Effective Date: August 29, 2014

NI 43-101 TECHNICAL REPORT

FIRST INDEPENDENT TECHNICAL REPORT ON THE TAMARACK NORTH PROJECT, TAMARACK, MINNESOTA

Submitted to:
Talon Metals Corp.
Tamarack North Project
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TECHNICAL REPORT

Report Number: 1407088

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1 PDF Copy - Talon Metals Corp.

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1.0 SUMMARY

1.1 Scope of Work

Golder Associates Ltd. (Golder) was retained by Talon Metals Corp. (together with its wholly owned indirect subsidiary Talon Nickel (USA) LLC, "Talon") to provide an independent mineral resource estimate, for the Tamarack North Project located in Aitkin County, Minnesota, USA, including a National Instrument 43-101 (NI 43-101) technical report for filing with the relevant Canadian securities regulators. This report represents the initial public disclosure of a mineral resource for the Tamarack North Project.

The mineral resource estimates were completed by Brian Thomas, P.Geo., and reviewed by Paul Palmer, P.Geo., P.Eng., both of Golder. Brian Thomas completed a site visit to the Tamarack North Project on July 16, 2014. Both authors are qualified persons (QP) as defined by NI 43-101.

A summary of the metallurgical work completed on the property has been completed by Manochehr Oliazadeh Khorakchy, P.Eng. of Hatch Ltd. (Hatch) and he is the QP responsible for sections 1.7, 1.10.1, 13 and 19.1 of this report.

1.2 Location and Ownership

The Tamarack North Project is located in north central Minnesota approximately 100 km west of Duluth and 200 km north of Minneapolis, in Aitkin County. The Tamarack North Project covers approximately 24,998 acres and is located near the town of Tamarack.

The Tamarack North Project is currently 100% held by Kennecott Exploration Company (Kennecott), a wholly owned subsidiary of the Rio Tinto Group. It is subject to earn-in by Talon pursuant to an Exploration and Option Agreement between Talon and Kennecott dated June 25, 2014 (Earn-in Agreement). Talon has the right to acquire a 30% interest in the Tamarack Project (which is comprised of the Tamarack North Project and the Tamarack South Project) over a three year period (Earn-in Period) by making US$7.5-million in installment payments to Kennecott, and incurring US$30-million in exploration expenditures (Earn-in Conditions). Upon successful completion of the Earn-in Conditions, Kennecott will elect whether to: (a) proceed with a 70/30 joint venture on the Tamarack Project, with Kennecott holding a 70% participating interest, and Talon owning a 30% participating interest; or (b) grant Talon the right to purchase Kennecott's interest in the Tamarack Project for a purchase price of US$107.5-million. In the event Kennecott grants Talon the right to purchase its interest in the Tamarack Project, and Talon elects to proceed with the purchase option, Talon will have up to 18 months to close the transaction, provided it makes an upfront non-refundable payment to Kennecott of US$7.5-million (thereby reducing the purchase price to US$100-million).

Kennecott's mineral tenure and surface rights agreements are currently held in good standing with the state of Minnesota and private landholders.

1.3 Geology and Mineralization

The Tamarack Igneous Complex (TIC) is an ultramafic to mafic intrusive, hosting nickel-copper sulphide mineralization with associated cobalt, platinum, palladium (PGE's) and gold. The intrusion of the TIC (dated at 1105 Ma+/-1.2 Ma, Goldner 2011) is related to the early evolution of the approximately 1.1 Ga Mesoproterozoic

Mid-continental Rift (MCR) and has intruded into slates and greywackes of the Thomson Formation of the Animikie Group which formed as a foreland basin during the Paleoproterozoic Penokean Orogen (approximately 1.85 Ga, Goldner 2011). The TIC is completely buried beneath approximately 40 m of Quaternary age glacial and fluvial sediments. The TIC is consistent with other earlier intrusions associated with the MCR that are often characterised by more primitive melts.

The geometry of the TIC, as outlined by the well-defined aeromagnetic anomaly, consists of a curved, elongated intrusion striking north-south to south–east over 18 km. The configuration has been likened to a tadpole shape with its elongated, northern tail up to 1 km wide and large, 4 km wide, ovoid shaped body in the south (Figure 7-5 and 7-6). The northern portion of the TIC (the Tamarack North Project), which hosts the currently defined resource and identified exploration targets, is over 7 km long and is the focus of this report.

The Tamarack North Project hosts magmatic nickel (Ni)-copper (Cu)-platinum-group elements (PGE) sulphide mineralization. These deposits form as the result of segregation and concentration of liquid sulphide from mafic or ultramafic magma and the partitioning of chalcophile elements into the sulphide from the silica melt (Naldrett, 1999).

The various mineralized zones at the Tamarack North Project occur within different host lithologies, exhibit different types of mineralization styles, and display varying sulphide concentrations and tenors. These mineralized zones range from massive sulphides hosted by altered sediments in the Massive Sulphide Unit (MSU), to net textured and disseminated sulphide mineralization hosted by the Coarse Grained Feldspathic Peridotite (CGO) in the Semi-Massive Sulphide Zone (SMSU); to a more predominately disseminated sulphide mineralization as well as layers of net textured sulphide mineralization, in the 138 Zone (see Table 1-1). Mineralization in the 138 Zone, where interlayered disseminated and net textured mineralization occurs is referred to as mixed zone (MZ) mineralization. All these mineralization types are typical of many sulphide ore bodies around the world. The current known mineral zones of the Tamarack North Project (SMSU, MSU and 138 Zone) that are the basis of this resource statement are referred to as the Tamarack Zone. Also located within the Tamarack North Project are currently, two lesser defined mineral zones, namely the 480 and Laucamp.

Table 1-1: Key Geological and Mineralization Relationships

Project	Area	Mineral Zone	Host Lithology	Project Specific Lithology	Mineralization Type
Tamarack North Project	**Tamarack Zone**	SMSU	Feldspathic Peridotite	CGO	Net Textured and Disseminated Sulphides
		MSU	Meta-Sediments	Sediments	Massive Sulphides
		138	Peridotite and Feldspathic Peridotite	Mixed Zone	Disseminated and Net Textured Sulphides
	Other	480	Peridotite	FGO	Disseminated Sulphides
		Laucamp	Peridotite	FGO	Massive Sulphide Veins

1.4 Exploration Programs

The TIC and associated mineralization was discovered as part of a regional program by Kennecott initiated in 1991. The focus on nickel and copper sulphide mineralization was intensified in 1999 based on a model proposed by Dr. A. J. Naldrett of the potential for smaller feeder conduits associated with continental rift volcanism and mafic intrusions to host nickel sulphide deposits similar to Norils'k and Voisey's bay.

Disseminated mineralization was first intersected at Tamarack in 2002, and the first significant mineralization of massive and net-textured sulphides were intersected in 2008 at the Tamarack North Project.

To-date, exploration by Kennecott has included a wide range of geophysical surveys including; airbourne magnetic and electromagnetic (EM-MegaTEM and AeroTEM), ground magnetic and EM, Induced Polarization (IP), gravity, seismic, MALM and downhole EM. Drilling in the main target areas of the Tamarack North Project has included 182 diamond drill holes totalling 67,387.37 m. Kennecott has conducted extensive drilling at the Tamarack North Project since 2002. This drilling has been comprised of 182 diamond drill holes totalling 67,387 m with holes between 33.5 m and over 956 m depth for an average hole depth of 534 m.

1.5 Sample Preparation, QA/QC and Chain of Custody

Golder reviewed Kennecott's sampling and Quality Assurance and Quality Control (QA/QC) protocols along with the chain of custody of samples. Kennecott samples core continuously through the mineralization and their sampling and logging procedures are consistent with industry standards and the assay methods are appropriate for the base metal sulphide mineralization found at the Tamarack North Project.

Their QA/QC program is based on insertion of certified reference materials, including a variety of standards, blanks and duplicate samples, used to monitor the precision and accuracy of their primary assay lab, and to prevent inaccurate data from being accepted into their assay database. The Kennecott QA/QC protocol is consistent with industry best practises.

Kennecott uses a system of metal seals to secure pails used to ship samples from the core shack to the assay lab ensuring that they have not been tampered with. Samples are prepared and stored in a secure facility and are monitored each step of the way to the lab. Golder is confident that the samples accurately reflect the mineralization and that there is little opportunity for the samples to be tampered with. All procedures were found to meet or exceed industry standard practises.

1.6 Data Validation

Golder compared assay data from the Kennecott database to the original assay certificates from ALS Chemex for the entire sample population used for resource estimation. No errors were identified during this review.

During the QP site visit, Brian Thomas of Golder, surveyed 4 drill hole collars and then compared the coordinates to those provided by Kennecott. All collars were found to be consistent with the Kennecott collar coordinates, within the accuracy of the handheld GPS.

Golder conducted verification sampling of drill core from each of the three mineral domains. A total of nine samples were taken along with three additional CRM samples, including two standards and one blank. Assay values from the verification sample program were consistent with results obtained by Kennecott.

Golder has concluded that the Tamarack North Project drill hole database is of suitable quality to support the resource estimate in this technical report.

1.7 Mineral Process and Metallurgical Testing

Metallurgical testing of the Tamarack North Project was carried out in two programs: From 2006-2010 samples consisting of high grade mineralization from the SMSU hosted in the CGO and low grade mineralization from the CGO were submitted to SGS Minerals Services for mineralogical and metallurgical testing, while the 2012-2013 program focussed only on low grade mineralization in each of the intrusions.

Head assays from both phases of testwork indicated that there were no problematic concentrations of deleterious material, such as talc and chlorite.

Mineralogy conducted by Quantitative Evaluation of Materials by Scanning Electron Microscope (QEMSCAN) on the two master composites indicated that the dominant copper sulphide was chalcopyrite, with minor amounts of cubanite present. Pentlandite was the dominant nickel sulphide with minor amounts of mackinawite. The dominant sulphide mineral was pyrrhotite, which needs to be rejected.

Bond ball mill work index (BWi) tests ranged from 13.0 to 19.0 kWh/t (metric), the work index was found to increase as the sulphide to rock ratio decreases.

Ni and Cu liberation analysis indicated the Ni and Cu were well liberated for a roughing stage, but a regrind would likely result in an increase of the concentrate grade of Ni and Cu.

Rougher flotation tests were designed to investigate the effect of primary grind on rougher flotation recoveries. The optimum grade recovery relationships for both Ni and Cu were achieved at grinds having a P80 between 90 and 129 µm, the recovery of Ni was 89.2% to 90.7% while Cu was 93.9% to 95.5%. Initial rougher concentrate grades in excess of 20% Cu+Ni were readily achieved. The sulphur grade of the tails needs to be decreased further, which is likely possible with extended flotation time and increased collector dosage. The best selectivity was achieved with no pH modifier, however adjusting the pH with acid may further help reduce the sulphur in the tails.

Batch cleaner flotation tests were carried out on all composites to establish the recoveries and grade of a final bulk Cu-Ni concentrate.

An initial investigation into the potential for producing separate, high grade Cu and Ni concentrates from a bulk concentrate was also started; however no optimization work has been commissioned to date. A regrind of the rougher concentrate was attempted. Specifically the impact of adding more collector and CMC to minimize metal losses in separate, high grade Cu and Ni concentrates need to be tested. The results also suggest that an additional cleaning step would be beneficial to help reject the additional non-sulphide gangue.

All the cleaning tests employed a Cu-Ni separation stage following the cleaner flotation stage. The Ni concentrate graded 21.5% Ni with a Cu:Ni ratio of 0.09. Ni recovery to this concentrate was 78.5%. The best results from the Cu separation tests results resulted in Cu concentrate graded 32.4% Cu with 0.72% Ni with 71.4% Cu recovery.

The results for the Cu-Ni separation tests were satisfactory for the Ni concentrate as the target of a Cu:Ni ratio of < 0.2 in the Ni concentrate was met, therefore production of a high grade Ni concentrate with a Cu:Ni ratio of <0.2 looks readily achievable. Producing a Cu concentrate that meets the target of <0.7% Ni in the Cu concentrate was not met. The best result achieved a Ni grade in the Cu concentrate of 0.72%. The average %Ni in all the tests on samples from the SMSU was 1.2% when a regrind and one stage of copper cleaning was used. The goal of the next set of testing (see recommendation under section 13.8), is to produce a Cu concentrate that meets the target of <0.7% Ni in the Cu concentrate.

An ICP scan carried out on a blend of Cu and Ni concentrates indicated that there were no concentrations of impurity elements that would be of concern during smelting or refining of these concentrates.

1.8 Mineral Resource Estimate

The independent initial NI 43-101 mineral resource estimate for the Tamarack North Project has been prepared by Mr. Brian Thomas (B.Sc, P.Geo), Senior Resource Geologist at Golder and is summarized in Table 1-2 below. The effective date of the mineral resource estimate is August 29, 2014. Mr. Brian Thomas is an independent QP pursuant to NI 43-101.

Table 1-2: Tamarack North Project Mineral Resource Estimate (August 29, 2014)

Domain	Mineral Resource Classification	Tonnes (000)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	NiEq (%)
SMSU	Indicated Mineral Resource	3,751	1.81	1.00	0.05	0.41	0.25	0.19	2.35
SMSU	Inferred Mineral Resource	949	1.12	0.62	0.03	0.25	0.16	0.14	1.47
MSU	Inferred Mineral Resource	158	5.25	2.47	0.11	0.66	0.44	0.22	6.42
138 Zone	Inferred Mineral Resource	2,012	0.95	0.78	0.03	0.23	0.14	0.17	1.33
Total	Indicated Mineral Resource	3,751	1.81	1.00	0.05	0.41	0.25	0.19	2.35
Total	Inferred Mineral Resource	3,119	1.22	0.82	0.03	0.26	0.16	0.16	1.63

Notes:
All resources reported above a 0.9% NiEq cut-off.
Mining recovery and dilution factors have not been applied to the estimates.
Tonnage estimates are rounded down to the nearest 1,000 tonnes.
Estimates do not include metallurgical recovery.
% - percent
g/t – grams per tonne

**Where used in this resource estimate, NiEq% = Ni%+ Cu% x 2.91/9.20 + Co% x 14/9.20 + Pt [g/t]/31.103 x 1,400/9.2/22.04 + Pd [g/t]/31.103 x 600/9.2/22.04 + Au [g/t]/31.103 x 1,300/9.2/22.04*

The mineral resources are derived from a Datamine constructed block model (block size = 7.5 m by 7.5 m by 7.5 m) of three mineral domains (SMSU, MSU and 138 Zone) and are reported above a NiEq cut-off of 0.90%. All Domains were “unfolded” and had top cuts applied to restrict outlier values (Pt, Pd and Au). The three domains (see Figure 14-1) utilized either Ordinary Kriged (OK) or Inverse Distance (ID) methodology to interpolate grades (Ni, Cu, Co, Pt, Pd and Au) from 1.5 m composited drill holes. Density values were based on specific gravity measurements taken from whole core and where absent, regression formulas. The resources reported are based on a “blocks above cut-off” basis and were then examined visually by Golder and found to have good continuity.

1.9 Conclusions

The mineral resource estimate in this technical report is the initial NI 43-101 mineral resource estimate for the Tamarack North Project. The resource estimate has been prepared in accordance with CIM best practise guidelines and is compliant with NI 43-101 regulations.

Mr. Brian Thomas, P.Geo., is the QP of the resource and has visited the site, collected samples for check assay, and reviewed the Tamarack North Project data, including geological and metallurgical reports, maps, technical papers, digital data including lab results, sample analyses and other miscellaneous information. The QP believes that the data presented is an accurate and reasonable representation of the Tamarack North Project and concludes that the database is of suitable quality to provide the basis of the conclusions and recommendations reached in this report.

The Tamarack North Project is considered to be a project of merit and has the potential for increased resources through additional exploration.

Risks identified that could affect the accuracy of the resource estimate include the following:

- Orientation of drilling is predominantly near vertical and is not necessarily ideal for accurately determining the true width of the mineralization;
- There is a possibility that the MSU domain is not as continuous as modeled;
- The Inferred Mineral Resources in the SMSU and 138 Zone domains are sensitive to higher cut-off grades which could affect the resource if mining costs increase significantly.
- The tonnage of the 138 Zone domain is based on bulk density that was calculated by polynomial regression.

Golder has taken many steps to mitigate the impact of these risks and has classified the resources accordingly.

Golder sees many opportunities for the Tamarack North Project which can result in an increase of resources and increased classification. These opportunities include the following:

- Inferred Mineral Resource in the SMSU and 138 Zone domains could be upgraded to Indicated Mineral Resource with additional infill drilling.
- The MSU domain could be extended another 150 m down plunge if infill drilling can confirm continuity between the existing domain and high grade massive sulphide intervals located in the footwall of the 138 Zone domain. The MSU is also open up plunge and has not been tested in this direction.

- The SMSU zone has potential to be extended up plunge to the north-east with additional exploration drilling that can outline the CGO.
- Lower grade mineralization hosted in the FGO, located up plunge, has yet to be modeled and quantified.
- The property has good exploration potential as there are indications of mineralization at various other locations throughout the property which have not been thoroughly explored at this point in time.

1.10 Recommendations

Golder notes that Kennecott is currently the operator of the Tamarack North Project pursuant to the Earn-in Agreement. Although Golder makes the following recommendations to Talon, Golder understands that Kennecott is under no obligation to follow such recommendations pursuant to the terms of the Earn-in Agreement.

Golder has the following recommendations for the next two phases of the Tamarack North Project. The goal of the first phase would be to increase the size of the resource and then the second phase would be to focus on upgrading the confidence in the resource and moving it towards development. Estimated costs of each phase are summarized in Table 1-3.

Recommendations for phase 1 include the following:

- Continue data analysis to the north of the SMSU domain to identify drill targets in the CGO intrusive.
- Exploration drilling to: a) the north of the SMSU; b) the south and east of the 138 Zone domain; and c) confirm and expand the Laucamp target area.
- Model lower grade mineralization located up plunge, hosted in the FGO, in order to quantify the potential resource in that area.
- Develop a QA/QC reporting protocol (monthly, bi-monthly) during drilling programs for auditing purposes and include a check on the primary assay laboratory by sending a selection of duplicate samples to second laboratory.

The second phase of recommendations may be contingent on successful results of phase 1 or could be implemented if the focus is switched from expanding the resource to developing the resource towards production.

- A preliminary economic assessment (PEA) is recommended in order to outline high level economics for the Tamarack North Project.
- Complete infill drilling in the existing resource to increase confidence. Drilling should cross cut the mineralization in order to delineate the true width of the SMSU and 138 Zone domains.
- Measure specific gravity from existing sample pulps in the 138 Zone domain to ensure that specific gravity values are representative of the sample intervals. Alternatively, a specific gravity formula could be developed based on calculated mineral abundances that can be applied to each sample interval. This would require additional assays for iron (Fe) to calculate the abundances of sulphide minerals.

- The estimation technique may need to include Indicator Kriging once sufficient data becomes available, in order to better represent the bimodal distributions observed in the SMSU and MSU domains.
- A mineral resource update is recommended once sufficient infill drilling has been completed.
- Continued exploration drilling to expand the resource.

Table 1-3: Estimated Costs of Recommendations

Recommended Item	Cost $US
Phase 1	$10,000,000
Phase 2	$20,000,000
Total Expense	**$30,000,000**

Notes: Drilling costs are preliminary estimates.

1.10.1 Metallurgical Recommendations

The following are metallurgical related recommendations:

- Testing a wider range of samples, including the very high grade zone (MSU) and the lower grade (but still >0.5% Ni) material within the CGO and mixed zone mineralization areas.
- Some of the PGE metals could be hosted in silicate minerals and may only be partially recoverable by flotation. Metallurgical recovery of PGE metals have not been well established at this point in time and therefore metallurgical testing should be conducted to determine the approximate expected recoveries of PGE metals (specifically Pt, Pd) and Au.
- Establish crushability and grindability of samples.
- Confirm optimum primary grind size between a P80 of 60 and 120 µm.
- Test production of non-acid generating tailings by scavenging rougher tailings at pH 7.5 with acid and with a powerful collector at longer flotation time.
- Evaluate regrinding of rougher concentrate with and without CMC (300 g/t) and xanthate, followed by two stages of bulk cleaning.
- Define optimum particle size for regrinding feed to copper nickel separation.
- To minimize the amount of complex copper sulphide particles reporting to Cu-Ni separation, consider a copper prefloat prior to roughing to scalp off the liberated and simple binary copper sulphide particles and only do copper nickel separation on this stream.
- Establish if scavenger concentrate needs to be reground.
- Conduct locked cycle tests on preferred flowsheet.

Depending on the level of testwork, it is estimated that the costs will be $US150,000 - $US350,000, which are included in Phase 2 costs in Table 1-3 above.

2.0 INTRODUCTION

2.1.1 Purpose and Site Visit

Golder was retained by Talon to provide an independent mineral resource estimate, for the Tamarack North Project located in Aitkin County, Minnesota, USA, including a NI 43-101 technical report for filing with the relevant Canadian securities regulators. This report represents the initial public disclosure of a mineral resource for the Tamarack North Project. Talon USA has entered into the Earn-in Agreement with Kennecott where it can earn a 30% ownership interest in the property upon successful completion of the Earn-in Conditions.

The mineral resource estimates were completed by Brian Thomas, P.Geo. and reviewed by Paul Palmer, P.Geo., P.Eng., both of Golder and QP for the technical report. Brian Thomas completed a site visit to the Tamarack North Project on July 16, 2014 as required for NI 43-101.

This report was prepared as an NI 43-101 technical report for Talon. The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in Golder's services, based upon:

- information available at the time of preparation;
- data supplied by outside sources; and
- the assumptions, conditions and qualifications set forth in this report.

This report is intended to be used by Talon, subject to the terms and conditions of its contract with Golder. That contract permits Golder and Talon to file this report as a technical report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities laws, use of this report by any third party is at that party's sole risk.

During the site visit, Mr. Thomas reviewed the site conditions, reviewed logging procedures, confirmed collar locations, and confirmed metal mineralization through the inspection of core and independent check assays. Logging and storage facilities were also visited. A detailed description of the site visit is included in Section 12.

2.1 Source of Information

The sources of information that were provided in the preparation of the mineral resource estimate and technical report were provided by Talon, under the direction of Mr. James McDonald (P.Geo), and by Kennecott under the direction of Mr. Robert Rush. This report and mineral resource estimate is based on the following data and pre-existing reports:

- The Earn-in Agreement.
- Tamarack Magmatic Nickel Copper Sulfide Due Diligence (Talon) report.
- Kennecott internal reports.

- Kennecott database of surface drill holes that included:
  - Ni, Cu, Co, Pt, Pd, Au, Lithology sample/assay data;
  - Sample bulk density;
  - Drill hole collar survey data and down-hole survey data; and
  - QA/QC summary data and graphs.
- Assay certificates from ALS Chemex, including historical data and 2013 drilling data.
- Metal price assumptions based on an average of forecast long term prices provided by major financial institutions located in North America and Europe.

2.2 UNITS OF MEASURE AND ABBREVIATIONS

All units of measure used in this report are in the metric system, unless stated otherwise. Currencies outlined in the report are in US dollars unless otherwise stated.

Capital expenditure	CAPEX
Centimetre	cm
Copper	Cu
Cobalt	Co
Cubic centimetre	cm^3
Cubic metre	m^3
Degree	°
Degrees Celsius	°C
Gold	Au
Gram	g
Grams per tonne	g/t
Greater than	>
Hectare (10,000 m^2)	ha
Internal rate of return	IRR
Kilogram	kg
Kilograms per cubic metre	kg/m^3
Kilograms per square metre	kg/m^2
Kilometre	km
Less than	<
Metre	m
Metres above sea level	masl
Millimetre	mm
Million	M
Million tonnes	Mt
Million tonnes per annum	Mtpa
Operating expense	OPEX
Ounce (troy ounce - 31.1035 grams)	oz
Nickel	Ni
Palladium	Pd
Percent	%

Platinum	Pt
Platinum group element	PGE
Pound(s)	lb
Parts per million	ppm
Parts per billion	ppb
Relative Percentage Difference	RPD
Specific gravity	SG
Square km	km^2
Square metre	m^2

Figure 2-1: Units of Measure and Abbreviations

3.0 RELIANCE ON OTHER EXPERTS

In sections 4.2 (Property Ownership), 4.3 (Exploration Permits and Approvals) and 4.4 (Environmental) of this technical report, the QPs have relied upon, and believe there is a reasonable basis for this reliance on, information provided by Talon regarding mineral tenure, surface rights, ownership details, the Earn-in Agreement and other agreements relating to the Tamarack North Project, royalties, environmental obligations, permitting requirements and applicable legislation relevant to the Tamarack North Project. The QPs have not independently reviewed the information in these sections and have fully relied upon, and disclaim responsibility for, information provided by Talon in these sections.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

The Tamarack North Project is located in north central Minnesota approximately 100 km west of Duluth and 200 km north of Minneapolis, in Aitkin County (Figure 4-1). The Tamarack North Project covers approximately 24,998 acres. The project is located at approximately Latitude 46°41' north and Longitude 93°6' west. The town of Tamarack, which gives the project its name, lies in the southern portion of the Tamarack North Project area (though away from the known mineralization).

