineral Resource Statement. The values are only presented to show the sensitivity of the block model estimate to the base case cut-off grade.

Table 14-5 Comparison of Average Assay and Composite Grades with Global Block Model Grades

Domain	Variable	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	Ag g/t
Mineralized Envelope	Assays	0.78	0.86	0.03	0.82	0.75	0.28	0.97
	Composites Capped	0.69	0.76	0.03	0.76	0.73	0.28	0.95
	Blocks	0.55	0.63	0.02	0.53	0.54	0.19	0.53

Table 14-6 Crean Hill Project Underground Mineral Resource Estimate at Various Cut-off Grades, April 15, 2024

Cut-off Grade	Tonnes	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	NiEq %
Indicated								
0.90	24,944,000	0.77	0.87	0.030	0.86	1.00	0.32	1.70
1.10	**18,444,000**	**0.87**	**1.01**	**0.035**	**0.98**	**1.12**	**0.37**	**1.96**
1.30	13,764,000	0.98	1.15	0.039	1.10	1.27	0.41	2.21
1.50	10,441,000	1.08	1.29	0.043	1.23	1.43	0.46	2.48
Inferred								
0.90	3,912,000	0.45	0.60	0.022	0.83	1.32	0.24	1.31
1.10	**989,000**	**0.53**	**0.70**	**0.026**	**0.98**	**1.66**	**0.29**	**1.56**
1.30	562,000	0.62	0.80	0.030	1.07	1.91	0.32	1.78
1.50	352,000	0.74	0.93	0.034	1.00	1.99	0.28	1.96

14.11 Comparison of the updated MRE to the 2022 MRE

The Underground portion of the 2022 MRE is presented in Table 14-7. Overall, grades of the updated 2024 MRE are slightly higher, and tonnes have increased (18,444,000 vs.14,531,000) compared to the 2022 MRE. Variance can be explained by the 2024 MRE based entirely on underground resource, while the 2022 MRE had a component of near surface open pit mining at a lower cut-off grade, resulting in less tonnes at higher grade within the area of the 2022 open pit resource.

Table 14-7 Crean Hill Project 2022 Underground Mineral Resource Estimate, August 19, 2022

Cut-off Grade	Tonnes	Cu%	Ni%	Co %	Pt g/t	Pd g/t	Au g/t
Indicated							
1.1%	14,531,000	0.84	0.96	0.03	0.88	1.02	0.54
Inferred							
1.1%	1,170,000	0.46	0.61	0.02	0.64	1.09	0.21

14.12 Disclosure

All relevant data and information regarding the Project are included in other sections of this Technical Report. There is no other relevant data or information available that is necessary to make the technical report understandable and not misleading.

The Authors are not aware of any known mining, processing, metallurgical, environmental, infrastructure, economic, permitting, legal, title, taxation, socio-political, or marketing issues, or any other relevant factors not reported in this technical report, that could materially affect the updated MRE.

15 MINERAL RESERVE ESTIMATE

There are no Mineral Reserve Estimates for the Property.

16 MINING METHODS

16.1 Introduction

The Crean Hill mine site experienced several periods of open-pit and underground mining operations until 2002 and has since been flooded and all surface infrastructure was dismantled. The mineral resource for the current project is centered around the existing historical underground excavations. The sub-vertical vein-type deposit extends approximately 700 m along an east-west axis and descends to a maximum depth of approximately 1,370 m (level 4,500) below the surface, with a thickness ranging between 2.0 m and 30 m, the typical thickness being 4.0 m.

The original shaft had a depth of approximately 600 m (2,000 feet), just below the 2,000 level, and was later deepened to the 4,000 level. The historical sublevels above the 2,000 level were developed from the shaft on track drifts. There was no internal ramp system connecting the levels. In the upper levels, the shrinkage stoping mining method was used, and these stopes were assumed to be left open or partially backfilled with unconsolidated waste rock.

Below the 2,000 level, the primary mining method was Vertical Retreat Mining (VRM), without an internal ramp system. The VRM stopes were mined as primary and secondary stopes, with hydraulic sandfill used to fill the voids. The primary stopes were backfilled with cemented sand, and the secondary stopes were backfilled with unconsolidated sand. It is understood that some secondary stopes were mined in panels to limit the exposure of the sand backfill in the primary stopes. Below the 3,900 level, an internal ramp enabled mining down to the 4,400 level.

The mining method selected for this study is longitudinal longhole stoping with backfill. The sublevels will be established based on the spacing of the elevations of the existing sublevels where possible, generally targeting around 25 m. All material extracted above the 2,000 level will be hauled to the surface by a fleet of 40T underground trucks via the ramp. Material extracted below the 2,000 level will first be hauled to the 2,000 level, then hoisted to the surface via the shaft, at a rate of 2,200 tonnes per day when the mine reaches full production.

16.2 Geotechnical

The geotechnical presented in this study is based on previous reports and broadly summarizes the work carried out in the PEA by Stantec in 2023. It establishes rock mass properties for analyzing stope stability and the stability of pillars against historically mined-out stopes that may or may not contain backfill.

16.2.1 Longhole Stope

For the stope sizing and stability assessment, the Modified Stability Graph method was used. The Modified Stability Number (N’) was estimated using information from previous reports and plotted against the stope surface hydraulic radius (area/perimeter ratio). For longhole stopes approximately 25 m high, 20 m along strike, and 15 m wide (from hanging wall to footwall), the median N’ value falls within the stable zone for all stope surfaces without additional support, except when the stope surface is in a dyke structure. The Modified Stability Graph plots for the stope sidewall, back, and hangingwall/footwall are shown in Figure 16-1, Figure 16-2, and Figure 16-3.

Figure 16-1 Stope Stability – Stope Sidewall

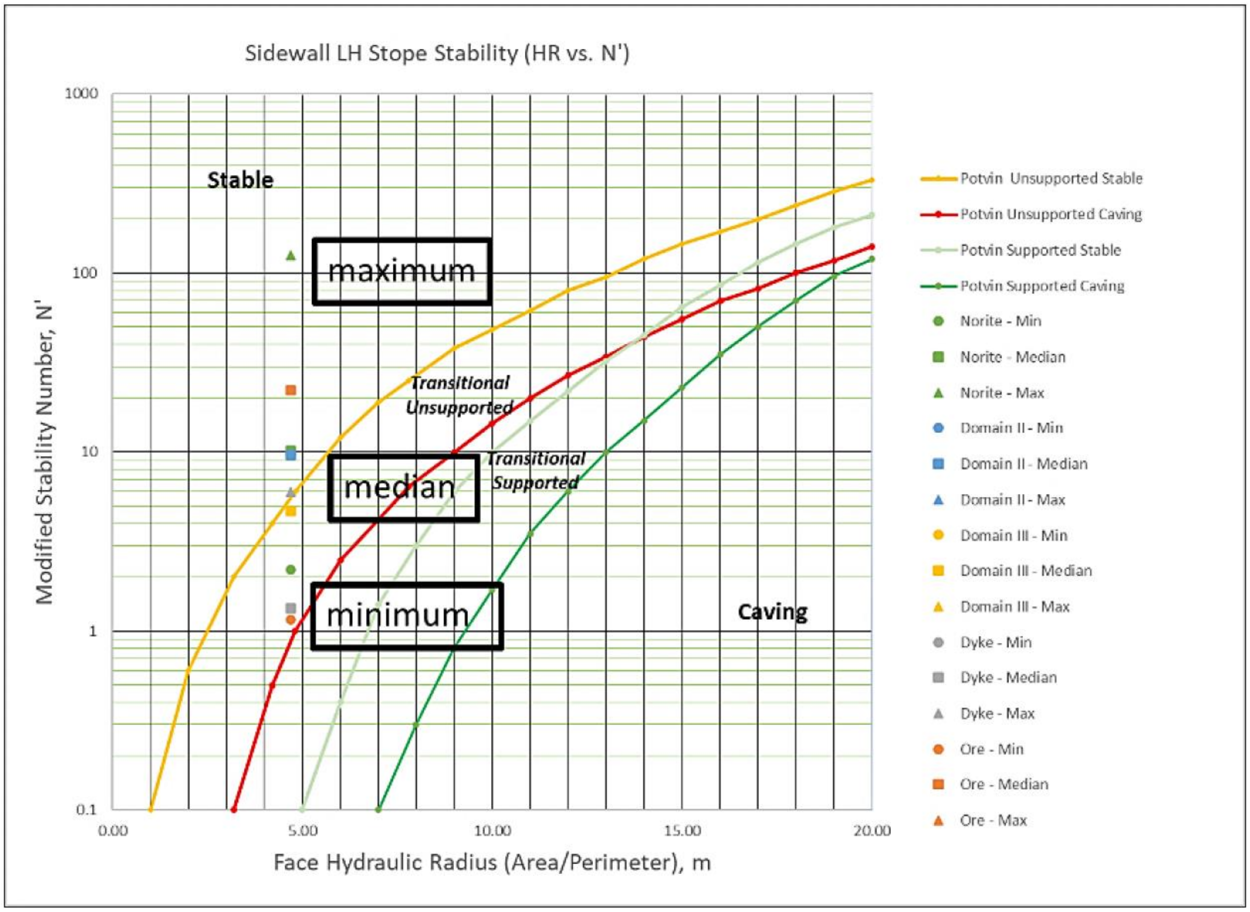


Figure 16-2 Stope Stability – Stope Back

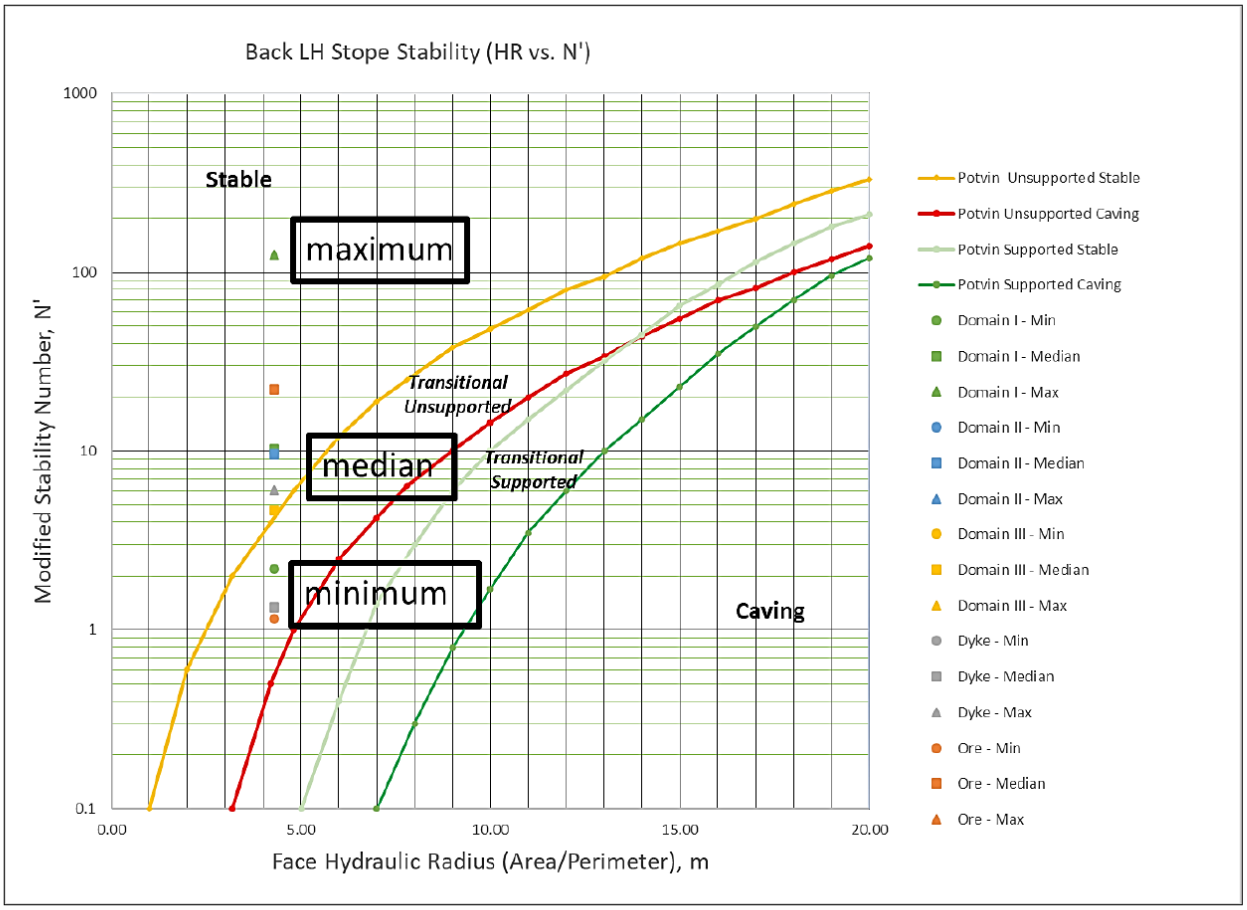
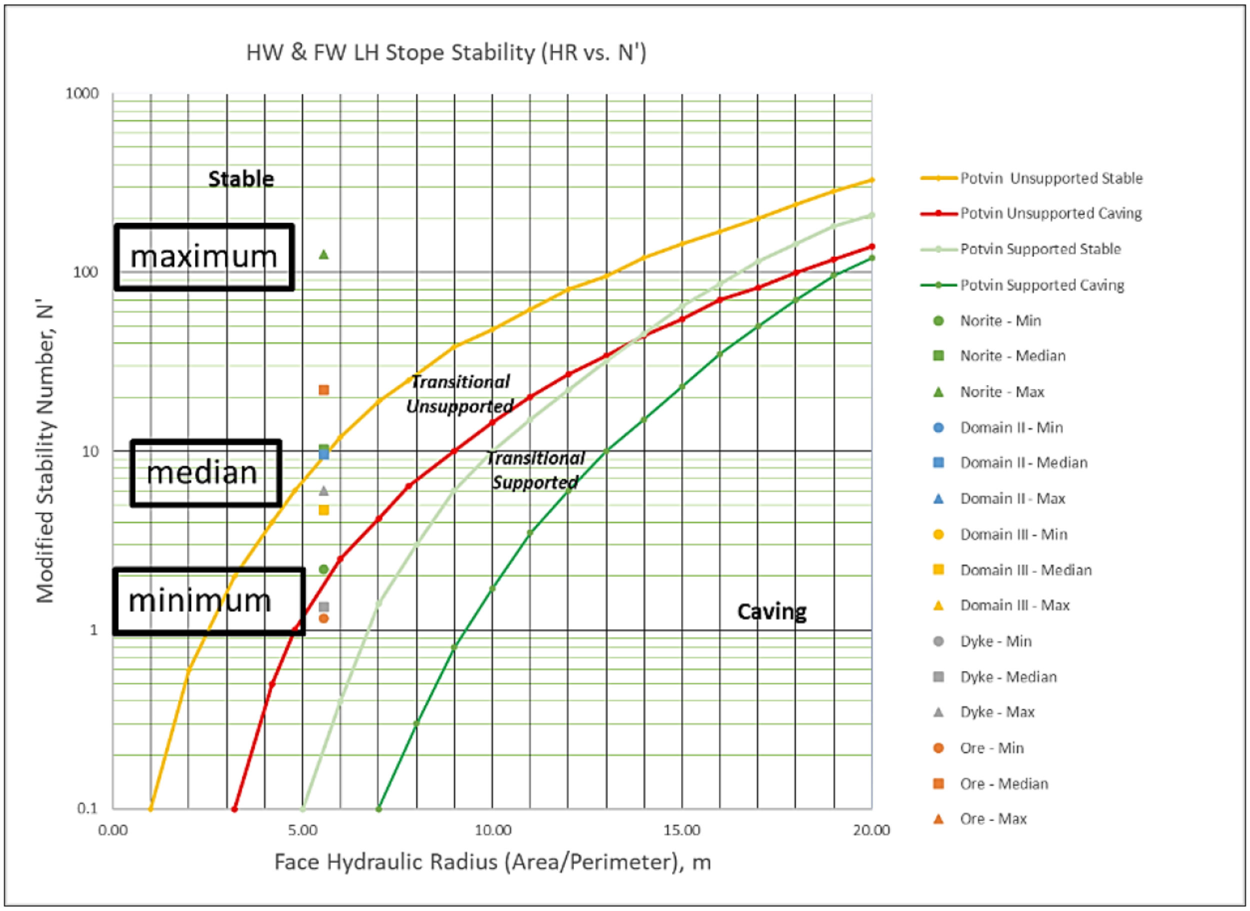


Figure 16-3 Stope Stability – Stope Hangingwall/Footwall



16.2.2 Pillar Design

There is a mineralized resource adjacent to the historically mined-out stopes. The backfill status of these stopes above the 2000L is unknown; they could be open, partially backfilled with unconsolidated fill, or fully backfilled with unconsolidated fill. Below the 2000L, the stopes are known to have been backfilled with sandfill. These stopes were mined in a primary and secondary sequence, with the primaries containing sufficient binder to mine against. However, it is not known which stopes were primaries and filled with consolidated sandfill.

The resource adjacent to these historic stopes is generally of higher grade and value. For the purposes of the PEA, an exclusion zone of 3.0 m was created around the existing excavations for generating minable stope shapes.

It is anticipated that systematic probe hole drilling and ground monitoring will be implemented to maximize resource recovery. If reliable records of consolidated backfill placement in historic mining areas are available, there is potential to mine against the fill.

16.2.3 Ground Support

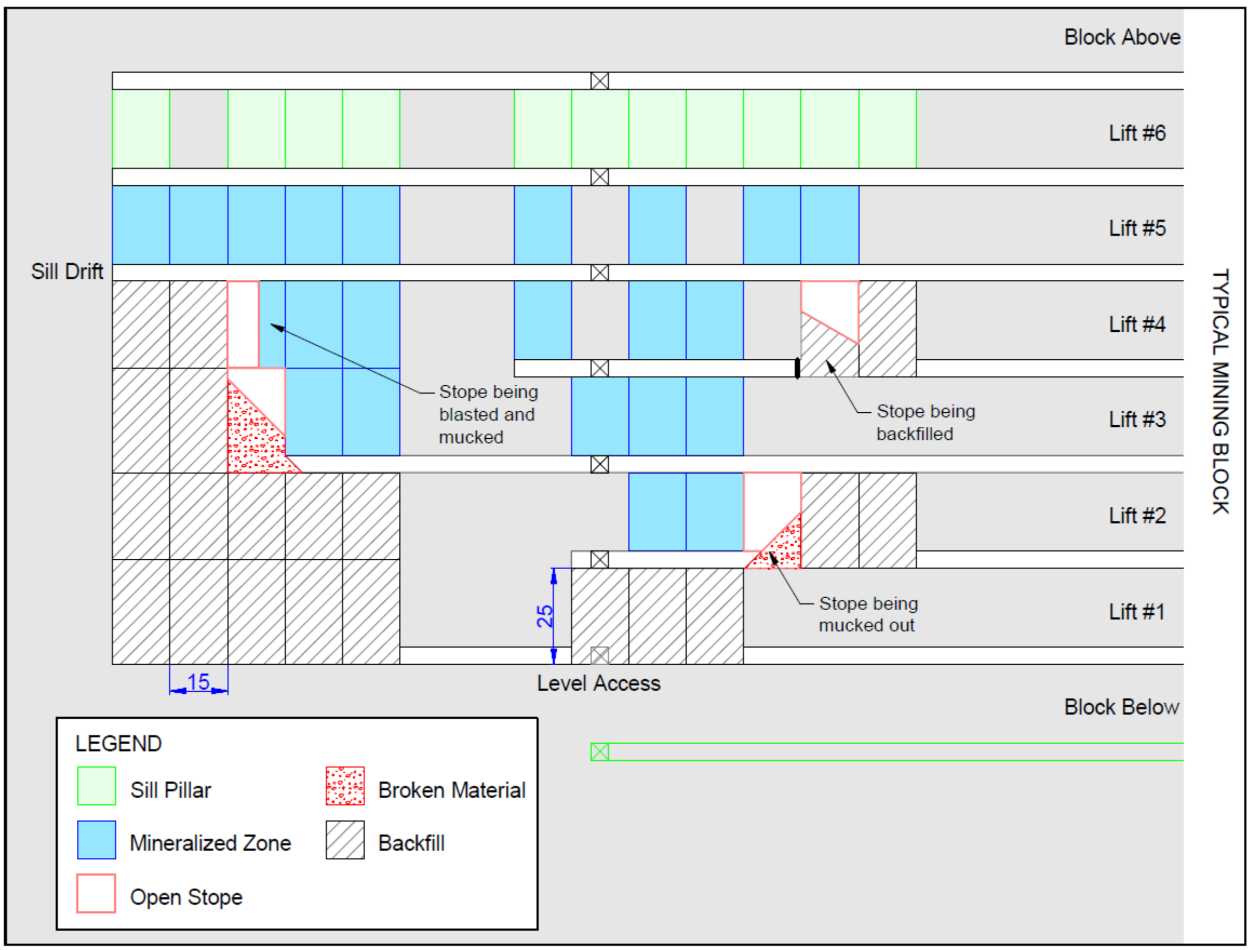
For ground support, a standard pattern of 2.4-m-long resin rebar installed in a 1.2-m by 1.2-m pattern with welded-wire mesh screen has been assumed for all development areas. To accommodate larger spans at intersections and areas of poorer quality ground, an allowance for applying cable bolts has also been included.

16.3 Mining Method

The longitudinal longhole method is suitable for the Crean Hill project, where the dip of the mineralization is near vertical and extends to depth, and the mineralized zones are of sufficient width and grade for extraction by longhole. While there is some mineralization near the surface, it is accessible from underground. Therefore, it was deemed preferable to use the more selective underground method rather than a starter pit. Due to the lack of great continuity in the mineralized zone, the increased flexibility of the transverse method does not justify the additional development required. However, a significant portion of tonnes will be extracted from areas adjacent to historical workings, necessitating numerous bypass drifts and accesses. Consequently, certain stopes will be mined transversely.

From the access ramp, sills are developed along the strike of the mineralization to economic extents. Once sill development is completed, production holes are drilled. If there is both undercut and overcut access, drilling is done downhole between the sills; if there is only undercut access, drilling is done uphole. After blasting and mucking, the stope is prepared for backfilling with the construction of a retaining wall at the undercut. The stope is then backfilled with hydraulic sandfill delivered through piping from the overcut access. Once backfilling is completed, the stope above can be mined. Mining progresses by retreating towards the level access. A longitudinal view of a typical longitudinal longhole stoping with backfill mining block is shown in Figure 16-4.

Figure 16-4 Longitudinal View of a Typical Mining Block



16.4 Preliminary Cut-Off Value

The preliminary cut-off value for the underground mine design was estimated based on the cost assumptions summarized in Table 16-1. The preliminary cut-off values assume third party milling costs.

Table 16-1 Preliminary Cut-Off Value for Underground Mine Planning

Operating Costs			Primary $/t	Incremental $/t
Mining	Grade control	Definition Drilling & Sampling	4.00	2.00
	Mine Development	Development	20.00	2.00
	Production	Production drilling	8.00	8.00
		Blasting	4.00	4.00
		Mucking & Hauling	12.00	12.00
		Hoisting	4.00	4.00
		Backfilling	10.00	10.00
	Services	Infrastructure	17.50	3.50
		Supervision	3.00	0.60
		Maintenance	7.00	1.40
		Technical	4.00	1.00
Processing		Crushing	4.50	4.50
		Haul to processing plant	12.00	12.00
		Toll milling	45.00	45.00
G&A		General & Administration	15.00	3.00
Total			170.00	113.00

The mine design will primarily focus on mining stopes with a NSR exceeding the target cut-off values, with nearby incremental material also included in the plan. A cut-off grade of 1.20% nickel equivalent was applied for primary stopes, while a cut-off grade of 0.90% nickel equivalent was used for incremental stopes.

16.5 Underground Development and Production

16.5.1 Mine Access

Access to the underground workings will be established in a phased approach. Initially, a box cut and portal will be constructed, and an Access Ramp developed to support an Advanced Exploration (AdEx) program that includes an underground bulk sample and diamond drilling. Following the AdEx program, the Access Ramp will be extended to support initial production from the upper portion of the mine (above 2000L) while the existing shaft is being reconditioned and re-equipped for production and servicing the mine up to 2000L.

16.5.2 Box Cut and Portal

The box cut and portal will be established at an outcrop with a highwall face that was previously excavated and supported for other purposes. The proposed box cut location will be investigated for hazards, such as historic raises or boreholes, that may exist but are not shown on existing mine models. The planned portal location is shown in a satellite view of the site in Figure 16-5.

Figure 16-5 Planned Portal Location (not to scale)

A short access road will be established to the portal location, and an area will be prepared to make a pad for infrastructure, services, and temporary waste rock and mineralized resource stockpiles. The road leading into the portal will be designed with a gradient and ditching to minimize the catchment of surface water runoff into the ramp. Additionally, a small sump will be established a short distance down the ramp to collect any water that may enter.

16.5.3 Access Ramp

The upper portion of the Access Ramp will be developed with sufficient back height to accommodate two runs of 1.2 m round poly duct and the largest piece of mobile equipment anticipated, which is a loaded 40T class haul truck. The design assumptions for the Access Ramp are summarized in Table 16-2.

Table 16-2 Ramp Design Assumptions

Item	Access Ramp
Width	4.5 m
Height	5.0 m
Planned Maximum Gradient	15%
Design Gradient for PEA (accounts for transitions at sublevels)	13%
Safety Bays and Remuck Bays	Accounted for in a design allowance factor

16.5.4 Shaft

The existing shaft is capped with concrete and currently flooded. It extends to the 4000L (approximately 1,270 m below surface) and was previously equipped with five compartments: two skips, a cage, a counterweight, and services and a ladderway. The purpose and use of the existing shaft will evolve as the project and mine life progress. The plan includes dewatering and rehabilitating the shaft and the loading station up to the 2000L level. Experience from other sites suggests that complete submersion of workings is generally preferable for preserving shaft timbers; however, for the purposes of this PEA, it is assumed that rehabilitation of the underground shaft will be required. The shaft use at various stages of mine development is summarized in Table 16-3.

Table 16-3 Shaft Use at Various Stages of Mine Development

Shaft Use	Notes
Dewater flooded UG workings	Lower a pump down the shaft from surface.
Ventilation for Access Ramp Development	Access Ramp will connect to exiting near-shaft development at various elevation to establish a ventilation loop.
Production Shaft - 2000L to Surface	Recondition and re-equip the shaft to produce from below 2000L (shaft stations, loading pocket). Mine access Ventilation

The final Production Shaft will be used for skipping, personnel and material movement. The assumptions for the Production Shaft facility are summarized in Table 16-4.

Table 16-4 Production Shaft Facility Assumptions

Item	Notes
Headframe	Steel structure Collar house Bins/Truck Loadout Chute to outside pad
Production Hoist Hoisting capacity	12 ft diameter, Double Drum, 2,200 hp 4,000 tonnes per day from 2000L
Configuration	1-Skip Cage Compartment, 14-t skips 1-Skip Counterweight, 14-t skips 3-Empty
Shaft Stations	2000L
Loading Pocket	Approximately 2000L
Material Sizing	Rock Breaker and Grizzly

16.5.5 Dewatering

The existing underground mine voids, including the open pits that are connected to underground workings, are either backfilled with waste rock or sandfill or flooded with water. As part of the mine's development, it will be necessary to dewater these flooded workings ahead of advancing development. The volume to be dewatered has been estimated based on the mine model of existing voids and assumptions regarding the volume that may be displaced by backfill.