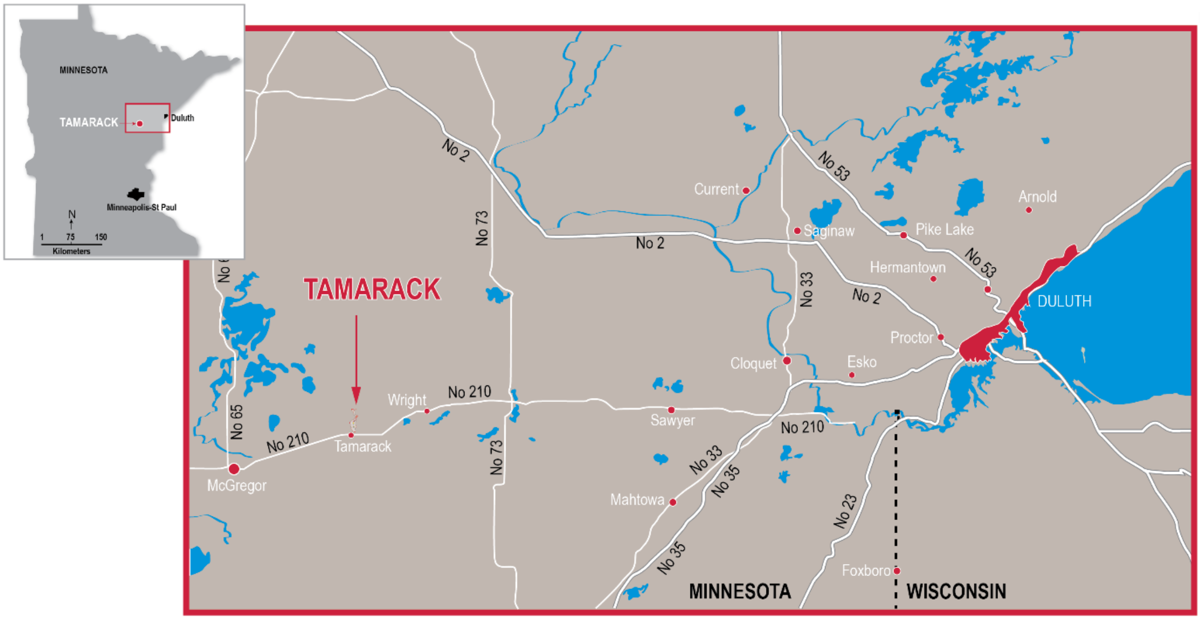


Figure 4-1: Location of the Tamarack North Project

4.2 Property Ownership

The Tamarack North Project is currently 100% held by Kennecott. It is subject to earn-in by Talon pursuant to the Earn-in Agreement which is described in further detail in Section 4.2.1 below.

4.2.1 Exploration and Option Agreement

Talon and Kennecott entered into the Earn-in Agreement, pursuant to which Talon has the right to acquire a 30% interest in the Tamarack Project (which is comprised of the Tamarack North Project and the Tamarack South Project) over a three year period by making US$7.5-million in installment payments to Kennecott, and incurring US$30-million in exploration expenditures (Earn-in Conditions), in accordance with the following schedules:

Talon Payments to Kennecott

Table 4-1: Talon's earn in payments to Kennecott (committed/optional)

Payment Date	Amount (US$)	Term of Payment
Upon Signature	1,000,000	Committed
First Anniversary	2,500,000	Talon’s Option
Second Anniversary	4,000,000	Talon’s Option
Total	**7,500,000**	

Exploration Expenditures to be Funded by Talon

Table 4-2: Talon's exploration expenditures (committed/optional)

Payment Period	Payments to be Made (US$)	Term of Payment
Year 1	10,000,000	Committed
Year 2	10,000,000	Talon's Option
Year 3	10,000,000	Talon's Option
Total	**30,000,000**	

In addition to the above, Talon has agreed to make certain land option payments on behalf of Kennecott, which may also be payable over the Earn-in Period (and, if payable, are included as part of the Earn-in Conditions).

If at any point prior to expending the total earn-in funds pursuant to the Earn-in Conditions, Talon elects not to continue with the Tamarack Project, it will earn no interest in the Tamarack Project and Kennecott will have no further obligations to Talon.

During the Earn-in Period, Kennecott will continue to be the operator of the Tamarack North Project. Further, Talon and Kennecott have agreed to form a Technical Committee with both parties appointing representatives who will provide strategic input in regards to ongoing and upcoming exploration programs.

Upon Talon completing the Earn-in Conditions and Kennecott having spent the funds advanced by Talon within the time period provided for under the Earn-in Agreement, Kennecott will elect whether to: (a) proceed with a 70/30 joint venture on the Tamarack Project, with Kennecott holding a 70% participating interest, and Talon owning a 30% participating interest; or (b) grant Talon the right to purchase Kennecott's interest in the Tamarack Project for a purchase price of US$107.5-million. In the event Kennecott grants Talon the right to purchase its interest in the Tamarack Project, and Talon elects to proceed with the purchase option, Talon will have up to 18 months to close the transaction, provided it makes an upfront non-refundable payment to Kennecott of US$7.5 million (thereby reducing the purchase price to US$100-million).

4.2.2 Mineral Tenure

4.2.2.1 Introduction

Land in Minnesota is held by a combination of private, state and federal ownership. In addition, surface estate owner(s) may be the same or different to the mineral estate owner(s) (i.e., the mineral interest may be severed from the surface interest and form its own property ownership right).

The Tamarack North Project is comprised of:

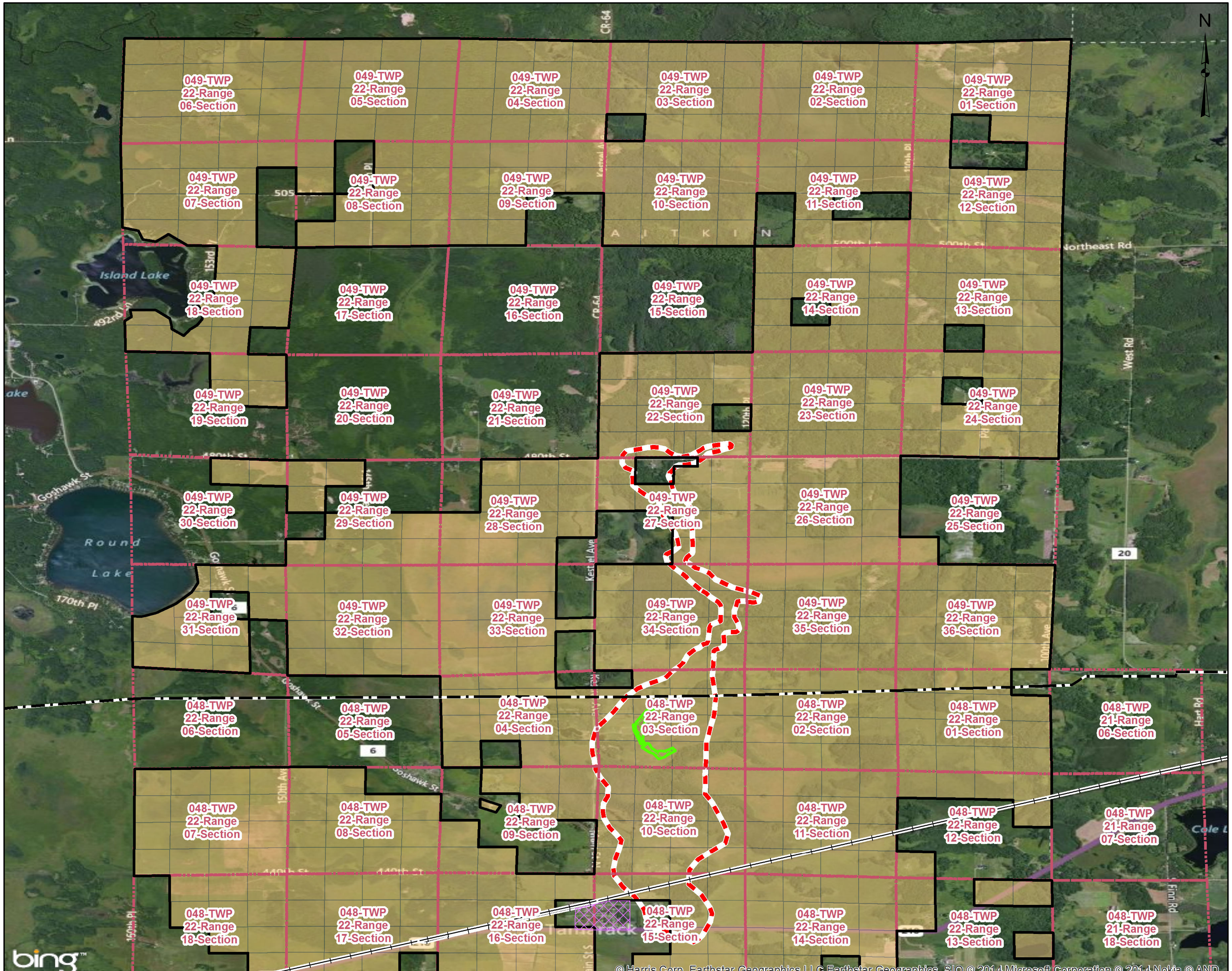
- Minnesota State Leases (many of which also include the surface rights);
- Private Mineral Leases, Surface Use Agreements and Options to Purchase; and
- Fee Mineral and Surface Interests owned outright by Kennecott.

These various interests are summarized in Table 4-3. The mineral rights owned or controlled by Kennecott are summarized in Figures 4-2 and 4-3 and the surface rights owned or controlled by Kennecott are shown in Figures 4-4 and 4-5. All of the Tamarack North Project mineral and surface interests are held in Kennecott's own name.

Table 4-3: Summary of Kennecott's Interests

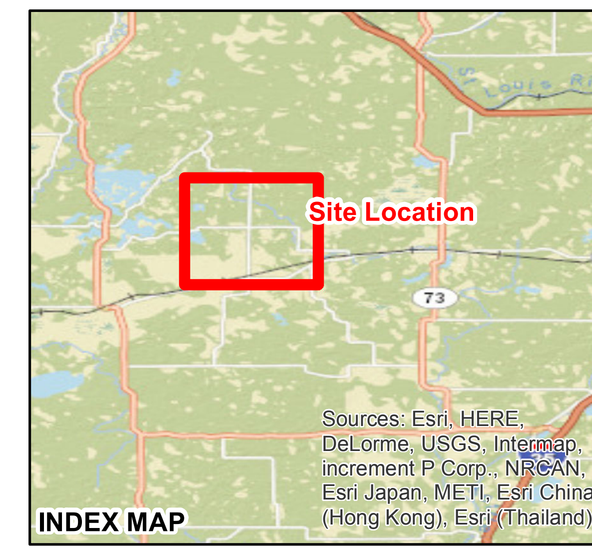
Type	Number	Acreage
Minnesota State Leases	48	23,615
Private Mineral Leases	6	686
Fee Minerals and Surface Interests	N/A	697
Total	**54**	**24,998**

Note that all of the locations for mineral leases and other property locations are described in the United States Public Land Survey System in Township, Range, Section and Section subdivisions.



LEGEND

- Mineral Zones
- Town of Tamarack
- Hydro Line
- Railway Line
- TWP-Range-Section
- TIC Outline
- Kennecott Controlled Mineral Rights
- Kennecott Mineral Rights Boundaries



REFERENCE

Geographic Coordinate System: GCS WGS 1984
Datum: WGS 1984

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SCALE 1:60,000 METRES

PROJECT

TALON METALS CORP
TAMARACK NORTH PROJECT

TITLE

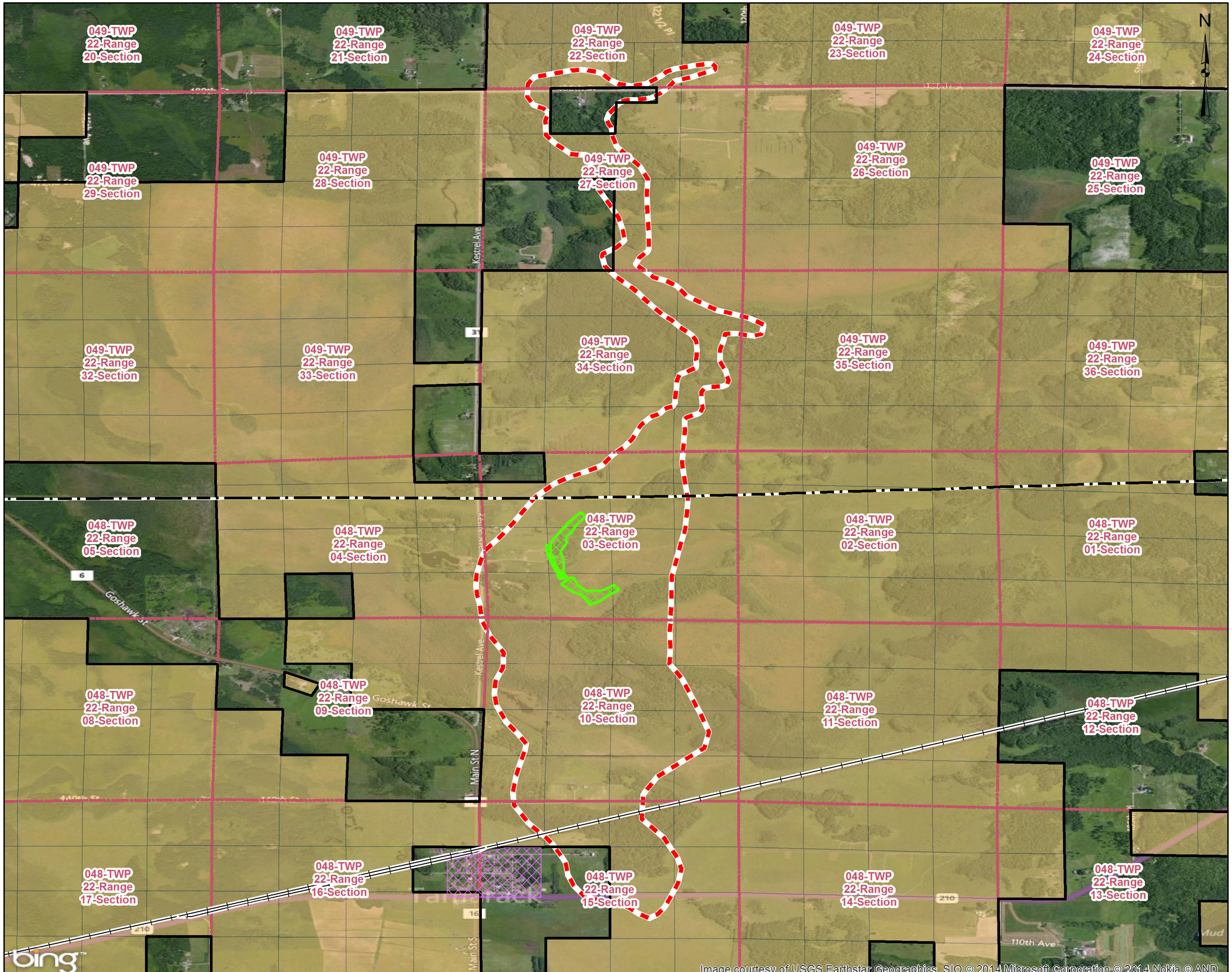
Mineral Ownership

Golder Associates
Sudbury, Ontario

PROJECT No. 1407088			SCALE AS SHOWN	REV. 0
DESIGN	RRD	Apr. 2014		
GIS	RRD	July 2014		
CHECK	MK	July 2014		
REVIEW	PGP	Sep. 2014		

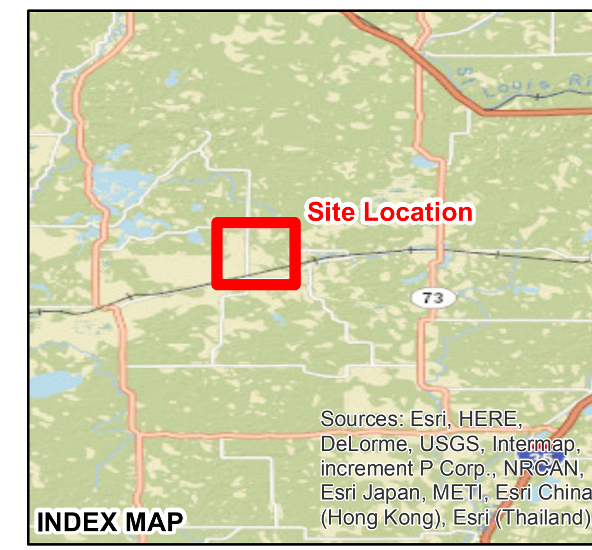
FIGURE 4-2

Path: Z:_Clients\TALON_METALS\Tamarack\99_PROJECTS\1211930025\02_PRODUCTION\MXD\ReportMining_CM\12-1193-0025-001-CM-0024_Figure 4-2.mxd



LEGEND

- Mineral Zones
- Town of Tamarack
- Hydro Line
- Railway Line
- TWP-Range-Section
- TIC Outline
- Kennecott Controlled Mineral Rights
- Kennecott Mineral Rights Boundaries



REFERENCE

Geographic Coordinate System: GCS WGS 1984
Datum: WGS 1984

990 0 990

SCALE 1:35,000 METRES

PROJECT

TALON METALS CORP
TAMARACK NORTH PROJECT

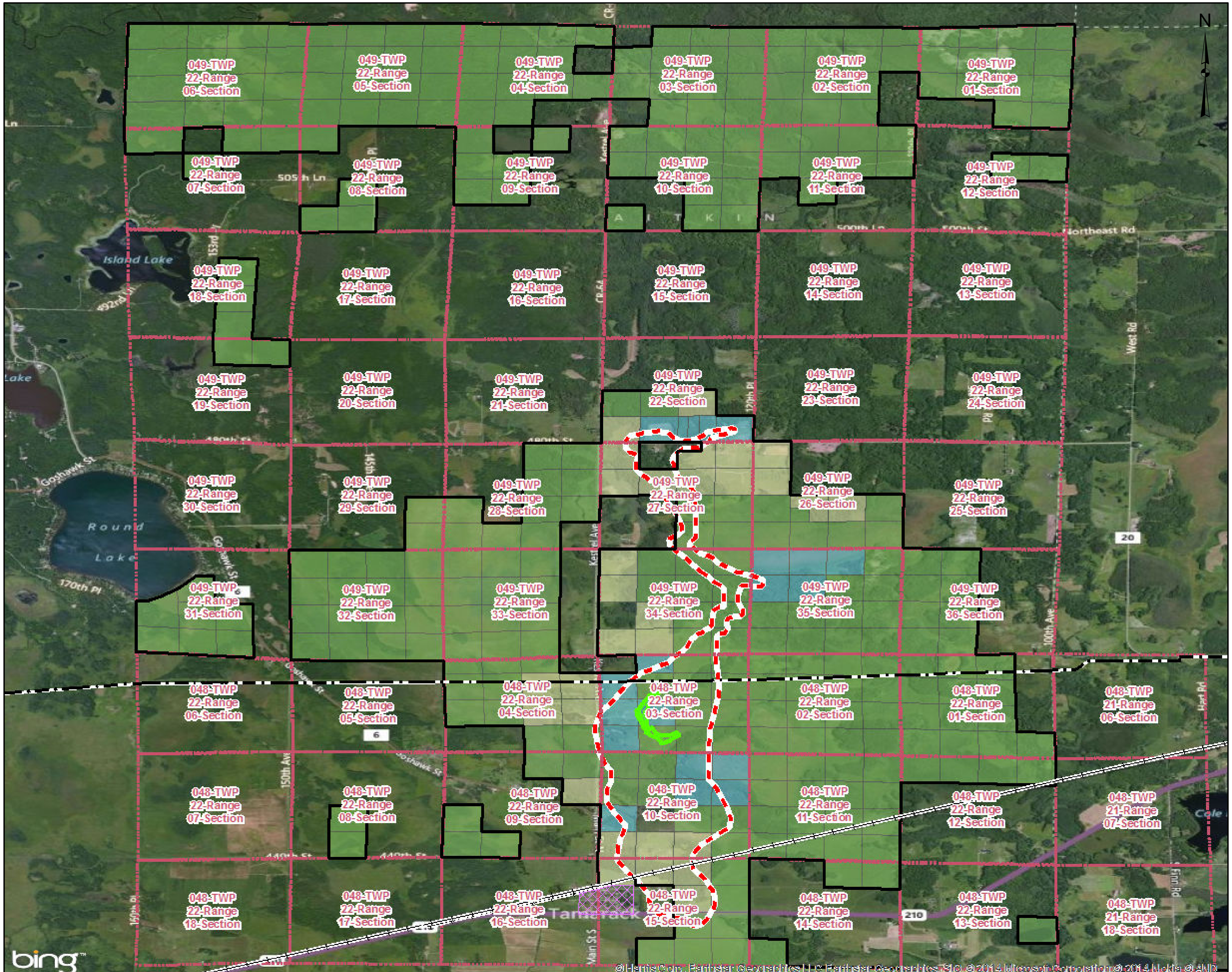
TITLE

Mineral Ownership

Golder Associates
Sudbury, Ontario

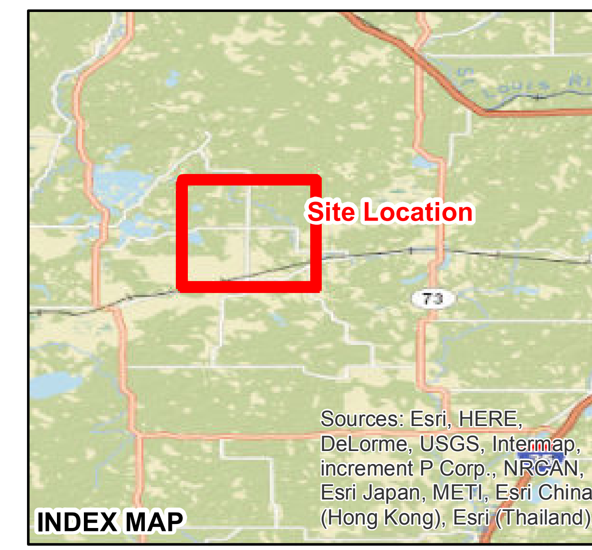
PROJECT No. 1407088			SCALE AS SHOWN	REV. 0
DESIGN	RRD	Apr. 2014	**FIGURE 4-3**	
GIS	RRD	July 2014		
CHECK	MK	July 2014		
REVIEW	PGP	Sept. 2014		

Path: Z:_Clients\TALON_METALS\Tamarack\99_PROJECTS\1211930025\02_PRODUCTION\MXD\ReportMining_CM\12-1193-0025-001-CM-0023_Figure 4-3.mxd



LEGEND

- Mineral Zones
- Town of Tamarack
- Hydro Line
- Railway Line
- Kennecott Controlled/Owned Surface Rights
- TWP-Range-Section
- TIC Outline
- Private Agreements - Kennecott Controlled Surface Rights
- Kennecott Owned Land
- State Leases - Kennecott Controlled Surface Rights



REFERENCE

Geographic Coordinate System: GCS WGS 1984
Datum: WGS 1984

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SCALE 1:60,000 METRES

PROJECT

TALON METALS CORP
TAMARACK NORTH PROJECT

TITLE

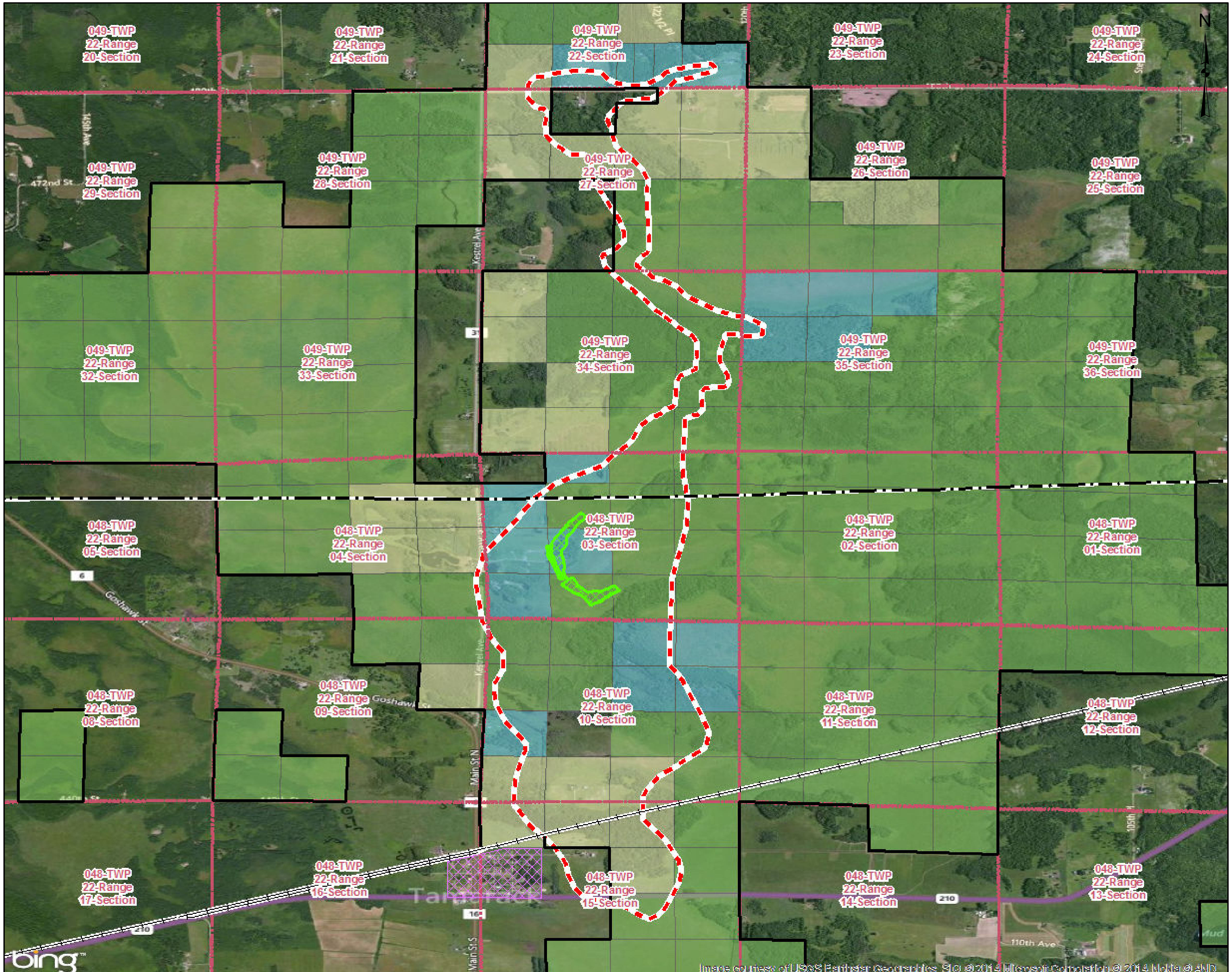
Surface Ownership

Golder Associates
Sudbury, Ontario

PROJECT No. 1407088			SCALE AS SHOWN	REV. 0
DESIGN	RRD	Apr. 2014		
GIS	RRD	July 2014		
CHECK	MK	July 2014		
REVIEW	PGP	Sep. 2014		

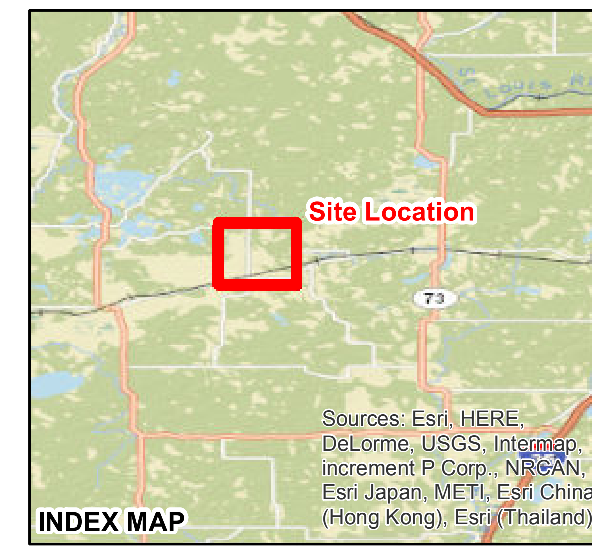
FIGURE 4-4

Path: Z:_Clients\TALON_METALS\Tamarack\99_PROJECTS\1211930025\02_PRODUCTION\MXD\ReportMining_CM12-1193-0025-001-CM-0025_Figure 4-4.mxd



LEGEND

- Mineral Zones
- Town of Tamarack
- Hydro Line
- Railway Line
- TWP-Range-Section
- TIC Outline
- Private Agreements - Kennecott Controlled Surface Rights
- Kennecott Owned Land
- State Leases - Kennecott Controlled Surface Rights
- Kennecott Controlled/Owned Surface Rights



REFERENCE

Geographic Coordinate System: GCS WGS 1984
Datum: WGS 1984

1,000 0 1,000

SCALE 1:35,000 METRES

PROJECT
TALON METALS CORP
TAMARACK NORTH PROJECT

TITLE
Surface Ownership

Golder Associates
Sudbury, Ontario

PROJECT No. 1407088			SCALE AS SHOWN	REV. 0
DESIGN	RRD	Apr. 2014	**FIGURE 4-5**	
GIS	RRD	July 2014		
CHECK	MK	July 2014		
REVIEW	PGP	Sep. 2014		

Path: Z:_Clients\TALON_METALS\Tamarack\99_PROJECTS\1211930025\02_PRODUCTION\MXD\ReportMining_CM\12-1193-0025-001-CM-0022_Figure 4-5.mxd

4.2.2.2 Minnesota State Leases

State Leases to Explore, Mine and Remove Metallic Minerals (State Leases) are issued by the Minnesota Department of Natural Resources (MDNR) and may be held for up to 50 years. “Metallic Minerals” are defined in the State Leases as “any mineral substances of a metalliferous nature, except iron ores and taconite ores”. State Leases allow a mining company to engage in mineral exploration and mineral development located on the state-owned property, subject to compliance with all laws and issued permits.

The Tamarack North Project is comprised of 48 State Leases, covering an area of approximately 23,615 acres (see Table 4-4 for further details of the State Leases).

The State Leases are issued on standard lease forms and generally contain uniform terms and conditions.

In order to keep the State Leases in good standing, certain quarterly and/or annual payments must be made to the state and/or county. Rental payments must be made to the state, and are paid quarterly in arrears on each February 20, May 20, August 20 and November 20 for the previous calendar quarter. The quantum of such rental payments are as follows: (1) initially, US$1.50 per acre for the unexpired portion of the then current year and US$1.50 per acre for each of the two succeeding years; (2) US$5 per acre for the next three calendar years; (3) US$15 per acre for the next five calendar years; and (4) US$30 per acre for the duration of the lease.

A county tax is also levied on the State Leases, with the current amount being US$0.40 per acre, payable on May 15 of each year.

An operating mining company must also pay a production royalty. The base royalty consists of a base rate (3.95%) and in some cases an additional bid rate (applicable only to those leases acquired through state bids or negotiations with the state). Details are included in Table 4-4. State leases also contain a royalty escalation clause that increases the base royalty as the net return value per ton of raw ore increases. This escalation of the royalty rate begins at a net return value per ton of US$75.01. It rises to the maximum of 20% if such net return value exceeds US$444 per ton of raw ore.

The State of Minnesota has an option to cancel a mineral lease after the end of the 20th year if, by that time, a lessee is not actively engaged in mining ore under the lease from the mining unit, a mine within the same government township as the mining unit or an adjacent government township and has not paid at least US$100,000 to the state in earned royalty under a state lease in any one calendar year. The state must exercise that option within the 21st year of the lease. If the state does not cancel within the 21st year, the lessee has until the end of the 35th calendar year to meet the conditions. If the lessee has not met the conditions by the end of the 35th year, the state has another window to cancel the lease during the 36th calendar year of the lease.

Table 4-4: Tamarack North Project State Lease Details

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 9765-P	9/7/2000	50 years	3.95%	N/A	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 3: Lot 3, NE/4SW/4, SW/4SW/4 Minerals and mineral rights Sec. 3: Lots 1-2, S/2NE/4, SE/4NW/4, SE/4SW/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	482.26
MM 9766-P	9/7/2000	50 years	3.95%	N/A	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 10: NE/4NW/4, S/2NW/4, NW/4SE/4 Minerals, mineral rights and surface Sec. 10: SW/4, NE/4 Minerals and mineral rights Sec. 10: NW/4NW/4, NE/4SE/4, S/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	640
MM 9767-P	9/7/2000	50 years	3.95%	N/A	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 14: N/2NE/4 Minerals, mineral rights and surface Sec. 14: N/2SE/4, SE/4SE/4, S/2NE/4, NW/4, NE/4SW/4, NW/4SW/4 except 2.58 acres for highway right-of-way, E/2SE/4SW/4 Minerals and mineral rights Sec. 14: SW/4SW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	577.42

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 9768-P	11/9/2005	50 years	3.95%	N/A	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 15: SW/4NE/4, NE/4NW/4 except 3.17 acres for railroad right-of-way, NW/4NW/4 except 2.14 acres for railroad right-of-way Minerals and mineral rights Sec. 15: NE/4NE/4 except 0.80 acres for railroad right-of-way, NW/4NE/4 except 3.17 acres for railroad right-of-way, SE/4NE/4, SE/4SW/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	430.72
MM 9849-N	9/6/2001	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 34: NE/4NE/4, E/2NW/4 Minerals, mineral rights and surface Sec. 34: W/2NW/4, NW/4NE/4, SW/4 Minerals and mineral rights Sec. 34: S/2NE/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	640.00
MM 10002-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 2: Lots 1-4, S/2NE/4, S/2NW/4, S/2 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	605.04
MM 10003-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 4: SW/4NE/4, SE/4NE/4, SW/4SW/4, N/2SE/4 Minerals and mineral rights Sec. 4: Lots 2-4, S/2NW/4, N/2SW/4, S/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	505.85

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10004-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 9: S/2NE/4, NE/4NW/4 Minerals and mineral rights Sec. 9: N/2NE/4; SE/4NW/4, that part commencing at the NW corner, thence S. along W. line of SE/4NW/4 206 ft. to Round Lake Road the point of beginning, thence S. along same W. line a distance of 427 ft., thence deflect to the left 73 deg. a distance of 612.5 ft., thence deflect to the left 87 deg. 10 min. a distance of 400 ft. to the center of Round Lake Road, thence deflect to the left 92 deg. along said road a distance of 762 ft. to the point of beginning; W/2SW/4; SE/4SW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	326.50
MM 10005-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 11: All Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	640.00
MM 10006-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 16: N/2NE/4, SW/4NE/4, W/2, SE/4 Minerals and mineral rights	600.00
MM 10007-N	6/5/2003	50 years	3.95%	0.40%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 27: W/2NW/4, SE/4 Minerals and mineral rights Sec. 27: SE/4NW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	280.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10008-N	6/5/2003	50 years	3.95%	0.40%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 28: NE/4, NE/4SE/4, SW/4SE/4 Minerals, mineral rights and surface Sec. 28: E/2NW/4, NE/4SW/4 Minerals and mineral rights Sec. 28: W/2SW/4, SE/4SW/4, NW/4SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	520.00
MM 10009-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 33: N/2NE/4SE/4 Minerals and mineral rights Sec. 33: W/2NE/4, W/2, W/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	500.00
MM 10010-N	6/5/2003	50 years	3.95%	0.30%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 35: E/2NE/4, SW/4NE/4, SW/4, NE/4SE/4 except coal and iron, NW/4SE/4 except coal and iron, SW/4SE/4 except coal and iron, SE/4SE/4 except coal and iron Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	440.00
MM 10202-N	6/21/2008	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 22: N/2SW/4 Minerals, mineral rights and surface Sec. 22: NW/4, SW/4SW/4, E/2NE/4 Minerals and mineral rights	360.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10203-N	6/21/2008	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 26: E/2NE/4, W/2NE/4, E/2NW/4, NE/4SW/4, NW/4SE/4 Minerals and mineral rights Sec. 26: W/2SW/4, SE/4SW/4, NE/4SE/4, S/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	560
MM 10204-N	6/21/2008	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 29: SW/4NW/4, E/2SW/4, SW/4SW/4, W/2SE/4, undivided one-half interest in N/2NW/4 Minerals and mineral rights Sec. 29: E/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	400.00
MM 10205-N	6/21/2008	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 32: E/2SE/4 Minerals, mineral rights and surface Sec. 32: N/2, SW/4, W/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	640.00
MM 10252-N	9/30/2009	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 22: W/2NE/4 Minerals and mineral rights, except coal and iron	80.00
MM 10253-N	9/30/2009	50 years	3.95%	0.50%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 23: All Minerals and mineral rights, except coal and iron	640.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10315	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 1: SE/4NE/4, NE/4SE/4 Minerals and mineral rights Sec. 1: Lots 2-4, SW/4NE/4, S/2NW/4, SW/4, W/2SE/4, SE/4SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	588.30
MM 10316	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 7: Lots 1-4, E/2, E/2NW/4, E/2SW/4 Minerals and mineral rights	626.07
MM 10317	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 8: E/2SW/4 Minerals, mineral rights and surface Sec. 8: S/2NE/4, NW/4, W/2SW/4, SE/4 Minerals and mineral rights	560.00
MM 10318	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 12: NW/4NE/4, N/2NW/4 Minerals, mineral rights and surface Sec. 12: SE/4NE/4, SW/4SW/4 Minerals and mineral rights Sec. 12: NE/4NE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	240.00
MM 10319	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 13: N/2NE/4, W/2NW/4 Minerals and mineral rights Sec. 13: NE/4SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	200.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10320	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 17: N/2, N/2SW/4, SW/4SW/4 except 3.22 acres for railroad right-of-way, SE/4SW/4 except 3.22 acres for railroad right-of-way, N/2SE/4, SW/4SE/4 Minerals and mineral rights	593.56
MM 10321	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 18: NE/4SE/4, NE/4, E/2NW/4, NW/4SE/4, SE/4SE/4 except 2.42 acres for highway right-of-way Minerals and mineral rights	357.58
MM 10332	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 1: SW/4SW/4 Minerals and mineral rights Sec. 1: Lots 1-4, S/2NE/4, S/2NW/4, N/2SW/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	573.60
MM 10333	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 2: Lots 1 & 3, S/2NE/4, S/2NW/4, SW/4, W/2SE/4 Minerals, mineral rights and surface Sec. 2: E/2SE/4 Minerals and mineral rights Sec. 2: Lots 2 & 4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	591.84

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10334	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 3: Lot 4 Minerals and mineral rights Sec. 3: Lots 1-3, S/2NE/4, S/2NW/4, N/2SW/4, SE/4SW/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	560.40
MM 10335	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 4: Lots 3-4, SW/4NW/4, NW/4SW/4, NE/4SE/4 Minerals, mineral rights and surface Sec. 4: SE/4NE/4, SE/4SE/4, SW/4SE/4 Minerals and mineral rights Sec. 4: Lots 1-2, SW/4NE/4, SE/4NW/4, NE/4SW/4, S/2SW/4, NW/4SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	610.96
MM 10336	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 5: Lots 1-4, S/2NE/4, S/2NW/4, S/2 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	615.42
MM 10337	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 6: Lots 1-2 & 7, S/2NE/4 Minerals, mineral rights and surface Sec. 6: SE/4SW/4 Minerals and mineral rights Sec. 6: Lots 3-6, SE/4NW/4, NE/4SW/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	709.34

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10338	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 7: Lots 2-5, SE/4NE/4, NE/4NW/4, NE/4SW/4, W/2SE/4 Minerals and mineral rights Sec. 7: Lot 1, N/2NE/4, SE/4NW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	572.56
MM 10339	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 8: NW/4NW/4, NE/4SW/4, S/2SW/4 Minerals, mineral rights and surface Sec. 8: SW/4NW/4, SW/4SE/4, NE/4, N/2SE/4, SE/4SE/4 Minerals and mineral rights	520.00
MM 10340	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 9: NE/4NE/4, SW/4NE/4 except the north 100 feet, SE/4NE/4 except the north 100 feet, NE/4NW/4, S/2SW/4 Minerals and mineral rights Sec. 9: NW/4NE/4, SW/4NE/4 the north 100 feet, SE/4NE/4 the north 100 feet, W/2NW/4, SE/4NW/4, N/2SW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	480.00
MM 10341	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 10: E/2, SW/4SW/4 Minerals, mineral rights and surface Sec. 10: N/2SW/4, SE/4SW/4 Minerals and mineral rights Sec. 10: NW/4 Minerals and mineral rights, including the interest in	640.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
						the surface thereof owned by the state, if any	
MM 10342	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 11: SE/4SW/4, SW/4SE/4, SE/4SE/4 except township road Minerals and mineral rights Sec. 11: N/2, NE/4SW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	478.00
MM 10343	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 12: S/2NE/4 Minerals, mineral rights and surface Sec. 12: W/2NW/4, S/2, NE/4NE/4, SE/4NW/4 –Minerals and mineral rights	560.00
MM 10344	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 18: Lots 3-6, N/2NE/4, SE/4NE/4, E/2SE/4 Minerals and mineral rights Sec. 18: SW/4NE/4, W/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	438.97
MM 10345	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 19: S/2NE/4 Minerals and mineral rights Sec. 19: N/2NE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	160.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
MM 10346	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 25: SW/4SW/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	40.00
MM 10347	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 30: N/2NE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	80.00
MM 10348	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 31: Lot 1, SE/4NE/4, undivided one-half interest in NE/4NE/4, undivided one-half interest in NW/4NE/4 Minerals and mineral rights Sec. 31: Lots 2-4, E/2SW/4, W/2SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	430.36
MM 10349	2/26/2010	50 years	3.95%	0.611%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 36: W/2 Minerals, mineral rights and surface Sec. 36: E/2 Minerals and mineral rights	640.00
MM 10377-N	3/4/2011	50 years	3.95%	0.55%	Yes	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 13: NE/4NE/4, NE/4NW/4, SW/4SW/4 except coal and iron, undivided one-half interest in SW/4SE/4, undivided one-half interest in SE/4SE/4 Minerals and mineral rights Sec. 13: W/2NE/4, SE/4NE/4, W/2NW/4, SE/4NW/4, NE/4SW/4 except coal and iron, NW/4SW/4 except coal and iron, SE/4SW/4 except coal and iron,	640.00

State Lease Number	Start Date	Term	Base Royalty	Additional Royalty	Royalty Escalator Applies	Lands	Acreage
						N/2SE/4, undivided one-half interest in SW/4SE/4, undivided one-half interest in SE/4SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	
MM 10378-N	3/4/2011	50 years	3.95%	0.55%	Yes	**<u>Township 49 North, Range 22 West, Aitkin County, Minnesota</u>** <u>Sec. 14</u>: W/2NW/4, SE/4NW/4, NE/4SW/4, SW/4SW/4, SE/4SW/4 Minerals, mineral rights and surface <u>Sec. 14</u>: NW/4SW/4, NE/4NE/4 except the north 2 rods and the east 2 rods, NW/4NE/4, NE/4NW/4 Minerals and mineral rights <u>Sec. 14</u>: NE/4NE/4 the north 2 rods, NE/4NE/4 the east 2 rods except the north 2 rods, S/2NE/4, SE/4 Minerals and mineral rights, including the interest in the surface thereof owned by the state, if any	640.00
MM 10379-N	3/4/2011	50 years	3.95%	0.55%	Yes	**<u>Township 49 North, Range 22 West, Aitkin County, Minnesota</u>** <u>Sec. 24</u>: W/2NE/4, SE/4NE/4, S/2SW/4, E/2SE/4, W/2SE/4, NE/4NE/4, NE/4NW/4, undivided three-fourths interest in NW/4NW/4, undivided three-fourths interest in SW/4NW/4, undivided three-fourths interest in NE/4SW/4, undivided three-fourths interest in NW/4SW/4 Minerals and mineral rights	600.00

4.2.2.3 *Private Mineral Leases, Surface Use Agreements and Options to Purchase*

In addition to the State Leases, Kennecott holds mineral leases, surface use agreements and options to purchase, covering privately owned surface and mineral interests (Private Agreements). There are six Private Agreements, which cover approximately 686 acres of surface and/or mineral interests within the Tamarack North Project area. The provisions and terms of each Private Agreement are specific to each Private Agreement. Certain Private Agreements include royalties payable if and when the Tamarack North Project begins production on lands covered by such Private Agreement. The royalties range from a 2% Net Smelter Return (NSR) to a 3.9% NSR and include certain buy-back rights. Table 4-5 provides further information on the Private Agreements.

Kennecott has also entered into easement agreements with certain property owners which allow Kennecott to install and monitor groundwater monitoring wells for a nominal annual fee.

Table 4-5: Summary of Private Agreements

Type of Agreement	Term	Annual Fee (US$)	Lands	Acreage
Lease and Option Agreement*	Sept 25/08 to Sept 25/14	N/A	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 4: SE/4NE/4 *Surface only*	38.18
Mineral Lease and Option Agreement	May 8/08 to May 8/16	25,000	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 26: W/2NW/4 Sec. 26: N/2NE/4SW/4, SE/4NE/4SW/4, NW/4SE/4, surface Sec. 27: NE/4 less 10 acres in the NW corner *Part surface and minerals, part surface only*	300
Lease and Option Agreement*	Nov 1/09 to Nov 20/14	N/A	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 22: The East 400 feet of the West 750 feet of the SW/4SE/4 *Surface only*	11.57
Lease and Option Agreement*	Nov 20/08 to Nov 20/14	N/A	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 4: NW/4SE/4 *Surface only*	40
Lease and Option Agreement*	Nov 1/12 to Nov 1/15	N/A	**Township 48 North, Range 22 West, Aitkin County, Minnesota** Sec. 10: S/2SW/4, SW/4SE/4 Sec. 15: NE/4NW/4 excepting certain lands *Surface only*	177.92
Lease and Option Agreement	Feb 1/13 to Feb 1/18	10,000	**Township 49 North, Range 22 West, Aitkin County, Minnesota** Sec. 34: NE/4SW/4, SE/4SW/4, SW/4SW/4 excepting certain lands *Surface only*	118.01

*Kennecott has served notice exercising the purchase option. No further annual fees are due.

4.2.2.4 Fee Mineral and Surface Interests

Kennecott also owns fee surface and/or mineral interests which cover approximately 697 acres of land within the Tamarack North Project area. Details of the fee surface and mineral interests are detailed in Table 4-6.

In certain instances, as part of the purchase price paid by Kennecott for the mineral rights, Kennecott agreed to pay a royalty to the previous mineral rights owner. The royalties range from a 2% NSR to a 3.9% NSR. There are also buy-back rights for Kennecott on certain of these royalties.

Table 4-6: Summary of Fee Mineral and Surface Interests

Township	Range	Section	Acreage
48 North	22 West	Sec. 3: NW/4 SW/4, SW/4NW/4 except Parcel Nos. 8 and 9	80 (Surface and Mineral)
49 North	22 West	Sec. 22: SE/4SW/4	40 (Surface and Mineral)
48 North	22 West	Sec. 3: Government Lot 3	26.54 (Surface Only)
49 North	22 West	Sec 35: NW/4, NW/4 NE/4	200 (Surface and Mineral)
48 North	22 West	Sec. 3: SW/4 SW/4 except parcel no. 7	40 (Surface Only)
48 North	22 West	Sec. 3: NE/4SW/4	40 (Surface Only)
49 North	22 West	Sec. 22: SE/4SE/4 except Parcel No. 28	36 (Surface and Mineral)
49 North	22 West	Sec. 22: SW/4 SE/4 excepting certain lands	36 (Part Surface and Minerals, Part Surface Only)
48 North	22 West	Sec. 10: NW/4 SW/4 except Parcel No.6, Highway Plat No. 10; NE/4	198 (Surface Only)

4.2.3 Surface Rights

The State Leases also grant Kennecott the right to use surface lands owned by the State of Minnesota within the leased land.

From a legal standpoint, where the surface rights are owned by third parties, the State Leases provide that written notice to the owner of the surface estate must be provided at least 20 days in advance of surface activities and contemplate compensation payable by lessees to surface owners for any disturbance of the surface estate. Many states also address the rights of surface owners in case law, and although the Minnesota Supreme Court has not specifically opined on the issue, the general rule is that the mineral rights carry with them the right to use as much of the surface as is reasonably necessary to reach and remove the minerals, unless otherwise restricted by the mineral severance deed. Guidance provided by the MDNR takes this approach.

Notwithstanding the above, to date, Kennecott's approach for surface access over areas that it is interested in drilling has been to negotiate with the applicable surface land owner a surface use agreement. Also, in certain cases, Kennecott has negotiated an option to purchase the surface lands.

In the case of Private Agreements where there has been no severance of the surface and mineral estates, surface use is provided as part of the mineral lease. Where the mineral and surface estates are severed and where surface rights are held privately, surface access has typically been negotiated with the surface owner.

The surface rights held by Kennecott are detailed in Figure 4-4 and Figure 4-5.