To achieve this, the preferred approach selected for the PEA is to lower a pump in the shaft. The pump rate is set at 32 l/s, while the average inflow recharge rate is 3 l/s. This dewatering strategy aims to keep the water recede rate ahead of the estimated rate of Access Ramp vertical advance.

Assuming the ramp will descend at a rate of 20 vertical m per month and the dewatering program starts three months before ramp development, the water level will stay ahead of ramp development until it reaches a depth of 1,200 m. Below this depth, the water recede rate and ramp descent rate will be similar.

For long-term pumping, the rate will be adjusted to 400 USgpm (25 l/s) to manage the continuous inflow and maintain the necessary conditions for ongoing mining operations.

16.5.6 Lateral Development and Infrastructure

All ramp and lateral excavations will be developed using conventional drill and blast methods and diesel-powered mobile equipment. This development includes both the expansion of historical workings (slashing) and new development in virgin rock.

Level development will occur in the footwall rock. The typical infrastructure will include:

- Level access from the ramp
- Remuck and truck loading area at the level entrance
- Water collection sump
- Electrical cut-out
- Stope accesses

- Ventilation raise access

Some sublevels will include additional infrastructure such as:

- Refuge Stations
- Explosives and Detonators Storage
- Material Storage Bays
- Pump Stations
- Fuel Bays
- Maintenance Shop and Wash Bay

The lateral development design assumptions are summarized in Table 16-5.

Table 16-5 Lateral Development Design Assumptions

Item	Level Access Waste Rock	Other Dev Waste Rock	Sills
Width Height	4.5 m 4.5 m	4.5 m 4.5 m	4.5 m 4.5 m
Planned Gradient (for drainage) Desing Gradient for PEA	+ 2% 0%		
Sand-Off Distance form Ramps to mineralized Zone	Approximately 30 m		

Existing development on levels above 2000L was developed as track drifts, measuring approximately 3.0 to 3.7 m wide by 3.4 to 3.7 m high. At the lower levels of the mine, existing sublevel development is larger, up to 4.3 m wide by 4.0 m high. Utilizing these existing excavations will require slashing to the required dimensions and the installation of new ground support.

16.5.7 Vertical Development

Raises will be required for ventilation, egress, and access/muck passes for some specific stopes. The assumptions and design criteria for raises are summarized in Table 16-6.

Table 16-6 Raise Development Design Assumptions and Criteria

Item	Raise < 9 m^2	Raise > 9 m^2
Excavation Method	Alimak*	Raisebore
Supported	Yes (due to Alimak)	Yes, if below 600 m from surface Yes, if greater than 4.5 m diameter Yes, if equipped with escapeway

* Raises less than 30 m long and not supported can be drop raised.

16.5.8 Development Overbreak and Design Allowance

Overbreak and design allowance factors have been applied to the neat quantities for waste rock development. The overbreak factor accounts for unplanned breakage beyond the planned dimensions. The design allowance factor covers miscellaneous excavations not shown in the model, such as remuck bays, safety bays, storage bays, electrical cut-outs, slashes at intersections, back slashes, and similar excavations. The additional allowance accounts for excavations outside the critical path, such as those related to ventilation and maintenance infrastructure. These factors are incorporated into the model and reported in the overall quantities and schedule. The overbreak and design allowance factors are summarized in Table 16-7.

Table 16-7 Waste Rock Development Overbreak and Design Allowance Factors

Item	Value
Overbreak	10%
Design Allowance	10%
Additional Allowance Off Critical Path	20%

There is no overbreak or design allowance applied to excavations in mineralized resource. The design allowance is applied first, followed by the additional allowance, which is calculated on the sum of the waste development quantity and the design allowance.

16.5.9 Longhole Stoping

Mining at the Crean Hill project will be carried out using longitudinal longhole stopes. Even in thicker areas, longitudinal mining will be used to reduce the number of stope accesses in waste rock. Sublevels will be established based on the spacing of the existing sublevel elevations where practical, but generally target approximately 25 m between sublevels.

Production tonnes come primarily from downholes, used in combination with upholes to maximize recovery and minimize development. Production holes will be loaded with bulk emulsion using a mobile explosive loader. Both downhole and uphole stopes utilize a conventional drop raise for slot development. After opening the slot, the stope is taken with a series of successive non-electric firings.

When generating the stope shapes, a 3 m exclusion zone around existing excavations was maintained. The design assumptions for longhole stopes are summarized in Table 16-8.

Table 16-8 Longhole Stope Design Assumptions

Item	Value
Minimum mining width Minimum stope dip Sublevel interval Stope Length (along strike)	2 m 55° Approximately 25 m floor to floor 15 m
Drill Hole Diameter Ring Burden Hole Spacing	Top Hammer Electric-Hydraulic Top Hammer Pneumatic 64 mm 1.5 m 1.8 m
Slot Raise	Drop raise for downer Conventional inverse for upper
Explosive Type Detonators Loading Method	Bulk Emulsion Non-Electric Mobile Explosives Loader
LHD	8 yd^3
Backfill	Unconsolidated Rockfill (URF) High Density Hydraulic Fill
Haul	40T Class Haul Truck

Blasted material will be mucked from stopes using an 8 yd^3 LHD. When the stope brow is closed, the LHD will be operated with the operator in the cab. When the stope brow is open, the LHD will be operated by remote control with the operator stationed at a remote stand, located a safe distance from the brow and away from the path of the moving LHD. The LHD will tram and dump into a remuck bay typically located near the sublevel access. When a haul truck is present at the remuck bay, the LHD will load the truck. The height of the drift at the truck loading area will accommodate the truck loading.

16.5.10 Dilution and Recovery

Dilution can be either internal (planned) or external (unplanned). Internal dilution involves the deliberate inclusion of non-mineralized material in a mining shape. External dilution occurs incidentally because of overbreak or poor drilling/blasting practices. This type of dilution adds additional tonnes below the cut-off value (COV) to a mining plan. Additional external dilution can also result from backfill dilution, which occurs due to endwall overbreak into filled stopes or from floor gouging or poor fill wall locations. Internal dilution is reported along with the in-situ resource from stope shapes in the Deswik model.

External dilution in longhole stopes will primarily come from waste rock in the hanging wall (HW) and footwall (FW) that overbreaks into the stope and is mined with the stope resource. Additional dilution can come from backfill in adjacent stopes. A 50 cm overbreak was applied to both the HW and FW (totalling 1.0 m) for all the stope shapes.

A mining recovery factor will be applied to account for stope resources that are planned to be mined but, due to losses in the mining process, will not be delivered to the surface. The mining recovery factor by mining method is summarized in Table 16-9.

Table 16-9 Mining Recovery Factors

Longhole	Mining Recovery Factor
Uphole	85%
Downhole	90%

16.6 Material Handling

16.6.1 Hauling Mineralized Resource

Above the 2000L, trucks will be loaded by the LHD and will haul the mineralized resource to the surface pad near the portal. Below the 2000L, trucks will haul and dump the mineralized resource into the 2000L grizzly and rock breaker before it can be hoisted to the surface. It is anticipated that 40T class underground haul trucks will be used for production.

16.6.2 Hauling Waste Rock

Before stope production starts, all waste rock will be hauled to the surface and dumped at a waste rock dump near the portal. Once stope production begins, waste rock will be hauled and dumped at other levels for use as backfill. It is anticipated that 40T underground haul trucks will be used for hauling waste rock.

16.6.3 Backfill

Stopes that will be mined against will be backfilled with high-density hydraulic fill, while stopes that will not be mined against will be backfilled with unconsolidated rock fill (URF) or left open. The target for the backfill is 80% solids by weight, using sand as the backfill material. A backfill plant will be installed on the surface, and the backfill will be distributed underground via a borehole and a 150 mm pipe system. When URF is being placed, haul trucks will deliver waste rock to the backfilling level where an LHD will rehandle the material for dumping into the stope. The backfill assumptions are summarized in Table 16-10.

Table 16-10 Backfill Assumptions

Item	Assumption
Replacement ratio of volume mined to fill placed in stopes	67%
Portion of the stopes filled with unconsolidated waste rock	25%
Cement binder content	5%

16.7 Mining Schedule

There will be three main phases of underground activity, as follows.

- Advanced Exploration Program
- Phase 1 Production to 2000L
- Phase 2 Production to 4000L

16.7.1 Advanced Exploration Program

There will be an initial Advanced Exploration (AdEx) program that will include.

- Establishing some of the site surface infrastructure.
- Dewatering flooded underground workings to 585L from surface via the shaft.
- Developing an Access Ramp to 585L elevation.
- Underground bulk sampling program of approximately 57,900 tonnes.
- Diamond drilling from underground locations.

16.7.2 Phase 1 - Production to 2000L

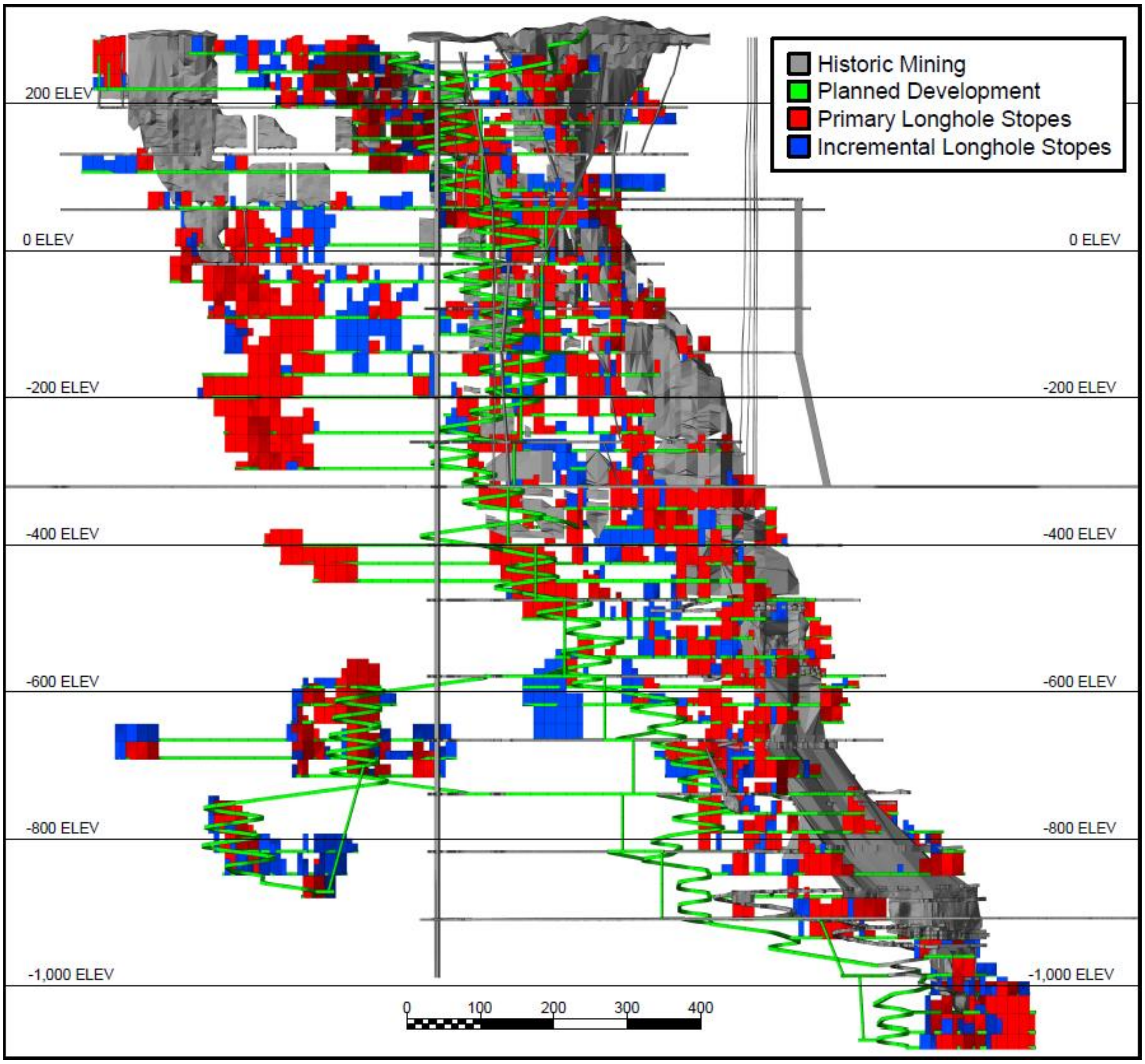
Following AdEx, the Project capital period for Phase 1 will start to prepare for production. Phase 1 production will be using the ramp for material and personnel movement, with a second egress established in the ventilation raises. During Phase 1, the production shaft facilities will be prepared for producing during Phase 2. The following activities will occur during Phase 1.

- Expand surface site infrastructure to support increased underground activity.
- Continue dewatering the flooded underground workings and establish egress in the shaft in stages, initially to 585L and then to 1000L and 2000L.
- Develop a return air raise and fresh air raises to surface and establish internal ventilation raises.
- Install surface ventilation plants to increase ventilation flows to support additional mobile equipment and mining activity.
- Continue ramp and lateral development.
- Expand underground systems (power, communications, dewatering, process water, compressed air).
- Expand underground infrastructure.
- Start longhole production using trucks to haul muck to surface via the ramp.
- Recondition, re-equip, and commission the shaft and loading pocket and establish the hoisting facility in preparation for Phase 2.

16.7.3 Phase 2 - Production to 4000L

Phase 2 will be an expansion of the mine below 2000L, down to approximately 4500L, using the shaft as the main facility for material handling. During Phase 2 there will be continued mining above 2000L. The production from Phase 2 will be timed to ramp up as production from Phase 1 starts to ramp down to avoid a drop in the production profile. Figure 16-6 shows a longitudinal view looking north of the extent of development at the end of Phase 2.

Figure 16-6 Underground Mine Design at the End of Phase 2



16.8 Production Plan

16.8.1 Development Schedule

The proposed lateral development schedule for Crean Hill has been planned based on long-term performance metrics, with ramp headings advancing at a rate of 120 m per month and other horizontal development crews achieving 150 m per month. Throughout the life of the project, up to four crews will be required to meet development targets.

In the initial four months, ramp development will proceed at an accelerated pace of 165 m per month, facilitated by a single face that allows for blasting at will.

Vertical development over 30 m will be completed using a contractor operated raise boring machine, or an Alimak climbing system. Vertical development of less than 30 m will be drop raised using a production drill. Annual advance totals can be found by type in Table 16-11. Note that allocation factors are included in the reported quantities.

Table 16-11 Development meters per type per year

Item	Unit	Grand Total	AdEx			Production														
			2024	2025	Total	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	Total
Ramp	m	14,321	506	1,477	1,983	1,367	573	110	369	710	1,403	1,402	1,404	1,389	1,379	1,405	827	0	0	12,338
Level access and infrastructure	m	9,514	101	932	1,033	1,042	651	63	340	435	635	940	893	626	1,042	1,220	530	65	0	8,481
Operating Waste	m	25,424	0	575	575	916	2,284	3,495	2,431	2,060	2,072	2,153	1,905	2,130	1,997	1,821	1,205	379	0	24,849
Operating	m	22,877	0	383	383	856	2,034	2,034	2,419	2,163	1,887	1,563	1,809	1,848	1,601	1,609	2,312	358	0	22,493
Total Horizontal	m	72,136	607	3,367	3,974	4,182	5,542	5,702	5,560	5,368	5,997	6,057	6,012	5,993	6,019	6,055	4,874	801	0	68,162
Vertical Development	m	1,568	0	59	59	137	113	197	56	56	0	170	213	0	0	318	171	79	0	1,509

16.8.2 Mining Inventory

The production quantities reported include dilution and mining recovery. Quantities for AdEx and production phase are summarized in Table 16-12.

Table 16-12 Mining Inventory

Item	Unit	Grand Total	AdEx	Production Feed		Total Production
				Primary	Incremental	
Resource Mined	t	10,746,509	57,903	7,996,761	2,691,845	10,688,606
NSR	$/t	240	291	258	148	240
NiEq Cut-Off Grade	%	-	1.20	1.20	0.90	-
Ni Grade	%	0.83	1.42	0.92	0.56	0.83
Cu Grade	%	0.72	0.63	0.79	0.50	0.72
Co Grade	%	0.03	0.05	0.03	0.02	0.03
Pt Grade	g/t	0.91	0.40	1.01	0.63	0.91
Pd Grade	g/t	1.04	0.27	1.16	0.70	1.04
Au Grade	g/t	0.34	0.11	0.38	0.21	0.34

16.8.3 Mine Production Schedule

Production is scheduled to begin in mid-2026, with the target production rate of 2,200 tonnes per day expected to be reached by 2028. The mine life is 13.5 years, or until mid-2039. It is estimated that 1.3 Mt of mineralized material will be recovered through development, and 9.4 Mt through stoping, resulting in a total of 10.7 Mt at an NSR of $240.

The diluted and mining-recovered production quantities are summarized in Table 16-13.

Table 16-13 Annual Production Tons, NSR, and Grade Profile

Item	Unit	Grand Total	AdEx 2025	Pre-Prod 2026	Production 2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	Total 2026-39
Resource Mined	kt	10,747	58	284	675	824	821	821	821	821	821	821	820	821	821	820	699	10,689
NSR	$/t	240	291	284	232	207	201	230	258	250	252	271	268	228	226	264	210	240
Ni Grade	%	0.83	1.42	1.16	0.81	0.85	0.72	0.79	0.74	0.77	0.96	1.04	1.01	0.84	0.75	0.71	0.65	0.83
Cu Grade	%	0.72	0.63	0.85	0.83	0.63	0.60	0.72	0.65	0.56	0.75	0.85	0.85	0.63	0.70	0.85	0.69	0.72
Co Grade	%	0.03	0.05	0.04	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.03	0.02	0.02	0.03
Pt Grade	g/t	0.91	0.40	0.56	0.66	0.72	1.22	0.73	1.39	1.47	0.66	0.71	0.70	0.82	1.05	1.12	0.65	0.91
Pd Grade	g/t	1.04	0.27	0.53	0.78	0.49	1.10	1.01	1.56	1.51	0.99	0.76	0.85	1.03	1.02	1.46	1.17	1.04
Au Grade	g/t	0.34	0.11	0.25	0.26	0.26	0.48	0.31	0.57	0.45	0.18	0.22	0.21	0.21	0.27	0.63	0.38	0.34

16.9 Mine Services

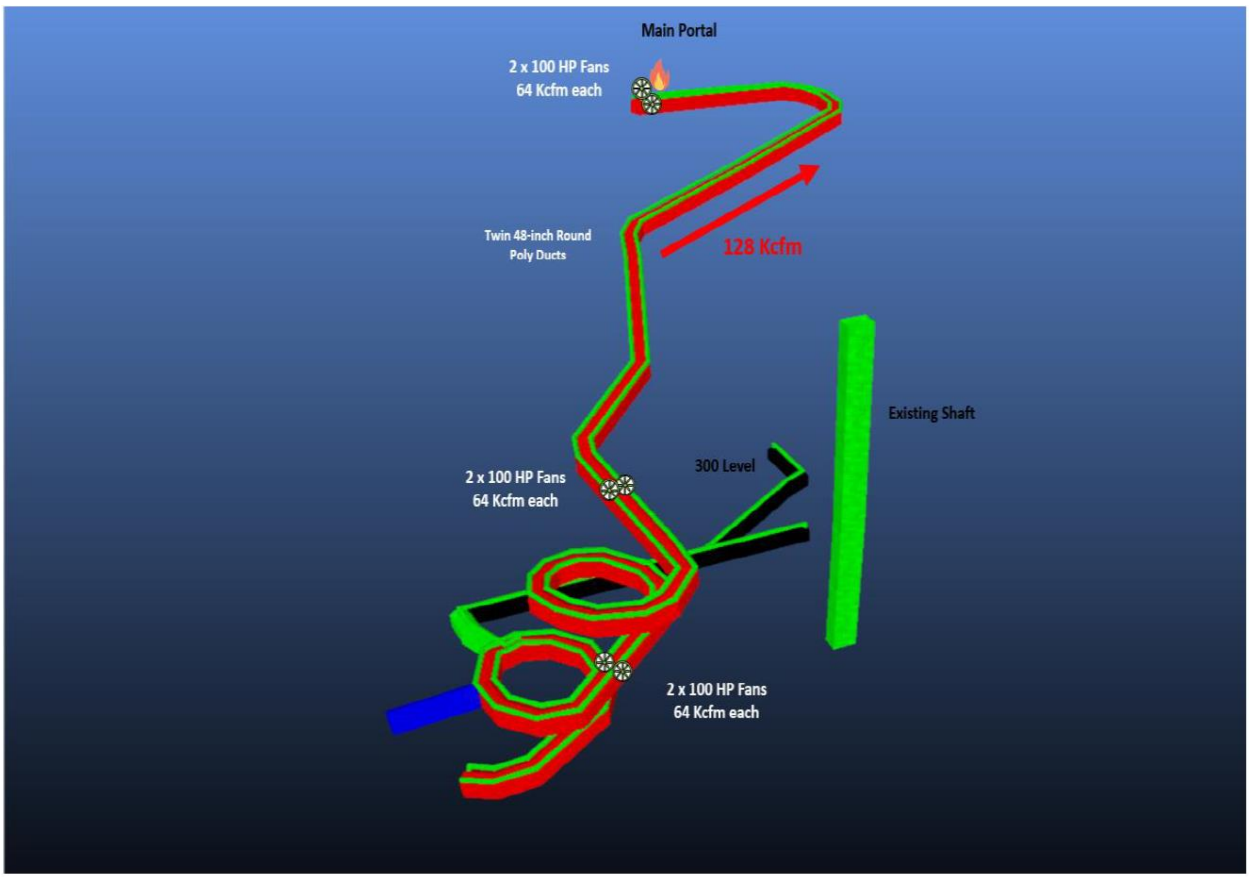
16.9.1 Ventilation

Details of the ventilation study are presented in the document Crean Hill Updated PEA Ventilation Design (Jodouin, 2024). The ventilation system will be installed in stages as underground activity progresses. The ventilation models have been prepared to simulate the airflows during each of the determined stages and at steady state (full production), where mining is active in most areas and ventilation demand is at its peak. Air heating will be done with a conventional propane system.

16.9.1.1 Stage 1 – Main Ramp to 300L Development

The installation involves two runs of 48-inch (1.2 m) round Poly duct, complete with Portal Fresh Air (FA) fans and heaters. The development priority is to establish a fresh air ventilation loop on the 300 Level, providing a total available airflow of 128 kcfm (60 m³/s). The ventilation configuration at Stage 1 is depicted in Figure 16-7.

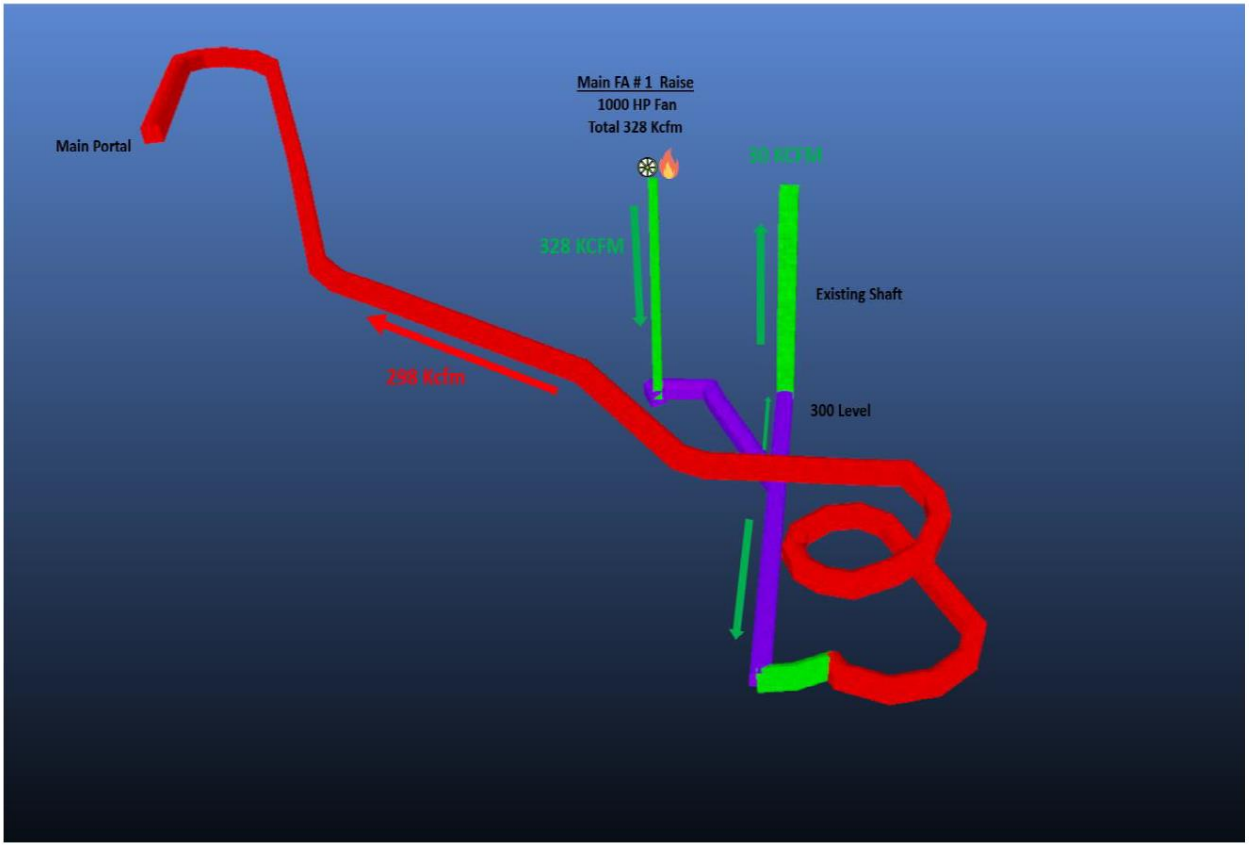
Figure 16-7 Stage 1 Portal/Main Ramp to 300L Development



16.9.1.2 Stage 2 – Ventilation Loop 300 Level

The completion of the fresh air ventilation loop on the 300 Level includes the installation of Surface #1 FA fans and heater, providing a total available airflow of 328 kcfm (155 m³/s). The ventilation configuration at Stage 2 is illustrated in Figure 16-8.

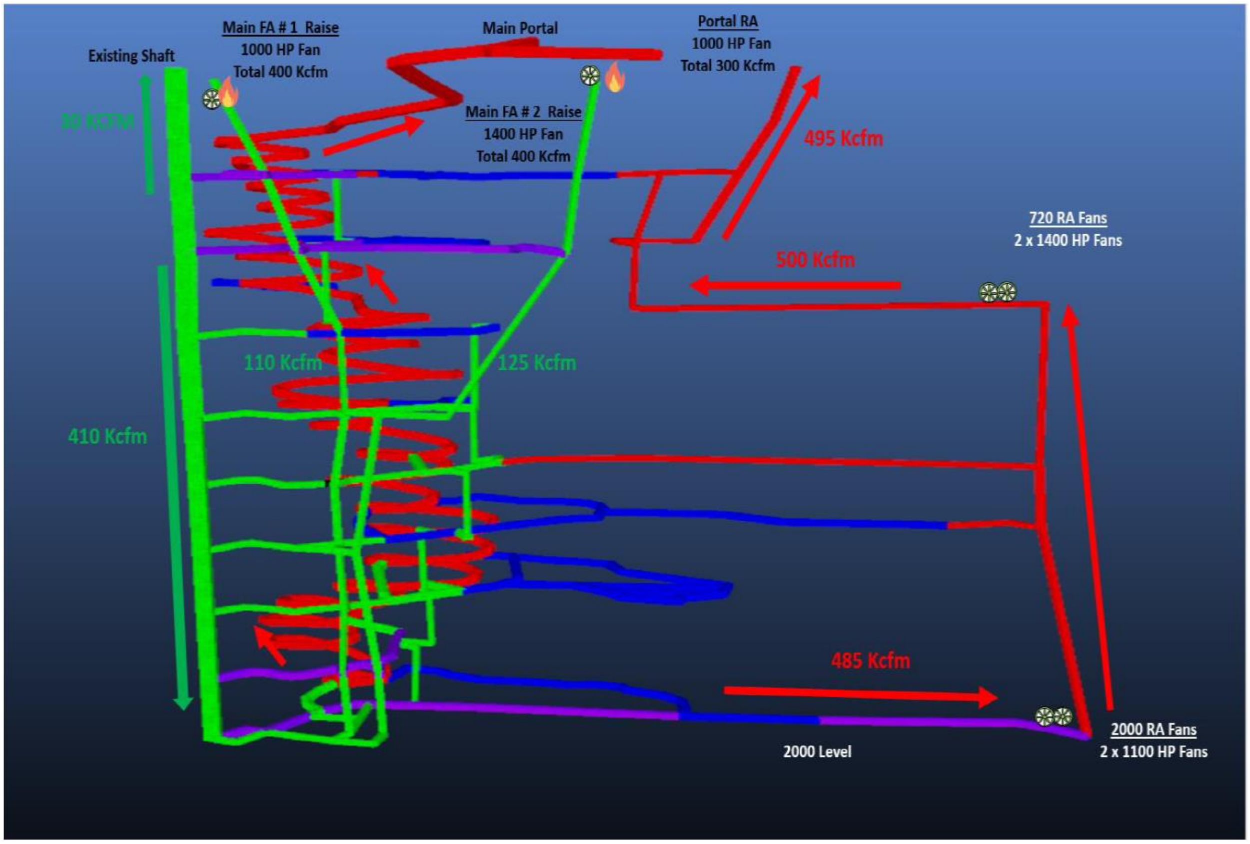
Figure 16-8 Stage 2 Vent Loop 300 Level, Commissioning Surface FA #1



16.9.1.3 Stage 3 – Ventilation Loop 2000 Level

The main ventilation loop after completing development down to the 2000 Level achieve a total airflow of 800 kcfm (378 m³/s). This includes the installation of Portal Return Air (RA) fans, Surface #2 FA fans, and a heater. Additionally, the return air system will be established to the surface, with underground RA boosters installed at the 720 Level and the 2000 Level. The ventilation configuration at Stage 3 is illustrated in Figure 16-9.

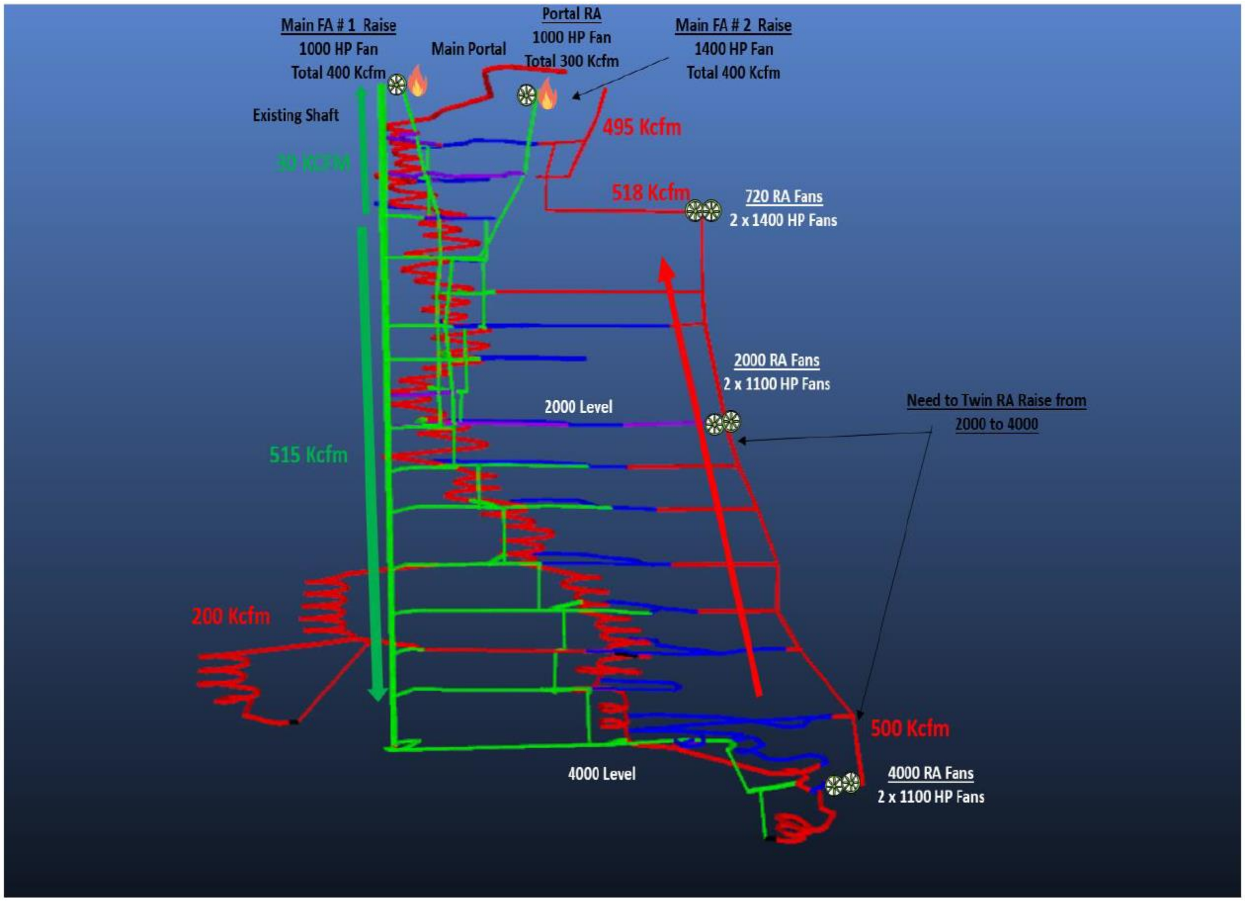
Figure 16-9 Stage 3 2000 Level



16.9.1.4 Stage 4 – LOM

The final ventilation loop, after the development of the 4000 Level, will provide a total airflow of 800 kcfm (378 m³/s). This includes the installation of underground RA boosters at the 4000 Level and the twinning of RA raises from the 2000 Level to the 4000 Level. The ventilation configuration at Stage 4 is illustrated in Figure 16-10.

Figure 16-10 Stage 4 LOM



16.9.1.5 Main Fan Operating Duties

Main fan operating duties for the modeled scenarios and the resultant maximum duties used for fan specification are shown in Table 16-14.

Table 16-14 Main Fan Operating Points and Power

Main Fans	Air flow cfm	Total pressure in.w.g.	Number of fans	Power per fan HP	Total Power HP
Surface Portal RA Fans	300,000	13.1	1	1,000	1,000
Surface #1 FA Fan and Heater	400,000	7.5	1	1,000	1,000
Surface #2 FA Fan and Heater	400,000	12.8	1	1,400	1,400
720 Level UG RA Booster	508,200	21.4	2	1,400	2,800
2000 Level UG RA Booster	501,300	15.0	2	1,100	2,200
4000 Level UG RA Booster	500,000	14.6	2	1,100	2,200
Total					10,600

16.9.2 Compressed Air

Compressed air will be delivered to sublevels through a 6-inch (150 mm) pipe installed in the Access Ramp. The underground equipment requiring compressed air includes pneumatic drills, pneumatic pumps, blowpipes for cleaning holes, a shotcrete sprayer, tools in the maintenance shop, refuge stations, and Alimak raising systems. A preliminary estimate indicates that the mine will require approximately 4,000 cfm (600 hp) of compressed air at peak airflow during full production.

16.9.3 Process Water

The underground process water users are anticipated to include the following.

- All drills (jumbo, bolter, longhole, cable bolter, jacklegs/stopers, diamond drill)
- Dust Suppression – Hose/nozzle, water sprays
- Shotcrete
- Wash Bay
- Miscellaneous washing

A pre-engineered pumphouse building will transfer process water from the water source to water storage tanks. Process water air delivered to sublevels via a 6-inch (150 mm) pipe in the Access Ramp.

16.9.4 Dewatering System

Water inflow will come from both infiltration and mining activities. During the mine's previous operation, the average pumping rate was approximately 400 USgpm (25 l/s), with peak rates of up to 600 USgpm (38 l/s) during the spring snowmelt season. It is assumed that similar pumping capacity will be required when the mine reaches its maximum footprint during Phase 2.

The anticipated mine dewatering system will include the following components:

- A development gradient designed to direct water flow along a floor ditch.
- Collection sumps on each sublevel, which will either gravity feed to a sump at a lower elevation via a borehole or be equipped with a submersible pump to transfer water to another sump.
- Intermediate sump and pump stations to transfer water to the main sump and pump stations.
- Main sump and pump stations to filter solids and pump clean water to the surface.

16.9.5 Electrical Power Distribution

The original Crean Hill mine complex received its electricity from the 69 kV Vale power distribution network. However, discussions between Vale and Magna have confirmed that Vale Power will not permit another entity to connect to their grid. As a result, the current plan is to connect to a nearby 13.8 kV distribution system, supported by a substation constructed in 2016. This substation is connected to the HONI S22A 230 kV transmission line and includes two 25/40 MVA transformers with a 13.8 kV secondary, providing substantial additional electrical capacity. To facilitate this connection, an overhead power transmission line of approximately 3.5 km in length will be built.

Due to the long lead time for key electrical equipment, the AdEx program will initially be powered by diesel generators until grid power is established for Phase 1. The power demand for the Crean Hill mine during production is estimated at 8.0 MW, which includes equipment, dewatering, ventilation, and compressors, with a total connected load estimated at 11.3 MW.

16.9.6 Underground Communication

The communication systems planned for the underground facilities will use proven technologies. The following systems are planned.

- Leaky feeder system (radio)
- Blasting system

Leaky Feeder System (Radio Communication)
The leaky feeder system will be the primary method of communication. It will be routed along the main ramp and will branch out to various levels underground.

Blasting System
A central blasting system will be used for blast initiation.

16.10 Mobile Equipment

The mobile equipment fleet will include units that are commonly used in similar development and production applications. The estimated peak mobile equipment fleet is summarized in

Table 16-15.

Table 16-15 Mobile Equipment Fleet

Description	Qty
DEVELOPMENT	
Jumbo 2 boom	4
ANFO Loader	1
Scoop 8 yd^3	4
Scissor Lift	4
PRODUCTION	
Pneumatic Drill	2
Electro-Hydraulic Drill	1
ANFO Loader	1
Scoop 8 yd^3	2
HAULAGE	
Truck 40 t DEV	2
Truck 40 t PROD	5
SERVICES	
Cable Bolter	1
Shotcrete Sprayer	1
Scoop 3 yd^3	1
Boom Truck	1
Grader	1
Tractor	1
Personnel Carrier	2
Light Vehicle	9
Surface Loader	1

16.11 Mine Labor

The underground mine will operate 2 x 12-hour shifts per day, 365 days per year. There will be four crew rotations required to support underground operations. For example, crews A and B will be on-site working Dayshift and Nightshift while crews C and D are on days off. The AdEx program and capital project period during Phase 1 will be completed by contractor personnel. Once production begins during Phase 1, there will be a transition from contractor personnel to Owner personnel.

The estimated peak Owner personnel on payroll to support the underground operation are summarized in Table 16-16. After the initial Phase 1 project period, it is anticipated that contractors will continue to complete specialized work such as raising, shaft reconditioning, and diamond drilling over the life of mine.

Table 16-16 UG Mine Owner's Labour (on Payroll)

Area	Position	Qty
Mine Directs	UG Mine General Foreman	1
	Mine Shift Bosses	4
	Jumbo Operator	16
	Dev. Support Leader	9
	Dev. Support Miner	8
	Scoop Operator	20
	Truck Operator	24
	Long hole driller	12
	Long hole blaster	4
	Service Long hole & dev	4
	Cage / Skip Tender	4
	Deckman	4
	Shaftman	1
	Hoistman	4
	Construction	4
	Service Underground	1
	Hoist Mechanic	1
	Electrician	5
	Instrumentation	1
	Mechanics	12
	Total Mine Directs	139
Mine Indirects	Mine Technical Services Manager	1
	Senior Mine Engineer	1
	Ventilation Engineer	1
	Rock Mechanics / Backfill Engineer	1
	Mine Planner - Longhole	1
	Surveyors	4
	Mine IT Support	1
	Chief Geologist	1
	Production Geologists	2

Area	Position	Qty
	Geology Technicians	2
	Mine Operations Superintendent	1
	UG Trainer	1
	Shaft Captain	1
	Mine Maintenance Superintendent	1
	Maintenance Planner	1
	Mechanical General Foreman	2
	Electrical General Foreman	2
	Backfill Plant Operators	8
	Sample Tower Operators	2
	Total Mine Indirects	34
Administration	Site General Manager	1
	Admin Assistant	1
	Controller / Cost Accountant	1
	Warehouse Supervisor	1
	Warehouse Floor Staff / Shipping / Receiving	2
	Site Environmental Superintendent	1
	Site Environmental Technician	1
	Safety Officers	1
	Gatehouse Security / First Responders	4
	Janitorial Staff	2
	Total Administration	15
Grand Total		188

16.12 Underground Infrastructure

16.12.1 Refuge Stations

There will be permanent Refuge Stations at strategic locations where larger numbers of personnel gather frequently (such as the maintenance shop). The permanent refuge stations will also be used as a lunchroom. Portable refuge stations will be located at key areas and near the working face in headings being developed away from the main infrastructure. Portable refuge stations will be used during emergency conditions only.

Portable refuge stations will be self-contained manufacturer-supplied and located in repurposed excavations. Each portable refuge station is capable of housing 12 people for 36 hours and will be supplied with oxygen by bottled systems and not through a compressed-air line.

16.12.2 Maintenance Facilities

Infrastructure related to mechanical maintenance will be minimal. Due to the proximity of mining services available in Sudbury, major maintenance will be conducted on the surface or in the city. Basic maintenance tasks will be carried out underground in service bays.

17 RECOVERY METHODS

The recovery approach discussed in this report is based on a sale agreement. As discussed, Magna has entered into a Definitive Off-Take Agreement with Vale Base Metals for its Crean Hill Contact style mineralization AdEx production from zones, Main, Intermediate, 9400, 9400 Footwall and 101 Footwall zones. (See Magna Press Release March 27, 2024). The agreement includes processing of the Crean Hill Contact mineralization through the Clarabelle Mill and downstream smelters and refineries. Concentrator metal recoveries are calculated based on the sampled and measured feed grade using established feed grade versus recovery equations. These equations were developed by lab scale testing of sampled of the Contact mineralization through Clarabelle Mill lab testing procedure. The equations are included in the Definitive Off-Take Agreement with Vale Base Metals.

The overall metal recovery is therefore a very predictable parameter in the economics and a function of sampled and measured feed grades.

The sale terms are confidential; however, the process follows a standard sale arrangement. When material is mined, it will be accumulated into 2000 t processing lots at site, which will be sampled via a sampling tower prior to transportation to Vale's Clarabelle Mill. The sample tower will follow best practice sampling protocols and will include crushing of all the Contact AdEx production to -1" for the primary sample cut and subsequent continuous crushing to -2 mm before continuous final (vesin) sample extraction. Redundant samples will be collected for Magna, Vale and umpire requirements. Each truck in the lot will be weighed and the grade of the lot will determine the recovery of metals in accordance with the equations included in the Definitive Off-Take Agreement.

Once the material has been treated, concentrate containing the metal recoveries predicted by the feed grade versus recovery equations at the Mill's targeted concentrate grade will be designated for smelting. For this stage of processing, there is a set of terms to describe a milling and smelting treatment charge, payables/deduction for each metal and refining charges as per the Definitive Agreement with Vale, to ultimately determine the Net Smelter Return (NSR).

Through this process, payments for Ni, Cu, Co, Pd, Pt, Au and Ag will be realized.

At the time of publication of this report, the Definitive Off-Take Agreement with Vale has been finalized and includes all feed grade/recovery relationships, milling charges, smelting charges, payables and payment terms.

For 109FW, Magna is pursuing other opportunities to further improve base and PGE-Au recovery. A set of Base Case and Optimized metallurgical models have been developed and indicative terms provided by local smelters to perform a preliminary economic analysis. At the time of the report, a 20,000 tonne bulk sample has been mined and processed as per the Toll Milling Agreement with Glencore Canada Corporation (see Magna Press Release June 4 2024) to process this sample at its Strathcona Mill. The results of this bulk sample test and follow up lab scale evaluation will further inform the metal recovery opportunities and business case analysis for the mining, milling and subsequent processing of 109FW mineralization.

18 PROJECT INFRASTRUCTURE

The aerial photo for the project site is presented in Figure 18-1.

Figure 18-1 Aerial Photo of the Crean Hill Project Site

Credit: Magna Mining

18.1 Surface Infrastructure

The mine, mill processing plant, and major mine site-related infrastructures will be located at the Crean Hill mine site approximately 30 km southwest of downtown Sudbury are described in Sections 18.1 to 18.1.8. The Project infrastructure is designed to support an operation with an underground mine supplying an annual average of 810,000 metric tonnes or 2,250 tonnes per day processing plant, operating 360 days per year. It has been developed for the most economical operation at this production rate and will require further expansion and development for any increases in throughput. The overall site layout showing the location of the proposed portal, a shaft for dewatering and rehabilitation, old waste dump expansion, and other support facilities is provided on Figure 18-2.

18.1.1 Summary

The infrastructure required for the Crean Hill Project will include:

- Portal and The Shaft Rehabilitation.
- Waste Dump expansion.
- Backfill Plant.
- Sampling Tower.
- Overall water management plan.
- Water management structures.
- Electrical site reticulation and.
- Warehouse, offices, facilities, weighing scale, and other services.

The mineralized material from underground will be transported to Vale's Clarabelle mill in Sudbury for processing as shown in Figure 18-3. A definitive offtake agreement is in place with Vale Base Metals for the advanced exploration portion of Crean Hill, including bulk sample material from the Main, Intermediate, 9400, 9400 Footwall, and 101 Footwall zones for processing.

18.1.2 Surface Facilities

The portal area will include clearing/grubbing and stripping the overburden for drilling and blasting to "collar in" the ramp. Geotechnical-related issues require further investigation at the proposed collar location.

The surface fan/heater installation is located on high ground. The ventilation raises collar elbow is also outfitted with a man door airlock system to access the raise manway compartment. An electrical building is required to house the fan starters or 600-volt variable frequency drives.

The surface sampling tower complex including the mineralized and low-grade stockpile area is located north of the portal area. At the portal area, additional facilities shall be installed such as a storage bunker, water supply tank, compressor house, mineralized stockpile, fuel, and generator (stand-by).

A warehouse and storage building will be in the dry/shop/storage building/shop/office complex, near the shaft. A laydown area will be prepared adjacent to the warehouse to accommodate the storage of such items as pipes, ventilation ducting, and electrical cable.

Mine supervision and engineering will be in the dry/shop/warehouse/office complex. Part of this complex will house a safety conference room, shifter wickets, dry, and engineering offices.

A modular portable 40-person mine dry will be installed initially, with office space for mine rescue, supervision, engineering, meeting room, tag in/out board, lunchroom, washroom facilities, first aid, etc.

A septic field will be used for sewage containment with regular pump-out as required. Minimal primary warehouse facilities will be maintained on-site in a portable trailer, or prefabricated structure, with miscellaneous cold storage in additional "containers". For each modular building, "C" cans will be provided for survey equipment, and accessories, etc.

A 40-foot shipping container shelter dome and cover equipped with a crane shall be located near the shaft covering an area of 12 m X 18 m. The containers could be used for warm storage for equipment, materials, and supplies.

Dedicated storage tanks will be provided on the surface for diesel fuel and propane requirements. Magna is planning to install on-site 2 X 30,000-gal propane tanks. The suppliers will directly fill these tanks. Other items further outlined in this section of the report include compressors, ventilation fans/heaters, and electrical switchgear/transformers.

The surface facilities also include the upper west retention pond and retention pond dam, a settling pond and filter berm, a polishing pond and dam, and site access roads. An existing powder magazine is located north of the mineralized stockpile.

Additional clearing/grubbing will be required at the site to establish a laydown area for temporary supplies storage (pipe, ground support), as well as pads for mineralization and waste stockpiling (McIntosh 2006).

Figure 18-2 Crean Hill Site Plan

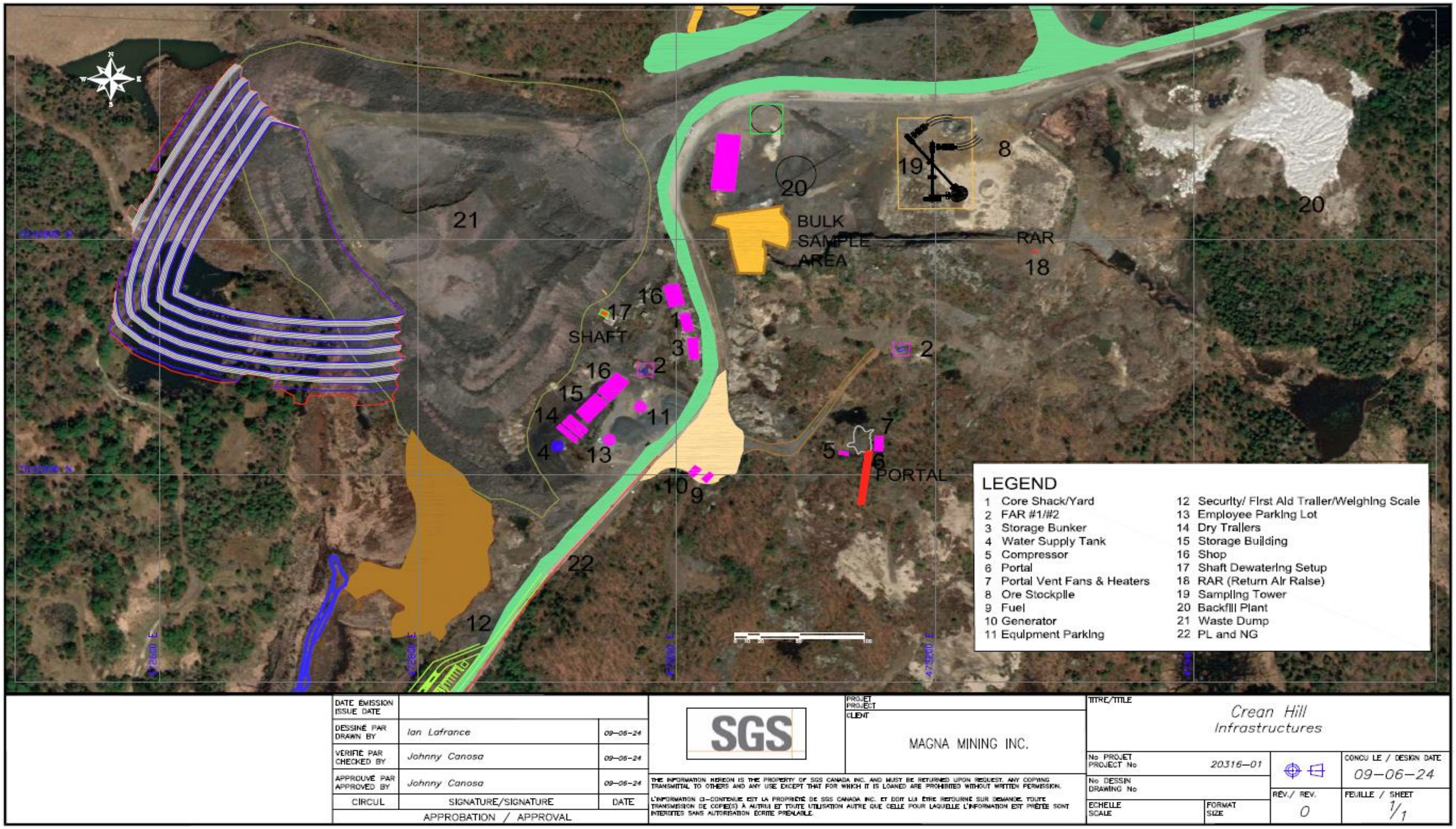


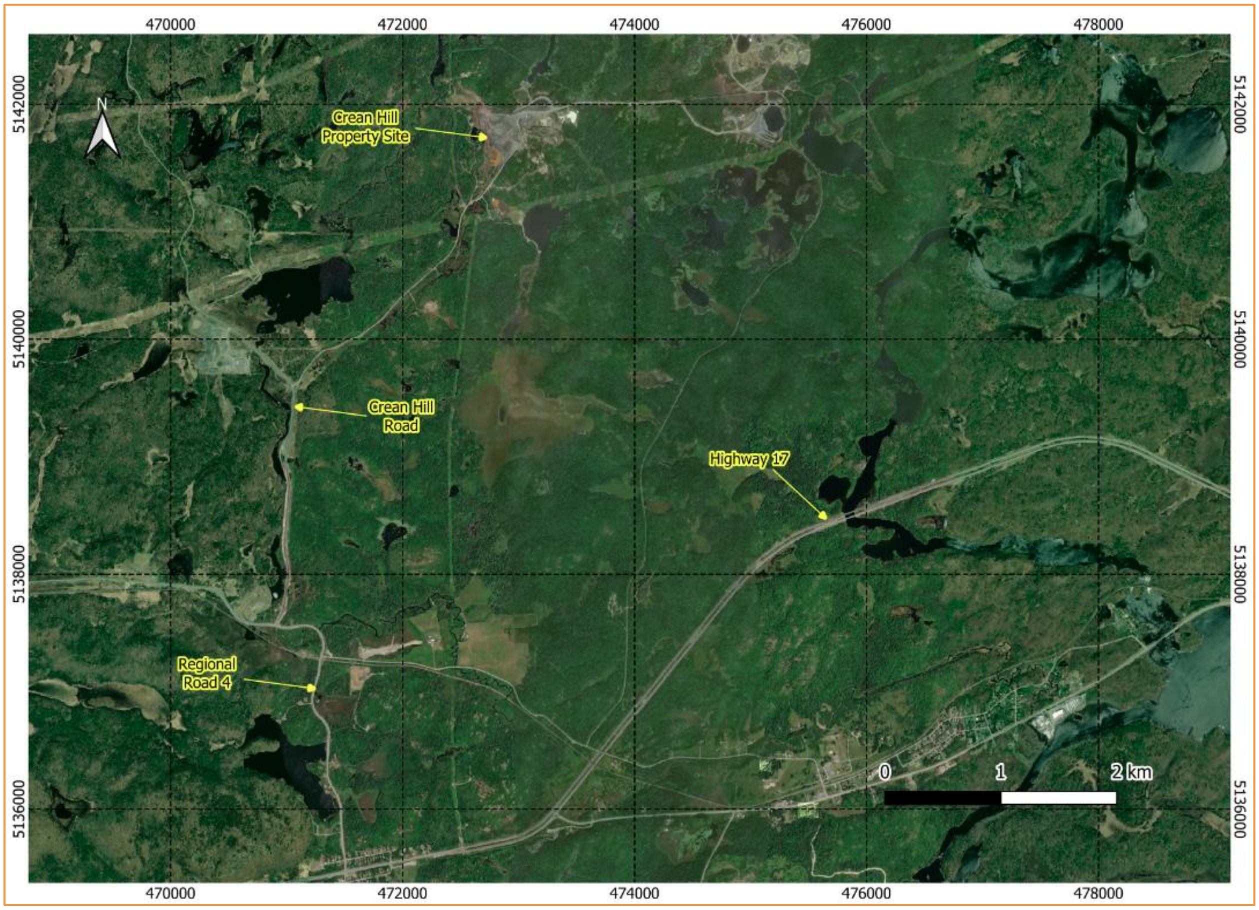
Figure 18-3 Mill Plant Site

18.1.3 Roads

18.1.3.1 Site Main Access Road

The Project site is accessible year-round by an all-season gravel road from the nearby Regional Road 4 and Trans-Canada Highway 17. The all-season gravel road has been the main access to the site for decades and remains suitable for heavy traffic. Materials and equipment will be transported directly to and from the site using typical highway delivery trucks. Workers will use the same roads to commute to and from the site from Sudbury and other nearby communities during project construction and mine operations. The roads leading to the Project site are shown in Figure 18-4.