4.2.4 Title Insurance

Old Republic National Title Insurance Company has issued a title insurance policy for the benefit of Talon over the following areas (which are depicted on Figure 4-6):

- Township 48 North, Range 22 West, Section 3
- Township 48 North, Range 22 West, Section 10
- Township 49 North, Range 22 West, Section 34

4.2.5 Tax Forfeiture and Leasing of Mineral Rights

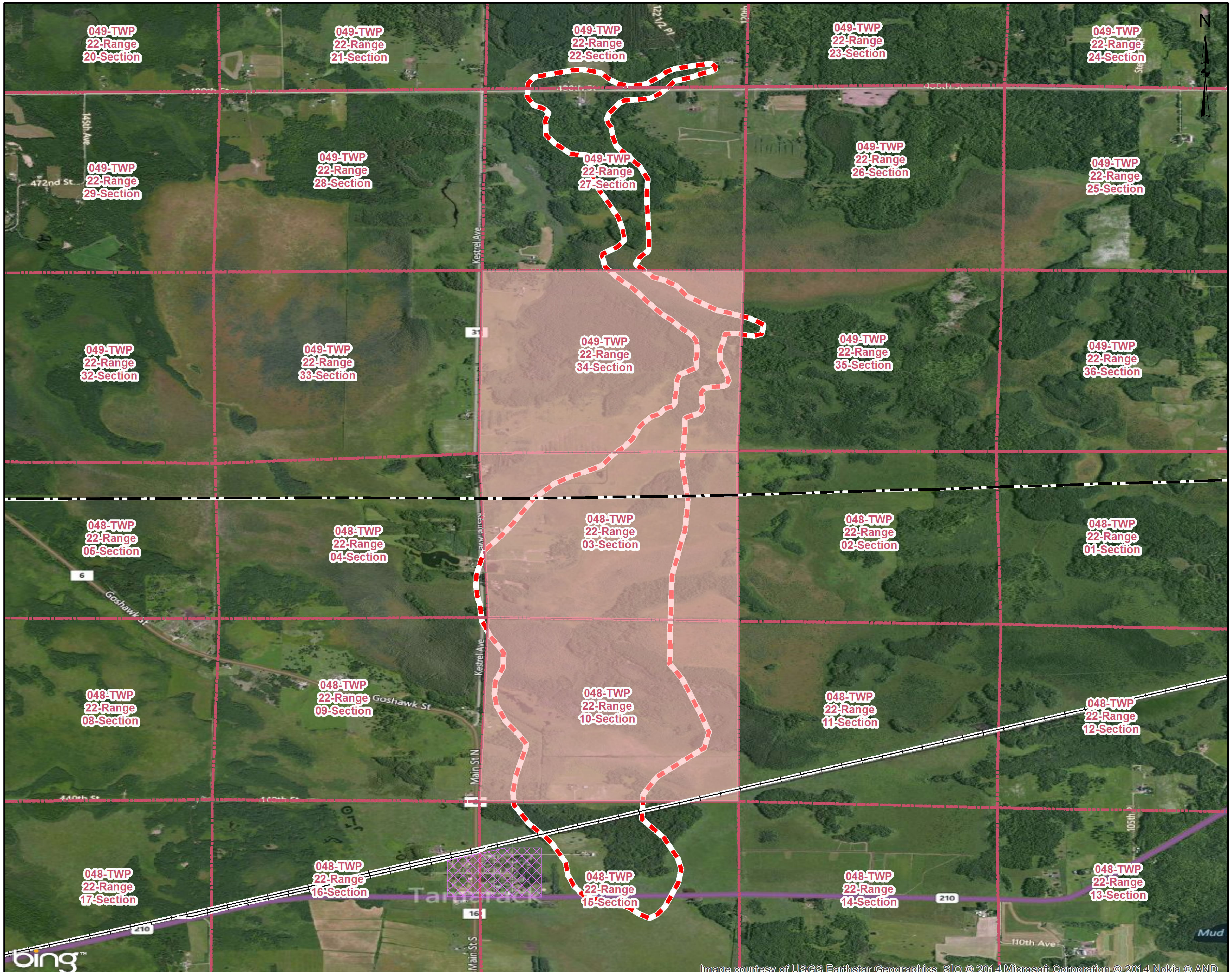
The Minnesota Severed Mineral Interests Law (Forfeiture Law) requires owners of severed mineral interests (i.e., mineral rights that are owned separately from the surface interest) to register their interests with the office of the county recorder.

Severed mineral interests are taxed. If the mineral interest owner does not file the severed mineral interest statement within the deadline provided by the law, the mineral interest forfeits to the state after notice and an opportunity for a hearing.

The owner, to avoid forfeiture, must prove to the court that the taxes were timely paid and that the county records specified the true ownership, or, in the alternative, that procedures affecting the title of the interest had been timely initiated and pursued by the true owner during the time when the interest should have been registered. To the extent the owner fails to prove this, the forfeiture to the state is deemed to be absolute. Additionally, if the owner of record fails to show up to the hearing, the forfeiture to the state is also deemed to be absolute.

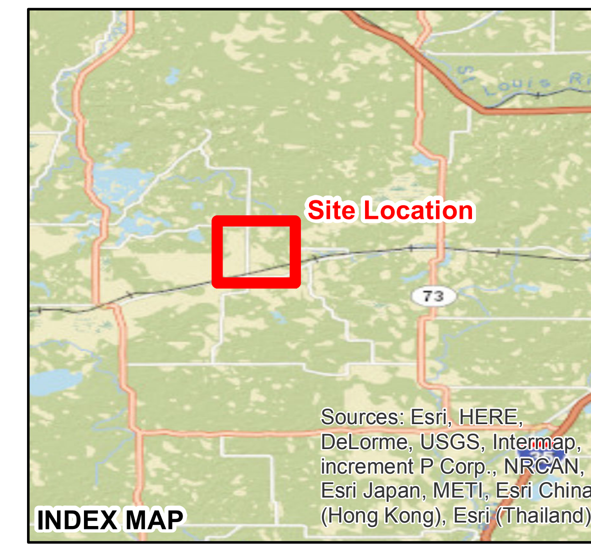
The state may lease mineral rights prior to the completion of the forfeiture procedures, provided that the leased rights are limited to exploration activities, exploratory boring, trenching, test pitting, test shafts and drifts, and related activities. A lessee under such a lease may not mine the leased mineral rights until the forfeiture procedures are completed.

The state obtained an interest in the mineral rights leased under several of the State Leases pursuant to the Forfeiture Law. The forfeiture procedures have only been completed for certain of the lands covered by these State Leases. The state is slow to complete the forfeiture procedures given the large number of these forfeitures the state contends with, the cost to do so, and the fact it is not required until a lessee is looking to mine a property.



LEGEND

- Town of Tamarack
- Hydro Line
- Railway Line
- Areas with Title Insurance
- TWP-Range-Section
- TIC Outline



REFERENCE

Geographic Coordinate System: GCS WGS 1984
Datum: WGS 1984

1,000 0 1,000

SCALE 1:35,000 METRES

PROJECT

TALON METALS CORP
TAMARACK NORTH PROJECT

TITLE

Title Insurance

Golder Associates
Sudbury, Ontario

PROJECT No. 1407088			SCALE AS SHOWN	REV. 0
DESIGN	RRD	Apr. 2014	FIGURE 4-6	
GIS	RRD	July 2014		
CHECK	MK	July 2014		
REVIEW	PGP	Sept. 2014		

Path: Z:_Clients\TALON_METALS\Tamarack\99_PROJECTS\1211930025\02_PRODUCTION\MXD\ReportMining_CM\12-1193-0025-001-CM-0017_TitleInsurance.mxd

Until the forfeiture procedures have been completed, there is a remote risk that the owner of a mineral interest that the state has leased to Kennecott will demonstrate at a required hearing to complete the forfeiture that he was in compliance with the registration and taxation requirements as detailed above. In such a case, the mineral rights would revert back to this original owner.

4.3 Exploration Permits and Approvals

The Tamarack North Project is currently in the exploration phase. The following is a discussion of the main permitting issues relevant to this stage of operations, along with a list of other potential permits or approvals that may be required depending on the nature and location of current and future exploration and related operations. We understand that Kennecott currently has all required permits and approvals in place for work completed and the current 2014 exploration program. The QP has not independently verified these permits and approvals.

4.3.1 Minnesota Department of Natural Resources

Before exploration activity may occur on state leased land for nonferrous metallic minerals, an explorer lessee must submit an exploration plan to the MDNR for review and approval. The explorer must submit an exploration plan 20 days prior to the start of activities. The MDNR reviews these plans prior to granting the right to proceed. In approving the exploration plan, the MDNR may impose conditions to ensure protection of the environment, such as temporary fencing and buffer zones to avoid adverse effects on threatened or endangered species. An explorer lessee must also register with the Minnesota Department of Health (MDH), which shares jurisdiction with the MDNR for exploratory borings. The MDH, for example, has jurisdiction over the construction and sealing of exploratory borings under the Minnesota Well Code. After the exploration plan is approved, MDNR, MDH, or the Minnesota Pollution Control Agency (MPCA) may inspect the activities during drilling. In most cases, the MDNR conducts drilling inspections. When drilling is complete, the lessee explorer must submit a report of sealing the drill hole to the MDNR and the MDH.

Kennecott has received approval from the MDNR for its current exploration program (period of July 28, 2014, to December 31, 2014)

4.3.2 Wetlands

The area in and around the town of Tamarack contains many wetlands that are protected “waters of the United States” under the *Clean Water Act*. Materials may not be placed in or on such wetlands without permits issued by the United States Army Corps of Engineers (Corps). Kennecott has had to place drilling equipment temporarily in certain *Clean Water Act* wetlands but it has typically drilled exploratory cores in the winter, when the wetlands are frozen and are not as susceptible to damage. More recently, Kennecott has drilled cores in the spring and summer months using “mats” that protect wetlands from damage by equipment during the temporary drilling. Kennecott holds two permits from the Corps for drilling activities in Township 48 North, Range 22 West, Section 3 and Township 48 North, Range 22 West, Section 10. These permits are valid until January 31, 2017. For any new drilling areas that contain wetlands outside of these existing permit areas, Kennecott will need to get the approval of the Corps.

Kennecott has also conducted some preliminary mapping of wetlands in the area to identify not only wetlands that are protected under the *Clean Water Act* but also wetlands protected under the Minnesota work in public waters program and the *Minnesota Wetland Conservation Act*.

4.3.3 Conditional Use Permits

Conditional use permits, which are issued by the county, are necessary when exploring for minerals on lands where private landowners hold the mineral rights. Conditional use permits are not required where the mineral rights are owned by the state. Kennecott has applied for and received certain Aitkin County conditional use permits and currently has the necessary conditional use permits in place for its upcoming drill programs. If new conditional use permits are required, the timeframe for receiving a new permit is approximately two months.

4.3.4 Potential Exploration Activity Permits

Table 4-7 lists some of the most common permits and approvals that may be required during the exploration phase of the Tamarack North Project, but it is not an exhaustive list. The ultimate scope of permits and approvals required will depend on the proposed scope of activities, the type(s) of activities, and/or the particular location of proposed activities.

Table 4-7: Summary of Potential Exploration Permits/Approvals

Federal	
Agency	**Permit/Approval**
US Army Corps of Engineers	Clean Water Act – Section 404 Permit
US Army Corps of Engineers	National Historic Preservation Act – Section 106
US Fish & Wildlife Service	Endangered Species Act Compliance – Section 7
State	
Agency	**Permit/Approval**
MDNR	Exploration Plan
MDH	Explorer's License and Designated Responsible Individual; Exploratory Boring Notification
MDH	Temporary and Permanent Sealing Reports
MPCA	NPDES/SDS Construction Storm Water Permit (General Permit)
MPCA	NPDES/SDS Industrial & Storm Water Discharge Permit (General Permit)
MPCA	Storm Water Pollution Prevention Plan
MDNR	Burning Permit
MDNR	Permit to Work in Public Waters, including Public Waters Wetlands
MDNR	Water Appropriation Permit
MDNR	Wetland Conservation Act approvals for activities impacting certain wetlands
MDNR	Threatened and Endangered Species Review
Local	
Agency	**Permit/Approval**
City of Tamarack	Zoning and Building Permits
County	Conditional Use Permit
County	Zoning Permits

4.4 Environmental

4.4.1 Baseline Work

Kennecott has initiated baseline studies to support future environmental review and permitting of a potential mine at Tamarack. Work to date has included surface water and groundwater monitoring; wetland delineation and evaluation surveys; and rare, threatened and endangered species and vegetative communities surveys.

In particular, since 2008, Kennecott has operated 21 surface water monitoring stations (19 streams and 2 lakes) and 12 groundwater monitoring stations. It has also completed a limited amount (14 samples) of static short term acid tests. Independent oversight and sign-off of the sampling and analysis is completed by Foth Infrastructure and Environment LLC, of De Pere, Wisconsin.

4.4.2 Environmental Liabilities

Talon has advised Golder that it is not aware of any environmental liabilities at the Tamarack North Project.

4.5 Significant Risk Factors

Talon has advised Golder that it is not aware of any significant factors and risks, other than what has been described in this section of the report, which may affect access, title, or the right or ability to perform work on the Tamarack North Project.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Introduction

The Tamarack North Project is located in north central Minnesota approximately 100 km west of Duluth and 200 km north of Minneapolis, in Aitkin County. The area is characterized by farms, forested areas and abundant surface waters. The town of Tamarack (population 94 according to the 2010 census), which gives the project its name, lies within the boundaries of the Tamarack North Project (though away from the known mineralization) at an elevation of 386 m above sea level. Kennecott’s field office is located in Tamarack. Other small towns in the area are Wright (10 km from Tamarack) and McGregor (15 km from Tamarack).

5.2 Accessibility

Access to the Tamarack North Project is via paved state and county highways and roads. From the city of Duluth, the Tamarack North Project can be accessed by Interstate 35 south for 32 km and then onto State Highway 210 west for 61 km to the town of Tamarack. The Tamarack North Project is easily accessible from the town of Tamarack by paved road, with the current known mineralization located approximately 500 m from a paved all weather road.

5.3 Physiography

The Tamarack North Project falls within the Tamarack Lowlands of the Northern Minnesota Drift and Lake Plains, as characterised by the MDNR. The topography is level to gently rolling as is typical of old glacial lake plains. The soils are dominated by clay-silt to silty-sand lacustrine deposits. Peat bogs are also found in the area. Relief is minimal, and where found is generally a result of small till moraines. As a result of the flat to gentle relief, poor drainage has allowed the area to be dominated by lowland conifers surrounding sedge meadows and marshland. Areas of higher relief will support aspen-birch and upland conifers.

5.4 Climate

The climate of Minnesota is typical of a continental climate, with hot summers and cold winters. Minnesota's location in the Upper Midwest allows it to experience some of the widest variety of weather in the United States, with each of the four seasons having its own distinct characteristics. The annual average temperature at the Tamarack North Project is 5°C. The temperature averages a high of -7°C and a low of -18°C in January and a high of 26°C and a low of 13°C in July. Annual rainfall averages approximately 764 mm. Annual snowfall averages 142 cm. Exploration operations at the Tamarack North Project can be conducted throughout the whole year (subject to any permitting restrictions) and future mining activities could be conducted on a year-round basis.

5.5 Local Resources

The mining support industries and industrial infrastructure in Minnesota are well developed and of a high standard, though most of the mining in the state occurs in the Duluth Iron Ore Complex approximately 150 km to the northeast. There is a large pool of skilled and unskilled labour in the area that could be used for exploration and development activities at the Tamarack North Project.

5.6 Infrastructure

The local infrastructure for mining is excellent. An active railroad (BNSF Railway) runs east/west across the Tamarack North Project and connects into the extensive United States and Canadian rail network, including direct access into the Port of Duluth, approximately 100 km to the east. The Port of Duluth, on Lake Superior, provides worldwide shipping access via the Great Lakes and St. Lawrence Seaway. In addition, Kennecott has secured surface rights on land that is adjacent to the railway line which would allow it to build a railroad siding directly from the Tamarack North Project.

The Great River Energy Transmission Line crosses through the Tamarack North Project. The line connects through substations close to the towns of Wright and Cromwell.

There is an abundance of water in the area of the project. A Water Appropriations Permit from the MDNR will be required to use water to operate a mine. The MDNR will be the lead state agency on the entire environmental review of a mine at Tamarack and once that process has been completed, a Water Appropriations Permit is not expected to be difficult to obtain.

5.7 Sufficiency of Surface Rights

The Tamarack North Project is currently at a stage where the design, footprint and layout for a potential mine has not been considered in any detail. However, as can be seen from the extensive package of surface rights secured by Kennecott (Figures 4-4 and 4-5), Kennecott likely has sufficient rights to allow for mining operations and supporting infrastructure at the Tamarack Extension. Further work, which is beyond the scope of this report, will be needed to better understand future development of the Tamarack North Project.

6.0 HISTORY

The Tamarack area has until recently been subject to only very limited exploration efforts and there has been no prior mineral production from the Tamarack North Project. The relatively thick post mineral, glacial fluvial sediment cover and nearly complete lack of bedrock exposure severely hampered any early exploration (the nearest known bedrock exposure to the Tamarack North Project is located approximately 15 km to the southeast of the deposit).

Starting in 1972, the Minnesota Geological Survey oversaw a 12 year program to collect high-resolution airborne magnetic data over the entire state, including the Tamarack area. The program was paid for by a penny per pack tax on cigarettes sold in the state. This program ran concurrently to a MDNR sponsored program of regional lake sediment sampling. As part of the follow up to the airborne surveys, the state carried out a program of scientific drilling to try and identify the bedrock source of selected magnetic anomalies. Information from MDNR staff involved with the program indicates that the magnetic anomalies were prioritized by the presence of anomalous lake sediment geochemistry. This is reported as being the case for the TIC, with two local lakes being anomalous in Ni, Cu and Cr.

In the summer of 2000, Kennecott leased mineral title in Aitkin County from the state of Minnesota covering areas of the Tamarack North Project. Additional mineral title has been added to Kennecott's land position in the area since then as detailed in Section 4.0, Property Description and Location, of this report.

Kennecott began exploration on the Tamarack North Project in 2001 when Kennecott flew an airborne MEGATEM and magnetic survey covering most of the TIC. Ground EM and gravity surveys were also carried out to refine anomalies identified in the airborne survey.

In the winter of 2002, Kennecott began drilling at the Tamarack North Project (see Section 9.0, Exploration, for further details of the exploration work conducted by Kennecott).

There is no historical NI 43-101 compliant resource or reserve on the Tamarack North Project. The resource in this technical report will be the first NI 43-101 compliant resource on the Tamarack North Project.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geological Setting; Introduction

The TIC is an ultramafic to mafic intrusive, hosting nickel-copper sulphide mineralization with associated cobalt, platinum, palladium (PGE's) and gold. The intrusion of the TIC (dated at 1105 Ma+/-1.2 My, Goldner 2011) is related to the early evolution of the approximately 1.1 Ga Mesoproterozoic MCR and has intruded into slates and greywackes of the Thomson Formation of the Animikie Group which formed as a foreland basin during the Paleoproterozoic Penokean Orogen (approximately 1.85 Ga, Goldner 2011). The TIC is completely buried beneath approximately 40 meters of Quaternary age glacial and fluvial sediments.

The lack of outcrop has limited the understanding of the TIC in its regional geological context relative to its location in the deformed southern margin of the Animikie Basin. The TIC is also adjacent to the northern part of the Penokean accreted terrain which was in turn dissected by subsequent rifting associated with the MCR and thus has contributed to a complex geological and structural setting. The regional geological setting is described below within the context of the major depositional periods and tectonic events (Figure 7-1 and Figure 7-2).

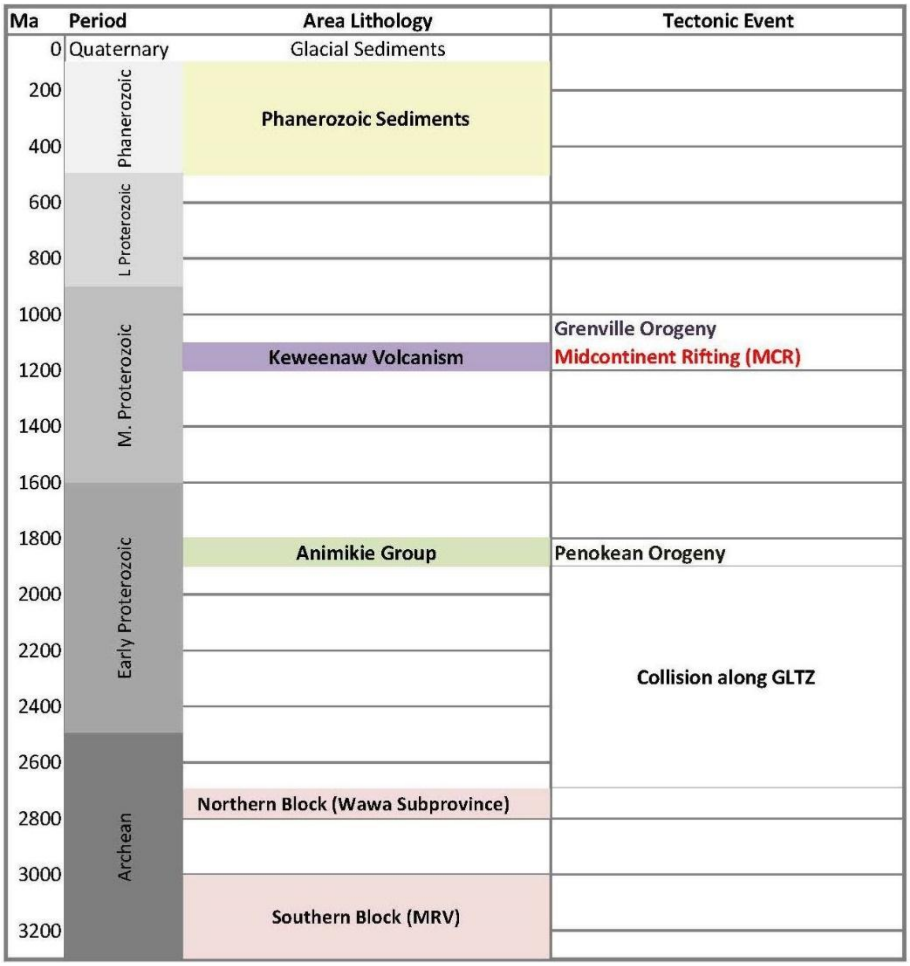


Figure 7-1: Major depositional periods and structural events effecting the geological emplacement and history of the TIC. Modified after Lundin Mining Corporation (2013).

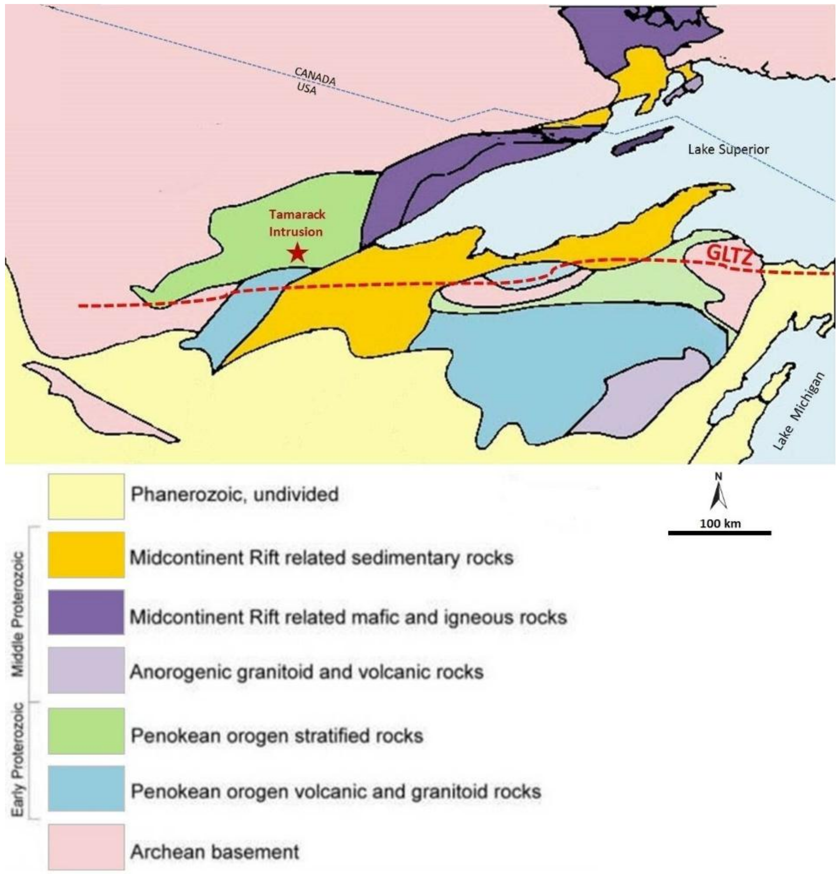


Figure 7-2: Regional Geological and Tectonic Setting for the TIC. The GLTZ structure represents an inferred position due to younger, overlying lithology. Modified from Khirkham (1995) and Lundin Mining Corporation (2013).

7.1.1 Archean Stratigraphy and the GLTZ

Archean basement and supracrustal rocks underlie the Paleoproterozoic Animikie sedimentary Basin. The nearest outcrop of Archean basement rocks are located 35 km to the south of Tamarack in the McGrath gneiss dome. In western Minnesota, the Archean is divided into an older southern block referred to as the Minnesota River Valley (MRV) Terrane and the northern Wawa Subprovince of the Archean Superior Craton (Figure 7-1).

The southern Paleoarchean MRV Terrane is comprised of 3.3 Ga gneiss, migmatite and amphibolite of predominantly Middle Archean age, intruded by Late Archean granitoids.

The northern Wawa Subprovince is comprised of late Archean (2.6-2.7 Ga) supracrustal rocks intruded by a variety of intrusions. Wawa Subprovince rocks are believed to form the basement beneath the southern part of the Animinkie Basin at Tamarack.

A broad east-west striking regional structural zone marks the boundary between the MRV Terrane and the Wawa Subprovince and is referred to as the Great Lakes Tectonic Zone (GLTZ, Figure 7-2). The GLTZ can be inferred eastward from western Minnesota into Northern Michigan and perhaps into Ontario. Kinematic analysis in the only known outcrop of the GLTZ south of Marquette, Michigan suggests the GLTZ at this location dips steeply southward, and that vergence was to the northwest, indicative of an oblique collision that brought the Paleoarchean rocks over the younger Archean rocks of the Wawa Subprovince (Sims et al., 1993). The collision along the GLTZ is believed to have occurred between 2692-2686 Ma (Schneider et al., 2002).