Figure 18-4 Existing Roads to the Crean Hill Project Site



18.1.3.2 Haul Road – Mine to Clarabelle Process Plant

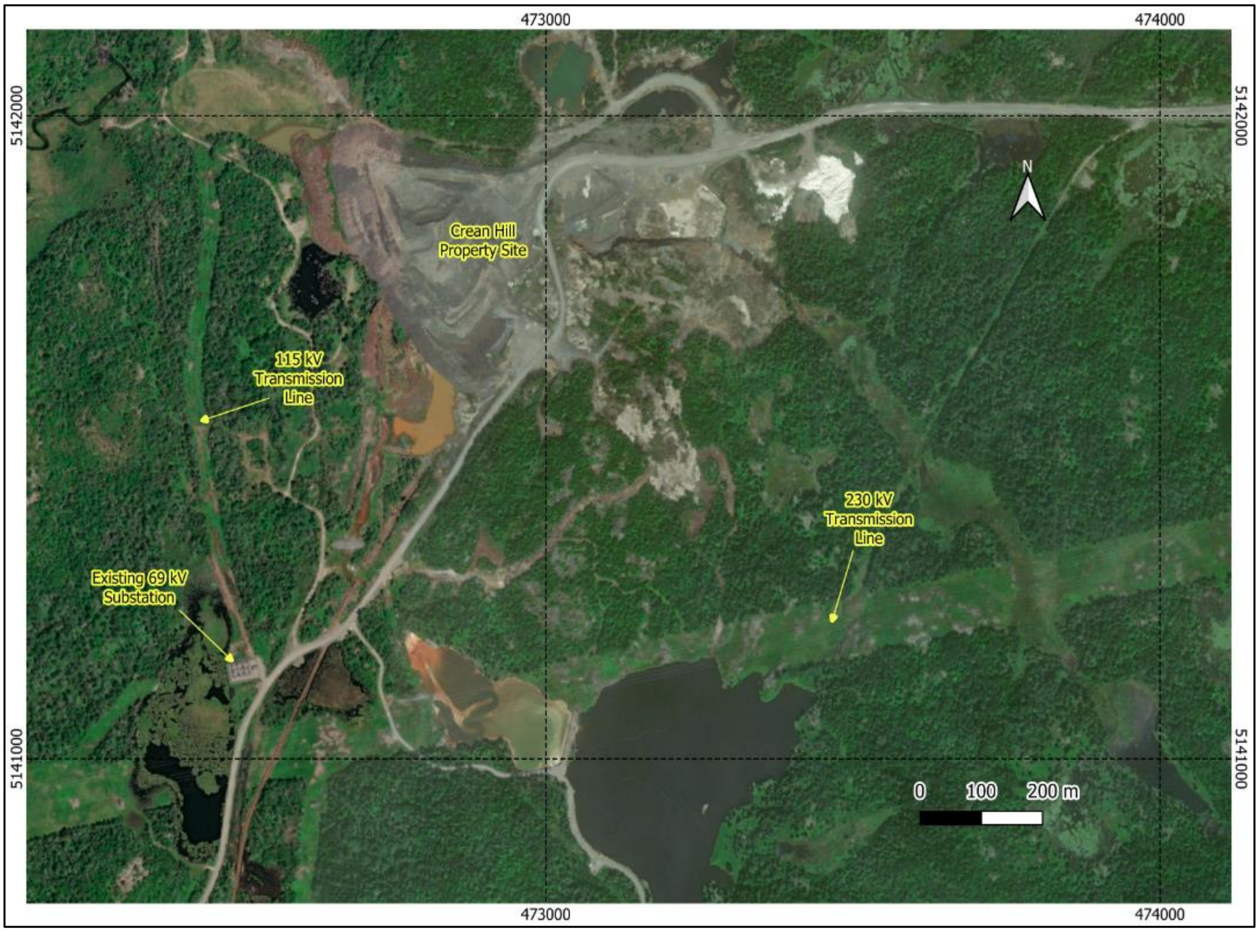
A haulage road will be established from the mill at Copper Cliff to the mine site, approximately 36 km via Crean Hill Road, Number 4 Road (Fairbank Lake Rd), and Trans Canada Hwy 17. This haul road will be suitable for use by heavy haulage trucks, with a provision for regular road maintenance. The haul road is presented in Figure 18-5.

Figure 18-5 Haul Road (Mine to Clarabelle Mill)

18.1.4 Power

A 230-kV power transmission line passes south of the project site and a 115-kV transmission line passes across the western edge of the site. There is an existing substation at the property boundary that may be used to supply power to the site at 69 kV. There are two nearby operating mines which are potential avenues to supply Crean Hill. An aerial view of the adjacent power infrastructure near the active or inactive mines as shown in Figure 18-6.

Figure 18-6 Existing Power Lines Near Project Site



Magna is considering the Crean Hill mine to be connected to a nearby substation which will require an approximate 3.2 km power line to connect to the buildings area. An underground power line will be required to be installed for facilities that will be located close to the portal area for the underground mine and the facility's power requirements.

18.1.5 Waste Rock Stockpile

The underground will mine and haul a calculated quantity of waste rock from underground development to access the mineralized resource.

Magna requested SGS to design a waste dump 590 meters (haul distance) north of the proposed portal which is called Waste Dump Expansion for identification purposes. The area identified is in the vicinity of the old waste dump southwest corner within the watershed area .kmz file provided by Magna (2015 catchment areas for natural input tool). The .kmz was used as the basis of the footprint of the waste dump expansion. The dump is suitable for waste rock storage on the basis that the location is close to the proposed portal and shaft and is designed to stay clear of existing waterways and natural ponds. The waste dump configuration is shown in Figure 18-2. The waste dump expansion has a storage capacity of 1 million tonnes which is sufficient to accommodate the calculated waste tonnage of 998,746 to be hauled or hoisted.

18.1.6 Water Management

18.1.6.1 Water Supply

The main water will be supplied from underground sources and will include process water introduced to the mine for drilling, washing, and dust suppression, water inflow captured by openings to the surface, and water inflow from the surrounding rock mass. Raw water from underground water sources will be delivered to a treatment module within a nearby trailer by a submersible pump before re-use underground and the surplus water for delivery to the west retention pond for treatment and discharge. Please refer to Section 16.9.4 (Underground Dewatering System). Treated water will report to a nearby insulated surge tank providing a fire water source.

The sources of raw water in the area are known to have high iron, manganese, sulfur, and hardness content. A submersible pump with a flow rate of 0.7 l/s and a pressure tank will be installed. The water will be treated to reduce iron, manganese, and sulfur with an air-injected system. Precipitated material will be removed via fully automatic twin iron filters. A water softening system will reduce scaling in the ultraviolet system and other plumbing. A surge tank will store the treated water and a 10 hp pump with a capacity to pump 8 L/s will supply the potable water system with the water from the surge tank.

Service water from the settling pond is a backup source of process water that will be provided to the mine using a 40-hp submersible pump.

18.1.6.2 Sewage System

It is planned that domestic sewage generated at the mine site will be disposed of using a peat moss-based subsurface disposal system. This option is expected to be more cost-effective (capital and operating costs for a 15-year mine life) than a conventional septic system or a package sewage treatment plant and it doesn’t require a licensed operator.

18.1.6.3 Effluent Management System

The effluent management system and approved discharge point is owned by Vale and comprise water containment structures and effluent treatment equipment.

18.1.6.4 Water Containment Structures

The topography at the mine site is described as rugged, with rock knobs which represent the dominant bedrock landform in the area.

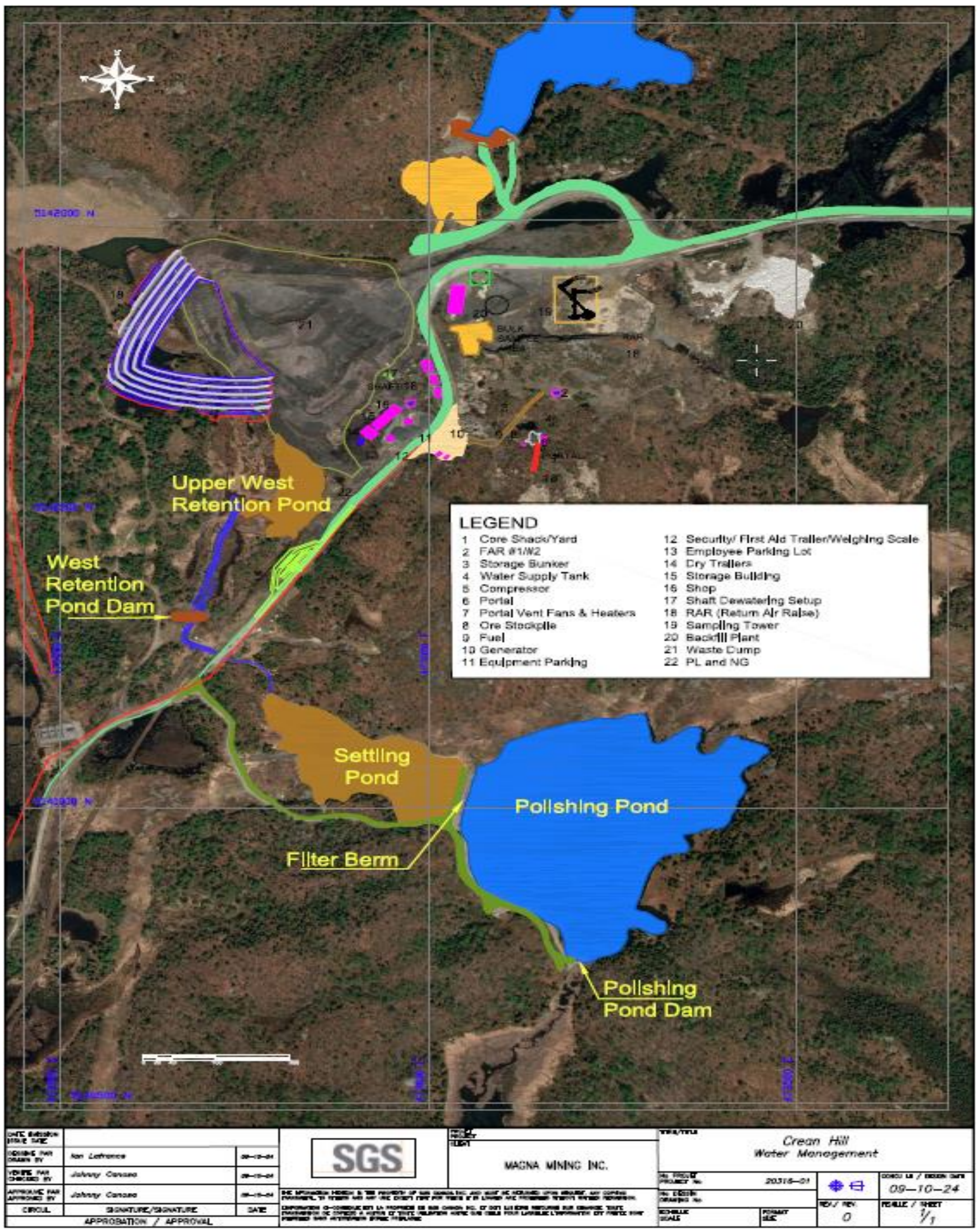
The property is contained entirely within the Vermillion River watershed. The Vermillion River eventually discharges to the Spanish River, which drains to the North Channel of Lake Huron. Most of the property drains to three sub-watersheds flowing into the Vermillion River.

- Fairbanks Creek watershed is situated to the west and northwest of the property and includes the lakes and tributaries draining to Fairbanks Creek. Major lakes situated in this watershed include Fairbank Lake, Little Fairbank Lake, Skill Lake, and Ethel Lake. Fairbanks Creek flows southward from Fairbank Lake towards the property. The catchment only receives surface water runoff from the property's western edge, including the west edge of the rehabilitated Crean Hill Mine landfill and a portion of the access road.
- Northeast Sub-Watershed covers the east end of the property. Drainage flows eastward through a series of wetlands and beaver ponds to the Vermillion River. This sub-watershed receives surface and groundwater discharges from the eastern portion of the property. Diversion dams were constructed to the north and west of the former Ellen No. 1 Pit to redirect freshwater to nearby wetlands, which drain to the Vermillion River.

- The former Crean Hill Mine site is situated in the headwaters of this watershed. Monk Lake is used as a water treatment polishing pond to treat runoff and dewatering from mining activities at the property. A diversion dam was constructed at the north end of this sub-watershed to redirect freshwater northward and ultimately east to the Vermillion River.

The property is located entirely within a bedrock valley that slopes to the west and runoff from the mine site will report to the Settling Pond by gravity as shown in Figure 18-7. Pre-treated underground mine water will also be directed to the settling pond. Water in the settling pond will normally seep through the filter berm and report to the polishing pond. Water from the settling pond may also be actively filtered and directed to the polishing pond. If quality is found to be adequate during the mine operation, water in the settling pond will be allowed to decant through the culvert in the filter berm and into the polishing pond. The water containment structures are presented in the water management drawing provided in Figure 18-7.

Figure 18-7 Water Management Containment Structures



18.1.6.4.1 Filter Berm

The filter berm is designed to remove suspended solids (e.g., metal hydroxide precipitates) from pH-adjusted water in the settling pond as it seeps into the polishing pond. The filter berm is designed with a crest elevation of 272 m to facilitate its use as a road that connects to the mine yard and ring road. An appropriately sized culvert will be installed with an invert elevation of 272 m to decant water to the polishing pond and to pass an Inflow Design Flood (IDF). This high-water elevation is intended to prevent encroachment on the mine yard and the associated infrastructure.

18.1.6.4.2 Polishing Pond Dam

A preliminary water balance was prepared. The water balance considered the commonly used 1:100-year return, 30-day duration rain or snow event to size the polishing pond dam and effluent treatment equipment. The water balance determined that a spillway invert elevation for the polishing pond dam of 273.44 m and an effluent discharge rate of 600 m^3/day was sufficient to withstand the selected design event.

18.1.6.4.3 Potential Groundwater Impacts

Ore will normally be managed within a stockpile area close to the sampling tower north of the proposed portal. Development rock will be hauled or hoisted to the waste rock dump expansion. As a result, potential acid rock drain/metal leaching (ARD/ML) contaminated contact runoff water will be confined to the mine and will report to the settling pond by gravity. As the settling pond was created by the filter berm and the underlying bedrock, it will be hydraulically connected to upstream overburden groundwater within the Mine yard. The pH of this water in the settling pond will be maintained at approximately pH 11 so that metals will be maintained as low solubility hydroxides.

Should any of this water percolate into the underlying overburden, the metal hydroxides will be attenuated by the upper overburden horizons. Impacted horizons will be delineated, excavated, and placed in the underground workings at closure. The drawdown cone created by the dewatering of the mine during operation will result in a net movement of local bedrock groundwater into the mine from the vicinity of the mine yards. As the handling of development rock and mineralization will be limited to the mine area, this drawdown cone will prevent the migration of bedrock groundwater off-site during the mine operation. At closure, development rock and overburden with elevated metal concentrations will be placed in the underground workings and flooded with alkaline water, effectively removing the sources of ARD/ML contamination from the surface, and preventing long-term ARD/ML.

18.1.6.5 Effluent Treatment System (ET Plant)

Based on an assessment of the preliminary water balance a design for an effluent treatment system that incorporates the attributes of the settling pond and polishing pond to maximize cost-effectiveness and minimize risks of non-compliance was undertaken.

The ultimate planned treatment system concept is described below.

1. Pre-treatment: Oil-water separator will be required.

2. Settling Pond: The settling pond (9,700 m^2) is located immediately south of the waste dump and will serve as a backup source of process water and oxidize non-regulated water constituents that could impact toxicity, such as nitrite. The settling pond will receive pH-adjusted water from the west retention pond, which will be a combination of mine water and runoff from the mine site. Lime/caustic addition to adjust the pH of mine water reporting to the settling pond to precipitate metals and maintain metals as low solubility hydroxides. The complexation of metals with ammonia is of minimal concern because the ammonia from the blasting agents is not organic. The existing settling pond was constructed using a permeable filter berm and the underlying bedrock valley, which is overlain by approximately 1-2 meters

of overburden. Water will filter and/or decant to the polishing pond. The settling pond will also serve as a surge pond for the ET Plant and as a process water storage pond for the Mine.

3. ET Plant: The ET plant will consist of a pumping system to withdraw water from the settling pond and deliver it to a conditioning tank where a coagulant/flocculant will be added. Water will then report to the (parallel plate) clarifier to settle the suspended solids. Clarifier underflow will gravity drain to a sludge-drying cell beside the settling pond. Clarifier overflow will be pumped through automated media filters to further remove suspended solids and then to automated resin canisters to remove ammonia. Water from the ET Plant will report to the polishing pond.

4. Polishing Pond: The polishing pond with an elevation of 272 m located immediately west of Monk Lake will also serve as a backup source of process water and oxidize non-regulated water constituents that could impact toxicity, such as nitrite. Diversion structures will direct unimpacted runoff from the upslope of the mine site yard, facilities, and portal area into the settling and polishing ponds.

5. Final pH Adjustment System: Water will gravity drain to the final pH adjustment system downstream of the polishing pond dam before discharge to the environment. Additional erosion control and energy dissipation measures will be field-fit and installed at the time of start-up. Discharge volumes will be measured, and “end-of-pipe” samples will be collected at this location, following regulatory requirements.

18.1.7 Sampling Tower

The sampling tower (Figure 18-1 Area 19) is planned to be located approximately 260 m north of the planned portal location. This area is a flat compacted hardstand surface for the tower and conveyors. The sampling system is designed to receive minus 1” sized material (95% passing) at a rate of 30 mtph. The feed material is subject to the upstream crushing and screening of run-of-mine (ROM) material by Others. Additionally, consideration has been given to the fact that this plant will need to process higher throughputs in the future as ‘bolt-on’ additions.

18.1.8 Backfill Plant

The scoped mobile plant footprint is approximately 16 m by 12 m and is shown to scale on an ariel view of the property at the initially proposed location in Figure 18-1 (Area 20). A larger footprint of 48 m X 18 m was included to encompass the stockpile screening equipment, conveyor, and plant enclosure. A sand stockpile location of 25 m X 25 m was also added to indicate the scale for a multi-day reserve that nominally suits the identified primary plant locations. Additional space would be required for the sand storage area if an enclosure is added to better maintain sand consistency and quality or approximately 20 m X 40 m. Proximity to the main access road was considered a priority due to the high number of trucks required to maintain sand requirements of approximately 60,000 tonnes per month at full production.

19 MARKET STUDIES AND CONTRACTS

19.1 Markets

No project-specific marketing studies were undertaken for the PEA. The PEA discusses the sale of run of mine material from the Crean Hill Project to a third-party mill within trucking distance in the surrounding area. There are two nickel processing facilities (mills) in Sudbury, and one in Timmins, all of which are currently in operation.

The existing mills in Sudbury are located less than 60 km away from the Crean Hill Project. As of August 2024, both Sudbury mills are believed to have capacity to process additional ore. Mineralized material from the Crean Hill Project could be sold to one of these third-party mills and processed into nickel and copper concentrates.

There are two smelters in Sudbury which, due to proximity, would likely serve as the destination for processed concentrate. It is assumed that in accordance with the start of mining operations from Crean Hill, a contract would be in place to sell ore to one of the Sudbury-based processing facilities. For purposes of this PEA, no processing charges or penalties at the smelter for deleterious elements and potential out-of-spec concentrate have been assumed and if required, will be included in a negotiated contract with the toll milling facility and smelter.

The Company is planning the Advanced Exploration (AdEx) program, and it is anticipated that mineralized material recovered from this program will be processed under negotiated terms for milling and smelter processing. The economic analysis in this PEA is based on the terms of this negotiated agreement.

19.2 Contracts

Vale retains a 3% Net Smelter Return (NSR) royalty from the sale or other distribution of any metals, non-metallic minerals, or other materials mined, produced, or otherwise recovered from the Revised Denison Property (or any waste rock or tailings derived from the Revised Denison Property). Such royalty is to be on, in accordance with, and subject to the terms set out in the Royalty Agreement.

19.3 Metal Prices

No marketing studies related to metal price projections were conducted for this PEA. The Company provided base case metal pricing, this was compared against the three year trailing average prices, spot market prices as of Mid July, 2024 and the pricing used in the 2023 PEA. These values are provided in Table 19-1.

Table 19-1 Preliminary Cut-Off Value for Underground Mine Planning

	Nickel	Copper	Cobalt	Platinum	Palladium	Gold
	$/lb	$/lb	$/lb	$/oz	$/oz	$/oz
Base Case Magna	$8.50	$4.00	$13.00	$900	$1,000	$2,150
3 Year Trailing Average	$9.96	$4.06	$19.89	$971	$1,622	$1,915
Spot Prices July 20, 2024	$7.30	$4.20	$12.45	$965	$923	$2,401
2023 PEA	$9.50	$3.50	$22.00	$1,000	$1,800	$1,700

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

The Crean Hill Project is located at the west end of the historic Sudbury mining camp, which has hosted mining and processing for over a century. The Crean Hill Mine on the property operated from 1906 to 2002. Magna acquired partial mining rights to the property in 2022 and has undertaken early exploration activities and economic evaluation work.

On February 29, 2024, Magna received confirmation that the amended Closure Plan for the Crean Hill Project had been filed with the Ontario Ministry of Mines. This allows Magna to move forward with an advanced exploration plan, which includes a surface bulk sample and the development of a ramp from the surface to perform test mining in the 101 Footwall, 109 Footwall, and Intermediate mineralized zones. The tonnage of the mineralized rock from the surface and underground test mining is outlined as 400,000 tonnes.

Magna has also applied for a Permit to Take Water (PTTW) to the Ministry of Environment, Conservation and Parks (MECP). In September 2023, Magna received comments back from the MECP on the application, amendments to the application were made in October and December 2023. Magna received confirmation that the Permit to Take Water has been approved by the Ministry of Environment, Conservation and Parks (MECP). This is the final permit required to enable dewatering of the existing mine workings and allow Magna to move forward with their advanced exploration plan, including a surface bulk sample and development of a ramp from the surface to perform test mining in the 101 Footwall, 109 Footwall and Intermediate Zones.

20.1 Environmental Studies

The climate in the property area is characterized by moderately long, cold winters and shorter, warm summers, as is typical of continental conditions. The area experiences a wide variation in temperature throughout the year. In winter months, the temperature may drop below -20°C for extended periods. In the summer, the maximum daily temperature may reach over 25°C for extended periods. The daily mean temperatures typically fall below freezing from December through March. Precipitation in the region is moderate and generally distributed evenly throughout the year, with only minor seasonal trends. However, the wettest months occur typically from May to October. Canadian Climate Normals (1981 to 2010) for the Sudbury airport estimate average annual total precipitation at 903 mm, with 676 mm falling as rain and 228 mm (water equivalent) falling as snow. The Sudbury airport is located approximately 45 km northeast of the property. Lake evaporation is estimated at 536 mm using data collected from Rawson Lake (Ontario), located approximately 105 km northeast of the property.

The topography at the property is rugged, with rock knobs representing the dominant bedrock landform in the area. These knobs are often bare or covered with a meter or less of boulder-strewn sandy till, thickening between the highs to between approximately 3 m and 5 m. Slopes are generally steep and complex, and relief ranges between 15 m and 60 m. The exposed rock knobs themselves are well drained. Organic deposits that are often found confined between outcrops are generally observed to be low-lying and wet. Drainage to the Vermillion River and several smaller creeks is poor—as a result, small swamps and marshes are numerous.

The property is contained entirely within the Vermillion River watershed. The Vermillion River eventually discharges to the Spanish River, which drains to the North Channel of Lake Huron. Most of the property drains to three separate sub-watersheds that flow into the Vermillion River.

- **Fairbanks Creek Watershed**: The basin forming this watershed is situated to the west and northwest of the property and includes the lakes and tributaries draining to Fairbanks Creek. Major lakes situated in this watershed include Fairbank Lake, Little Fairbank Lake, Skill Lake, and Ethel Lake. Fairbanks Creek flows southward from Fairbank Lake towards the property. This catchment only receives surface water runoff from the western edge of the property, including the west edge of the rehabilitated Crean Hill Mine landfill and a portion of the access road.

- **Northeast Watershed**: This sub-watershed covers the east end of the property. Drainage flows eastward through a series of wetlands and beaver ponds to the Vermillion River. This sub watershed receives surface and groundwater discharges from the eastern portion of the property. Diversion dams were constructed to the north and west of the Ellen No. 1 Pit to redirect freshwater to nearby wetlands, which drain to the Vermillion River.
- **Monk Lake Watershed**: The former Crean Hill Mine site is situated in the headwaters of this watershed. Monk Lake is used as a water treatment facility to treat runoff and dewatering from mining activities at the property. A diversion dam was constructed at the north end of this subwatershed to redirect freshwater northward and ultimately east to the Vermillion River.

As presented in the Crean Hill Mine Closure Plan (Vale, 2022), surface water quality has shown a wide range of concentrations for dissolved metals, as well as sulphate and pH values, demonstrating effects from natural mineralization as well as historic mining activities. Monitoring, reporting, and implementation of mitigation measures in accordance with regulatory requirements is ongoing at the property.

Groundwater flow systems have been identified and characterized around the property, as described in the Crean Hill Mine Closure Plan (Vale, 2022). Groundwater flows away from the site towards the Vermillion River, which is located approximately 2 km to the southeast. Estimated groundwater flow velocities in the overburden flow systems were estimated at between approximately 0.4 to 6 m/yr. Groundwater quality in overburden has shown a wide range of concentrations for dissolved metals, as well as sulphate and pH values, demonstrating effects from natural mineralization as well as historic mining activities. Groundwater quality for the parameters of interest for the bedrock flow system at the property has either remained the same or has improved over the 2011 to 2018 monitoring period, as documented in the Crean Hill Mine Closure Plan (Vale, 2022). Monitoring, reporting, and implementation of mitigation measures in accordance with regulatory requirements is ongoing at the property.