The GLTZ appears to have played a direct role in localizing later Paleoproterozoic sedimentation and volcanism. Possible structures related to the GLTZ, may have localized other Paleoproterozoic sedimentary basins and later Midcontinent Rift related intrusions in the region (Owen et al., 2013). Although the exact location of GLTZ beneath the Animikie Basin is uncertain, it has been interpreted by Holm et al. (2007) to occur just south of the TIC. Based on this interpretation it may be possible that it may have played a role in the localisation of the Tamarack Intrusion.

7.1.2 Paleoproterozoic; the Animikie Basin and the Penokean Orogen

The depositional and tectonic history of the Penokean Orogen is dated at around 1.85 Ga and in Minnesota consists of two main components. One is a fold and thrust belt representing an accreted terrain to the south while the other is a foreland basin (Animikie Basin) formed to the north as a result of a collision between the continental margin of the Archean Superior Province Craton and the Pembine-Wausau oceanic arc (Figure 7-3).

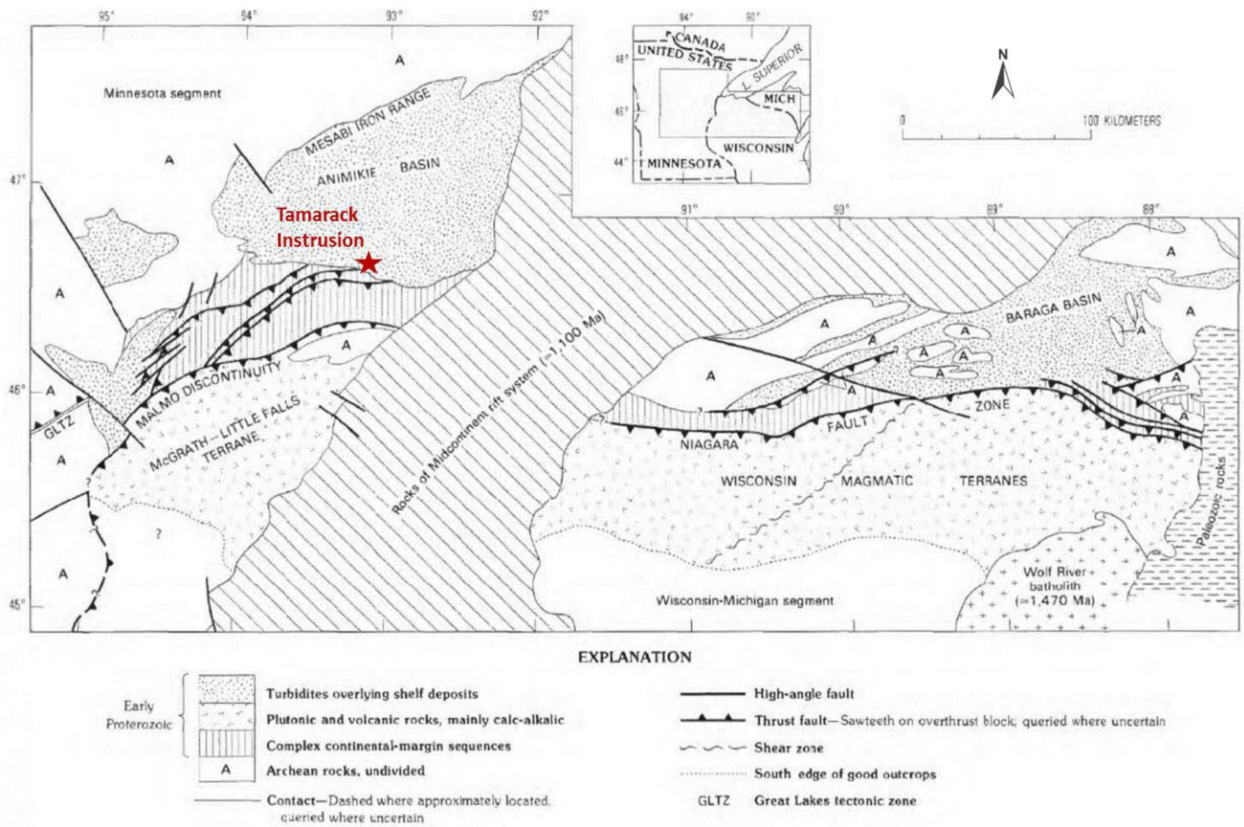


Figure 7-3: Location of the TIC in relation to the Mid-continental rift (MCR) and southern boundary of the Animikie Basin with the tectonic Imbrication and Foredeep Development of the Penokean Orogen. An Interpretation based on Regional Geophysics and the Results of Test-Drilling by Southwick et al., 1991.

In east-central Minnesota, the Animikie Group sediments which are weakly to moderately folded and metamorphosed, unconformably overlie the more intensely deformed North Range Group and Mille Lacs Group and the Archean basement. The Animikie Group sediments include the basal quartzite and conglomerate of the Pokegama Formation; the Biwabik banded iron formation and inter-bedded argillite, siltstone and sandstone of the Virginia Formation which are exposed in the iron ore mines of the Mesaba Iron Range along the northern margin of the Animikie Basin. In the north of the basin these sediments are only weakly metamorphosed, but metamorphism and deformation increase towards the south where similar sediments have a well-developed axial planer foliation and are folded into north verging upright folds which become increasingly tighter and possibly overturned along the south margin of the basin. These more deformed and metamorphosed sediments are referred to as the Thompson Formation and have been interpreted to be the deformed equivalents of the Virginia Formation (Severson et al, 2003). Boerboom (2009) has subdivided the Thompson Formation into and Upper and Lower sequence with the Lower sequence comprised of carbonaceous siltstone and mudstone that is locally sulphide rich; and a proposed source for the sulphide at Tamarack. The Upper Thompson is composed of turbidite-like siltstone and sandstone.

At Tamarack the host rocks to the TIC are the Upper Thomson Formation. The Lower Thomson Formation subcrops to the south of Tamarack, dips towards the north (beneath the Upper Thomson Formation), and is interpreted to underlie the TIC at depth. A prominent seismic reflector under the Tamarack deposit at a depth of 4.6 to 4.8 km may represent the base of the Thompson Formation in the Tamarack area (Goldner 2011).

7.1.3 Mesoproterozoic (Mid-Continental Rift)

The Mesoproterozoic Mid-Continental Rift (MCR) is represented by a large igneous province that formed from intra-continental rifting at approximately 1.1 Ga (Hutchinson et al., 1990) resulting from a mantle plume. The MCR extends along a 2000 km arcuate path from the Lake Superior region to the southwest as far as Kansas and to the southeast beneath Lower Michigan (Hinze et al., 1997). Although only exposed in the Lake Superior area, the extent of the MCR beneath younger cover can be interpreted from its pronounced gravity and aeromagnetic signature.

In the Lake Superior region the Keweenaw Flood Basalt province represents the exposed portion of the Mid-continent Rift system. Seismic data indicates the rift below Lake Superior is filled with more than 25 km of volcanic rocks buried beneath a total thickness of up to 8 km of rift sediments (Bornhorst et al., 1994).

The Keweenaw Flood Basalt province was formed over a period of approximately 23 Ma (Miller and Vervont, 1996) and shows various magnetic polarity reversals. Volcanism occurred in distinct phases, with an earlier phase dominated by low alumina basalts (<15% Al2O3) that include both olivine and pyroxene phyric picrites. These may have been derived from primitive magmas tapping a deep mantle source. The later volcanic phases are dominated by high alumina basalts (>15%Al2O3) with Mid Ocean Ridge Basalt like chemistry. The evolution of the Mid-continent Rift closely resembles that of other large igneous provinces such as the North Atlantic Igneous Province and the Siberian Traps. In the North Atlantic Igneous Province, picritic volcanics, associated with an early phase of "plateau like" flood basalts, are spread out over an area of 2000 km (Larsen et al., 2000).

In addition to the extrusive rocks, a large volume of intrusive rocks were emplaced and include the Duluth Complex, the Mellen Complex, the Coldwell Complex, the Beaver Bay Complex and the Nipigon Sill Complex, in addition to numerous dyke swarms and sills that may have acted as feeders for lava flows along the flanks of the rift. The TIC is one of the numerous smaller satellite intrusions which also include Eagle; Echo Lake; Bovine Intrusive Complex intrusions in upper Michigan; the Coldwell Complex near Marathon, Ontario; the Seagull Lake; Kitto, and Disraeli Lake intrusions in the Lake Nipigon area; and the Crystal Lake Gabbro in the Thunder Bay area (Goldner 2011, Figure. 7-4). Many of these smaller intrusions, relative to the MCR, are older (3-15 Ma), occur distally, and have more primitive melt signatures. They are interpreted to represent the early evolution of the MCR.

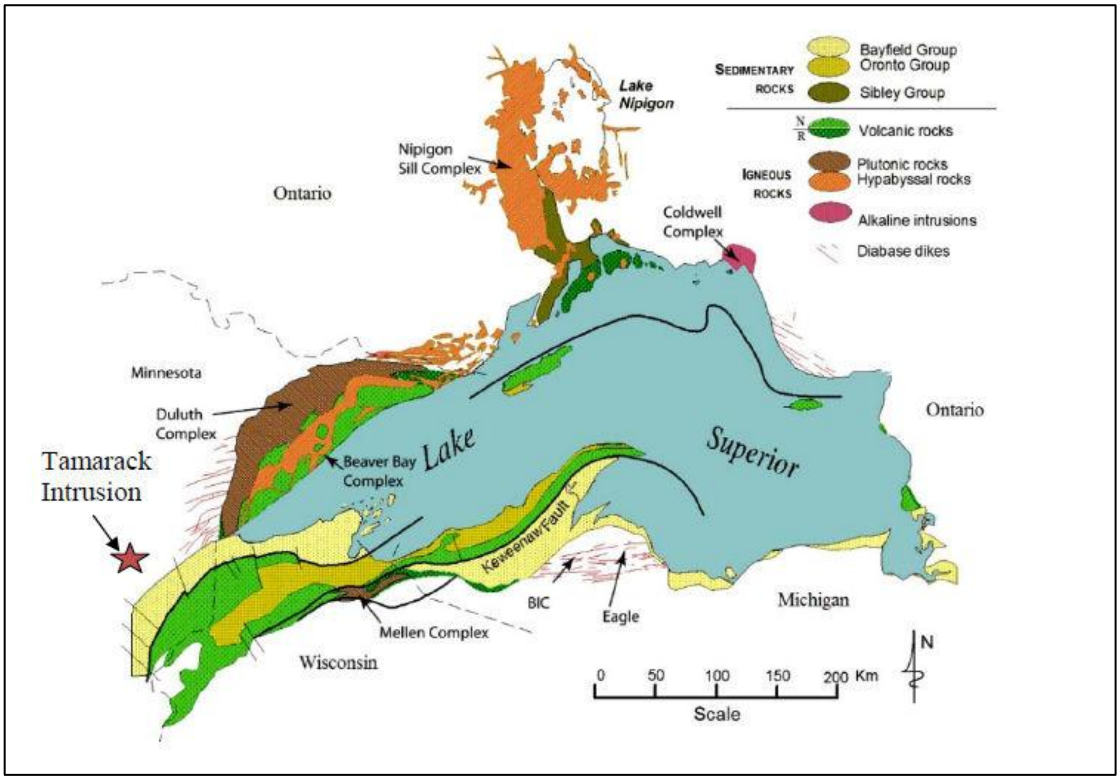


Figure 7-4: Map showing the Locality of the TIC and the geology of the Lake Superior Region with the location of other intrusive components of the Mid-continental Rift (Goldner 2011, modified from Miller et al., 1995).

The Mid-continental Rifting was terminated by a compressional tectonic phase resulting in the inversion of original, graben bounding, normal faults, into reverse faults. The compressional event has been interpreted to possibly be the result of the Grenville Orogeny which may have started as early as 1080 Ma and was probably completed by 1040 Ma (Bornhorst et al., 1994). The orogeny resulted in rotation of blocks towards the rift axis with local sediments derived from the erosion of uplifted horst blocks (an example is the Hinckley Sandstone formation in Minnesota). There is, currently, no evidence to suggest that the TIC has been affected by this rotational event.

7.1.4 Cretaceous

Cretaceous sediments that include fluvial conglomerates and sandstones, overlain by transgressive tidal flats deposits (including lignite layers) and progressively deeper marine sediments representing a transgression, are preserved in western and central Minnesota. These sediments often overly a well-developed paleo-lateritic weathering profile. At Tamarack, Cretaceous siltstone and sandstone unconformably overly parts of the TIC in the north and a layer of up to 30 m thick of mudstone occurs in the northeast of the TIC and is similar to other deposits that have been mined in the Minnesota River valley for manufacturing brick and tiles.

7.1.5 Quaternary

Thick glacial-lacustrine deposits cover most of the Tamarack area as they do other large areas of Minnesota. The deposits are a complex sequence of lobes representing multiple advances and retreats from the last Pleistocene glaciation which spanned a period from 10,000 to 100,000 years ago. Fluvial reworked glacial sediments and varved clay layers occur between various lobe layers. Varved clay layers underlie widespread peat bogs in the Tamarack area and are believed to have been deposited in Glacial Lake Upham which covered much of northeastern Aitkin County.

7.2 Property Geology

7.2.1 Introduction

The TIC is a cumulate mafic to ultramafic body that is associated with the early evolution of the MCR (dated at 1105 Ma +/- 1.2 Ma, Goldner, 2011). This age is significantly older than other Duluth Complex Intrusions which consistently date at 1099 Ma. The TIC is consistent with other earlier intrusions associated with the MCR that are often characterised by more primitive melts.

The TIC has intruded into Thomson Formation siltstones and sandstones of the Animikie Group and is preserved beneath remnant shallow Cretaceous fluvial and tidal sediments and Quaternary glacial sediments which unconformable overlie the intrusive. The geometry of the TIC, as outlined by the well-defined aeromagnetic anomaly (see Figure 7-5), consists of a curved, elongated intrusion striking north-south to south–east over 18 km. The configuration has been likened to a tadpole shape with its elongated, northern tail up to 1 km wide and large, 4 km wide, ovoid shaped body in the south (Figure 7-5 and 7-6). The northern portion of the TIC (the Tamarack North Project), which hosts the currently defined resource and identified exploration targets, is over 7 km long and is the focus of this report.

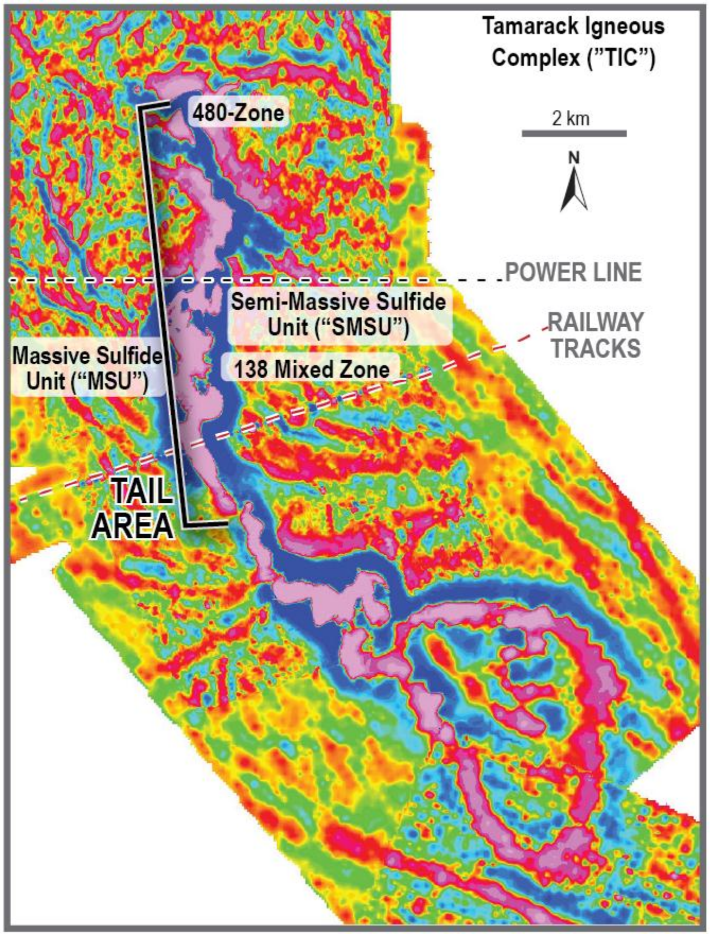


Figure 7-5: Aeromagnetic survey showing the 18 km long strike of the TIC with the long narrow intrusion that hosts the currently defined mineralization termed the "Tail" forming the Tamarack North Project and the large layered intrusion to the south termed the "Neck" and "Body" in an analogy where the shape has been compared to a tadpole (*Kennecott Aeromagnetic Survey, Modified by Talon, 2014*)

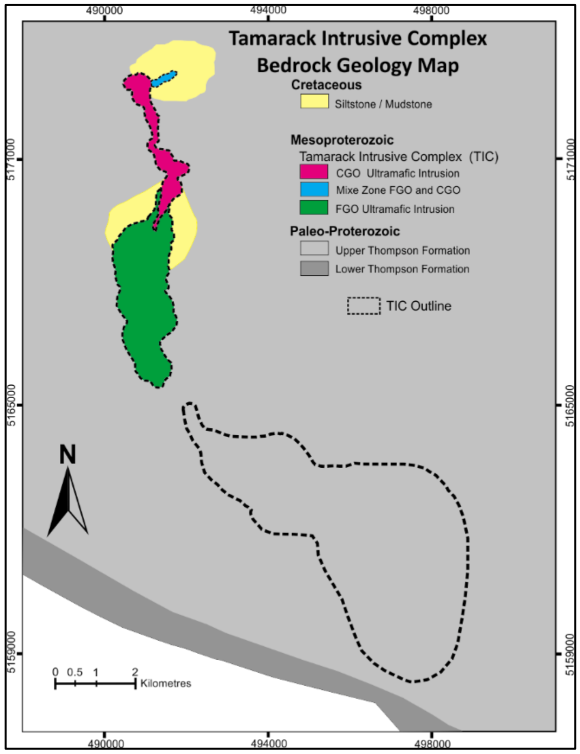


Figure 7-6: Bedrock (sub-glacial) Geological Map of the TIC, showing the progressively eroded profile of the TIC towards the north (modified from Kennecott Exploration Internal Report, May 2013).

7.2.2 Paleoproterozoic (Thomson Formation)

The TIC is intruded into a folded and metamorphosed (greenshist facies) sequence of siltstone and sandstone turbiditic sediments of the Upper Thompson Formation that dip shallowly towards the north. Contact metamorphism peripheral to the TIC ranges from granoblastic to spotted hornfels. Observations from core indicate that sedimentary and structural fabrics have largely been obliterated by the metamorphism.

7.2.3 Overview of the Tamarack North Project

The Tamarack North Project has been interpreted to consist of at least two separate phases of intrusions based on contact relationships, textural, and geochemical differences. These include a fine grained peridotite (termed the FGO) that forms the wider, upper part of the intrusion in the mid and southern part of the tail; and a coarse grained, intrusive phase of feldspathic peridotite (termed the CGO) interpreted to have intruded dyke-like along structures at the base of the FGO in the form of a keel that subcrops as a result of pre-Cretaceous erosion in the north of the 'tail'. Associated with the contact between these two intrusions is also a hybrid phase (termed the MZ) that is interpreted either as a zone of mixing of the two intrusions or possibly a separate intrusion altogether (Figure 7-7).

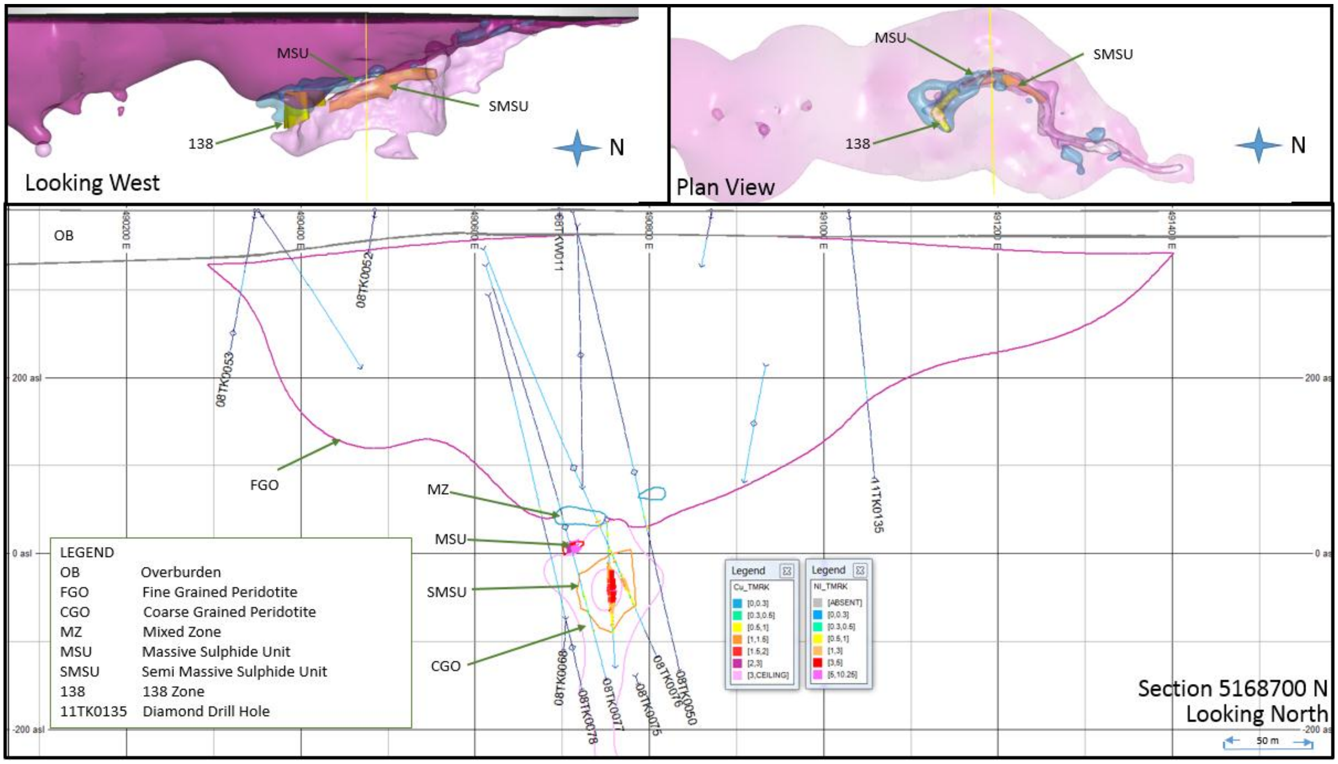


Figure 7-7: Plan, Long Section (South-North), and Cross Section through the Tamarack North Project showing the main components of the Tamarack North Project including the CGO at the base intruding dyke-like beneath the FGO in the shape of a Keel. MZ intrusive occurs near the interface of the two intrusions. Mineralization in the SMSU occurs at the top of the CGO, the MSU occurs in what is interpreted as a wedge of remnant wall rock. In the 138 Zone to the south of this section matrix and disseminated mineralization occurs in the MZ.

Sulphide mineralization occurs within various lithological settings but is primarily associated near the FGO/CGO contact, within the 138 Zone and along the CGO/Sediment contact (Figure 7-7). More specifically these zones are the SMSU (occurring in the upper part of the CGO near the FGO contact); the MSU hosted within sediment but proximal to the wallrock contact of the FGO and CGO; and the 138 Zone which is south of the SMSU and occurs within a large zone of MZ.

Other less developed exploration targets with defined mineralization include the shallow mineralization within the 480 zone towards the northern part of the 'tail', the Laucamp style mineralization in the Laucamp Zone towards the southern end of the 'tail', and widespread disseminated mineralization developed at shallow depths in the FGO north of the SMSU mineralization. There is also Ni and Cu mineralization concentrated in a well-developed paleo-weathered lateritic profile at the top of the FGO.

The TIC appears to dip to the south and east based on the dip of the basal contact of the FGO with the CGO, as well as the general dip of the mineralization. The FGO is eroded progressively towards the north exposing the CGO north of the Tamarack North Project (Figure 7-6). Evidence for this apparent dip being the result of tectonic block rotation however has not been conclusively proven.

7.2.3.1 Intrusion Types

The different intrusions of the Tamarack North Project include (Figures 7-6 and 7-7):

- FGO: The FGO forms an elongated, south plunging, gutter shaped intrusion primarily in the centre and south portions of the Tamarack North Project that is progressively eroded to the north (although it appears to be preserved in the 480 Zone). The FGO intrusion is approximately 1 km wide and up to 475 m thick. The intrusion is composed primarily of dunite/peridotite with fine grained olivine. The olivine (fosterite (Fo) at 70-86%, Goldner, 2011) decreases in modal amount downward towards the basal contact. In the northern part of the FGO intrusion, the contact zone with sediments (country rock) is marked by a fine-grained olivine gabbro. The Ni content of olivine is relatively low as plotted on a Ni vs Fo plot (Figure 7-8). Mineralization can occur as disseminated or in altered sediments (Laucamp Style) near or at the base of the FGO.
- CGO: The CGO intrusion is currently interpreted as a separate, but later, intrusive that has penetrated and eroded structures beneath the FGO complex either as dyke like bodies (described as the keel) or as linked discrete feeder zones. The bulk of the currently defined mineralization in the Tamarack North Project is contained within and near the top of the CGO and is referred to as the SMSU. The fact that the CGO widens beneath the FGO and the presence of chilling against the FGO, coupled with inclusions of FGO-like contact olivine melagabbro within it, indicate that it post-dates the FGO. The CGO is, lithologicaly, a feldspathic peridotite (60-30 modal percent olivine) with olivine gabbro present at the contact with enclosing sediments. The olivines are substantially coarser in grain than those of the FGO, reaching as much as 1 cm in diameter. They also define a higher Ni trend on a plot of Ni content versus Fo in olivine (Figure 7-8). Although the CGO is chilled against the FGO in the north, further south the contact between the CGO and FGO bodies is commonly marked by what has been logged as a MZ. In this unit the two distinctive intrusive types (FGO-CGO) do not show any obvious chill zone, and fine-grained and coarse-grained olivine occur together with the smaller olivines occurring in the interstices between coarser olivines.
- MZ: This has alternatively been interpreted as either a zone of mixing between the CGO and FGO or possibly as a separate intermediate phase intrusion between the FGO and CGO. The zone is characterised by a bimodal population of coarse and fine grained olivine with Ni vs Fo plotting intermediate between CGO and FGO (Figure 7-8). Mixed zones often host varying amounts of disseminated sulphide mineralization that, within the 138 Zone, is significantly concentrated to form a resource.

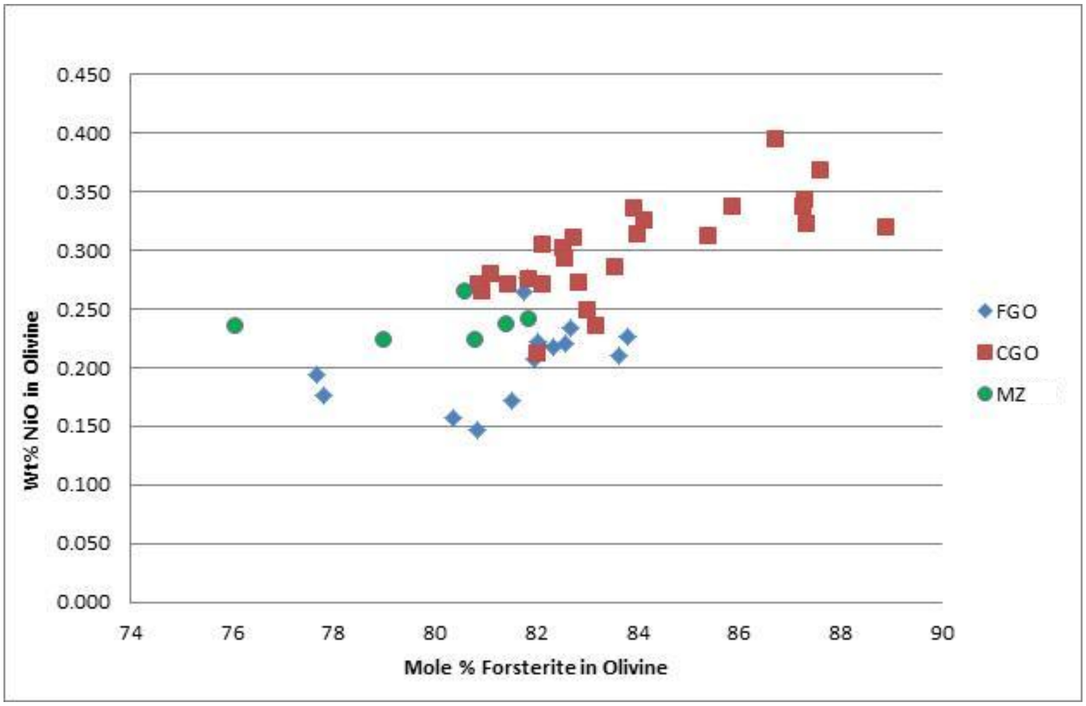


Figure 7-8: Plot of Ni in olivine vs Fo content of olivine. The FGO olivines define a continuous trend with a lower Ni content than the CGO. Olivine in the FGO define a narrow Fo% range (82-84% Fo) compared to the olivines in the CGO (Fo 81-89%). Olivines from the mixed zone fall in between the two trends. . (Data from *Goldner, 2011*).

7.2.4 Mineralization

The Ni-Cu (PGE) mineralization at the Tamarack North Project, occurs as various types ranging from disseminated to net textured to massive sulphides. Sulphide mineralogy is dominantly pyrrhotite, with pentlandite and chalcopyrite, and minor cubanite. Pentlandite occurs as coarse grains and as intergrowths with pyrrhotite. Metal tenors between the different mineralization styles are variable and are described below (see Table 7-1).

Metal tenors are the concentration of metals in a sulphide mineral calculated on the basis of 100% sulphide (thus not dependent on the amount of sulphide in the rock). This is different to grade which is the total metal concentration in the rock (which is also dependent on the amount of sulphide in the rock). Rocks may have low sulphide content but the sulphides present may have high metal concentrations (tenors). Analysis of tenors in magmatic sulphide deposits are useful as they give indications of the crystallisation history, mineralization, and metal concentration in the sulphides. The tenors of the different metals can also change laterally across a mineralised zone reflecting the crystallisation history and partition coefficients of the different metals. Massive and semi massive high grade mineralization can often be surrounded by lower grade disseminated mineralised haloes with higher PGE and/or Cu metal tenors, providing a useful vector for exploration.

Table 7-1: Table of different mineralization types at Tamarack North Project showing the range and variation in metal tenors

Ore Type	Number of Samples	Ni% 100% Sulp	Cu% 100% Sulp	Au ppm 100% Sulp	Pd ppm 100% Sulp	Pt ppm 100% Sulp	Cu/Ni	Pt/Pd	Fe2O3%	MgO%
SMSU	1193	10.66	7.01	2.30	2.94	5.08	0.65	1.62	21.63	22.52
MSU	57	9.30	4.70	0.55	0.87	1.68	0.51	1.89	44.42	2.35
138 Zone	810	12.37	8.87	2.27	2.53	4.9	0.79	1.80	18.66	27.01

Although some of the mineralization names at the Tamarack North Project are used to describe mineralization lithologically in terms of sulphide concentration, they have been used by Kennecott to describe specific ore-bodies. These ore bodies have different mineralization styles, with different metal tenors, genetic implications and different resource potential.

1) The Laucamp Zone:

The mineralization type within the Laucamp area, which is located around 1.5 km south of the 138 Zone typically occurs as variable massive sulphide veins and pods <2 m thick with blebby disseminated mineralization occurring at the base of FGO intrusion on the wall-rock contact, and often within hornfelsed and partially melted sediments near the chilled contact with the FGO. The mineralization is generally low tenor and has been interpreted as early cumulate mineralization associated with the base of the FGO. In the Laucamp Zone the base of the FGO is more complex. Thick intervals of variable textured gabbro, magmatic breccia, and thin sills or dykes occur within the partially melted meta-sediment where coarse blebby disseminated mineralization occurs in variable textured gabbro with granophyric patches.

Laucamp mineralization is characterized by a Ni tenor of 4.9 wt%, Cu of 2.3 wt% and 0.5 g/t Pt.

2) The 138 Zone:

A wide range of disseminated to net-textured and patchy net-textured sulphides typically occur in the 138 Zone. This type of mineralization is referred to as mixed zone mineralization. In the 138 Zone area, mixed zone type sulphides appear to form a wedge-like zone of 200 m length, 120 m to 160 m height and a width of approximately 50 m. The 138 Zone mineralization is characterized by a Ni tenor of 12.37 wt%, Cu of 8.87 wt% and 4.9 g/t Pt.

3) The SMSU Zone:

The SMSU Zone forms the bulk of the defined resource and occurs in the upper part of the CGO intrusion as an elongated tubular shaped zone at the top of the CGO. The dimensions of the body are 600 m in length, 30 m to 80 m wide and 60 to 160 m vertically. Within the SMSU Zone is a core of interstitial net textured sulphides (50-80% sulphides) (Table 7-1 and Figure 7-9). Surrounding the net textured sulphides are disseminated sulphides forming a peripheral halo decreasing towards the margins of the CGO. This halo has been shown to have elevated Cu and PGE tenors that could be used in targeting of extensions to the SMSU. The SMSU net textured sulphides show tenors of about 8.7 wt% Ni, 4.3 wt% Cu and 1.24 ppm Pt. The disseminated halo typically has higher metal tenors (11.5 wt% Ni, 8.2 wt% Cu, 6.7 ppm Pt), particularly Pt tenors, than the SMSU net-textured core. The overall tenor for the SMSU Zone is tabulated in Table 7-1.

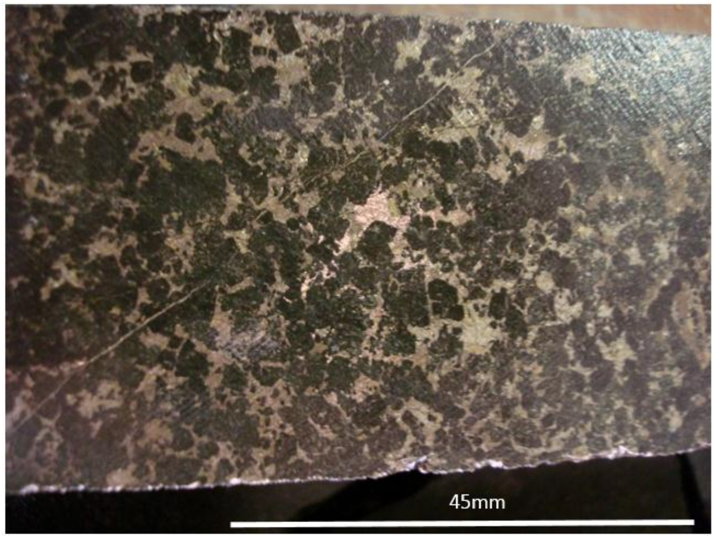


Figure 7-9: SMSU (net textured) sulphide from Tamarack Drill Core.

4) The MSU:

MSU type mineralization is defined as containing 80-90% sulphide (Figure 7-10). The MSU also refers to an ore-body hosted by intensely metamorphosed and partially melted meta-sediments occurring as fragments or wedges of country rock at the top of the CGO with typical dimensions of 20 to 30 m wide by 10 m thick. Close spaced drilling to test these massive sulphides suggest that they form southward plunging, pipe like zones. The zone has been drill intersected intermittently over 600 m from the SMSU to the 138 Zone and appears to be spatially related to the SMSU (occurs approximately 50 meters above the SMSU). Texturally these massive sulphide veins resemble the Laucamp type massive sulphide veins and both occur in intensely metamorphosed sediments with odd looking, lobate margins that often enclose blebs of granophyre. However, the metal tenors (9.3 wt% Ni, 4.7 wt% Cu and 1.68 ppm Pt) of these massive sulphides are higher than Laucamp type massive sulphides with coarse-grained, granular pentlandite eyes up to 1 cm across, readily visible in most of the massive sulphide intersection.

Figure 7- 10: MSU from Tamarack Drill hole 12TK0158

5) The 480 Zone:

Limited drilling in a narrow linear, east-west trending, positive magnetic anomaly at the northern portion of the Tamarack North Project, referred to as the 480 Zone, has intersected disseminated and net textured sulphide mineralization at relatively shallow depth. The host olivine cumulates visually resemble olivine cumulates of the FGO intrusion to the south and include intervals of quartz xenolith rich magmatic breccia similar to those in the Laucamp Zone. However, the higher sulphide metal tenors (8 wt% Ni, 8.1 wt% Cu, 6.5 g/t Pt) are more analogous to those seen in the lower part of the MZ in the 138 Zone.

6) Mineralization in the weathered laterite zone

A weathered lateritic profile is irregularly preserved in the north eastern part of Tamarack North Project beneath Cretaceous and Quaternary cover and has concentrated nickel, copper, chrome and iron. The weathered profile is up to 10 m thick and consists typically of a 0.5 m pisolithic, limontic hardcap, underlain by massive greenish saprolite, and saprock with remnant igneous textures. Native copper up to 2% (visual estimation) can be observed as 1-3 mm nuggets and veinlets in the weathered profile and persists into the serpentinised upper part of the FGO (Goldner, 2011).

7.2.5 Quaternary and Cretaceous cover and Weathering Profile

The Tamarack North Project does not outcrop at surface as it underlies 20 to 50 m of Quaternary glacial and fluvial sediments and in the north of the Tamarack North Project along the east part of the intrusion, Cretaceous siltstone and mudstone are preserved and unconformably overly the preserved paleo-weathered lateritic profile of the FGO.

In the Tamarack North Project the lateritic weathering profile is variably preserved. This is seen particularly in the east where up to 10 m thick saprock with remnant igneous textures and massive greenish saprolite covered with a pisolitic limonitic duricrust can be found. Native copper occurring as nuggets and veinlets can also be observed.

Serpentinisation of olivine cumulates occurs over considerable thicknesses in the FGO below the weathered lateritic profile and is believed to be due to supergene alteration processes related to pre-Cretaceous weathering. Magnetite generated by the serpentinisation process in the upper layers of the FGO is the main cause for the strong positive magnetic anomaly associated with parts of the Tamarack North Project.

Quarternary glacial-lacustrine deposits between 20 to 50 m cover the TIC with thicknesses increasing towards the south. The deposits are a complex arrangement of glacial and interglacial fluvial sands and silt and clay from lake sediments.

7.2.6 Current Models for the formation of the Tamarack North Project and mineralization

Exploration to date suggests the Tamarack North Project is composed of at least two intrusions, the FGO and the CGO. It is likely based on the geochemistry that both intrusions are derived from the same high-Mg olivine tholeitic parent magma (Goldner, 2011), but probably evolved differently.

Although Goldner (2011) originally proposed that the CGO represented the original intrusion, current thinking based on contact relationships is that the FGO was intruded first. This is supported by the more primitive nature of the FGO melt based on the narrow Fo % (82-84% Fo) of the olivines compared to the CGO (Fo 81-89%).

The FGO is also believed to have been the source for most of the sulphides that are interpreted to have been deposited initially as a Laucamp style cumulate on the FGO footwall. These remnant sulphides are still preserved on the flanks of the FGO (Laucamp style) and possibly the MSU, but the original significant mineralization near the keel was likely re-assimilated and re-concentrated by the CGO, and possibly mixed zone intrusions.

The MZ has been interpreted as a zone of mixing between the FGO and the CGO but also possibly as a separate intrusion intermediate between the FGO and CGO. The bimodal nature of the olivine sizes and geochemistry suggest mixing may have occurred with a more evolved and contaminated melt within the same conduit shared by the FGO. The later intruded CGO may reflect a slightly different emplacement history with different plumbing and more crustal contamination. It has been suggested based on the otherwise barren nature of the CGO that it was likely under saturated in sulphur but was able to upgrade the tenor of the original FGO mineralization.

8.0 DEPOSIT TYPES

The Tamarack North Project hosts magmatic nickel-copper-PGE sulphide mineralization. These deposits form as the result of segregation and concentration of liquid sulphide from mafic or ultramafic magma and the partitioning of chalcophile elements into the sulphide from the silica melt (Naldrett, 1999).

In order to sufficiently concentrate metals in a system, a number of basic factors are believed to be necessary including;

- A tectonic rift setting with upwelling mantle and deep seated structures necessary to generate partial melting of primitive magmas.
- Large volumes of magma flowing through an open system to achieve a high R factor (ratio of melt to sulphide).
- Mid-level external sulphur source from crustal assimilation of sulphur rich rocks to maintain sulphur saturation and continued partitioning with a rising magma.
- Physical and chemical conditions for sulphide accumulation such as cumulate settling, changes in flow velocity, magma mixing etc.

Ni-Cu sulphide deposits are economically important because they present favourable economics compared to the mining and processing of nickel laterite deposits. This is due to their relatively high grade; comparatively low environmental impact and comparatively low capital cost requirements.

The various mineralized zones at the Tamarack North Project occur within different host lithologies, exhibit different types of mineralization styles, and display varying sulphide concentrations and tenors. These mineralized zones range from massive sulphides hosted by altered sediments in the Massive Sulphide Unit (MSU), to net textured and disseminated sulphide mineralization hosted by the Coarse Grained Feldspathic Peridotite (CGO) in the Semi-Massive Sulphide Zone (SMSU); to a more predominately disseminated sulphide mineralization as well as layers of net textured sulphide mineralization, in the 138 Zone (see Table 8-1). Mineralization in the 138 Zone, where interlayered disseminated and net textured mineralization occurs is referred to as mixed zone (MZ) mineralization. All these mineralization types are typical of many sulphide ore bodies around the world. The current known mineral zones of the Tamarack North Project (SMSU, MSU and 138 Zone) that are the basis of this resource statement are referred to as the Tamarack Zone. Also located within the Tamarack North Project are currently, two lesser defined mineral zones, namely the 480 and Laucamp.

Table 8-1: Key Geological and Mineralization Relationships

<table>
<tr><th>Project</th><th>Area</th><th>Mineral Zone</th><th>Host Lithology</th><th>Project Specific Lithology</th><th>Mineralization Type</th></tr>
<tr><td rowspan="5">Tamarack North Project</td><td rowspan="3">Tamarack Zone</td><td>SMSU</td><td>Feldspathic Peridotite</td><td>CGO</td><td>Net Textured and Disseminated Sulphides</td></tr>
<tr><td>MSU</td><td>Meta-Sediments</td><td>Sediments</td><td>Massive Sulphides</td></tr>
<tr><td>138</td><td>Peridotite and Feldspathic Peridotite</td><td>Mixed Zone</td><td>Disseminated and Net Textured Sulphides</td></tr>
<tr><td rowspan="2">Other</td><td>480</td><td>Peridotite</td><td>FGO</td><td>Disseminated Sulphides</td></tr>
<tr><td>Laucamp</td><td>Peridotite</td><td>FGO</td><td>Massive Sulphide Veins</td></tr>
</table>

9.0 EXPLORATION

9.1 Historical Investigations

The TIC was initially targeted from the Minnesota State airborne magnetic survey flown between 1972 and 1983 and the follow-up drill-testing by the Minnesota Geological Survey (MGS) in 1984 of two holes, with peridotite intersected in AB-6 which was drilled on an anomaly north of the town of Tamarack.

9.2 Exploration by Current Owner; Kennecott

The TIC and associated mineralization was discovered as part of a regional program initiated by Kennecott in 1991. The focus on nickel and copper sulphide mineralization was intensified in 1999 based on a model proposed by Dr. A.J. Naldrett of the potential for smaller feeder conduits associated with continental rift volcanism and mafic intrusions to host nickel sulphide deposits similar to Norils'k and Voisey's bay. This model ('Dynamic Conduit Model') challenged previously held models that nickel sulphide deposits were only associated with large layered complexes.

Exploration by Kennecott continued at Tamarack concurrently with their testing of other targets, and in 1995, Kennecott discovered mineralization at Eagle in Michigan, and the Eagle Deposit in 2002. Disseminated mineralization was first intersected at Tamarack in 2002, and the first significant mineralization of massive and semi massive sulphide was intersected in 2008.

To-date, exploration by Kennecott has included a wide range of geophysical surveys including; airbourne magnetic and electromagnetic (EM-MegaTEM and AeroTEM), ground magnetic and EM, Induced Polarization (IP), gravity, seismic, MALM and downhole EM. Drilling in the main target areas of the Tamarack North Project has included 182 diamond drill holes totalling 67,387.37 m.

9.2.1 Geophysics

The Tamarack North Project is covered by Minnesota government regional magnetic and gravity surveys. The magnetic data in particular is recent and good quality and played a key role in the recognition of the TIC and the targeting of early drilling.

A wide variety of airborne, ground, and borehole (BH) geophysical surveys have been conducted by Kennecott at Tamarack since 2001 (Figure 9-1).

Airborne EM and magnetic surveys have included airborne Megatem (2001) and Aerotem (2007, 2008, 2009)

Ground geophysical surveys included EM 37 (2002), Crone TEM (2003), AMT (2003), Seismic Reflection (2006), CSAMT (2006), UTEM (2006), 3D RES/IP (2008), Mise-en-la Masse (MALM) (2008 and 2010), Gradient & Dipole Dipole IP/Resisivity (2010), and gravity surveys (2001, 2002, and 2011).

A test line to evaluate different surface TEM systems was surveyed with the UTEM system, the Crone system with SQUID sensor and with CRA95 coil sensor, the EMIT system with SQUID sensor, all in 2012. In addition, different borehole TEM systems were evaluated. These included Crone Geophysics with a fluxgate sensor and a coil sensor, Lamontagne Geophysics with the UTEM system and Discovery Geophysics with the EMIT system with fluxgate sensor. Borehole EM (BHEM) was first tested in 2003 and has been used since as an important tool for the detection and delineation of sulphide bodies in and near drill holes. Most holes since 2007 and all holes drilled since 2011 have been surveyed with BHEM.

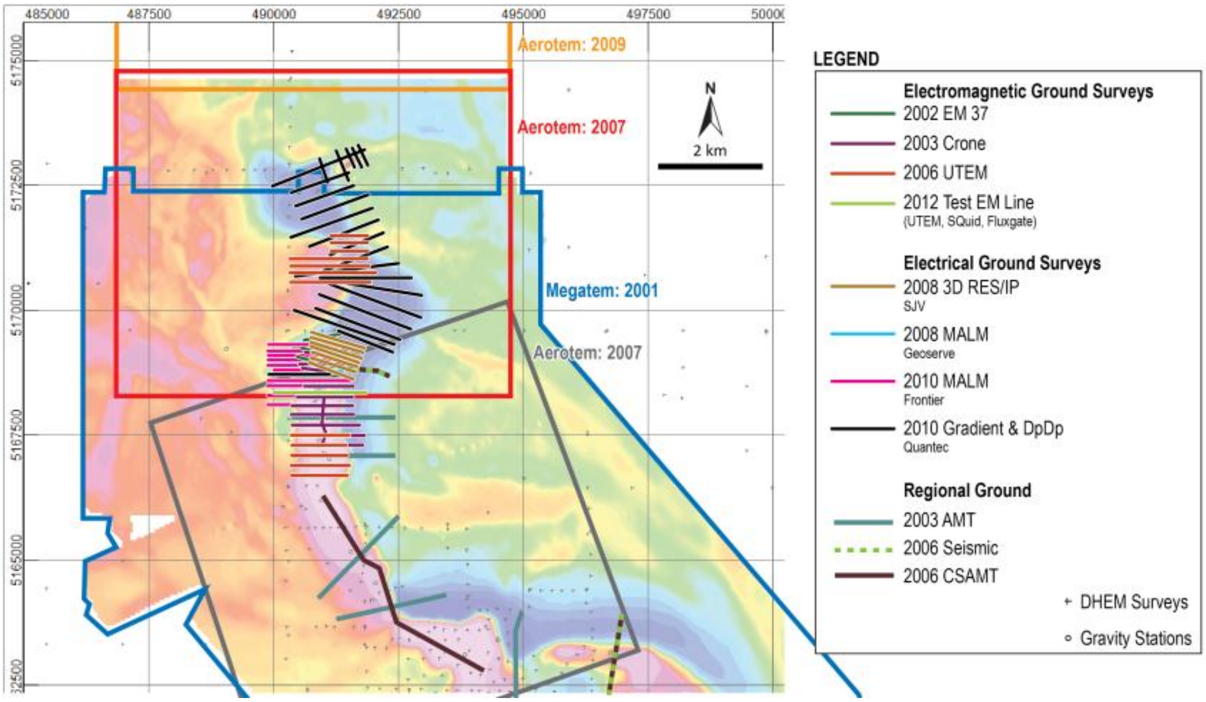


Figure 9- 1: Map showing localities of various geophysical surveys conducted over the TIC (composite magnetic TMI image background) Modified from Kennecott Internal Report and Survey Data, 2013).

Airborne Surveys

The Megatem survey in 2001 identified a conductive anomaly that led to the drilling of the first hole of the program. The hole intersected disseminated mineralization within gabbro. The survey was strongly affected by the numerous power lines in the area. Subsequent airborne EM surveying was conducted using the Aerotem system which has a smaller footprint than the more powerful but extended Megatem system and hence less sensitivity to nearby power lines.

The Aerotem system operates at lower power and higher frequency than the Megatem system with potentially less penetration through conductive overburden but has the capability of measurements in the on time of the transmitted pulse and hence potentially increased sensitivity to very conductive targets. Examination of the Aerotem summary grids suggest that the Aerotem data was less affected by the power lines The higher resolution (50 m line spacing vs 200 m line spacing for MegaTEM) AeroTEM surveys mapped with increased detail the conductive shallow FGO unit which may be spatially related to deeper mineralization. Based on Kennecott's subsequent work it appears that the response from both AEM systems is mostly due the mapping of the near-surface (top 300 m) conductive FGO unit and that direct detection of mineralization from the air has not yet been achieved.

Ground Surveys

Electrical and EM surveys

A variety of ground electrical and EM have been conducted on the property. Surveys included EM 37 (2002), Crone TEM (2003), AMT (2003), CSAMT (2006), UTEM (2006), 3D RES/IP (2008), Mise-en-la Masse (MALM) (2008 and 2010), Gradient & Dipole-Dipole IP/Resistivity (2010).