Three main soil types have been identified on the property. The soils, according to maps produced by the Soil Survey of Canada, include Rockland, Monteagle, and Baldwin (Soil Survey of Canada, 1983). The property straddles the south range of the Sudbury Igneous Complex (SIC) and hosts part of a large trough structure at the base of the SIC which contains several previously mined deposits, including the ore bodies at Crean Hill Mine, Ellen Mine, and Lockerby Mine, each sitting in embayments (terraces) within the larger trough. Much of the mined Ni-Cu contact mineralization is associated with the embayment structures in the SIC, and the embayments largely control the distribution of nickel-copper mineralization.

Given the abundant mineralization at the property, the mitigation of chemical instability issues (i.e., acid generation, metal leaching) has been the focus of the Water Quality Management Plan for the property that is being implemented by Vale. The Water Quality Management Plan is intended to help Vale make proactive and informed decisions on the management of water quality related environmental risks arising from their mining operations. The management plan establishes a hazard screening and risk evaluation process to assess water quality data for potentially affected water bodies. This process establishes an approach to evaluate and prioritize environmental risks and provides the means to establish remediation priorities and then develop site-specific action plans for mitigation.

Key risk factors used as a guide for prioritization of remediation priorities are as follows.

- Physical setting (surface water and groundwater flow conditions) 238
- Potential for biological impacts
- Potential for social impacts
- Preliminary assessment of the feasibility of mitigation.

The evaluation of the potential for biological impacts considers metal concentrations in water, the bioavailability of the metals, the presence of substances known to reduce toxicity including the underlying geochemistry of the receiver (e.g., levels of calcium, magnesium and dissolved organic carbon), biotic factors such as acclimation and adaptation, physical setting, and size and location of the receiver. The evaluation of social impacts includes factors such as visibility, potential for health risks, impact on use or enjoyment of the water resource, proximity to urban areas, and proximity to areas of importance to Indigenous communities.

Aquatic resource inventory work has been on-going at the property in accordance with regulatory requirements including the *Metal and Diamond Mining Effluent Regulations* (MDMER). Environment and Climate Change Canada's Environmental Effects Monitoring (EEM) guidance documents have been followed for recent studies.

- Despite concentrations of various metals in sediment being elevated above recognized thresholds due to naturally occurring mineralization and historic mining activities, the first two EEM studies found no effects within the benthic invertebrate communities from effluent discharge. However, the lack of confirmation in the benthic invertebrate community responses between the EEM studies warranted further work to meet MDMER requirements. This work was completed and submitted to Environment and Climate Change Canada in 2019 for review.
- As part of ongoing EEM work, fish sampling studies have been undertaken at the property in 2005, 2007, and 2012.

The 2012 EEM study replicated the fish population study using northern redbelly dace and creek chub, as fathead minnow were unable to be caught in sufficient numbers. The fish capture work identified the presence of white suckers in the receiving environment as well as a variety of small-bodied fish (i.e., fathead minnow, pearl dace, brook stickleback, Iowa darter, fine-scale dace, creek chub, northern redbelly dace, brow bullhead, central mud minnow, brassy minnow, and common shiner). The study did not observe any significant effects on creek chub. It did observe a difference greater than the Critical Effect Size on gonad size in northern redbelly dace, which had become significantly smaller since the previous study. Effects on liver size and condition factors were not confirmed in this study. The lack of confirmation in the fish population responses between the EEM studies warranted further work to meet MDMER requirements. This work was completed and submitted to Environment and Climate Change Canada in 2019 for review.

Background flora and fauna studies for the property were not conducted before initial development by the Canadian Copper Company in 1905. A site characterization for the property was conducted in 1993 to inventory and sample foliage from the existing vegetation. As documented in the Crean Hill Mine Closure Plan (Vale, 2022), the levels of metals in the vegetation sampled from around the former mining sites are slightly elevated.

Animal life at the property has not been surveyed recently. However, wildlife species such as moose, bear, deer, ruffed grouse, ducks, otter, beaver, and muskrat are common, based on observations by 239 personnel at the site and knowledge from trappers in the area. Presently, Magna is not aware of any species at risk or habitat features at the property that warrant consideration under Ontario's Endangered Species Act.

Culturally sensitive areas and areas with a high potential to host an archaeological or cultural heritage value have not been defined to date. Going forward, Magna will consult the proximal Indigenous communities and review available electronic databases (e.g., Natural Heritage Information Center) to identify any areas of cultural or heritage significance.

20.2 Permitting

The environmental assessment (EA) and permitting framework for metal mining in Canada is well established. The EA processes provide a mechanism for reviewing projects to assess potential impacts to the environment. A comprehensive permitting process is then completed to allow operations to proceed. The Project is regulated through all phases (construction, operation, closure, and post-closure) by both federal and provincial agencies.

Vale has been conducting environmental studies at the property by regulatory requirements for decades and data collection is ongoing. Cumulatively, environmental studies generally cover the following areas of study.

- Surface water quality and hydrology
- Groundwater quality and hydrogeology
- Geochemistry
- Terrestrial and aquatic biology

Magna will complete a gap analysis to determine if supplemental studies are warranted to support the permitting process for the development of the Project. Environmental studies characterize the biophysical environment before the development of the Project. Technical studies to date have not identified biophysical or cultural heritage values that pose a material constraint to development. The remaining environmental liabilities at the property are primarily the chemical stability risks associated with mine rock piles and decant water from the mine workings (open pits and underground). This section summarizes the permitting requirements for the Project.

20.2.1 Federal Impact Assessment Requirements

The maximum production by previous operators is assumed to be around 5,000 metric tonnes per day. The average production presented in the PEA is below the assumed 5,000 tonne per day threshold in Section 18 of the Physical Activities Regulations made under the Impact Assessment Act. Future studies will confirm the threshold value and the mine plan will consider a production rate that does not trigger a federal impact assessment. Other physical activities that can be subject to a federal impact assessment include transportation facilities (Sections 46 to 55) and water projects (Sections 58 to 61), but these components of the Project are below the applicable thresholds.

The Project is not required to complete a federal Impact assessment if the production rate is kept below the required threshold. However, under Section 9 (1) of the Impact Assessment Act, the Minister of Environment and Climate Change may designate a physical activity that is not prescribed by the Physical Activities Regulations if, in their opinion, either the carrying out of that physical activity may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation.

20.2.2 Provincial EA Requirements

The Project will need to complete the class EA processes listed below, which may be amended in the future by the provincial government.

- Class EA for Resource Stewardship and Facility Development, in accordance with MNR (2003), in advance of issuing permits for Crown timber harvesting, water crossings (>5 km^2 watershed area), occupying and constructing on Crown owned surface rights, online dams, and aggregate pit development.
- Class EA for any land tenure decisions, administered by Ministry of Mines
- Category B Class EA is required under the Electricity Projects Regulation (O. Regulation 116/01) for the use of diesel generators (>1MW and <5MW cumulative capacity).
- An evaluation will be required for potential EA requirements under the Electricity Projects Regulation (O. Regulation 116/01) and possible approvals from the Ontario Energy Board for potential electricity and natural gas service upgrades.

20.2.3 Permit Requirements

The provincial government permits that are anticipated to be required for the Project are listed in Table 20-1, depending on the final Project details. The federal government permits that are anticipated to be required for the Project are listed in Table 20-2, depending on the final Project details. The municipal government permits that are anticipated to be required for the Project are listed in Table 20-3, depending on the final Project details.

Two permits that are currently in place for the property are the following.

- Crean Hill Mine Closure Plan
- Sewage ECA 6763-9ZXQWA for the Crean Hill and Ellen Pit Wastewater Treatment Facility

It is possible to amend these permits to support the Project. Magna will consult with government agencies as planning progresses to confirm permit requirements.

Table 20-1 Concordance Table for Section 20 Requirements

Requirement of 43-101	Comment
Discuss reasonably available information on environmental, permitting, and social or community factors related to the Project.	Provided in Section 20.1
A summary of the results of any environmental studies and a discussion of any known environmental issues that could materially impact the issuer's ability to extract the mineral resources or mineral reserves.	Provided in Section 20.1, 20.3.1
Requirements and plans for waste and tailings disposal, site monitoring, and water management both during operations and post mine closure.	Provided in Section 20.3, 20.5
Project permitting requirements, the status of any permit applications, and any known requirements to post performance or reclamation bonds.	Provided in Section 20.2
A discussion of any potential social or community related requirements and plans for the Project and the status of any negotiations or agreements with local communities.	Provided in Section 20.4
A discussion of mine closure (remediation and reclamation) requirements and costs.	Provided in Section 20.5 Closure costs are not stated in Section 20. It is understood that these costs are included in the economic model for the PEA

Table 20-2 Federal Permits

Permit	Applicable Act	Responsible Agency	Description
Harmful Alteration, Disruption or Destruction of Fish Habitat	*Fisheries Act*	Fisheries and Oceans Canada	Effects of mine dewatering on fish-bearing surface water features under evaluation
Works in Navigable Waters	*Navigation Protection Act* *(formerly Navigable Waters Protection Act)*	Transport Canada	Authorizations for crossings and/or work in navigable waterway
Schedule 2 Listing, Metal Mining Effluent Regulation	*Fisheries Act*	Environment and Climate Change Canada	Overprinting of water frequented by fish by tailings and mine rock stockpiles (or other deleterious material) will require a listing under Schedule 2 of the *Metal and Diamond Mine Effluent Regulations*, pursuant to the *Fisheries Act*
Manufacturing, storage, and transportation of explosives	*Explosives Act*	Natural Resources Canada	On-site explosives production facility and on-site product storage. Required setbacks are defined in National Standard of Canada Explosives Quantity – Distances CAN/BNQ 2910-510/2015
Migratory Birds	*Migratory Birds Convention Act*	Environment and Climate Change Canada	Prohibition, harm, or disturbance to migratory birds
Transportation of Dangerous Goods	*Transportation of Dangerous Goods Act*	Transport Canada	There are no unique dangerous goods used at the Project. The Project also uses conventional fuels (diesel, gasoline, natural gas, propane) and commercially available welding gases
Species at Risk	*Species at Risk Act*	Environment and Climate Change Canada	Harm, or disturbance to species as designated under the *Species at Risk Act*
Radioisotope License	Nuclear Safety Control Act	Canadian Nuclear Safety Commission	Authorization for nuclear density gauges / X-ray analyzer

Note: These are the relevant permit requirements anticipated based on current understanding of the project presented in the PEA. Further discussion with agencies will be necessary once the project is further defined.

Table 20-3 Municipal Permits

Permit	Applicable Act	Responsible Agency	Description
Building Permits	*Ontario Building Code*	City of Greater Sudbury	Required for applicable structures
Zoning Designation / Re-Zoning	*Planning Act* and Municipal By-Laws (to be determined)		Potential requirement if the zoning designation of the selected site is not compatible with an industrial land use
Road User's Agreement	*Planning Act* and Municipal By-Laws (to be determined)		Agreement to establish cost sharing for road upgrades and maintenance for life of Project

Note: These are the relevant permit requirements anticipated based on current understanding of the project presented in the PEA. Further discussion with agencies will be necessary once the project is further defined.

20.3 Environmental Aspects and Sensitivities

The project is in the traditional territory of Whitefish Lake First Nation, Sagamok First Nation, and Atikameksheng Anishinawbek First Nation. Magna will seek guidance from the Crown regarding the potential interests of other Indigenous communities. The property is a brown field site and Magna will not be creating new impacts on undisturbed land areas. Emphasis has been placed on reducing water taking, water discharge, fugitive dust, and noise to minimize the potential for off-site impacts that could affect traditional uses and treaty rights.

Management plans that will be developed for the project are as follows:

- Emergency Response Plan
- Spill Prevention and Contingency Plan
- Hazardous Substances Management Plan
- Waste Management Plan
- Construction Environmental Protection Plan
- Air Quality Management Plan
- Water Management Plan
- Environmental Monitoring Plan
- Fish Habitat Compensation Agreement (possibly)
- Adaptive Management Plan
- Fugitive Dust Best Management Plan
- GHG Management Plan
- Engagement Management Plan
- Soils Management Plan
- Waste Rock Management Plan

Environmental aspects that are the focus of current planning efforts are described in the following sections.

20.3.1 Mine Rock Geochemistry

Potentially acid generating and/or metal leaching waste rock will be identified and segregated using lithology and sulphur content, so that it can be managed in accordance with an appropriate management plan. Current information regarding the risk of acid rock drainage / metal leaching (ARD/ML) from mine wastes at Crean Hill was based on historical sampling of waste rock from the former Waste Rock Dump located southeast of the Main Pit (Senes, 2004). One hundred and sixty-two waste rock samples were submitted for limited geochemistry test work. Sixty percent of these samples (97/162) would be classified as at potential risk of acid generation based on current regulatory guidance (MEND, 2009). Total sulphur concentrations were less than 1% wt. Acid neutralising capacity was also low. A geochemistry program to further evaluate the ARD/ML risk from mine wastes at Crean Hill is currently underway with initial results expected to be available later in 2023.

20.3.2 Water Discharge

Water discharge will be minimized by recycling water to the extent practical using industry standard practices. Surplus water that is not needed for the mining process will be treated using the existing sewage works at Crean Hill Mine in accordance with the issued ECA (as may be amended). Operational strategies that will be employed to help meet effluent criteria include chemical conditioning in the mine to reduce suspended solids, as well as good blasting practices and use of explosive emulsions in the mine to minimize ammonia with aeration, and biological oxidation of ammonia to prevent elevated nitrogen compound concentrations and solubilization of phosphorus from sediment under anoxic conditions.

20.3.3 Fugitive Dust

Air emission sources will comprise diesel-fueled equipment, diesel generators, combustion heating units, as well as fugitive dust emissions from vehicle operation, crushing, and on-surface material handling typically associated with a mining and crushing operation. Practices to minimize fugitive dust are listed below:

- Minimize vehicle speed and travel time, use dust suppressants on travelled roads, minimize track-out of fines from material handling areas.
- Minimize coarse mineralized-material stockpile size, enclose the fine-mineralized-material stockpile, and use buildings and tree lines as windbreaks to the maximum extent practical.
- Enclose material transfer points to prevent exposure to wind and use water sprays to suppress dust.
- Other applicable best practices listed in Environment Canada (2009).

Magna will develop and implement a management plan for controlling fugitive dust. Fugitive dust is considered in the site-wide emission summary and dispersion modelling (ESDM) report that is prepared to support the Air ECA amendment application listed in Table 20-1. The ESDM report demonstrates compliance with MECP air quality criteria during worst-case scenarios.

20.3.4 Site Plan Layout

The underground portal is proposed to be in the south-central area of the site away from the Fairbanks Creek watershed and the Monk Lake watershed. The portal avoids watercourses, and waterbodies and is an upgrade from a diversion dam constructed to divert south-draining runoff to Fairbanks Creek.

The waste rock storage area is proposed to be expanded to the west within the area identified in the vicinity of the old waste dump southwest corner within the watershed area (catchment areas). The waste rock stockpile has been sited as extension pile to provide a setback environmental buffer from a watercourse draining west. The fish-bearing status of this watercourse is uncertain and will require confirmation in future stages. However, the waste rock pile extension avoid interference to address concerns with a Fisheries Act Schedule 2 prohibition regarding the deposition of mine waste in waterbodies frequented by fish. Mineralized material will be processed, and tailings disposed of at existing processing and tailings storage facilities offsite.

20.4 Social and Community

The property is in the Sudbury Forest Management Unit and hosts wilderness, forestry, and mineral development land uses.

The site has been developed and is currently managed as it is in active closure. However, there continues to be access through the site for Vale’s management of waste rock and Ontario Hydro access to powerline infrastructure. The site is fenced, and natural features are used for safety and to reduce public access. It is not an active hunting or trapping area. Nevertheless, Magna has engaged with the potentially impacted communities to provide them with an update on our proposed activities. Once the PEA is complete and the required permits identified, Magna will again engage with those communities identified by the Crown and those who have expressed interests in the project area. One or more public information sessions will be held to promote the opportunities that the Crean Hill mine project will bring to the area, along with participation in regional mining and local business conferences.

20.4.1 Indigenous Consultation

Aboriginal and treaty rights of Indigenous communities are protected under Section 35 of Canada's Constitution Act. The federal and provincial governments share the duty to consult Indigenous communities regarding developments such as this Project as part of the environmental assessment and approvals process. Magna has initiated early communications and consulted with proximal First Nations. The Ministry of Mines will provide guidance to Magna regarding the consultation that is required for the Project and the aspects of the consultation process that will be delegated to Magna. Magna will then prepare an Indigenous Consultation Work Plan in accordance with the requirements of the *Mining Act*, while endeavouring to meet the consultation requirements of the other involved government agencies.

20.4.2 Public Consultation

Consultation with the local and regional communities has commenced and will continue as the Project progresses. This will include meetings with the municipal and provincial government as well as other parties. This consultation will include meetings, public information sessions, and other communications to ensure stakeholders are aware of Magna's proposed activities, comment and input can be received, and concerns can be resolved in an efficient manner.

20.5 Closure

For the Project to proceed to development, the existing closure plan will be amended to meet requirements of Ontario Regulation 240/00 (refer to Table 20-1) and are consistent with any traditional land uses and occupancy by Indigenous communities. A closure plan outlines how the project lands will be rehabilitated to a physically and chemically stable, productive land use post closure. The closure plan will meet the requirements of the *Mine Rehabilitation Code of Ontario* (Code) and describe the costs associated with doing so, as well as implementing a monitoring program. Closure plans must be amended periodically during the life of a mine if material changes are made.

To see to it that the rehabilitation work outlined in a closure plan is successfully performed, financial assurance equal to the estimated cost of the rehabilitation work must be provided by the proponent to be held in trust by the Ministry of Mines. Financial assurance must be included with the submission of a closure plan.

Further to Section 20.1.4, based on precedent, it will be possible to amend the Crean Hill Mine Closure Plan for the Project to proceed. Alternatively, a filed closure plan can be adjusted so that some of the lands become subject to a new closure plan. The path forward will be determined in consultation with the Ministry of Mines.

Elements of the rehabilitation work that would be integrated into the closure plan / closure plan amendment are summarized as follows.

-
- Buildings, infrastructure, and equipment that are not required for long-term water management will be removed and salvaged, recycled, or disposed of. Contractor owned items and leased items will be removed by the respective owners.
- Contaminated soil will be managed in accordance with MECP requirements.
- The development footprint will be scarified, and fill embankments will be sloped for long-term physical stability. Soil from a local soil stockpile will be placed over the site and the area that will be re-vegetated using a suitable seed mix prior to planting seedlings consistent with the surrounding plant community. The proportion of rock exposure and vegetation cover will conform to the local landscape.
- Open pits will be flooded following any potential in-pit backfilling to manage mine rock. Boulder fencing will be constructed along any high walls.

- Openings to underground mine workings will be sealed in accordance with the Rehabilitation Code prior to flooding with pH adjusted water.
- Mine rock piles will be built with overall embankment slopes that are adequate for long-term physical stability so that no re-contouring is required at closure. Available stockpiled soil will be used to vegetate waste rock piles as practical to conform to the local landscape. Mine rock types that pose a chemical stability risk will be managed in accordance with the management plan that will be developed as part of the closure plan.
- Final removal of power distribution and water management infrastructure once active water management is no longer required.

Roads will be rehabilitated in accordance with MNR (1995) and removed from use. Roads that are not requested to remain in place by MNRF, a First Nation, or a third party will be removed in accordance with MNR (1995) and any supplemental guidance from MNRF, with financial assurance provided in the closure plan.

21 CAPITAL AND OPERATING COSTS

21.1 Summary

Capital and Operating costs used in this PEA are estimated to an accuracy of + / - 40%. Costs are derived from a number of sources, including:

- First Principal calculations for mine operations, using CostMine© database values and direct calculations.
- CostMine© database estimates for underground and shaft equipment capital and operating costs
- Vendor quotes for power supply, ventilation, paste fill, and contractor development.
- SGS database and benchmarking of other published projects.
- Costs Provided by Magna.

The total project capital cost for the Crean Hill Project is $240.5M as shown in Table 21-1, consisting of $27.7M Pre-production capital and $212.8M sustaining capital.

Table 21-1 Crean Hill Capital Summary

Item	Units	Pre-Production (Initial Capital)	Production (Sustaining Capital)	Total Capital Cost
Development	M$CAD	12.8	143.5	156.3
Infrastructure	M$CAD	14.5	58.7	73.1
G&A and Indirects	M$CAD	0.4	4.8	5.2
Closure	M$CAD	-	5.8	5.8
Total Capital Cost	M$CAD	**27.7**	**212.8**	**240.5**

Exploration spending and underground development during the advanced Exploration Bulk Sample Program (AdEx) is not part of the economics of this PEA but is presented in Section 24, Other Relevant Data and Information.

Pre-Production Capital includes costs for mine development, primary ventilation and underground infrastructure.

Sustaining capital is required for underground mining, mine surface facilities, the backfill plant and periodic ventilation upgrades as mining progresses.

Operating costs were estimated for mining, process and G&A. Over the LOM, the operating costs will average $157.75/t of material processed.

Table 21-2 Crean Hill Operating Summary

Item	Units	Pre-Production	Production	Operating Cost Per Resource Tonne Mined ($/T)
Mining	M$CAD	40.3	894.7	$87.47
Crushing, Sampling, Haulage and Processing	M$CAD	17.3	635.7	$61.09
G&A	M$CAD	5.3	93.	$9.19
Total Operating Costs	M$CAD	**62.9**	**1623.3**	**$157.75**

21.2 Advanced Exploration (AdEx) Bulk Sample Program

The company is undertaking and advanced bulk sample program to confirm resource grade, continuity, mining dilution impacts and off-site toll milling and recovery characteristics to further de-risk the project in advance of future feasibility studies.

Details of the costs of this program are provided in Section 24.

21.3 Basis of Estimate

The basis of estimate has been developed in accordance with the following:

- Project scope of facilities
- Mine Designs and schedules for Development and Production
- Equipment lists
- Preliminary Site layouts
- Estimated and factored material take-offs
- PEA level quotations from vendors for fuel, power and commodities
- Publicly available documents on local labour rates

Currency exchange rates used in this study are shown in Table 21-3 below.

Table 21-3 Currency Exchange Rates

Currency	
Canadian Dollar (CAD)	1 CAD = 0.74 USD
US Dollar (USD)	1 USD = 1.35 CAD

Base commodity prices used in this PEA are shown in Table 21-4.

Table 21-4 Base Commodity Prices

Commodity	Units	Price per Unit
Diesel Fuel	Litres	$1.65
Power	Kw-Hr	$0.11
Propane	litres	$0.50

Unit costs for development are presented in Table 21-5. These costs are used both for capital and operating estimates. These calculations are based on direct consumables and equipment operating costs but do not include labour.

Truck haulage costs vary overtime and are presented in Table 21-6.

Labour rates used in this study are summarized in Table 21-7.

Table 21-5 Key Operating Rates

Area		Cost Item			Source
Mining	Grade control	Definition Drilling & Sampling	5.00	CAD/t	Magna
	Mine Development	Resource and Waste Development	9.21	CAD/t	First Principles
			1,730.69	CAD / m	
		Alimak Raising	2,800.00	CAD / m	SGS Database
		Raise Bore	2,000.00	CAD / m	SGS Database
	Production	Production drilling	4.55	CAD/t	First Principles
		Blasting	3.13	CAD/t	First Principles
		Mucking	2.04	CAD/t	First Principles
		Hoisting	1.11	CAD/t	First Principles
		Backfilling	12.98	CAD/t	Vendor Quote
	Services	Infrastructure	2.48	CAD/t	First Principles
		Supervision	0.66	CAD/t	First Principles
		Maintenance	0.12	CAD/t	First Principles
		Technical	0.41	CAD/t	First Principles
Processing		Crushing	3.18	CAD/t	First Principles
		Haul to processing Plant	12.00	CAD/t	Magna
		Toll milling	44.59	CAD/t	Magna
		Sample Tower Operation	1.32	CAD/t	First Principles
G&A		General & Administration	$4,217,689	Per Year	First Principles

Truck Haulage varies over the life of mine and is calculated on an annual basis. Waste is assumed to be dumped in open stopes and a haul distance of 1,000 m was used throughout the life of mine.

Resource haulage varies with ramp depth, allowing for hoisting from the 2000 Level once the shaft is available for use.

Table 21-6 Truck Haulage Costs

UG Truck Haul $/t CAD	Stoping Rate	Development Rate	Waste Rate
Year 1	$2.70	$2.70	$2.70
Year 2	$2.69	$2.54	$1.87
Year 3	$2.87	$3.32	$1.87
Year 4	$2.87	$3.32	$1.87
Year 5	$4.31	$4.79	$1.87
Year 6	$4.79	$7.18	$1.87
Year 7	$5.39	$3.32	$1.87
Year 8	$3.08	$3.08	$1.87
Year 9	$3.59	$4.31	$1.87
Year 10	$3.92	$6.16	$1.87
Year 11	$6.16	$6.16	$1.87
Year 12	$6.16	$7.18	$1.87
Year 13	$8.62	$10.78	$1.87
Year 14	$8.62	N/A	$1.87

Personnel rates used in this study are summarized in Table 21-7.

Labour Assumptions

Wage rates for contractor development crews are developed from benchmarking and the SGS database of current projects. These were compared to vendor quotes and found to be similar. Labour rates for operations are taken from existing collective bargaining agreements in the Sudbury area. Labour work hours and rotations are based on seven days per work, 12 hours per day and four day on / four day off configuration. Staff and G&A labour is developed based on an 8 hour / 5 day per week.

Statutory and regulatory costs for vacation pay, employment insurance, pensions and benefits are included in the overall burdens with the rates.

Direct operating personnel quantities are based on operating equipment requirements.

Indirect and G&A personnel quantities are based on benchmarking other studies and operations.

Personnel quantities are determined from equipment lists for direct operating personnel, while mine indirects, management and G&A are derived from first principles and benchmarking against other operations.

Table 21-7 Labour Rates

Area	Position	Annual Costs with Burdens
G&A	Site General Manager	$331K
G&A	Admin Assistant	$111K
G&A	Controller / Cost Accountant	$135K
G&A	Warehouse Supervisor	$123K
G&A	Warehouse Floor Staff / Shipping / Receiving	$114K
G&A	Site Environmental Superintendent	$144K
G&A	Site Environmental Technician	$120K
G&A	Safety Officers	$112K
G&A	Gatehouse Security / First Responders	$114K
G&A	Janitorial Staff	$108K
Mine Directs	UG Mine General Foreman	$198K
Mine Directs	Mine Shift Bosses	$127K
Mine Directs	Jumbo Operator	$182K
Mine Directs	Dev. Support Leader	$182K
Mine Directs	Dev. Support Miner	$182K
Mine Directs	Scoop Operator	$138K
Mine Directs	Truck Operator	$138K
Mine Directs	Long hole driller	$166K
Mine Directs	Long hole blaster	$160K
Mine Directs	Service Long hole & dev	$159K
Mine Directs	Cage / Skip Tender	$132K
Mine Directs	Deckman	$132K
Mine Directs	Shaftman	$170K
Mine Directs	Hoistman	$166K
Mine Directs	Construction	$156K
Mine Directs	Service Underground	$135K
Mine Directs	Hoist Mechanic	$126K
Mine Directs	Electrician	$124K
Mine Directs	Instrumentation	$124K
Mine Directs	Mechanics	$124K
Mine Indirects	Mine Technical Services Manager	$240K
Mine Indirects	Senior Mine Engineer	$198K
Mine Indirects	Ventilation Engineer	$149K
Mine Indirects	Rock Mechanics / Backfill Engineer	$149K
Mine Indirects	Mine Planner - Longhole	$131K
Mine Indirects	Surveyors	$121K
Mine Indirects	Mine IT Support	$127K
Mine Indirects	Chief Geologist	$147K
Mine Indirects	Production Geologists	$131K

Area	Position	Annual Costs with Burdens
Mine Indirects	Geology Technicians	$120K
Mine Indirects	Sample Tower Operators	$118K
Mine Indirects	Mine Operations Superintendent	$240K
Mine Indirects	UG Trainer	$122K
Mine Indirects	Shaft Captain	$123K
Mine Indirects	Mine Mainetnance Superintendent	$149K
Mine Indirects	Maintenance Planner	$122K
Mine Indirects	Mechanical General Foreman	$136K
Mine Indirects	Electrical General Foreman	$136K

Equipment costs are derived from the CostMine© database and benchmarking against published studies. Hourly costs are factored based on purchase costs divided by estimated equipment life hours. Capital rebuilds are factored at 5% of original capital cost per operating year. A lease rate of 5% of original equipment cost is applied to the hourly equipment costs.

As the mobile equipment is treated as a lease, there is no initial capital requirement assumed in this PEA. The operating costs reflect the equipment leases.

Table 21-8 Monthly Equipment Costs

Equipment	Lease Cost Per Month
Jumbo 2 boom	$48K
ANFO Loader	$21K
Scoop 8 vg3	$58K
Scissor Lift	$9K
Pneumatic Drill	$50K
Electro-Hydraulic Drill	$68K
ANFO Loader	$21K
Scoop 8 vg3	$58K
Truck 40 t	$87K
Cable Bolter	$39K
Shotcrete Sprayer	$31K
Scoop 3 vg3	$31K
Boom Truck	$19K
Grader	$32K
Tractor	$5K
Personnel Carrier	$16K
Light Vehicle	$5K
Surface Loader	$10K

21.4 Capital Cost Estimates

Total capital for the Crean Hill Project is estimated at $240.5 million CAD, with $27.7 million for pre-production, and $212.8 million for sustaining.

The majority of capital is for ramp and raise development as mining progresses. Details of capital expenditures are provided in Table 21-9.

Project capital is estimated in the following areas:

- Direct capital development, including ramps, level accesses, drift slashing, escape and ventilation raises.
- Mine Ventilation Capital.
- Shaft rehabilitation, headframe, and hoist installation.
- Mine dewatering Capital.
- Compressed air facilities.
- Underground facilities including shops, refuge stations, explosives storage, fuel and lube systems and escapeways.
- Surface facilities such as sample tower upgrades and backfill plant upgrades.
- Grid power supply and underground distribution.

Table 21-9 Details of Capital Expenditures

			Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Project Capital		**Pre-Production**	**Sustaining**														
Capital Development																	
Main Ramp	**m**	**1367**	**10604**	**1367**	573	110	369	710	1,403	1,402	1,404	1,389	1,379	1,215	650	0	0
Level Access	**m**	**286**	**1670**	**286**	64	34	36	123	133	259	92	195	282	299	154	0	0
Raise Access	**m**	**165**	**1627**	**165**	260	0	141	87	94	192	215	71	257	135	121	54	0
Additional Capital	**m**	**401**	**3068**	**401**	202	8	44	338	420	295	338	427	334	357	304	0	0
Slashing																	
Main Ramp	**m**	**0**	**367**	**0**	0	0	0	0	0	0	0	0	0	190	177	0	0
Level Slashing	**m**	**0**	**137**	**0**	0	0	0	0	0	0	0	0	0	137	0	0	0
Raise Access	**m**	**190**	**937**	**190**	123	0	46	34	69	98	203	24	99	212	28	0	0
Vertical Development	**m**	**137**	**1175**	**137**	113	0	56	56	0	170	213	0	0	318	171	79	0
Project Capital																	
Mine Development Capital																	
Ramp		**$2,365K**	**$18,352K**	**$2,365K**	$991K	$190K	$638K	$1,229K	$2,429K	$2,426K	$2,430K	$2,404K	$2,387K	$2,104K	$1,124K	-	-
Level Access		**$494K**	**$2,890K**	**$494K**	$111K	$59K	$62K	$214K	$230K	$448K	$159K	$338K	$488K	$517K	$266K	-	-
Raise Access		**$286K**	**$2,816K**	**$286K**	$450K	-	$243K	$150K	$163K	$333K	$372K	$123K	$445K	$233K	$210K	$93K	-
Additional Capital Waste		**$695K**	**$5,310K**	**$695K**	$350K	$14K	$76K	$585K	$727K	$510K	$586K	$739K	$579K	$618K	$526K	-	-
Vertical Development (Raise Bore)		**$274K**	**$2,350K**	**$274K**	$225K	-	$113K	$113K	-	$340K	$425K	-	-	$636K	$342K	$157K	-
Capital Development Equipment Leases		**$6,490K**	**$81,419K**	**$6,490K**	$6,490K	$7,873K	$7,873K	$7,873K	$7,873K	$7,873K	$7,873K	$7,873K	$6,490K	$6,490K	$6,490K	$350K	
Slashing Capital Development																	
Ramp			**$413K**	**-**	-	-	-	-	-	-	-	-	-	$214K	$200K	-	-
Level Access			**$154K**	**-**	-	-	-	-	-	-	-	-	-	$154K	-	-	-
Raise Access		**$214K**	**$1,054K**	**$214K**	$138K	-	$52K	$38K	$77K	$110K	$228K	$27K	$112K	$239K	$32K	-	-
Waste Haulage		**$439K**	**$2,341K**	**$439K**	$153K	$22K	$92K	$147K	$258K	$303K	$303K	$257K	$303K	$313K	$178K	$13K	-
Direct Mining Labour		**$1,563K**	**$26,392K**	**$1,563K**	$1,897K	$2,048K	$2,048K	$2,273K	$2,336K	$2,336K	$2,336K	$2,336K	$2,185K	$2,250K	$2,250K	$2,099K	-
Total Capital Development		**$12,820K**	**$143,491K**	**$12,820K**	**$10,805K**	**$10,205K**	**$11,195K**	**$12,621K**	**$14,092K**	**$14,679K**	**$14,712K**	**$14,096K**	**$12,988K**	**$13,768K**	**$11,618K**	**$2,712K**	**-**
Capital G&A / Mining Indirects		**$390K**	**$4,795K**	**$390K**	**$390K**	**$390K**	**$390K**	**$390K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**-**
Mine Ventilation																	
Surface Portal RA Fans		$2,000K	-	$2,000K	-	-	-	-	-	-	-	-	-	-	-	-	
Surface# 1 FA Fan and Heater		$3,000K	-	$3,000K	-	-	-	-	-	-	-	-	-	-	-	-	
Surface# 2 FA Fan and Heater		$3,500K	-	$3,500K	-	-	-	-	-	-	-	-	-	-	-	-	
720 Level U/G RA Booster		-	$4,600K	-	$4,600K	-	-	-	-	-	-	-	-	-	-	-	
2000 Level U/G RA Booster		-	$4,200K	-	-	$4,200K	-	-	-	-	-	-	-	-	-	-	
4000 Level U/G RA Booster		-	$4,200K	-	-	-	-	-	$1,223K	$1,464K	$1,460K	$53K	-	-	-	-	
Bulkhead with Fan and Person Door		-	$300K	-	$60K		$60K		$60K		$60K		$60K		-	-	
Air Monitoring Station		-	$40K	-	$20K	$20K	-	-	-	-	-	-	-	-	-	-	
Total Mine Ventilation		**$8,500K**	**$13,340K**	**$8,500K**	**$4,680K**	**$4,220K**	**$60K**	**-**	**$1,283K**	**$1,464K**	**$1,520K**	**$53K**	**$60K**	**-**	**-**	**-**	**-**
Shaft, Headframe and Hoistroom																	

			Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mining Costs		-	$6,000K	-	-	$1,728K	$1,725K	$2,546K	-		-	-	-	-	-	-	
Civil Installations		-	$3,751K	-	-	-	$832K	$2,919K	-	-	-	-	-	-	-	-	
Structural Installations		-	$3,271K	-	-	-	-	$3,271K	-	-	-	-	-	-	-	-	
Architectural Installations		-	$423K	-	-	-	-	$423K	-	-	-	-	-	-	-	-	
Mechanical Installations		-	$2,786K	-	-	-	-	$2,786K	-	-	-	-	-	-	-	-	
Electrical Installations		-	$2,751K	-	-	-	-	$2,751K	-	-	-	-	-	-	-	-	
Contractor Indirects		-	$2,767K	-	-	-	-	$2,767K	-	-	-	-	-	-	-	-	
Owner's Costs		-	$1,503K	-	-	-	-	$1,503K	-	-	-	-	-	-	-	-	
Commissioning		-	$87K	-	-	-	-	$87K	-	-	-	-	-	-	-	-	
Contingency (@40% Of Costs)		-	$8,673K	-	-	-	-	$8,673K	-	-	-	-	-	-	-	-	
Shaft Timber Set Rehabilitation		-	$1,526K	-	-	-	-	-	$1,526K	-	-	-	-	-	-	-	
Total Shaft, Headframe and Hoistroom		**-**	**$33,537K**	**-**	**-**	**$1,728K**	**$2,557K**	**$27,726K**	**$1,526K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Mine Dewatering (Operations Phase)																	
Booster Pump to 475m Level		$400K	-	$400K	-	-	-	-	-	-	-	-	-	-	-	-	
1500L Main Sump & Pump Station - Construction		-	$186K	-	-	$186K	-	-	-	-	-	-	-	-	-	-	
1500L Main Pumps - 400 hp Multistage (1 duty, 1 spare)		-	$322K	-	-	$322K	-	-	-	-	-	-	-	-	-	-	
3000L Sump & Pump Station - Construction		-	$186K	-	-	-	-	-	-	$186K	-	-	-	-	-	-	
3000L Pumps - 185 hp Multistage (1 duty, 1 spare)		-	$322K	-	-	-	-	-	-	$322K	-	-	-	-	-	-	
4000L Sump & Pump Station - Construction		-	$186K	-	-	-	-	-	-	-	-	-	-	$186K	-	-	
4000L Pumps - 185 hp Multistage (1 duty, 1 spare)		-	$322K	-	-	-	-	-	-	-	-	-	-	$322K	-	-	
Intermediate Pumps - 50 hp Submersible		-	$142K	-	$142K	-	-	-	-	-	-	-	-	-	-	-	
8 hp Submersible Pump		-	$57K	-	$57K	-	-	-	-	-	-	-	-	-	-	-	
Total Dewatering (Operations Phase)		**$400K**	**$1,724K**	**$400K**	**$199K**	**$508K**	**-**	**-**	**-**	**$508K**	**-**	**-**	**-**	**$508K**	**-**	**-**	**-**
Compressed Air																	
Phase 1/2 Compressor		$508K	-	$508K	-	-	-	-	-	-	-	-	-	-	-	-	
Total Compressed Air		**$508K**	**-**	**$508K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
UG Facilities																	
Maintenance Shop (c/w Wash Bay, equipped, etc.)		-	$1,250K	-	-	-	-	-	$1,250K	-	-	-	-	-	-	-	
Refuge Station - Portable		-	$328K	-	$328K	-	-	-	-	-	-	-	-	-	-	-	
Explosives Storage		-	$36K	-	$36K	-	-	-	-	-	-	-	-	-	-	-	
Detonators Storage		-	$36K	-	$36K	-	-	-	-	-	-	-	-	-	-	-	
Fuel/Lube Bay (SatStat)		-	$704K	-	$704K	-	-	-	-	-	-	-	-	-	-	-	
Service Boreholes		-	$49K	-	$49K	-	-	-	-	-	-	-	-	-	-	-	
Manways		$198K	$1,581K	$198K	$247K			$120K	$247K	$141K	$233K	$141K	$163K	$42K	$247K		
Vent Ducts		$43K	$129K	$43K				$16K	$16K	$16K	$16K	$16K	$16K	$16K	$16K		
Total UG Facilities		**$241K**	**$4,113K**	**$241K**	**$1,400K**	**-**	**-**	**$136K**	**$1,513K**	**$157K**	**$249K**	**$157K**	**$179K**	**$58K**	**$263K**	**-**	
Electrical Distribution																	
Power Line		$1,500K	-	$1,500K	-	-	-	-	-	-	-	-	-	-	-	-	
Site Ehouse at 13.8 kV		$800K	-	$800K	-	-	-	-	-	-	-	-	-	-	-	-	
Power Distribution Cable		$281K	-	$281K	-	-	-	-	-	-	-	-	-	-	-	-	

			Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
UG Switchroom with Mine Load Centre (MLC) 660 level		-	$700K	-	$700K	-	-	-	-	-	-	-	-	-	-	-	
UG Switchroom with Mine Load Centre (MLC) 1320 Level		-	$700K	-	$700K	-	-	-	-	-	-	-	-	-	-	-	
UG Switchroom with Mine Load Centre (MLC) 2000 Level		-	$700K	-	-	$700K	-	-	-	-	-	-	-	-	-	-	
Power Distribution to 2000 Level (assume part ramp and borehole		-	$281K	-	-	$281K	-	-	-	-	-	-	-	-	-	-	
Power Cable in Shaft (15 kV, 350 mcm Shielded)		-	$361K	-	-	-	-	-	$361K	-	-	-	-	-	-	-	
Total Electrical Distribution		**$2,581K**	**$2,742K**	**$2,581K**	**$1,400K**	**$981K**	**-**	**-**	**$361K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Surface Facilities																	
Surface Backfill Plant		$1,866K	$3,111K	$1,866K	$1,866K	$1,244K	-	-	-	-	-	-	-	-	-	-	
Sample Tower Upgrades		$360K	-	$360K	-	-	-	-	-	-	-	-	-	-	-	-	
Allowance for Historic Landfill		-	$100K	-	-	-	-	-	-	-	-	-	-	-	-		$100K
Total Surface Facilities		**$2,226K**	**$3,211K**	**$2,226K**	**$1,866K**	**$1,244K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**$100K**
Mine Closure - UG			**$5,848K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**$5,848K**
Total Development Capital		**$12,820K**	**$143,491K**	**$12,820K**	**$10,805K**	**$10,205K**	**$11,195K**	**$12,621K**	**$14,092K**	**$14,679K**	**$14,712K**	**$14,096K**	**$12,988K**	**$13,768K**	**$11,618K**	**$2,712K**	**-**
Total Infrastructure Capital		**$14,456K**	**$58,667K**	**$14,456K**	**$9,546K**	**$8,682K**	**$2,617K**	**$27,862K**	**$4,683K**	**$2,129K**	**$1,769K**	**$210K**	**$239K**	**$566K**	**$263K**	**-**	**$100K**
Total G&A Capital		**$390K**	**$4,795K**	**$390K**	**$390K**	**$390K**	**$390K**	**$390K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**$404K**	**-**
Total Closure Capital		**-**	**$5,848K**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**$5,848K**
Total Project Capital		**$27,666K**	**$212,801K**	**$27,666K**	**$20,741K**	**$19,277K**	**$14,203K**	**$40,873K**	**$19,179K**	**$17,213K**	**$16,885K**	**$14,710K**	**$13,631K**	**$14,738K**	**$12,286K**	**$3,116K**	**$5,948K**

Overall capital development costs for the project are estimated at $156.3 M. Total Capital Development is 22,131 m. Development costs per metre are estimated at an average of $7,063 per metre over the life of mine.

Facilities required for the advanced exploration program are summarized in Section 24.

21.5 Mine Operating Costs

Mining costs include:

- Underground resource access and drifting, including horizontal and vertical development.
- Waste drifting and slashing.
- Production Stoping, mucking and haulage.
- Alimak Stoping.
- Resource hoisting, including shaft maintenance.
- Mine dewatering.
- Backfilling, including waste rock backfill and cemented rock fill.

It is assumed that all waste haulage distances average 1,000 metres over the life of mine and is hauled to backfill historic open stopes and current stoping.

Resource haulage will be conducted by truck hauls to surface down to the 2000 level, after which the hoist is available, and resources will be hauled to the rock breaker and loading pocket from levels below the 2000 Level.

Resource haulage costs will vary over the life of mine and is presented in the Basis of Estimate above.

It is assumed that a grizzly, rockbreaker and loading pocket will be established using existing works at the 2000 Level.

Mine equipment costs are based on leased equipment rates amortized over estimated machine life hours with a 5% finance rate. Capital rebuild allowances are estimated in the hourly equipment lese costs. Regular maintenance is estimated as part of the hourly operating costs summarized in Table 21-5.

Grade Control Drilling

An allowance of $5 per resource tonne mined is estimated for grade control diamond drilling underground.

Production Access and Resource Drifting

Resource and waste mine development is estimated at $1,730 per metre for consummables and machine operation. Overall production drifting and waste access is estimated at $4,500 per metre over the life of mine.

Resource Stoping

Direct stoping costs over the life of mine is estimated at $66.87 per tonne, including production drilling, blasting, mucking, haulage, hoisting and backfilling.

Separate costs are developed for the equipment lease costs.

Personnel costs are calculated separately and subdivided into direct personnel for equipment operation and support, and mine indirects including supervision and Technical Services personnel.

Processing

Processing costs include Crushing, Sample Tower Operation, haulage to the mill and toll milling.

General and Administration

General and administration costs include overall site management as well as mine support consumable costs (Mine Services).

General and Administration Costs (G&A) include:

- Surface Building Maintenance
- Site Security
- Surface Mobile equipment operation (grading, snow removal)
- Environmental fees, licenses and compliance sampling
- First Responders support and supplies
- Office equipment and software licenses (general)
- Internet and Phone connections
- Municipal taxes
- General Site insurance
- Management and Administration salaries

The breakdown of administrative G&A is presented in Table 21-10.

Table 21-10 G&A Summary

G&A Summary	$CAD
Dry facility and building maintenance	$267,838
Security	$20,000
Surface mobile equipment operations	$266,709
Environment	$655,072
Administration	$1,029,730
Personnel	$1,978,340
Total Annual G&A	$4,217,689
Monthly G&A	$351,474

Services

Mine Services costs in addition to the G&A above include:

- Dewatering pumping,
- Compressor operation,
- Communications and Instrumentation
- Construction and Level Maintenance (ramp and level grading, backfill walls, ventilation bulkheads and doors)
- Supervision incidental costs
- Mine rescue training costs
- Maintenance Service costs (shop costs, light vehicles)
- Technical services costs (software, professional fees, consumables)

As these costs are variable, depending on production, the overall life of mine costs for mine services is $39.2M, or an average of $2.8M per year.

Table 21-11 Summary of Operating Costs

				Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mining Physicals		**Pre-Production**	**Production**	**Totals**														
Production																		
Resource Development																		
Drift dev. Resource	**m**	**755**	**19,916**	20,671	755	1,828	1,736	2,350	1,969	1,887	1,324	1,516	1,666	1,504	1,561	2,219	358	0
Slash dev. Resource	**m**	**101**	**1,721**	1,822	101	207	298	70	194	0	239	293	182	97	48	93	0	0
Vertical Development Resource	**m**	**0**	**150**	150	0	0	150	0	0	0	0	0	0	0	0	0	0	0
Resource Development																		
Drift dev. Resource	**t**	**43,335**	**1,172,059**	1,215,394	43,335	110,360	90,089	141,927	119,387	114,759	73,160	84,606	98,361	90,851	94,437	133,938	20,184	0
Slash dev. Resource	**t**	**3,752**	**65,772**	69,523	3,752	9,225	10,809	2,312	9,089	0	4,529	13,890	6,387	3,721	1,654	4,156	0	0
Vertical Development Resource	**t**	**0**	**2,652**	2,652	0	0	2,652	0	0	0	0	0	0	0	0	0	0	0
Waste																		
Waste Drifting	**m**	**710**	**20,713**	21,422	710	1,885	2,466	2,078	2,014	2,072	1,840	1,514	2,069	1,666	1,675	1,175	258	0
Waste Slashing	**m**	**207**	**3,220**	3,427	207	399	1,029	354	47	0	313	391	61	331	146	30	121	0
Vertical Development	**m**	**0**	**47**	47	0	0	47	0	0	0	0	0	0	0	0	0	0	0
Waste																		
Waste Drifting	**t**	**39,595**	**1,202,772**	1,242,367	39,595	109,865	141,820	121,547	119,150	122,523	107,197	83,380	119,562	98,363	95,677	68,478	15,210	0
Waste Slashing	**t**	**6,142**	**74,889**	81,031	6,142	14,958	21,063	8,630	1,111	0	4,010	7,264	657	7,270	5,813	1,690	2,424	0
Vertical Development	**t**	**0**	**783**	783	0	0	783	0	0	0	0	0	0	0	0	0	0	0
Resource Stoping		**236,807**	**9,164,230**	9,401,037	236,807	555,581	720,098	676,390	692,481	705,784	743,131	722,118	716,057	725,921	724,895	682,841	800,263	698,670
Primary Resource	**t**	**236,807**	**6,472,385**	6,709,191	236,807	427,069	474,996	455,663	457,414	481,830	545,362	507,053	552,900	555,901	452,656	471,986	662,270	427,285
Incremental Resource	**t**	**0**	**2,691,845**	2,691,845	0	128,512	245,102	220,727	235,067	223,954	197,769	215,065	163,157	170,021	272,239	210,856	137,992	271,385
Resource Tonnes Backfilled	**t**	**236,807**	**8,465,560**	8,702,367	236,807	555,581	720,098	676,390	692,481	705,784	743,131	722,118	716,057	725,921	724,895	682,841	800,263	
Resource Hoisted		**0**	**5,479,167**	5,479,167	0	0	0	0	0	28,351	80,733	707,370	681,182	820,493	820,986	820,935	820,447	698,670
Stoping	**t**	**0**	**4,846,579**	4,846,579	0	0	0	0	0	0	3,045	634,510	576,434	725,921	724,895	682,841	800,263	698,670
Resource Dev.	**t**	**0**	**632,588**	632,588	0	0	0	0	0	28,351	77,688	72,860	104,748	94,572	96,091	138,094	20,184	0
Resource Movement					0													
Contact Zone	**t**	**283,893**	**10,174,487**	10,458,380	283,893	675,166	760,499	653,553	820,957	820,543	820,820	820,615	820,805	820,493	820,986	820,935	820,447	698,670
Footwall Zone	**t**	**0**	**230,226**	230,226	0	0	63,150	167,076	0	0	0	0	0	0	0	0	0	0
Total Production Tonnes	**t**	**329,630**	**11,683,157**	12,012,788	329,630	799,989	987,315	950,806	941,218	943,066	932,026	911,260	941,023	926,126	922,475	891,103	838,080	698,670
Production Mining																		
Resource (Non Labour)																		
Resource Development Drifting		**$1,306K**	**$34,469K**	$35,776K	$1,306K	$3,163K	$3,004K	$4,067K	$3,407K	$3,266K	$2,291K	$2,624K	$2,883K	$2,602K	$2,702K	$3,840K	$619K	-
Resource Development Slashing		**$114K**	**$1,936K**	$2,050K	$114K	$232K	$335K	$78K	$218K	-	$269K	$330K	$205K	$109K	$54K	$104K	-	-
Resource Development Alimak		**-**	**$426K**	$426K	-	-	$426K	-	-	-	-	-	-	-	-	-	-	-
Resource Stoping & Mucking		**$2,303K**	**$89,130K**	$91,433K	$2,303K	$5,404K	$7,004K	$6,578K	$6,735K	$6,864K	$7,228K	$7,023K	$6,964K	$7,060K	$7,050K	$6,641K	$7,783K	$6,795K
Resource Stoping Haulage		**$639K**	**$45,106K**	$45,745K	$639K	$1,495K	$2,067K	$1,941K	$2,985K	$3,381K	$4,005K	$2,224K	$2,571K	$2,846K	$4,465K	$4,206K	$6,898K	$6,023K
Resource Development Haulage		**$127K**	**$5,953K**	$6,080K	$127K	$304K	$335K	$479K	$615K	$824K	$258K	$303K	$451K	$583K	$592K	$992K	$218K	-
Grade Control Drilling		**$1,419K**	**$52,024K**	$53,443K	$1,419K	$3,376K	$4,118K	$4,103K	$4,105K	$4,103K	$4,104K	$4,103K	$4,104K	$4,102K	$4,105K	$4,105K	$4,102K	$3,493K

				Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total Resource Mining Costs		**$5,910K**	**$229,044K**	$234,954K	**$5,910K**	**$13,973K**	**$17,289K**	**$17,247K**	**$18,066K**	**$18,438K**	**$18,155K**	**$16,608K**	**$17,179K**	**$17,303K**	**$18,968K**	**$19,889K**	**$19,621K**	**$16,311K**
Production Waste (non Labour)																		
Waste Drifting		**$1,228K**	**$35,847K**	**$37,076K**	$1,228K	$3,263K	$4,268K	$3,596K	$3,485K	$3,585K	$3,184K	$2,621K	$3,581K	$2,884K	$2,899K	$2,034K	$447K	-
Waste Slashing		**$233K**	**$3,623K**	**$3,855K**	$233K	$449K	$1,158K	$398K	$53K	-	$352K	$440K	$69K	$372K	$164K	$34K	$136K	-
Waste Raise Bore		**-**	**$93K**	**$93K**	-	-	$93K	-	-	-	-	-	-	-	-	-	-	-
Waste Mucking		**$93K**	**$2,612K**	**$2,706K**	$93K	$255K	$334K	$266K	$246K	$250K	$227K	$185K	$246K	$216K	$207K	$143K	$36K	-
Waste Haulage		**$123K**	**$2,391K**	**$2,514K**	$123K	$233K	$306K	$243K	$225K	$229K	$208K	$170K	$225K	$198K	$190K	$131K	$33K	-
Total Production Waste Costs		**$1,678K**	**$44,566K**	**$46,244K**	**$1,678K**	**$4,200K**	**$6,160K**	**$4,503K**	**$4,008K**	**$4,065K**	**$3,971K**	**$3,415K**	**$4,120K**	**$3,669K**	**$3,460K**	**$2,342K**	**$652K**	**-**
Production Equipment Lease Costs		**$6,096K**	**$122,944K**	**$129,040K**	**$6,096K**	**$8,624K**	**$8,624K**	**$8,624K**	**$9,668K**	**$9,668K**	**$9,668K**	**$9,668K**	**$9,668K**	**$9,668K**	**$10,713K**	**$10,713K**	**$11,757K**	**$5,879K**
Backfilling Costs		**$3,074K**	**$109,896K**	**$112,970K**	**$3,074K**	**$7,212K**	**$9,348K**	**$8,781K**	**$8,990K**	**$9,162K**	**$9,647K**	**$9,374K**	**$9,296K**	**$9,424K**	**$9,410K**	**$8,864K**	**$10,389K**	
Hoisting Costs		**-**	**$6,087K**	**$6,087K**	**-**	**-**	**-**	**-**	**-**	**$31K**	**$90K**	**$786K**	**$757K**	**$911K**	**$912K**	**$912K**	**$911K**	**$776K**
Total Non Labour Mining Costs		**$16,758K**	**$512,537K**	**$529,295K**	**$16,758K**	**$34,010K**	**$41,421K**	**$39,154K**	**$40,732K**	**$41,364K**	**$41,531K**	**$39,852K**	**$41,020K**	**$40,976K**	**$43,463K**	**$42,720K**	**$43,330K**	**$22,966K**
Direct Mining Labour		**$11,680K**	**$205,983K**	**$217,663K**	$11,680K	$14,176K	$15,305K	$15,305K	$16,994K	$17,459K	$17,459K	$17,459K	$17,459K	$16,330K	$16,819K	$16,819K	$15,690K	$8,709K
Indirect Mining Labour		**$2,915K**	**$37,542K**	**$40,457K**	$2,915K	$2,915K	$2,915K	$2,915K	$2,915K	$3,023K	$3,023K	$3,023K	$3,023K	$3,023K	$3,023K	$3,023K	$3,023K	$1,696K
Total Operating Labour Costs		**$14,595K**	**$243,525K**	**$258,120K**	**$14,595K**	**$17,091K**	**$18,220K**	**$18,220K**	**$19,909K**	**$20,483K**	**$20,483K**	**$20,483K**	**$20,483K**	**$19,353K**	**$19,842K**	**$19,842K**	**$18,713K**	**$10,405K**
Mine Ventilation Costs		**-**	**-**		-													
Stage 1 Electrical Costs		**$8,051K**	**$40,255K**	**$48,306K**	$8,051K	$8,051K	$8,051K	$8,051K	$8,051K	$8,051K								
Stage 1 Heating Costs		**$896K**	**$3,584K**	**$4,480K**	$896K	$896K	$896K	$896K	$896K									
Stage 2 Electrical Costs		**-**	**$76,198K**	**$76,198K**	-						$10,160K	$10,160K	$10,160K	$10,160K	$10,160K	$10,160K	$10,160K	$5,080K
Stage 2 Heating Costs		**-**	**$18,574K**	**$18,574K**	-					$2,185K	$2,185K	$2,185K	$2,185K	$2,185K	$2,185K	$2,185K	$2,185K	$1,093K
Total Ventilation Costs		**$8,947K**	**$138,611K**	**$147,559K**	**$8,947K**	**$8,947K**	**$8,947K**	**$8,947K**	**$8,947K**	**$10,236K**	**$12,345K**	**$12,345K**	**$12,345K**	**$12,345K**	**$12,345K**	**$12,345K**	**$12,345K**	**$6,172K**
Total Mine Operating Costs		**$40,300K**	**$894,674K**	**$934,973K**	$40,300K	$60,047K	$68,588K	$66,321K	$69,587K	$72,083K	$74,358K	$72,679K	$73,847K	$72,674K	$75,650K	$74,907K	$74,388K	$39,543K
Processing Costs																		
Sample Tower Costs		**$374K**	**$13,712K**	**$14,086K**	$374K	$890K	$1,085K	$1,081K	$1,082K	$1,081K	$1,082K	$1,081K	$1,082K	$1,081K	$1,082K	$1,082K	$1,081K	$921K
Crushing Costs		**$903K**	**$33,092K**	**$33,995K**	$903K	$2,147K	$2,620K	$2,610K	$2,611K	$2,610K	$2,611K	$2,610K	$2,611K	$2,610K	$2,611K	$2,611K	$2,609K	$2,222K
Haulage to Process Plant		**$3,407K**	**$124,857K**	**$128,263K**	$3,407K	$8,102K	$9,884K	$9,848K	$9,851K	$9,847K	$9,850K	$9,847K	$9,850K	$9,846K	$9,852K	$9,851K	$9,845K	$8,384K
Toll Milling Contact		**$12,660K**	**$453,727K**	**$466,387K**	$12,660K	$30,109K	$33,914K	$29,145K	$36,610K	$36,592K	$36,604K	$36,595K	$36,603K	$36,590K	$36,612K	$36,609K	$36,587K	$31,157K
Toll Milling Footwall		**-**	**$10,267K**	**$10,267K**	-	-	$2,816K	$7,451K	-	-	-	-	-	-	-	-	-	-
Total Processing Costs		**$17,344K**	**$635,655K**	**$652,999K**	$17,344K	$41,248K	$50,319K	$50,135K	$50,155K	$50,129K	$50,146K	$50,134K	$50,145K	$50,126K	$50,156K	$50,153K	$50,124K	$42,684K
G&A Costs		**$4,218K**	**$54,830K**	**$59,048K**	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K	$4,218K
Mine Services Costs		**$1,040K**	**$38,122K**	**$39,162K**	$1,040K	$2,474K	$3,018K	$3,007K	$3,008K	$3,006K	$3,007K	$3,007K	$3,007K	$3,006K	$3,008K	$3,008K	$3,006K	$2,560K
Total G&A Costs		**$5,258K**	**$92,952K**	**$39,162K**	$5,258K	$6,691K	$7,235K	$7,224K	$7,226K	$7,224K	$7,225K	$7,224K	$7,225K	$7,224K	$7,226K	$7,225K	$7,224K	$6,778K
Total Operating Costs		**$62,901K**	**$1,623,280K**	**$1,686,181K**	**$62,901K**	**$107,987K**	**$126,142K**	**$123,680K**	**$126,968K**	**$129,437K**	**$131,730K**	**$130,037K**	**$131,218K**	**$130,024K**	**$133,032K**	**$132,285K**	**$131,735K**	**$89,005K**

22 ECONOMIC ANALYSIS

The Crean Hill Project economic analysis commences after the planned Advanced Exploration (AdEx) program, with 1 year of pre-production ramp up to full production in Year 2.

Capital expenditures for pre-production are reduced from previous studies as a significant portion of the required site infrastructure is delegated to the AdEx program.

The project cash flow estimates are based on the mine development and production schedule, estimated capital expenditures, and the estimated operating costs over the life of the project. The revenues and costs are in constant Q2 2024 Canadian dollars (CAD) without escalation.

The metal prices and exchange rate used in the cash flow model are shown in Table 22-1. Metal prices from the 2023 PEA are provided for comparison purposes.

Table 22-1 Metal Prices and Exchanges Rate

Item	Units	Base Case Pricing	2023 PEA Pricing
Nickel	US$/lb	$8.50	$9.50
Copper	US$/lb	$4.00	$3.50
Cobalt	US$/lb	$13.00	$22.00
Platinum	US$/toz	$900	$1,000
Palladium	US$/toz	$1,000	$1,800
Gold	US$/toz	$2,150	$1,700
Exchange Rate	CAD:USD	$1.35	$1.30
	USD:CAD	$0.74	$0.77

22.1 Metal Revenue

Revenues are derived from NSR calculations based on third party toll milling and smelting agreements.

The recovered NSR values vary depending on feed grade, thus the return for any particular block of resource will vary. For this PEA, annual delivered grades and tonnages are used to develop annual NSR values used in the financial analysis.

22.2 Royalties

There is a 3% royalty on the project, which is paid on total revenue less the amount for resource transportation.

22.3 Taxes

Canadian federal and Ontario provincial income tax rates of 15% and 10%, respectively, were applied to the taxable income each year to arrive at the annual income tax paid. The Ontario Mining tax of 10% net of exemptions is also applied to the cash flows.

Canadian federal income taxes were calculated using the operating cash flow of the project. Canadian Exploration Expenses (CEE), Capital Cost Allowances (CCA) and the Canadian Development Expense (CDE) were deducted from the operating cash flow before tax to arrive at taxable income. The Accelerated Investment Provisions from November 2018 were included in the available CEE, CCA and CDE deductions for applicable years. The Critical Technology Investment Tax Credit is also applied as needed.

Ontario income taxes were calculated using the operating cash flow the project. The annual profit exemption of $500,000 has been applied in calculating the Ontario tax payable.

22.4 Cash Flow

This PEA envisions an underground only mining scenario, with ramp access through the entire life of mine, and shaft access available after mining reaches the 2000 Level.

The estimated post-tax net present value (NPV) using an 8% discount rate is $194.1 million, with a 129% IRR. The cash flow, NPV, and IRR results are summarized in Table 22-2. The high IRR reflects the reduction of direct project capital that is assigned to the AdEx program.

This PEA also compares the base case metal pricing against the 2023 PEA metal pricing (Case 1). The 2023 PEA results are provided for comparison purposes.

Table 22-2 Cash Flow Results Summary

	Units	2024 PEA - SGS		2023 PEA - Stantec
Mining Method	-	**Underground Only**		Open Pit and Underground
Total Resource Mined	Tonnes	**10,688,606**		20,102,605
Mine Life	Years	**13**		15
Average Production Rate	tpd	**2193**		3668
Operating Cost	$/Tonne	**157.76**		116.57
Pre-Production Capital	$M	**$27.7**		81.1
Sustaining Capital	$M	**$212.8**		330.0
Ni in Resource Sold	M lbs	**195.5**		276.6
Cu in Resource Sold	M lbs	**169.5**		243.5
Co in Resource Sold	M lbs	**6.8**		9.8
Pt in Resource Sold	k oz	**313.4**		367.5
Pd in Resource Sold	k oz	**359.0**		401.6
Au in Resource Sold	k oz	**116.5**		220.2
		Base Case Pricing	**2023 Pricing**	**2023 Pricing**
Average NSR	$/Tonne	**240**	281	179.1
Average Annual Pre-Tax Cash Flow	$M	**$40.5**	71.3	47.1
Payback Period (overall)	Years	**1.5**	<1.0	4.5
Pre-Tax NPV (8%)	$M	**$265.3**	487.7	290.4
Pre-Tax IRR	%	**142%**	375%	24%
Post Tax NPV (8%)	$M	**$194.1**	345.9	230.4
Post Tax IRR	%	**129%**	346%	23%

***Note: The Advanced Exploration Bulk Sample is not treated as part of the PEA economics, but relegated to exploration**

The PEA cash Flow model is presented in following Table 22-3.

Table 22-3 Underground Estimated Cash Flow

Project Year	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
Tonnes Processed		**283,893**	**675,166**	**823,649**	**820,629**	**820,957**	**820,543**	**820,820**	**820,615**	**820,805**	**820,493**	**820,986**	**820,935**	**820,447**	**698,670**	**10,688,606**
Project Capital																
Pre-Production	**$3,000K**	**$24,666K**														**$24,666K**
Sustaining			**$20,741K**	**$19,277K**	**$14,203K**	**$40,873K**	**$19,179K**	**$17,213K**	**$16,885K**	**$14,710K**	**$13,631K**	**$14,738K**	**$12,286K**	**$3,116K**	**$5,948K**	**$212,801K**
Total Project Capital	**$3,000K**	**$24,666K**	**$20,741K**	**$19,277K**	**$14,203K**	**$40,873K**	**$19,179K**	**$17,213K**	**$16,885K**	**$14,710K**	**$13,631K**	**$14,738K**	**$12,286K**	**$3,116K**	**$5,948K**	**$237,467K**
Project Operating Costs																
Mining		**$40,300K**	**$60,047K**	**$68,588K**	**$66,321K**	**$69,587K**	**$72,083K**	**$74,358K**	**$72,679K**	**$73,847K**	**$72,674K**	**$75,650K**	**$74,907K**	**$74,388K**	**$39,543K**	**$934,973K**
Processing		**$17,344K**	**$41,248K**	**$50,319K**	**$50,135K**	**$50,155K**	**$50,129K**	**$50,146K**	**$50,134K**	**$50,145K**	**$50,126K**	**$50,156K**	**$50,153K**	**$50,124K**	**$42,684K**	**$652,999K**
G&A		**$5,258K**	**$6,691K**	**$7,235K**	**$7,224K**	**$7,226K**	**$7,224K**	**$7,225K**	**$7,224K**	**$7,225K**	**$7,224K**	**$7,226K**	**$7,225K**	**$7,224K**	**$6,778K**	**$98,209K**
Project Operating Costs		**$62,901K**	**$107,987K**	**$126,142K**	**$123,680K**	**$126,968K**	**$129,437K**	**$131,730K**	**$130,037K**	**$131,218K**	**$130,024K**	**$133,032K**	**$132,285K**	**$131,735K**	**$89,005K**	**$1,686,181K**
Metal Sales Revenue		**$80,618K**	**$156,918K**	**$170,657K**	**$165,092K**	**$189,082K**	**$211,490K**	**$205,210K**	**$206,546K**	**$222,368K**	**$219,520K**	**$187,300K**	**$185,215K**	**$216,509K**	**$146,611K**	**$2,563,137K**
3% Royalty		**$2,316K**	**$4,464K**	**$4,823K**	**$4,657K**	**$5,377K**	**$6,049K**	**$5,861K**	**$5,901K**	**$6,376K**	**$6,290K**	**$5,323K**	**$5,261K**	**$6,200K**	**$4,147K**	**$73,046K**
Total Revenue		**$78,302K**	**$152,454K**	**$165,834K**	**$160,434K**	**$183,705K**	**$205,441K**	**$199,349K**	**$200,645K**	**$215,993K**	**$213,230K**	**$181,977K**	**$179,954K**	**$210,309K**	**$142,464K**	**$2,490,090K**
Net Operating Income		**$15,400K**	**$44,467K**	**$39,692K**	**$36,754K**	**$56,737K**	**$76,004K**	**$67,619K**	**$70,608K**	**$84,775K**	**$83,206K**	**$48,945K**	**$47,669K**	**$78,574K**	**$53,460K**	**$803,909K**
Cash Flow	**-$3,000K**	**-$9,266K**	**$23,726K**	**$20,414K**	**$22,551K**	**$15,864K**	**$56,825K**	**$50,406K**	**$53,722K**	**$70,064K**	**$69,574K**	**$34,206K**	**$35,383K**	**$75,458K**	**$47,512K**	**$566,442K**
Cumulative Cash Flow	-$3,000K	-$12,266K	$11,460K	$31,875K	$54,426K	$70,290K	$127,115K	$177,521K	$231,243K	$301,308K	$370,882K	$405,089K	$440,471K	$515,929K	$563,442K	
Pre-Tax NPV	**$265,282K**															$265,282K
Pre-Tax IRR	**142%**															
Taxes payable																
Federal corporate taxes									-$6,825K	-$9,220K	-$9,091K	-$4,502K	-$4,406K	-$8,919K	-$5,824K	-$48,787K
Ontario corporate taxes					-$728K	-$3,602K	-$5,102K	-$4,542K	-$4,925K	-$6,168K	-$6,061K	-$3,001K	-$2,937K	-$5,946K	-$3,882K	-$46,895K
Ontario mining taxes			-$2,021K	-$2,361K	-$2,163K	-$3,590K	-$5,564K	-$4,723K	-$5,553K	-$7,445K	-$7,473K	-$3,911K	-$4,007K	-$8,089K	-$5,109K	-$62,008K
Total Taxes			**-$2,021K**	**-$2,361K**	**-$2,891K**	**-$7,192K**	**-$10,666K**	**-$9,266K**	**-$17,304K**	**-$22,833K**	**-$22,624K**	**-$11,415K**	**-$11,350K**	**-$22,954K**	**-$14,815K**	**-$157,691K**
After-tax cash flow	**-$3,000K**	**-$9,266K**	**$21,706K**	**$18,053K**	**$19,660K**	**$8,672K**	**$46,159K**	**$41,140K**	**$36,419K**	**$47,231K**	**$46,950K**	**$22,792K**	**$24,033K**	**$52,504K**	**$32,697K**	**$408,751K**
Cumulative After Tax Cash Flow	-$3,000K	-$12,266K	$9,440K	$27,493K	$47,153K	$55,825K	$101,984K	$143,125K	$179,544K	$226,775K	$273,725K	$296,517K	$320,550K	$373,054K	$405,751K	
After Tax NPV	**$194,087K**															
After Tax IRR	**129%**															

The post-tax discounted (8%) cash flow for the Project is shown in Figure 22-1.

Figure 22-1 Life of Mine Cash Flow Pre-Tax

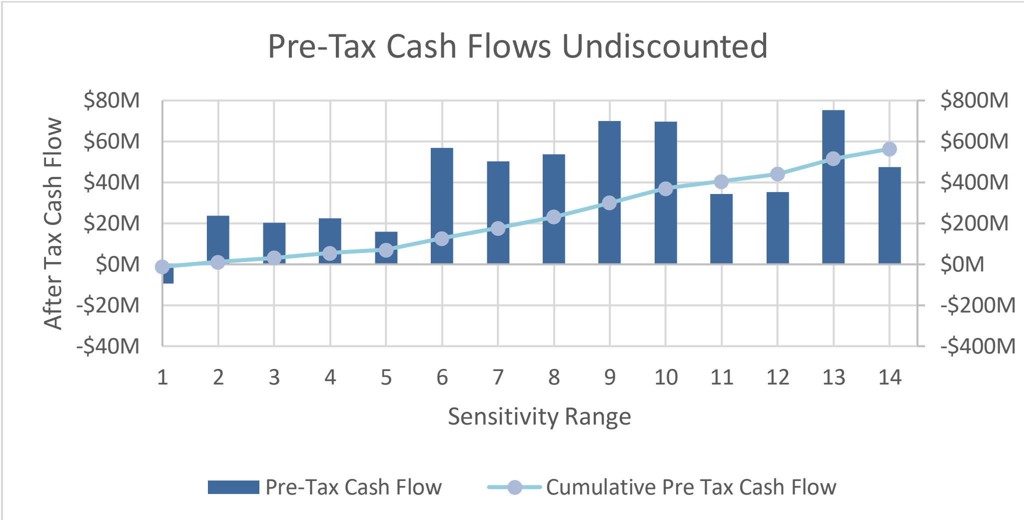
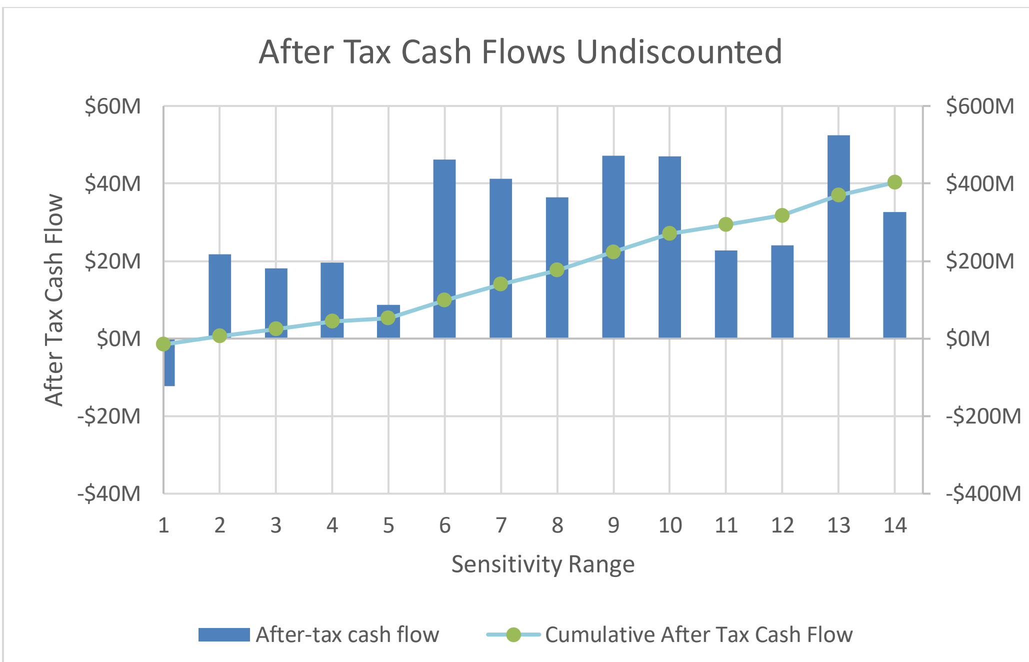


Figure 22-2 Life of Mine Cash Flow After-Tax



22.5 Payback Period

Due to reduced initial capital, the project will achieve payback on initial capital within the pre-production period of operations.

22.6 Sensitivity Analysis

A range of sensitivities are analyzed at discount rates from 5% to 10% and value items ranging between +/- 20%.

The Crean Hill Project is most sensitive to metal prices and USD:CAD exchange rates, and least sensitive to capital costs. The following tables present the results of the Sensitivity Analyses.

Table 22-4 Operating Cost Sensitivities

Operating Cost Sensitivities					
Pre-Tax	80%	90%	100%	110%	120%
5%	$571.3M	$459.2M	$347.1M	$235.M	$123.M
6%	$524.7M	$420.8M	$316.8M	$212.9M	$108.9M
7%	$482.8M	$386.3M	$289.7M	$193.1M	$96.5M
8%	$445.1M	$355.2M	$265.3M	$175.4M	$85.4M
9%	$411.1M	$327.2M	$243.4M	$159.5M	$75.6M
10%	$380.3M	$302.M	$223.6M	$145.2M	$66.9M
After Tax					
	80%	90%	100%	110%	120%
5%	$405.3M	$329.1M	$252.5M	$175.2M	$96.6M
6%	$373.M	$302.1M	$230.9M	$158.8M	$85.3M
7%	$343.9M	$277.9M	$211.5M	$144.2M	$75.2M
8%	$317.7M	$256.1M	$194.1M	$131.1M	$66.3M
9%	$294.M	$236.4M	$178.4M	$119.3M	$58.4M
10%	$272.5M	$218.7M	$164.2M	$108.7M	$51.3M

Table 22-5 Capital Cost Sensitivities

Capital Cost Sensitivities					
Pre-Tax	80%	90%	100%	110%	120%
5%	$381.7M	$364.4M	$347.1M	$329.8M	$312.5M
6%	$349.4M	$333.1M	$316.8M	$300.5M	$284.3M
7%	$320.4M	$305.M	$289.7M	$274.3M	$259.M
8%	$294.3M	$279.8M	$265.3M	$250.8M	$236.3M
9%	$270.8M	$257.1M	$243.4M	$229.7M	$216.M
10%	$249.5M	$236.6M	$223.6M	$210.6M	$197.6M
After Tax					
	80%	90%	100%	110%	120%
5%	$287.1M	$269.8M	$252.5M	$235.2M	$217.9M
6%	$263.4M	$247.2M	$230.9M	$214.6M	$198.3M
7%	$242.2M	$226.9M	$211.5M	$196.2M	$180.8M
8%	$223.1M	$208.6M	$194.1M	$179.6M	$165.1M
9%	$205.8M	$192.1M	$178.4M	$164.7M	$151.M
10%	$190.2M	$177.2M	$164.2M	$151.2M	$138.3M

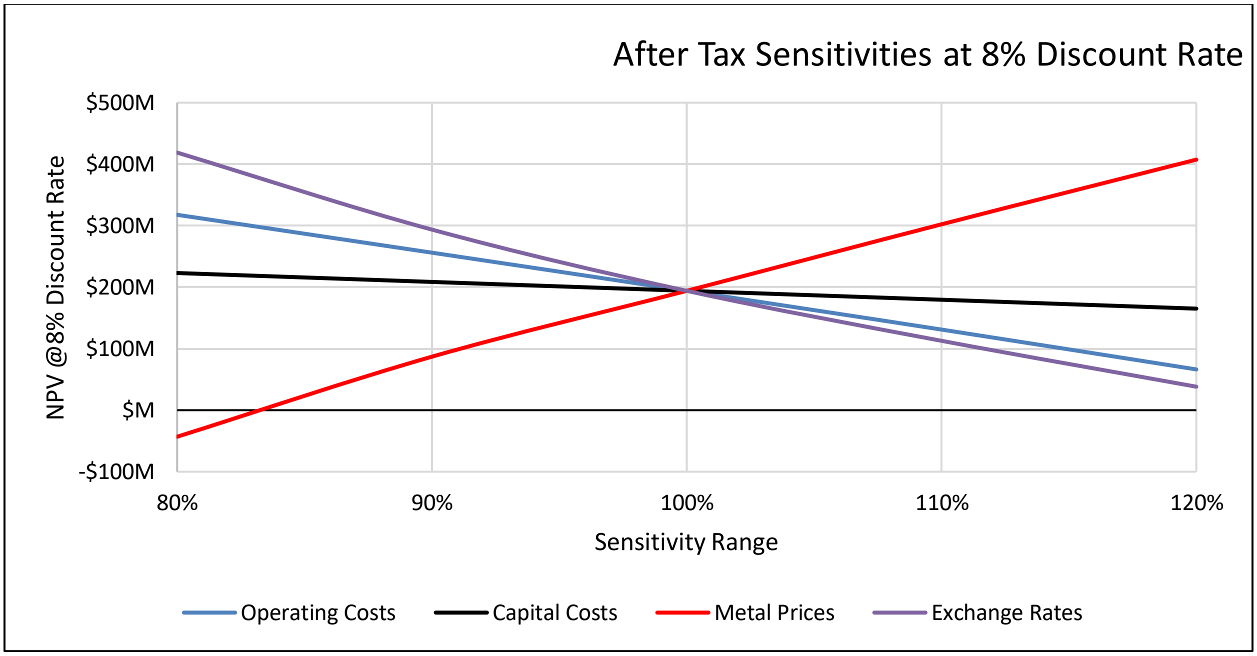
Table 22-6 Metal Price Sensitivity

Metal Price Sensitivity					
Pre-Tax	80%	90%	100%	110%	120%
5%	-$38.1M	$155.7M	$347.1M	$544.7M	$739.2M
6%	-$39.7M	$139.7M	$316.8M	$499.8M	$679.9M
7%	-$41.M	$125.4M	$289.7M	$459.5M	$626.5M
8%	-$41.9M	$112.7M	$265.3M	$423.2M	$578.5M
9%	-$42.6M	$101.3M	$243.4M	$390.5M	$535.M
10%	-$43.1M	$91.2M	$223.6M	$360.9M	$495.7M
After Tax					
	80%	90%	100%	110%	120%
5%	-$39.8M	$120.6M	$252.5M	$386.7M	$518.M
6%	-$41.3M	$108.1M	$230.9M	$355.6M	$477.3M
7%	-$42.3M	$97.M	$211.5M	$327.5M	$440.5M
8%	-$43.1M	$87.M	$194.1M	$302.3M	$407.4M
9%	-$43.7M	$78.2M	$178.4M	$279.5M	$377.5M
10%	-$44.M	$70.2M	$164.2M	$258.8M	$350.3M

Table 22-7 Exchange Rate Sensitivity

Exchange Rate Sensitivity					
Pre-Tax	80%	90%	100%	110%	120%
5%	$760.6M	$529.2M	$347.1M	$201.M	$76.6M
6%	$699.7M	$485.4M	$316.8M	$181.6M	$66.5M
7%	$644.9M	$446.M	$289.7M	$164.3M	$57.5M
8%	$595.4M	$410.6M	$265.3M	$148.8M	$49.6M
9%	$550.8M	$378.6M	$243.4M	$135.M	$42.6M
10%	$510.4M	$349.7M	$223.6M	$122.6M	$36.4M
After Tax	80%	90%	100%	110%	120%
5%	$532.5M	$376.2M	$252.5M	$152.M	$60.8M
6%	$490.6M	$345.8M	$230.9M	$137.5M	$52.3M
7%	$452.9M	$318.3M	$211.5M	$124.5M	$44.8M
8%	$418.9M	$293.6M	$194.1M	$112.8M	$38.2M
9%	$388.1M	$271.3M	$178.4M	$102.4M	$32.4M
10%	$360.3M	$251.2M	$164.2M	$93.M	$27.2M

Figure 22-3 Crean Hill PEA Sensitivities Graph



23 ADJACENT PROPERTIES

There is no information on properties adjacent to the Property necessary to make the technical report understandable and not misleading.

24 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information available that is necessary to make the technical report understandable and not misleading. To the Authors' knowledge, there are no significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Project.