Gravity surveys (2001, 2002 and 2011)

Kennecott did detail gravity surveying over the property to add to the available Minnesota state data. The new data did not change the larger picture much but provided more detail over the TIC.

Seismic Reflection (2006)

Seismic reflection surveys were carried out on one test line and two survey lines.

BHEM surveys

To date, approximately 117 of the 182 holes at Tamarack have been surveyed with the Crone BHEM system.

Data for all holes was presented as .PEM files (off-time data with one on-time channel) and for many holes the.STP files were provided as well. The response from the BHEM surveys is dominated by the conductive FGO response which decays at late time and the response from the MSU and SMSU units which persists generally until late time. The BHEM surveys are very successful in locating sulphides in and near the drill holes. Much of the interpretation to date has been based on the .PEM data and so there is potential to identify even better conductors by reviewing the step data (.STP files). Such a review is currently under way.

10.0 DRILLING

10.1 Historical Drilling

The historical drilling at Tamarack is restricted to the two drill holes by the Minnesota Geological Survey (MGS) that were targeted as follow-up on anomalies generated by the State Aeromagnetic Survey. These included AB-6 (1984) located north of the town of Tamarack which intersected peridotite and AB-5 (1984) which was drilled further south and intersected metamorphosed sediments. This drilling is not part of the current resource but contributes to the overall regional geological interpretation.

10.2 Kennecott Drilling Programs

Kennecott has conducted extensive drilling at the Tamarack North Project since 2002. This drilling has been comprised of 182 diamond drill holes (Table 10-1, Figure 10-1 and 10-2) totalling 67,387 m with holes between 33.5 m and over 956 m depth for an average hole depth of 534 m. Drilling has been conducted in both summer and winter programmes.

Drilling at the Tamarack North Project was initiated in the winter of 2002, with L02-01 intersecting broad zones of low grade disseminated sulphide mineralization north of the Tamarack Zone.

Between 2003 and 2006 drilling was limited to a few holes (Table 10-1) with the first multi hole programme of 14 holes carried out in the winter of 2007 when the first significant intersection of disseminated sulphide mineralization was made with drillhole 07L-031 north of the Tamarack Zone

Drilling was stepped up in the summer and winter of 2008 with 32 drill holes after the first intersections of the SMSU in drill hole 08L-042. During the subsequent delineation of the SMSU ore body in the same year, the MSU was first intersected in drill hole 08TK-0049.

Drilling was reduced in 2009 to 13 holes following the economic downturn, mainly testing new targets and focusing on the 480 zone in the north of the Tamarack North Project. Drilling in 2010 followed on from 2009 with 19 holes testing new targets with continued focus on the 480 zone. Drilling in 2011 included 5 holes north of the Tamarack Zone.

In 2012, the programme was stepped up with 28 holes drilled to the south of the SMSU, with the first wide intersection of predominately disseminated mineralization and interlayered net textured mineralization from drill hole 12TK-138 (in what was later to be called the 138 Zone)

38 holes were drilled during the 2013 campaign. The highlights included the defining of the 138 Zone, the first intercept of massive sulphide veins in meta-sediments in what is referred to as the Laucamp Zone (located approximately 1.5 km South of the 138 Zone), and further encountering of disseminated mineralization to the north of the Tamarack Zone.

Table 10-1: Showing breakdown of drilling conducted by Kennecott

Year	Number of holes	Meters	Targets
2002	1	276	North Tamarack area
2003	8	2009	North Tamarack, 138 area
2004	3	915	Tamarack, North Tamarack, Laucamp area
2007	14	3363	North and East Tamarack area
2008	53	19,965	Tamarack Zone, 480 area
2009	13	5044	North and East Tamarack, Laucamp area, 480
2010	19	6556	North Tamarack, 138, Laucamp, 480
2011	5	1857	North Tamarack
2012	28	14,280	138, Laucamp
2013	38	13,122	North and East Tamarack, 138, Laucamp area
TOTAL	182	67,387	

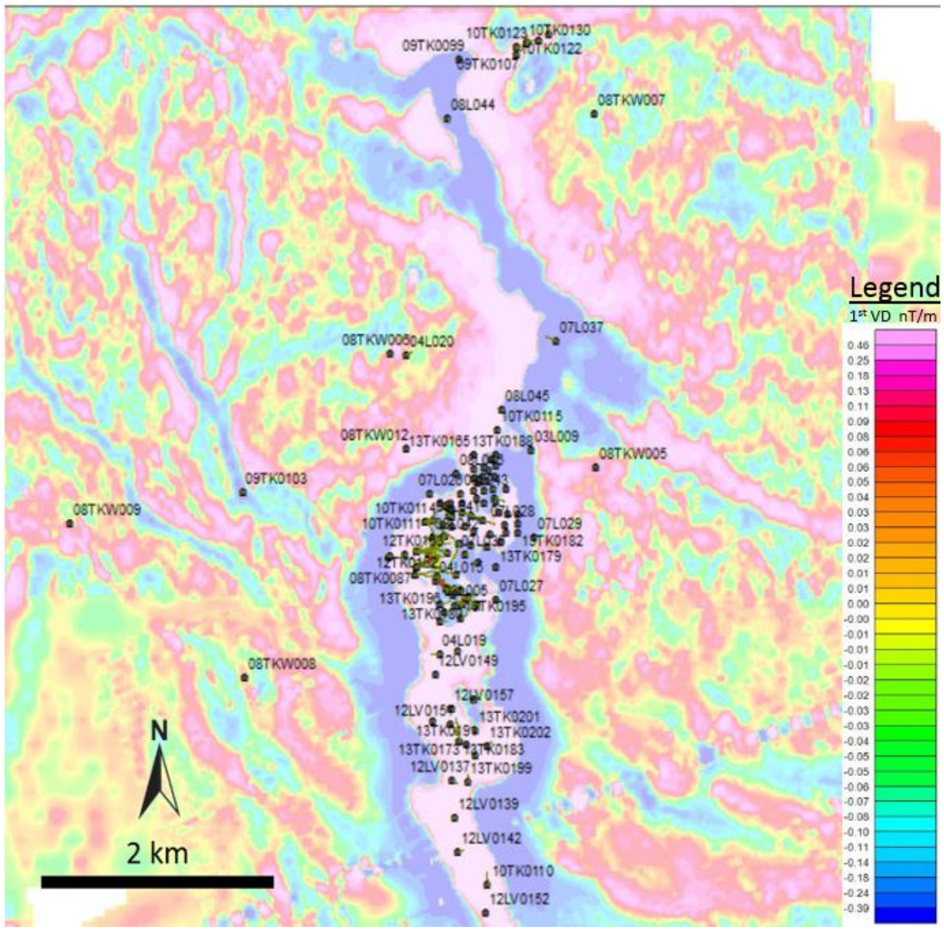


Figure 10- 1: Map showing localities of drill holes, prospects and targets in the Tamarack North Project (background 1VD magnetic image). Modified from Kennecott Internal Report and Survey Data, 2013

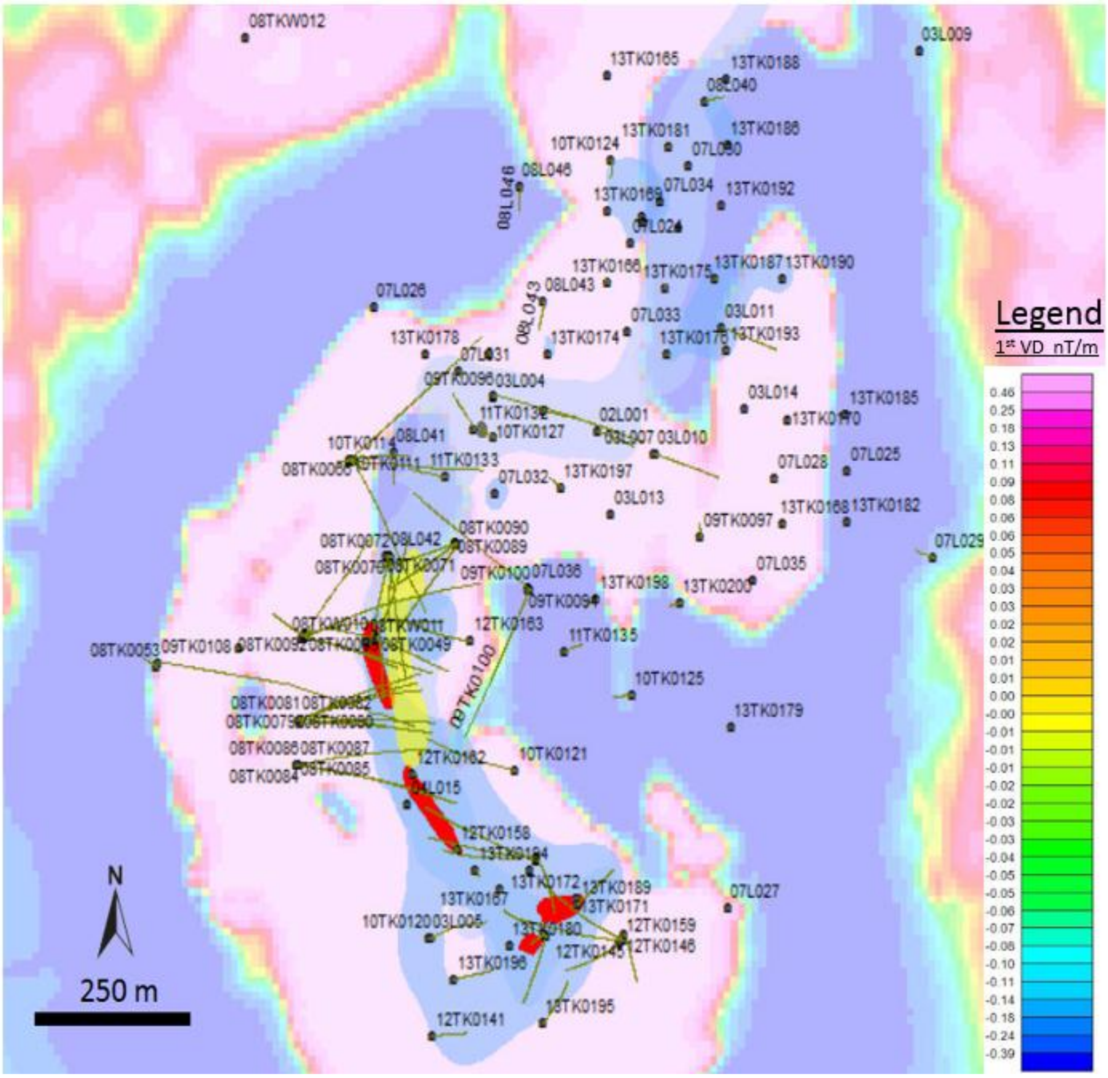


Figure 10- 2: Enlarged map showing localities of drill holes, in the Tamarack North Project (background 1VD magnetic image). Modified from Kennecott Internal Report and Survey Data, 2013

The number of total drill holes in the North Zone Project (182) and the number of drill holes that were included in the mineral resource estimate (46 drill holes) are different. Only drill holes that had mineralized intercepts that were sufficient to meet the domain modelling cut-off and had sufficient continuity were included in the mineral resource estimate. The drill holes and the mineral intercepts that were used in the mineral resource are provided in Section 14 and Figure 14-1. Some of the remaining drill holes, occurring outside of the current mineral resource estimate (as defined in Section 14), do include relevant mineralization that could be included in an updated mineral resource estimate depending on results of future exploration programs.

Provided in Table 10-2 are the drill hole composited, mineralized intersections for the SMSU, MSU and 138 Zone domains from the mineral resource estimate provided in Section 14. The SMSU and MSU zones consist of plunging pipe like mineralization domains which do not have a tabular type geometry. The orientation of the drilling is mainly in the vertical to sub-vertical dip component, therefore there is some uncertainty regarding the relationship between drill hole intersection length and the true width of the deposit in some areas. Each drill hole listed in Table 10-2 includes the entire composited length used in the mineral resource estimate and includes a selection of significant mineralization intervals within the composited length. There were a number of drill holes (noted in the table) that did not have significant mineralization and only the total composited length was provided. If a drill hole intersection was composed entirely of significant mineralization the entire composited length was provided.

Golder has estimated the true width to be perpendicular to the plunge based on an average plunge of -25 degrees and an average plunge direction of 170 degrees for the SMSU and MSU zones (domains).

The estimated true width may be subject to change with additional drilling oriented across the deposit.

The true width of drill hole mineralization intersections for the 138 Zone could not be estimated at this time due to the strictly vertical nature of the existing drill holes and weak understanding of the plunge and plunge direction.

The remaining drill holes in the database (136 holes) have not been included in Table 10-2 since they were not considered to be material to the mineral resource estimate completed in Section 14.

Table 10-2: Mineralized Drillhole Intersections for Tamarack North Project – Mineral Resource Estimate

Zone	Hole No.	Easting	Northing	Elevation	Az	Dip	From	To	True Width (m)	Sample Length	Total Hole Length	NiEq %	Cu %	Ni %	Co %	Au g/t	Pt g/t	Pd g/t
SMSU	08L042	490734.9	5168847.6	388.8	180	-80	**325.6**	**464.0**	**125.3**	**138.4**	**515.7**	**2.14**	**1.06**	**1.61**	**0.04**	**0.18**	**0.32**	**0.22**
							416.0	*429.5*	*12.2*	*13.5*		*5.46*	*2.43*	*4.38*	*0.10*	*0.13*	*0.48*	*0.39*
SMSU	08TK0048	490715.1	5168729.6	391.1	33	-79	**331.0**	**479.5**	**140.2**	**148.5**	**908.0**	**2.47**	**1.14**	**1.88**	**0.05**	**0.22**	**0.40**	**0.26**
							416.5	*457.0*	*21.2*	*22.5*		*5.09*	*2.37*	*3.95*	*0.08*	*0.37*	*0.63*	*0.46*
SMSU	08TK0049	490717.8	5168728.4	391.2	183	-80	**423.0**	**460.5**	**34.1**	**37.5**	**553.5**	**0.93**	**0.40**	**0.50**	**0.02**	**0.24**	**0.84**	**0.41**
							438.0	*441.0*	*2.7*	*3.0*		*1.42*	*0.60*	*0.71*	*0.02*	*0.37*	*1.58*	*0.71*
							453.0	*454.5*	*1.4*	*1.5*		*1.70*	*0.77*	*0.90*	*0.03*	*0.43*	*1.61*	*0.75*
SMSU	08TK0058	490590.2	5168609.4	389.8	89	-71	**473.0**	**558.5**	**75.1**	**85.5**	**649.5**	**2.69**	**0.96**	**2.09**	**0.06**	**0.24**	**0.58**	**0.35**
							489.5	*513.5*	*21.1*	*24.0*		*4.14*	*1.34*	*3.44*	*0.09*	*0.13*	*0.42*	*0.28*
SMSU	08TK0061	490672.6	5168987.8	389.0	145	-65	**451.0**	**494.5**	**42.8**	**43.5**	**634.3**	**1.36**	**0.66**	**0.85**	**0.02**	**0.32**	**0.71**	**0.41**
							461.5	*463.0*	*1.5*	*1.5*		*2.06*	*0.94*	*1.57*	*0.04*	*0.25*	*0.28*	*0.27*
							479.5	*482.5*	*2.9*	*3.0*		*2.44*	*1.11*	*1.36*	*0.03*	*0.75*	*2.04*	*0.89*
							487.0	*490.0*	*2.9*	*3.0*		*2.06*	*1.04*	*1.13*	*0.03*	*0.52*	*1.63*	*1.00*
SMSU	08TK0064	490671.6	5168986.8	389.1	96	-63	**363.0**	**412.5**	**42.5**	**49.5**	**492.9**	**0.88**	**0.41**	**0.66**	**0.02**	**0.09**	**0.17**	**0.10**
							372.0	*394.5*	*2.6*	*3.0*		*1.45*	*0.72*	*1.11*	*0.03*	*0.11*	*0.17*	*0.13*
SMSU	08TK0067	490734.7	5168847.4	389.0	168	-70	**408.0**	**509.5**	**101.0**	**101.5**	**590.4**	**2.65**	**1.02**	**2.07**	**0.05**	**0.20**	**0.49**	**0.29**
							432.0	*471.0*	*38.8*	*39.0*		*4.53*	*1.58*	*3.74*	*0.10*	*0.14*	*0.39*	*0.26*
SMSU	08TK0073	490846.4	5168867.4	389.5	251	-74	**309.5**	**386.0**	**75.4**	**76.5**	**550.5**	**0.53**	**0.25**	**0.40**	**0.01**	**0.05**	**0.08**	**0.05**
							360.5	*363.5*	*3.0*	*3.0*		*1.12*	*0.48*	*0.88*	*0.02*	*0.08*	*0.11*	*0.07*
SMSU	08TK0074	490845.7	5168867.2	389.3	250	-77	**305.3**	**398.5**	**91.0**	**93.2**	**531.9**	**1.62**	**0.75**	**1.26**	**0.04**	**0.11**	**0.15**	**0.09**
							332.5	*353.5*	*8.8*	*9.0*		*3.03*	*1.31*	*2.42*	*0.06*	*0.20*	*0.19*	*0.17*
SMSU	08TK0075	490587.7	5168609.8	389.9	71	-68	**435.5**	**504.0**	**68.3**	**68.5**	**578.1**	**3.60**	**1.46**	**2.84**	**0.07**	**0.21**	**0.52**	**0.33**
							450.5	*495.5*	*44.9*	*45.0*		*4.61*	*1.75*	*3.72*	*0.09*	*0.19*	*0.53*	*0.38*

Zone	Hole No.	Easting	Northing	Elevation	Az	Dip	From	To	True Width (m)	Sample Length	Total Hole Length	NiEq %	Cu %	Ni %	Co %	Au g/t	Pt g/t	Pd g/t
SMSU	08TK0076	490593.3	5168728.4	390.3	101	-69	430.0	493.5	57.1	63.5	553.8	1.22	0.61	0.79	0.02	0.26	0.57	0.31
							456.0	469.5	12.1	13.5		2.35	1.11	1.58	0.04	0.44	0.97	0.55
SMSU	08TK0077	490592.3	5168728.6	390.3	100	-72	438.5	482.0	39.5	43.5	558.1	0.61	0.23	0.39	0.01	0.13	0.36	0.21
							458.0	464.0	5.4	6.0		1.07	0.42	0.70	0.02	0.24	0.56	0.34
SMSU	08TK0079	490588.9	5168604.7	389.9	90	-66	457.6	527.0	59.5	69.4	582.8	2.75	1.10	2.17	0.06	0.18	0.39	0.27
							476.0	504.5	24.5	28.5		4.59	1.63	3.79	0.10	0.12	0.37	0.28
SMSU	08TK0081	490587.2	5168609.5	390.1	71	-69	437.5	524.0	86.1	86.5	601.1	1.96	0.78	1.47	0.04	0.23	0.50	0.30
							466.9	489.0	22.0	22.2		3.89	1.34	3.18	0.09	0.17	0.39	0.32
SMSU	08TK0082[1]	490586.7	5168609.4	390.0	70	-73	461.5	478.0	16.3	16.5	708.5	0.21	0.04	0.15	0.01	0.03	0.10	0.05
SMSU	08TK0083	490583.4	5168541.9	390.2	98	-67	528.5	585.5	50.4	57.0	705.0	0.45	0.16	0.30	0.01	0.10	0.23	0.14
							555.5	558.5	2.7	3.0		1.33	0.68	0.78	0.02	0.45	0.74	0.54
SMSU	08TK0086	490583.9	5168542.3	389.9	82	-68	500.0	561.5	52.0	61.5	621.5	2.53	0.92	1.96	0.05	0.26	0.50	0.31
							515.0	545.0	25.5	30.0		3.39	1.13	2.74	0.08	0.23	0.45	0.29
SMSU	08TK0089	490846.4	5168866.3	388.8	237	-76	316.8	487.5	166.4	170.7	603.7	2.88	1.22	2.27	0.06	0.18	0.34	0.23
							353.2	464.5	65.5	67.2		4.68	1.88	3.84	0.09	0.16	0.26	0.22
SMSU	08TK0090	490848.4	5168865.9	389.7	217	-71	350.0	465.5	110.5	115.5	534.0	1.23	0.62	0.87	0.02	0.17	0.30	0.17
							433.0	446.5	12.9	13.5		2.37	1.09	1.78	0.05	0.28	0.43	0.26
SMSU	08TK0091	490595.7	5168734.3	390.2	79	-65	391.1	420.5	29.4	29.5	526.7	0.76	0.34	0.58	0.02	0.08	0.11	0.07
							410.0	411.5	1.5	1.5		2.68	0.59	2.36	0.06	0.01	0.18	0.10
SMSU	08TK0093	490598.1	5168729.3	390.3	64	-57	389.0	413.0	23.5	24.0	545.0	0.85	0.43	0.56	0.02	0.14	0.36	0.19
							395.0	398.0	2.9	3.0		1.73	1.30	1.18	0.03	0.18	0.21	0.13
SMSU	09TK0094	490969.9	5168798.7	388.9	310	-61	349.5	408.0	55.5	58.5	509.6	0.84	0.42	0.64	0.02	0.06	0.08	0.05
							366.0	372.0	5.7	6.0		1.56	0.89	1.17	0.03	0.14	0.14	0.09

Zone	Hole No.	Easting	Northing	Elevation	Az	Dip	From	To	True Width (m)	Sample Length	Total Hole Length	NiEq %	Cu %	Ni %	Co %	Au g/t	Pt g/t	Pd g/t
SMSU	10TK0127	490909.2	5169023.5	388.6	282	-86	**302.5**	**355.0**	**48.0**	**52.5**	**599.9**	**0.99**	**0.45**	**0.72**	**0.02**	**0.12**	**0.23**	**0.13**
							349.0	*352.0*	*2.7*	*3.0*		*1.38*	*0.71*	*0.88*	*0.02*	*0.25*	*0.69*	*0.33*
SMSU	12TK0162	490775.1	5168528.7	388.3	230	-90	**475.0**	**530.0**	**49.9**	**55.0**	**620.9**	**0.88**	**0.40**	**0.55**	**0.02**	**0.20**	**0.51**	**0.32**
							494.0	*500.0*	*5.4*	*6.0*		*1.68*	*0.82*	*1.03*	*0.03*	*0.40*	*1.00*	*0.50*
MSU	08TK0049	490717.8	5168728.4	391.2	183	-80	**396.0**	**408.0**	**10.9**	**12.0**	**553.5**	**7.51**	**3.30**	**6.03**	**0.11**	**0.33**	**0.67**	**0.59**
MSU	08TK0058	490590.2	5168609.4	389.8	89	-71	**448.8**	**452.2**	**2.9**	**3.3**	**649.5**	**6.13**	**2.56**	**4.96**	**0.08**	**0.46**	**0.52**	**0.45**
MSU	08TK0068	490733.3	5168847.3	388.8	194	-75	**378.4**	**383.7**	**4.8**	**5.3**	**516.3**	**3.14**	**0.99**	**2.64**	**0.06**	**0.06**	**0.23**	**0.22**
							378.4	*382.2*	*1.9*	*2.0*		*7.71*	*2.40*	*6.53*	*0.15*	*0.13*	*0.50*	*0.53*
MSU	08TK0075	490587.7	5168609.8	389.9	71	-68	**420.5**	**423.7**	**3.2**	**3.2**	**578.1**	**6.14**	**2.11**	**5.17**	**0.10**	**0.09**	**0.44**	**0.35**
MSU	08TK0077	490592.3	5168728.6	390.3	100	-72	**396.4**	**409.9**	**12.3**	**13.6**	**558.1**	**7.07**	**2.68**	**5.82**	**0.13**	**0.22**	**0.51**	**0.44**
MSU	08TK0081	490587.2	5168609.5	390.1	71	-69	**421.1**	**431.6**	**10.4**	**10.5**	**601.1**	**6.40**	**3.04**	**4.98**	**0.09**	**0.28**	**0.96**	**0.52**
MSU	08TK0083	490583.4	5168541.9	390.2	98	-67	**497.5**	**507.8**	**9.1**	**10.3**	**705.0**	**8.60**	**2.89**	**7.01**	**0.14**	**0.30**	**1.51**	**0.70**
MSU	08TK0086[1]	490583.9	5168542.3	389.9	82	-68	**466.5**	**469.5**	**2.5**	**3.0**	**621.5**	**0.02**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
MSU	12TK0162	490775.1	5168528.7	388.3	230	-90	**439.1**	**443.0**	**3.6**	**3.9**	**620.9**	**3.18**	**1.15**	**2.64**	**0.06**	**0.13**	**0.13**	**0.23**
							439.1	*439.9*	*0.7*	*0.8*		*4.10*	*2.62*	*3.03*	*0.07*	*0.33*	*0.21*	*0.26*
							441.3	*443.0*	*1.6*	*1.7*		*5.20*	*1.42*	*4.49*	*0.10*	*0.14*	*0.18*	*0.39*
138	09TK0095[1]	490983.2	5168407.4	388.8	265	-74	**435.0**	**485.7**	**U**[2]	**50.7**	**663.9**	**0.27**	**0.06**	**0.20**	**0.01**	**0.03**	**0.09**	**0.05**
138	12TK0136[1]	490980.7	5168402.7	388.5	282	-72	**446.5**	**465.0**	**U**[2]	**18.5**	**700.1**	**0.42**	**0.12**	**0.29**	**0.01**	**0.07**	**0.24**	**0.12**
138	12TK0138	491124.9	5168285.5	388.5	274	-74	**431.5**	**572.3**	**U**[2]	**140.8**	**731.5**	**1.58**	**0.96**	**1.03**	**0.03**	**0.20**	**0.64**	**0.18**
							443.1	*572.3*	*U*[2]	*28.5*		*3.11*	*2.05*	*2.15*	*0.05*	*0.39*	*0.62*	*0.31*
138	12TK0146	491125.4	5168286.2	388.5	293	-75	**432.0**	**539.0**	**U**[2]	**107.0**	**670.0**	**0.68**	**0.33**	**0.50**	**0.02**	**0.08**	**0.12**	**0.07**
							442.3	*477.9*	*U*[2]	*4.7*		*2.10*	*1.20*	*1.52*	*0.04*	*0.31*	*0.25*	*0.16*
138	12TK0148[1]	490982.1	5168404.4	388.4	276	-72	**442.0**	**474.9**	**U**[2]	**32.9**	**577.3**	**0.32**	**0.09**	**0.24**	**0.01**	**0.04**	**0.11**	**0.06**