25 INTERPRETATION AND CONCLUSIONS

SGS Geological Services Inc. was contracted by Magna Mining Inc., to complete an updated Preliminary Economic Assessment for the Crean Hill Project and prepare a NI 43-101 Technical Report written in support of the updated PEA.

The current PEA is based on an updated Mineral Resource Estimate ("MRE"). The reporting of the updated MRE complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects. The classification of the updated MRE is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions) and adhere as best as possible to the 2019 CIM Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines (2019 CIM Guidelines). Armitage is responsible for the current Crean Hill MRE.

The current Technical Report will be used by Magna in fulfillment of their continuing disclosure requirements under Canadian securities laws, including National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101"). This Technical Report is written in support of an updated PEA completed for Magna.

25.1 Diamond Drilling

A total of 4,009 drillholes totalling 515,664 m (1,691,812 ft)—make up the Crean Hill drillhole dataset prior to Magna acquiring the property in late 2022.

Since its acquisition of the Crean Hill property in November 2022, Magna nearly continuously completed diamond drilling within the Crean Hill property. As of the date of this report, drilling has focused on defining continuity and grade of mineralization (within the current mineral resources), and expansion of the known mineralized zones. More recently in 2024 exploration and drilling efforts have focused on the footwall environment. Magna has completed 130 surface diamond drill holes for a total of 28,439 m of drilling between November 2022 and April 2024. The results of the diamond drilling completed by Magna to date have been considered in the geological interpretation, and assay results have incorporated into the current MRE.

A total 130 diamond drillholes totalling 28,439 m (93,280 ft) were completed from 2022 to April 2024 by Magna.

25.2 Metallurgy

The test work performed to date on Contact style mineralization been used to develop a set of feed grade versus recovery relationships included in the Definitive Off-Take Agreement with Vale Base Metals and is sufficient to advance the AdEx portion of Crean Hill Mine. Further testing may be required to assess other zones and mineralogy identified during the AdEx.

The lab testing and bulk sample processing of 109FW has generated feed grade versus recovery relationships and furthered understanding of base and PGM recovery opportunities from the mineralization. Further testing and evaluation is required to confirm process changes needed to improve the concentrate grade versus recovery performance required in an sale agreement with a local mining company.

25.3 Mineral Resource Estimate

Completion of the updated mineral resource estimates (MREs) for the Crean Hill project involved the assessment of a drill hole database, which included all data for surface drilling completed through to the effective date of this report, as well as three-dimensional (3D) mineral resource models (resource domains), 3D models of all mined-out areas (open pit and underground), 3D models of cross-cutting dykes, a recent topographic surface, and available written reports.

The Inverse Distance Squared (ID^2) calculation method restricted to mineralized domains, and utilizing dynamic anisotropy search orientations was used to interpolate grades for Ni (%), Cu (%), Co (%), Pt (g/t), Pd (g/t), Au (g/t) and Ag (g/t into block models.

The current MRE takes into consideration that the Projects deposits would be mined by underground mining methods.

The reporting of the MRE for Crean Hill complies with all disclosure requirements for Mineral Resources set out in the NI 43-101 Standards of Disclosure for Mineral Projects (2016). The classification of the MREs is consistent with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards (2014 CIM Definitions).

25.3.1 Mineral Resource Statement

The current underground MRE for the Crean Hill deposit is presented in Table 1-1.

Table 25-1 Crean Hill Project Underground Mineral Resource Estimate, April 15, 2024

Cut-off Grade	Tonnes	Cu %	Ni %	Co %	Pt g/t	Pd g/t	Au g/t	NiEq %
Indicated								
1.1% NiEq	18,444,000	0.87	1.01	0.035	0.98	1.12	0.37	1.96
Inferred								
1.1% NiEq	989,000	0.53	0.70	0.026	0.98	1.66	0.29	1.56

The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au, a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.

Crean Hill Property Mineral Resource Estimate Notes:

(1) *The effective date of the Crean Hill Property Mineral Resource Estimate (MRE) is April 15, 2024. This is the close out date for the final mineral resource models and mine out models (as-builts)*

(2) *Allan Armitage, Ph.D., P. Geo. of SGS Geological Services is an independent Qualified Person as defined by NI 43-101 101 and is responsible for the current Crean Hill MRE. Armitage conducted multiple site visits to the Crean Hill Property including on May 25-26, 2022, July 25, 2023, July 02, 2024, and July 25, 2024.*

(3) *The classification of the current MRE into Indicated and Inferred mineral resources is consistent with current 2014 CIM Definition Standards - For Mineral Resources and Mineral Reserves.*

(4) *All figures are rounded to reflect the relative accuracy of the estimate and numbers may not add due to rounding.*

(5) *The mineral resource is presented undiluted and in situ, constrained by 3D grade control resource models, and are considered to have reasonable prospects for eventual economic extraction. The mineral resource is exclusive of mined out material.*

(6) *Mineral resources which are not mineral reserves do not have demonstrated economic viability. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that most Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

(7) *The Crean Hill mineral resource estimate is based on a validated drill hole database which includes data from 3,892 surface and underground diamond drill holes completed between 1951 and March 2024 and totals 475,773 m. The resource database totals 98,757 assay intervals, representing 197,536 m of data.*

(8) *The mineral resource estimate is based on a three-dimensional ("3D") resource model of the main mineralization and a broader dilution envelope. 3D models of mined out areas were used to exclude mined out material from the current MRE.*

(9) *Grades for Ni, Cu, Co, Pt, Pd, Ag and Au are estimated for each mineralization domain using ~2.0 m capped composites assigned to that domain. To generate grade within the blocks, the inverse distance squared (ID^2) interpolation method was used for all domains.*

(10) *Specific gravity values were assigned to each block based on a regression formula defined by a database of 32,592 samples. SG=(0.2057xNi%+2.88).*

(11) *Based on the size, shape, and orientation of the Crean Hill Deposit, it is envisioned that the deposits may be mined using both bulk and selective mining methods including Longhole Stoping and Mechanized Cut and Fill (MCAF) (mining methods that have long been utilized in the Sudbury region). The MRE is reported at a base case cut-off grade of 1.10% NiEq. The mineral resource grade blocks are quantified above the base case cut-off grade and within the constraining mineralized wireframes (considered mineable shapes).*

(12) *The underground base case cut-off grade of 1.10% NiEq considers metal prices of $8.50/lb Ni, $3.75/lb Cu, $17.00/lb Co, $950/oz Pt, $1100/oz Pd and $1,950/oz Au, metal recoveries of 78% for Ni, 95.5% for Cu, 56% for Co, 69.2% for Pt, 68% for Pd and 67.7% for Au (Ag is not considered), a mining cost of US$80.00/t rock and processing, treatment and refining, transportation and G&A cost of US$42.50/t mineralized material.*

(13) *The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.*

25.4 Mining

The all-underground mining plan employs methods suited to the current understanding of the site's historical exploitation, geological, geotechnical, and hydrological properties. The underground mine utilizes standard development and production methods and equipment, aiming to maximize efficiency while achieving realistic production rates. The constraints and limits applied to the schedule are designed to support the project's economic viability.

25.5 Recovery Methods

The Contact mineralization recovery approach discussed in this report is based on a sales agreement whereby concentrator metal recovery will be determined by established equations as a function of sampled and measured head grade. These equations were developed by lab scale testing of sampled Contact mineralization through Clarabelle Mill lab simulation testing. This includes material from the Main, Intermediate, 9400, 9400 Footwall and 101 Footwall zones. The equations are included in the Definitive Off-Take Agreement for Crean Hill AdEx production with Vale Base Metals. The 109 Footwall zone is excluded from the Agreement as Magna wishes to explore options to improve metal recovery.

The overall concentrator metal recovery is therefore a very predictable parameter in the economics and strictly a function of sampled head grade.

The sale terms are confidential; however, the process follows a standard ore sale arrangement. When material is mined, it will be accumulated in processing lots prior to crushing and sampling through a best practice sample tower. Each truck in the lot will be weighed and the grade of the lot will determine the recovery of metals in accordance with the equations included in the Definitive Off-Take Agreement.

Once the material has been treated, concentrate containing the metal recoveries predicted by the feed grade versus recovery equations at Clarabelle Mill's targeted concentrate grade will be designated for smelting. For this stage of processing, there is a set of terms to describe a milling and smelting treatment charge, payables net deductions for each metal and refining charges are per unit of each of the accounted metals as per the Definitive Agreement with Vale. Through this process, payments for Ni, Cu, Co, Pd, Pt, Au and Ag will be realized.

The 109FW recovery approach in this report is based on metal recovery equations developed as a function of head grade, predicting both Base Case and Optimized metallurgical performance. Magna has entered into an agreement with Glencore to process a ~20,000 tonne bulk sample through its Strathcona Mill in Sudbury, Ontario. (See Magna Press Releases June 4, 2024, and October 7, 2024). The results of this bulk sample test, indicative smelting terms and follow up lab scale evaluation will further inform the metal recovery opportunities and business case analysis for the mining and sale of 109FW mineralization.

25.6 Economic Analysis

The Crean Hill Project PEA displays robust economics with low initial capital, a very short payback period and high capital efficiency.

25.7 Risk and Opportunities

25.7.1 Risks

Metallurgy and Processing

Despite efforts made to produce representative samples of Contact style mineralogy from available drill core for testing and recovery prediction, AdEx mining may generate features not captured in the samples selected that could impact metallurgy and/or recovery predictions.

Mineral Resource Estimate

A minor portion of the contained metal of the Crean Hill deposit, at the reported cut-off grade for the MRE, is in the Inferred Mineral Resource classification. It is reasonably expected that the majority of Inferred Mineral resources could be upgraded to Indicated Minerals Resources with continued exploration.

The mineralized structures (mineralized domains) in all zones are relatively well understood. However, all mineralization zones might be of slightly variable shapes from what has been modeled. A different interpretation from the current mineralization models may adversely affect the current MRE. Continued drilling may help define with more precision the shapes of the zones and confirm the geological and grade continuities of the mineralized zones along strike or down dip/plunge.

25.7.2 Opportunities

Metallurgy and Processing

The presence of economic Rh (rhodium) grades in various Contact zones at Crean Hill could enhance NSR and should be measured, quantified for continuity, and evaluated for recovery during the AdEx phase.

The 109FW concentrator performance requires optimization when considering a sales agreement with a local mining company. Further testwork could enhance performance and define practical process changes to enhance the economics of Magna’s 109FW deposit and potentially other Footwall Cu-PGM deposits in the Sudbury Basin.

Ore sorting (Pre-Concentration) could enhance mine economics and should be evaluated for both Contact and 109FW mineralization using modelling, testwork and if justified, full scale ore sorter testing.

Mineral Resource Estimate

Based on recent exploration work, there is an opportunity to extend known mineralization at depth and on strike.

26 RECOMMENDATIONS

26.1 Advanced Exploration (AdEx) Program

The Company is currently planning and executing an Advanced Exploration Program (AdEx) that will extract an underground bulk sample of approximately 60,000 tonnes.

The AdEx program endeavors to de-risk the Crean Hill project by:

- Confirming and calibrating the Mineral Resource Estimate
- Confirming mining methods and stoping dilution, including backfilling strategy
- Confirming survey accuracy of existing workings
- Assessing the mine dewatering program
- Assessing ground conditions of the existing works
- Confirming on site processing rates and costs (crushing and Sample tower operations)
- Assessing toll milling recoveries
- Assessing metal sales and received NSR values against estimated values presented in this PEA

Facilities that are established during the AdEx program are expected to be utilized for future production requirements, should the program prove successful.

26.1.1 AdEx Facility Requirements

The facilities required for this program include:

- Surface office and temporary maintenance facilities.
- Generator and compressor installations (rental equipment).
- Initial ventilation for the AdEx program.
- Portal establishment.
- Initial mine dewatering via the existing shaft.
- Fuel Storage and dispensing.
- Stope backfilling.
- 600 tonne per day crushing and sample tower facilities.

26.1.2 Bulk Sample Program

The bulk sample plan envisions waste development of the ramp and level access of approximately 2,000 metres and 300 metres, and 400 metres of resource development access. Stoping will be conducted from the resource development drifts to extract 35,000 tonnes of resource material.

26.1.3 AdEx Costs and Revenue

The AdEx program will be conducted by mining contractors, and estimated costs were provided to the company for this program.

Metal sales revenues are expected to offset the total cost of the program.

Table 26-1 provides the estimated costs and revenues for the AdEx program.

Table 26-1 Estimated Costs and Revenues for the AdEx Program

Contractor Mobe / Demobe / Indirects	**$3,627K**
Site Preparation	$236K
Office / Dry / Generator/ Compressors, ShopsSet up	$2,803K
Site Water Distribution	$385K
Compressor / Generator Rental and Operation	$4,268K
AdEx Ventilation / Escapeways	$3,680K
Fuel Supply	$68K
AdEx Sample Tower, Backfill	$1,561K
Portal Excavation / Construction	$677K
AdEx Mine Dewatering	$848K
Waste Ramp Development	$22,587K
Resource Bulk Sample Drifting, Stoping, Mucking / Haulage	$3,009K
Resource Processing	$3,480K
Owner's Costs	$1,197K
Estimated AdEx Costs	**$48,424K**
AdEx Process Tonnes	58K
AdEx Estimated Sales Revenue	$16,349K
Net AdEx Program Costs	**$32,075K**

26.2 Additional Studies

The Company should proceed with their Advanced Exploration (AdEx) program to de-risk the project, and gain information prior to further studies.

Upon completion of the AdEx program, SGS recommends that the project progress to a Pre-Feasibility Study (PFS) Table 26-2.

The purpose of the PFS is to advance the engineering of the mine and infrastructure designs, investigate unknowns and assumptions, and update the cost estimate to AACE Class 4. The PFS should be disclosed in an NI 43-101 Technical Report.

Table 26-2 Budget Proposal for Crean Hill Preliminary Feasibility Study (Mining & Infrastructure)

Underground Mine Design and Infrastructure	PFS Estimated Cost ($ CAN)
• Geotechnical and Hydrogeological Considerations	1,600,000-2,600,000
• Investigate the condition of the existing shaft	
• Complete desktop trade-off studies	
• Advance mine designs and schedules	
• Reserves estimate	
• Advance surface and underground infrastructure designs	
Underground Facilities	
Mine Mobile Equipment Maintenance, Communications	
Logistics/Supplies Handling, Ventilation & Compressed Air/Processed Water	
• Cost estimates and financial analysis	
• NI 43-101 Technical Report	

26.2.1 Metallurgical Testing

Based on the results of the historical and recent testing completed at the time of publication of this report, the following are recommended;

1. To complete the evaluation of enhancing value and selling 109FW mineralization to an existing mining company.

The 109FW concentrator performance requires optimization when considering a sales agreement with a local mining company. Further testwork could enhance performance and define practical process changes to enhance the economics of Magna's 109FW deposit.

a. Complete the Glencore Strathcona Mill bulk sample processing and data analysis of daily/shift production accounting of metal recovery and concentrate grade.
b. From the production samples collected during the bulk sample processing, execute a testing program to assess the amenability of gravity separation, impact of finer primary grinding and PGM specific reagents on base and PGM recovery.
c. The follow up Phase 2 and 3 test program has been estimated at $205,000 and will take 6 months to complete.
d. Assess the economics considering recovery improvements and capital costs of required mill modifications.
e. Based on these results, perform a business case analysis.

2. The Definitive Vale – Crean Hill Off Take Agreement is sufficiently advanced with metal recovery equations defined for Contact AdEx production. This will allow Magna to evaluate the minable resource, tonnes and metal grades, capital and operating costs of mining, sampling, processing and other costs of opening of the Crean Hill Mine – Contact Zones.

No further testing of Contact mineralization is required in advance of the AdEx. AdEx drilling and sampling should however focus some attention to Rh (rhodium) as a potential source of revenue for Magna Mining. Further evaluation of the LOM mining zones and expected grades and mineralogy defined during the AdEx may prompt further testing if sufficiently different from the range of sample grades and mineralogy tested in 2023 program. It is expected that a similar approach would be used to define the feed grade versus recovery relationships required.

3. For both Contact and Footwall mineralization, further evaluate ore sorting economics based on typical capital/operating costs, base and PGM recovery and mass rejection rates including potential impact on concentrate grade versus metal recovery performance. If favorable, proceed with a full scale test run through a production scale ore sorter unit.

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28 DATE AND SIGNATURE PAGE

This report titled "Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada" dated November 1, 2024 (the "Technical Report") for Magna Mining Inc. was prepared and signed by the following authors:

The effective date of the report is April 15, 2024.
The date of the report is November 1, 2024.

Signed by:

Qualified Persons	Company
Allan Armitage, Ph. D., P. Geo.,	SGS Canada Inc. - Geological Services ("SGS")
William van Breugel, P.Eng.	SGS Canada Inc. - Geological Services ("SGS")
Johnny Canosa, P.Eng.	SGS Canada Inc. - Geological Services ("SGS")
Henri Gouin, P.Eng.	SGS Canada Inc. - Geological Services ("SGS")
Dominic Fragomeni, P.Eng.	Frago-Met Solutions Ltd.

November 1, 2024

29 CERTIFICATES OF QUALIFIED PERSONS

QP CERTIFICATE – ALLAN ARMITAGE

To accompany the technical report titled **Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada"** with an effective date of April 15, 2024 (the "Technical Report") prepared for Magna Mining Inc. (the "Company").

I, Allan E. Armitage, Ph. D., P. Geol. of 62 River Front Way, Fredericton, New Brunswick, hereby certify that:

1. I am a Senior Resource Geologist with SGS Canada Inc., 10 de la Seigneurie E blvd., Unit 203 Blainville, QC, Canada, J7C 3V5.
2. I am a graduate of: Acadia University having obtained the degree of Bachelor of Science - Honours in Geology in 1989; Laurentian University having obtained the degree of Master of Science in Geology in 1992; and, the University of Western Ontario having obtained a Doctor of Philosophy in Geology in 1998.
3. I have been employed as a geologist for every field season (May - October) from 1987 to 1996. I have been continuously employed as a geologist since March of 1997. I have been involved in mineral exploration and resource modeling at the grass roots to advanced exploration stage, since 1991, and mineral resource estimation and mineral resource and mineral reserve auditing since 2006, in Canada and internationally. I have experience in load gold deposits, base metal massive sulphide deposits, porphyry deposits, epithermal gold and silver deposits, and magmatic Ni-Cu-PGE deposits.
4. I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta (P.Geol.) (License No. 64456; 1999), the Association of Professional Engineers and Geoscientists of British Columbia (P.Geo.) (Licence No. 38144; 2012), and the Professional Geoscientists Ontario (P.Geo.) (Licence No. 2829; 2017).
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 – Standards of Disclosure for Mineral Projects – ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43 101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43 101.
6. I am an author of the Technical Report and responsible for Sections 2 to 12, 14, 23, 24 and 27. I am also co-author for the relevant portions of Sections 1, 25 and 26 of the Technical Report. I have reviewed all sections and accept professional responsibility for these sections of the Technical Report.
7. I have conducted site visits to the Property on several occasions, including May 25 and 26, 2022, July 25, 2023, July 2, 2024, and July 25, 2024
8. I have had prior involvement on the Crean Hill property. I was an author of previous NI 43-101 Technical Reports for the Property, dated December 14, 2022 and September 13, 2023, for Magna.
9. I am independent of the Company as described in Section 1.5 of NI 43-101.
10. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
11. I have read NI 43-101 and Form 43-101F1 (the "Form"), and the Technical Report has been prepared in compliance with NI 43-101 and the Form.

Signed and dated November 1, 2024, at Fredericton, New Brunswick.

"Original Signed and Sealed"

Allan Armitage, Ph. D., P. Geo., SGS Canada Inc.

QP CERTIFICATE – WILLIAM VAN BREUGEL, P.Eng.

To accompany the report entitled titled "Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada" prepared for Magna Mining Inc. dated November 1, 2024 and with an effective date of April 15, 2024.

I, William van Breugel, P. Eng. of Saskatoon, hereby certify that:

a) I am an Associate Mining Engineer for SGS Canada Inc, with an office located at 235 Ajawan Street, Christopher Lake, Saskatchewan, Canada,

b) I graduated from the University of Waterloo in 1990 (BaSc (Hons). Geological Engineering). I am a member of good standing of the Association of Professional Engineers and Geoscientists of Saskatchewan (License #22452). I have worked as a mining engineer for over 33 years since my graduation from University. I have worked on precious metals, base metals, industrial commodities and diamond projects including mine operations and property evaluations. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").

c) I have not conducted a site visit of the property.

d) I am an author of this report and responsible for Sections 19, 21, and 22. I am also co-author for the relevant portions of Sections 1, 3, 25, 26, and 27 of the Technical Report. I have reviewed these sections and I am the Qualified Person for matters related to the information contained in those report sections.

e) I am independent of Magna Mining Inc. as defined in Section 1.5 of National Instrument 43-101.

f) I have had no prior involvement with the subject property.

g) I have read the definition of qualified person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of National Instrument 43-101.

h) As at the effective date of the technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

i) I have read National Instrument 43-101, Form 43-101F1 and confirm that this technical report has been prepared in accordance therewith.

Signed and dated this November 1, 2024 at Christopher Lake, Saskatchewan.

"Original Signed and Sealed"

William van Breugel, P.Eng.

QP CERTIFICATE – JOHNNY CANOSA, P.Eng.

To accompany the report entitled: NI 43-101 TECHNICAL REPORT, Preliminary Economic Assessment Update Study for the Crean Hill Project, Sudbury, Ontario, Canada, dated November 1, 2024.

I, Johnny Canosa, P. Eng. of Surrey, British Columbia, Canada hereby certifies that:

a) I am a Senior Mine Engineer for SGS Canada Inc. - SGS Geological Services with an office at 10 Boul. de la Seigneurie Est, Suite 203, Blainville Quebec Canada, J7C 3V5. (www.sgs.com).

b) I am a graduate of Bachelor of Science in Mining Engineering from Saint Louis University, Baguio City Benguet, Philippines with diploma issue date on March 23, 1980.

c) I am a member of good standing of the Association of Professional Engineers of Ontario (licence # 100509964) and the Association of Professional and Geoscientist of Alberta (licence #93946).

d) My relevant experience includes more than 20 years of experience in mine engineering, mine planning, and mining operation, including mine optimization, projects, open pit planning and scheduling, and mining consultancy.

e) I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").

f) I have not personally inspected the Property.

g) I am the author of this report and am responsible for Sections 18 and 20. I am also co-author for the relevant portions of Sections 1, 3, 25, 26, and 27 of the Technical Report. I have reviewed these sections and accept professional responsibility for these sections of this technical report.

h) I am independent of Magna Mining Inc. (the issuer) as defined in Section 1.5 of National Instrument 43-101.

i) I have had no prior involvement with the subject property.

j) I have read the definition of a qualified person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of National Instrument 43-101.

k) As of the effective date of the technical report, to the best of my knowledge, information, and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

l) I have read National Instrument 43-101, Form 43-101F1, and confirm that this technical report has been prepared in accordance therewith.

m) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 1st day of November 2024 at Surrey, British Columbia, Canada.

"Original Signed and Sealed"

Johnny Canosa, P.Eng., SGS Canada Inc.

QP CERTIFICATE – HENRI GOUIN, P.Eng.

To accompany the technical report entitled "Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada", prepared for Magna Mining Inc., dated November 1, 2024, with an effective date of April 15, 2024.

1. I, Henri Gouin, P.Eng., of Moncton, New-Brunswick, Canada, hereby certify that:
2. I am a Mining Engineer with SGS Canada Inc. - SGS Geological Services, located at 10 Boul. de la Seigneurie Est, Suite 203, Blainville, Quebec, Canada, J7C 3V5.
3. I graduated from Laval University, Quebec City, in 2011 with a Bachelor's degree in Mining Engineering.
4. I am a member in good standing of the Order of Engineers of Quebec (OIQ No. 5032633).
5. My relevant experience includes eleven years of operational experience, in addition to one year as a mining engineering consultant. My roles have included mine design, short- and long-range planning, ventilation, ground control, budgeting, and Technical Services management.
6. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
7. I personally inspected the Crean Hill Project property on May 13, 2024.
8. I am the author of this report and am responsible for Section 16. I am also co-author for the relevant portions of Sections 1, 2, 12, 25, 26, and 27 of the Technical Report.
9. I am independent of Magna Mining Inc. (the issuer), as defined in Section 1.5 of National Instrument 43-101.
10. I have had no prior involvement with the subject property.
11. I have read National Instrument 43-101 and Form 43-101F1 and confirm that this technical report has been prepared in accordance therewith.
12. As at the effective date of the technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated November 1, 2024, at Moncton, New Brunswick.

"Original Signed and Sealed"

Henri Gouin, P.Eng., SGS Canada Inc.

QP CERTIFICATE – DOMINIC FRAGOMENI, P.Eng.

Frago-Met Solutions Ltd.
10-1642 Fairbank East Road
Whitefish, Ontario
P0M 3E0

I, Dominic Fragomeni, do hereby certify that:

1. I am President of Frago-Met Solutions Ltd., 10-1642 Fairbank East Road, Sudbury, Ontario P0M 3E0.
2. I am a graduate of the Haileybury School of Mines, Mining Technician Diploma (1984) and Queen's University at Kingston, Bachelor of Science with Honours, Mining Engineering (1988).
3. I am a member in good standing with Professional Engineers Ontario (PEO) as a P.Eng. (1996) Member # 90351719 and the holder of a PEO Certificate of Authorization #100592918
4. I have worked in mineral processing since graduation in various operating metallurgical and management positions in gold, copper/lead/zinc and nickel/copper operations. I held engineering and executive management positions in a metallurgical testing business and in technology development have been considered a subject matter expert in mineral processing. I have 18 years of experience in the testing and analysis of Ni/Cu/PGM mineral processing circuits.
5. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 (NI43-101) and certify that, by reason of my education, affiliation with a professional association and past relevant experience, I fulfill the requirements to be a 'Qualified Person' for the purposes of NI43-101.
6. I am responsible for authoring, co-authoring, Sections 13, 17 and parts of 1, 2, 3, 12, 18, 25, 26, 27 of the Technical Report entitled, "Preliminary Economic Assessment Update for the Crean Hill Project, Sudbury, Ontario, Canada", (The "Technical Report") effective date April 15, 2024.
7. I have read the NI43-101 and from 43-101F1 and the Technical Report sections I have authored and co-authored have been prepared in compliance therewith.
8. I have had prior involvement on the Crean Hill property with Magna Mining Inc.
9. I have been a contract metallurgical consultant with Magna Mining Inc. since 2023 and as part of my scope and deliverables, have reviewed and analyzed historical Crean Hill metallurgical testwork, represented Magna metallurgy for the 2023 test program with data analysis, supported Magna in negotiation of the Definitive Off-Take Agreement with Vale, Toll Milling Agreement with Glencore and supported and currently analyzing data from the 109FW bulk sample production test at Strathcona Mill.
10. I have visited the site as a part of the 109FW bulk sample test scope on July 15, July 29 and Aug 1, 2024.
11. As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report sections I have authored, co-authored contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
12. I am not aware of material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the sections of report I have authored or co-authored.
13. I am independent of the issuer, Magna Mining Inc., applying the tests in Section 1.5 of NI43-101.

Signed Date: November 1, 2024 at Sudbury, Ontario.

"Original Signed and Sealed"

Dominic Fragomeni, P.Eng., Frago-Met Solutions Ltd.