Zone	Hole No.	Easting	Northing	Elevation	Az	Dip	From	To	True Width (m)	Sample Length	Total Hole Length	NiEq %	Cu %	Ni %	Co %	Au g/t	Pt g/t	Pd g/t
138	12TK0153	490982.0	5168404.6	388.4	161	-82	**424.5**	**539.8**	**U[2]**	**115.3**	**683.7**	**0.61**	**0.29**	**0.44**	**0.02**	**0.06**	**0.11**	**0.06**
							518.6	*519.1*	*U[2]*	*0.5*		*12.88*	*7.56*	*9.89*	*0.20*	*0.07*	*0.89*	*0.94*
							529.0	*530.2*	*U[2]*	*1.2*		*1.61*	*0.36*	*1.37*	*0.02*	*0.18*	*0.17*	*0.14*
138	12TK0156	490996.1	5168293.5	388.3	293	-83	**420.5**	**532.3**	**U[2]**	**111.8**	**703.8**	**1.24**	**0.67**	**0.90**	**0.03**	**0.14**	**0.22**	**0.12**
							495.5	*521.6*	*U[2]*	*12.0*		*1.92*	*0.95*	*1.46*	*0.04*	*0.13*	*0.26*	*0.18*
138	12TK0158[1]	490849.8	5168417.9	388.3	58	-89	**418.4**	**468.3**	**U[2]**	**50.0**	**594.7**	**0.29**	**0.07**	**0.21**	**0.01**	**0.03**	**0.10**	**0.06**
138	12TK0160	490996.5	5168293.4	388.3	240	-86	**417.5**	**579.0**	**U[2]**	**161.5**	**634.0**	**1.32**	**0.74**	**0.94**	**0.03**	**0.16**	**0.25**	**0.15**
							434.0	*574.0*	*U[2]*	*23.7*		*3.19*	*1.72*	*2.40*	*0.05*	*0.25*	*0.44*	*0.28*
138	13TK0167	490921.6	5168361.1	388.2	240	-89	**417.0**	**509.3**	**U[2]**	**92.3**	**635.8**	**0.42**	**0.14**	**0.31**	**0.01**	**0.05**	**0.12**	**0.06**
							484.1	*484.6*	*U[2]*	*0.5*		*2.00*	*0.40*	*1.71*	*0.04*	*0.12*	*0.32*	*0.15*
138	13TK0171	491049.2	5168348.3	388.7	157	-90	**419.0**	**532.5**	**U[2]**	**113.5**	**641.9**	**0.89**	**0.45**	**0.65**	**0.02**	**0.11**	**0.17**	**0.10**
							471.4	*527.0*	*U[2]*	*1.5*		*3.21*	*1.37*	*2.51*	*0.05*	*0.17*	*0.58*	*0.27*
138	13TK0189	491051.3	5168339.9	388.7	47	-85	**416.8**	**527.1**	**U[2]**	**110.4**	**652.7**	**0.52**	**0.20**	**0.38**	**0.02**	**0.06**	**0.12**	**0.07**
							459.5	*463.3*	*U[2]*	*0.9*		*2.11*	*1.00*	*1.66*	*0.04*	*0.07*	*0.21*	*0.15*
							523.8	*524.1*	*U[2]*	*0.3*		*4.69*	*3.28*	*3.24*	*0.05*	*0.32*	*0.85*	*0.76*
138	13TK0194[1]	490880.6	5168388.9	388.8	145	-89	**417.2**	**500.2**	**U[2]**	**83.0**	**615.0**	**0.28**	**0.07**	**0.21**	**0.01**	**0.03**	**0.06**	**0.04**

Notes: [1] No significant mineralization intercepts for these holes

[2] U = Unknown true width

Bold text indicates total hole composite used for mineral resource calculation.

Italic text indicates a significant intersection within the larger composite.

10.2.1 Drill Site Management

Drilling at the Tamarack North Project is challenged by the extensive wetlands. Drilling initially was restricted to winter months with frozen ground to minimise impacts to swamps and wetlands in the project area. In 2008, drilling was also initiated in the summer months using swamp mats for both access roads and drill platforms which have been very successful in minimising the impact on the environment.

Kennecott has implemented and maintained strict environmental and safety protocols with regard to drilling which include; drilling contracts that ensure safety standards are not compromised; the use of swamp mats for drill platforms and access; and photographing the site before and after drilling and rehabilitation.

Diamond drilling diameters used at the Tamarack North Project have been NQ and HQ. Sonic drilling has been used extensively to pre-collar holes through the overlying glacial sediments which are then completely cased off prior to commencing diamond core drilling. All casing depths and sizes are recorded in the acQuire database.

Typical industry standard procedures are followed with all drilling and are outlined in the ‘Tamarack Core Processing Procedures Manual’ including:

- All statutory permits and approvals were received by the appropriate regulatory bodies prior to drilling.
- Drill collars were initially located in the field using a handheld GPS. Following completion of drilling each collar is professionally surveyed and the collar position permanently marked with a marker on a cement cap. If a permanent marker cannot be established because of ground conditions a certificate is issued by the surveyor. Collar positions are subsequently checked against high resolution satellite imagery.
- Closure of holes follow regulatory procedures as outlined by the MDH both for permanently abandoned holes, which are cemented from the base to surface with all casing removed, and temporarily abandoned holes, which are temporarily sealed according to regulations if there is a possibility of the hole being deepened or the hole is awaiting a downhole EM survey.

10.2.2 Core Delivery and Logging

Kennecott has defined and adopted clear procedures for core processing. A split-tube coring system has been adopted for all non-reconnaissance holes with core being transferred to V-rails directly from the core tube. Core is then transported a short distance to the core storage site via a customized, secure, v-rail enabled trailer. Core is only transferred to core boxes by the geologist after transport to the core storage site and after being marked-up and processed. This procedure minimises breakage and ensures the core-orientation (by the Reflex Ace Core Orientation Tool - ACT) that is used with each core-run is maintained.

10.2.3 Geological Logging Procedures

Geological summary logging is completed immediately on receiving the core while still in the V-rails and is intended to provide an overview of the key lithologies and features with accurate estimates of mineralization. The main unit lithologies are recorded with the codes; SED, FGO, CGO, MZ, SMSU, MSU, MMS etc. The logs are entered into the acQuire database and also prioritised for detailed logging.

Prioritisation of core is determined during the summary logging. High priority core is processed, and logged as soon as possible. Lower priority core is retained and stored in V-rails until it can be processed and logged.

Core processing and logging procedures include:

- Reference orientation line marking (based on the Reflex Ace Core Orientation Tool - ACT)
- Measurement conversion and run depth marking (Imperial to Metric)
- Run recovery logging and marking (core loss record)
- Core photography both on rails and boxes
- Detailed geotechnical logging: (logging interval based on geological domains and varied with detail required typically 3.05 m to 6 m). Standard logging and testing includes.
  - IRS Hardness (Rock strength estimation)
  - L10 (RQD)
  - Micro Defects
  - Alteration Intensity
  - Joint and fracture count and categorisation
  - Open and cemented joint set number
  - Point load testing (every 20m)
  - UCS Sampling (uniaxial compressive strength)
  - Geotechnical Major Structures (Interval structure logging)
- Detailed Geological Logging: Detailed geological logging is an important process for recording and understanding the geology and mineralization. Kennecott has adopted the system of logging into the acQuire database with specific custom fields and drop-down lists to ensure consistency. The logging includes a lithology log, an alteration log, a mineralization log, a point structure log, a linear structure log (where structure orientations and dips are measured); and a magnetic susceptibility log with a handheld magnetometer (discontinued temporarily in 2008 but subsequently resumed).

10.2.4 Surveying

All collars are professionally surveyed to sub-meter accuracy after completion of the drill hole.

Down-hole deviation surveys are conducted on all holes at the Tamarack North Project and include two independent surveys conducted on the holes completion, these include:

1) A multi-shot survey with a magnetic tool (Flexit) provided by the drill contractor (survey shots conducted at least 10 m intervals).

2) A multi-shot gyroscopic survey conducted by a down-hole survey contractor (survey shots conducted at a minimum of 20 m intervals).

The Flexit tool is susceptible to poor azimuth accuracy in the presence of strongly magnetic lithologies, such as those found at the Tamarack North Project. However, the dip readings are not affected by in hole magnetics and provide a reliable source of dip measurements as the hole progresses. Multishot gyroscopic surveys are not affected by magnetics and provide accurate downhole deviation.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Core Sampling and Chain of Custody

Standardized core sampling procedures were introduced by Kennecott in January 2007 and so have been incorporated for all the sampling at the Tamarack North Project with only minor modifications made subsequently. It is standard practice to sample all core irrespective of lithology type or sulphide content, although sulphide intervals are prioritised. Core is sampled on a minimum of 0.5 m intervals to a maximum of 3 m with 1.5 m being the most common sample length.

The following procedures are adhered to:

- Core is picked up at the drill site by Kennecott staff and returned to the secure core logging facility in the town of Tamarack (Figure 11-1).

Figure 11-1: Photo of Kennecott Core Processing Facility Tamarack, Minnesota.

- Once at the core processing facility, the core is “quick logged” for major lithological units and sulphide mineralization, then entered into the acQuire system database. Further detailed lithological logging will occur later in the process chain once geotechnical logging processes have occurred.
- Sample interval marking: Duplicate sample tags are displayed on the V-rails for photographing as well as after the core is transferred they are stapled to the core boxes.
- Core photography is conducted after the sample mark-up is completed on V-rails. Boxed core is also photographed and was reintroduced in 2012 after being discontinued in 2008.
- Density tests are performed every 20 m, based on 10 cm intervals of core, for all the samples submitted for the geotechnical UCS tests, post January 2009. The density tests include a hydrostatic-gravimetric test.
- Core sawing is conducted after core marking and sample tagging has occurred. Core is consistently cut 1cm to the right of the orientation line. Both halves are returned to the box.
- Sample packaging: half-core samples are packed, after air drying, in individual plastic bags with the sample ticket inserted inside the bag and the sample number written in permanent marker on the outside.
- The quality control protocol is documented by Kennecott and has been generally followed at the Tamarack North Project since the start of the programme (reportedly modified to the present procedure in early 2008). Current quality control samples include:
  - Blanks; inserted at the beginning of every batch, at every 30th sample, at changes in lithology, and specifically, prior to and after highly mineralised samples. Blanks used have included LV Silica Sand; GABBRO-1 (half core from hole 07L039); GABBRO-2 half core from 07L038 (since July 2008).
  - Standards; a matrix matched standard (corresponding to the sulphide content of the flanking sample) is inserted into the sample stream every 30 samples. A corresponding standard is also to be inserted at significant changes in mineralization. The standards were prepared from course rejects of the Eagle Deposit (Michigan) (EA type) and Tamarack North Project (TAM type) drillholes and are Lab certified (Round Robin Testing).
  - Duplicates: Field; Coarse Reject and Pulp duplicates are routinely used to monitor sampling and assay precision according to the following protocols:
    - Field Duplicates include two quartered core lengths submitted consecutively every 30 samples and are offset from the standards by 10 samples.
    - Coarse Reject Duplicates are splits from the coarse reject material that are inserted every 20 samples by the lab at the request of Kennecott.
    - Pulp Duplicates are randomly generated and assayed by ALS Chemex as an internal process at a rate of one every 30 samples.
    - Check assays from a secondary laboratory were not utilized by Kennecott to confirm the quality of the ALS Chemex values.

- Sample batches are packed in collapsible plastic bins for shipping. Sample consignments are limited to 200 samples and are grouped in batches of the same rock types and using the same assay methods. A dispatch form is created, with one copy being sealed in the container and the other e-mailed to the lab. The container is sealed with randomly selected, security tags that are listed in the Chain of Custody Sheet. Access to the samples cannot occur without breaking a seal.
- Samples are shipped to ALS Chemex lab in Thunder Bay, Ontario, Canada via Manitoulin Transport for sample preparation.
- The Chain of Custody Sheet will be signed upon receipt at the lab in Thunder Bay, confirming that they are not damaged or tampered with. These forms are scanned and e-mailed to Kennecott.

ALS Chemex is independent to Kennecott and Talon and is one of the world's largest and diversified testing services provider and has over 120 laboratories and offices in the Minerals Division. The ALS Thunder Bay and Vancouver laboratories are accredited by the Canadian Association for Laboratory Accreditation and Standards Council of Canada (http://www.alsglobal.com/).

11.2 Sample Preparation and Assay Protocols

Sample Preparation at ALS Chemex in Thunder Bay includes the following procedure:

- Samples are logged into the ALS Chemex database.
- Crush entire sample to 90% -2mm or better (CRU-32).
- Split off 250g using riffle splitter and pulverize to greater than 85% passing 75 micron (PUL-31).
- Vacuum seal master pulp and analytical split in plastic bag. Re-vacuum seal bag after opening bags to obtain assay aliquots.
- Wash pulverizers with barren material on a regular basis and after high-grade samples.
- Split duplicate sample from the coarse reject material every 20th sample.
- Conduct crushing quality control test every 20th to 40th sample.
- Conduct pulverizing quality control test every 20th to 40th sample.

Sample analysis are conducted at ALS Chemex's Vancouver laboratory. The methodology for ore-grade material (Ni>0.25%, Cu>0.1%, S>0.6%) at Tamarack is reported as follows:

- ALS Chemex Code ME-ICP81 - Multi-element ore-grade assay by sodium peroxide fusion/ICP-AES finish for 18 elements, including Cu, Ni, Co, and S.
- ALS Chemex Code PGM-ICP24 - 50g lead collection fire assay/ICP-AES finish for Au, Pt and Pd.
- ALS Chemex Code S-IR08 - Total sulfur by Leco furnace.

Other analytical methods conducted by ALS Chemex for rock characterisation and low grade samples include:

- ALS Chemex Code ME-ICP61 - 33 elements by HF-HNO3-HClO4 acid digestion, HCl leach, and ICP-AES finish.
- ALS Chemex Code ME-MS61 - Trace 48 element 4-acid 'near total' digestion / ICP-AES/MS plus Hg by cold vapor (ALS Chemex Code Hg-CV41).
- ALS Chemex Code ME-ICP06 - Whole rock package for 13 oxides plus loss on ignition (ALS Chemex Code OA-GRA05) and total (ALS Chemex TOT-ICP06) - Lithium metaborate or tetraborate fusion / ICP-AES finish.
- ALS Chemex Code ME-MS81 – Trace 38 elements by lithium meta-borate fusion and ICP-MS finish.
- ALS Chemex Code ME-4ACD81 – Nine (9) base metals by 4-acid digestion/ICP-AES finish (Ag, As, Cd, Co, Cu, Mo, Ni, Pb, and Zn).
- ALS Chemex Code ME-MS42 – Six (6) elements by aqua regia digest / ICP-MS finish (iAs, Bi, Hg, Sb, Se, Te).

11.3 Assay Data Handling

After receiving assay results for each despatch, QA/QC standards, blanks and duplicate data are immediately processed (GOMS acQuire) to confirm that results are consistent with expected ranges and values. The values reported for ALS Chemex's internal standards are also monitored. Kennecott has adopted a number of rules of variance that are acceptable versus those of exceedance. An internal QA/QC Analysis manual is available for all users of the data. If analyses are exceeded then the sample is logged as a "Fail" and an investigation is initiated. Reanalysis, sample switch checks, and other means of investigation are acted upon to resolve exceedances. All actions are tracked and logged (See Figure 11-2). Assay data is only considered final within the acQuire system once they have passed all QA/QC checks.

LEGEND

	= loaded
	= pending QC
	= pending revision

Tamarack - Lakeview Assay Batch Tracking Sheet

Despatch	Workorder	Date Samples received	Date Assays Finalized	Project	Hole ID	QC Status	QC Final	Date assays loaded to database	Failure Rule	Standard ID	Sample ID for Failed Sample(s)	Elements	Date ALS Chemex Advised of Failure	Date re-runs received	Comments
E40370	VA08019642	18/02/2008	10/03/2008	Tamarack	08L042	Failed	Passed	02/06/2008	1	EA-02	40013265	Au, Pt, Pd			assays imported by Peter T
E40371	VA08028862	12/03/2008	08/04/2008	Tamarack	08L040	Passed		08/07/2008							assays imported by Peter T
E40372	VA08028863	12/03/2008	05/04/2008	Tamarack	08L045	Passed		08/07/2008							assays imported by Peter T
E40373	VA08033273	18/03/2008	17/04/2008	Tamarack	08L042	Passed		08/07/2008							assays imported by Peter T
E40374	VA08015798	25/03/2008	23/04/2008	Lakeview	08L044	Passed		24/07/2008							assays imported by Peter T
E40375	VA08049561	17/04/2008	22/05/2008	Lakeview	07L038	Passed		27/05/2008							assays imported by Peter T
E40376	VA08042717	07/04/2008	21/05/2008	Tamarack	08L041	Failed	Passed	11/06/2008	1	EA-01	40013135, 40013235	Cu, Nu	22/05/2008	06/06/2008	Values for re-runs pass; initial failure due to c
E40377	VA08049299	17/04/2008	22/05/2008	Lakeview	07L039	Passed		23/05/2008							assays imported by Peter T
E40378	VA08049292	17/04/2008	22/05/2008	Tamarack	07L037	Passed		27/05/2008							assays imported by Peter T
E40379	VA08049560	17/04/2008	22/05/2008	Tamarack	04L015	Failed	Passed	11/06/2008	1	EA-01	40014395	Au, Pt, Pd	23/05/2008	03/06/2008	Values for re-runs pass; cause of initial failur
E40380	VA08036667	18/02/2008	21/06/2008	Tamarack	08L042	Failed									check samples(?) - unknown assay method, r
E40381	TB08077084	12/06/2008	04/07/2008	Tamarack	08TK0048	Passed		03/07/2008							assays imported by Peter T
E40382	TB08083297	25/06/2008	15/07/2008	Tamarack	08TK0048 & 49	Failed	Passed	20/08/2008	1	EA-01	40015030	Au	16/07/2008	8/13/08	assays imported by Peter T - sample number
E40383	TB08088647	02/07/2008	23/07/2008	Tamarack	08TK0050	Failed	Passed	03/09/2008					30/07/2008		assays imported by Peter T.

Figure 11-2: Table of Failures and Corrections

11.4 Quality Assurance and Quality Control (QA/QC)

QA/QC programs are intended to monitor the accuracy and precision of the sampling and analysis process in order to quantify the reliability and accuracy of assay data. Typical QA/QC programs consist of a routine insertion of QC materials to measure laboratory performance. QC materials generally consist of certified reference materials including standards and blanks (materials containing no economic minerals) as well as duplicate samples (duplicates).

The Tamarack North Project has shown Quality Assurance programs consistent with industry standards. Written procedures, acceptable industry software, database organization, and data presentation all contribute to confidence in the current program. Quality Control at the Tamarack North Project has evolved over the life of the project. The initial phase of the project saw duplicates, blanks and standards inserted at a rate of approximately 5% to 6%. With the maturity of the program and confidence in the laboratory the rate of insertion has been reduced to 3.5% to 4%. There is a consistent program of analysing duplicates of pulps, coarse rejects and core. However, of the files provided, analysis of blanks only exist up to the 2009 drill holes, analysis of core, coarse rejects and pulp duplicates exist up to the 2009 drill holes, while analysis of standards exist up to the 2012 program.

The QA/QC standards, blanks and duplicate testing protocols applied by Kennecott are outlined in Section 11.1.

It is Golder's opinion that the sample preparation, security and analytical procedures used by Kennecott are consistent with industry standards and are appropriate for the Tamarack North Project. Golder has no material concerns with these processes.

Golder recommends that Kennecott prepare an annual report summarizing the QA/QC analysis of their CRM data and that they incorporate laboratory check assays, from a referee lab, into their protocol to confirm the quality of assay values from their primary lab.

12.0 DATA VERIFICATION

12.1 Golder 2014

Golder has completed a number of data verifications while completing the mineral resource estimate for the Tamarack North Project. The verifications include a check of the drill hole database provide against original assay records and a site visit by a QP to the site to check drill hole collars, logging procedures, sample of custody and the collection of independent samples for metal verification. In addition, Golder has completed a number of verifications of the mineral resource estimate which is outlined in Section 14.

12.1.1 12.1.1. Database Verification

Golder compared 2091 sample assays for Ni%, Cu%, Co%, Pt ppm, Pd ppm, Au ppm, from the supplied drill hole database to the original ALS Chemex certificates. The database encompasses the entire set of drill holes at Tamarack North Project. Samples found within the resource areas were preferentially chosen (2008 to 2013 drill programs – Tamarack North Project) as they are material to the validity of the resource estimate. Assay certificates were available for all samples. A summary of the data validation is listed in Table 12-1

Table 12-1: Drill Hole Sample Data Validation

# of Holes	# of Samples	# of Assays	# of Errors
37	2,091	25,983	0

Only a small selection of all the drill holes at Tamarack North Project were validated against the original data. A total of 37 drill holes (2,091 samples), which represents 8.3% of the total available assay data, was reviewed. No errors were identified in any of the validated samples. No validation checks were completed on the remaining samples since most drill holes and samples were not to be included in the mineral resource estimate. It should be noted that certain assay values in ppm were expressed as percentages rounded to three decimal places in the database. Values below the detection limit were set to half of the detection limit instead of a zero value.

12.1.2 Site Visit

A site visit to the Tamarack North Project and Kennecott office, located in the town of Tamarack, Minnesota was carried out by Brian Thomas, P.Geo., a QP for this mineral resource estimate and Technical Report, on July 16, 2014. No active drilling or core logging was ongoing at time of the visit. The visit to the Tamarack North Project included:

- An overview tour of the exploration property,
- Inspection and GPS co-ordinate reading of drill collars 08TK0054, 08TK0058, 08TK0079 and 12TK0158. (See Table 12-2)
- Visual inspection of physiography and general conditions.

Table 12-2: Validation Check of Drill Collars.

HOLE NUMBER	SOURCE	EASTING	NORTHING	ELEVATION
08TK0054	Kennecott	490713	5168726	391
	Golder	490713	5168727	395
08TK0058	Kennecott	490590	5168609	390
	Golder	490588	5168610	391
08TK0079	Kennecott	490589	5168605	390
	Golder	490584	5168607	389
12TK0158	Kennecott	490850	5168418	388
	Golder	490850	5168419	390

All collar co-ordinates were found to closely match the Kennecott co-ordinates, generally within the accuracy of the GPS readings (+/- 3m).

The site visit to the Kennecott office and core logging facilities in Tamarack, Minnesota, included the following items:

- Review of the logging and sampling procedures used on the drill holes;

- Review core logs against the core available at time of visit;
- Review of the Tamarack geological and mineralization characteristics with Kennecott staff;
- Collection of representative duplicate samples for analysis at an independent laboratory;
- Collection and review of all available data required for the mineral resource estimate;
- Review of QA/QC protocol; and
- Review of sampling and shipping protocol.

No significant issues were identified during the review of data collection procedures and sample chain of custody. The core logging matched the core well and all processes were found to meet or exceed industry standards.

12.1.3 Independent Sampling

As part of the sample verification program 9 core samples and 3 CRM's samples were collected and transported back to Sudbury, Ontario, Canada where they were analysed by Actlabs using sodium peroxide fusion with ICP finish for base metals including Ni, Cu, and Co and fire assay with ICP finish for precious metals including Pt, Pd, and Au. Two Kennecott standards and 1 blank sample were also submitted to Actlabs to confirm their precision and accuracy. Specific gravity was also measured on the pulps. The Actlabs laboratory in Sudbury is certified ISO 17025.

The objective of the samples collected was to represent the low, medium and high grade mineralised samples of the 3 mineralized domains, and to confirm specific gravity. Pictures of samples representing each mineral domain are displayed in Figures 12-1 to 12-3.

Figure12- 1: Example of Core from the 138 Zone

Figure12- 2: Example of Core from the SMSU

Figure 12- 3: Example of Core from the MSU

Golder Samples 1310101-1310104 were from hole 12TK0138 (138), samples 1310105-1310107 (SMSU) were from hole 08TK0079, while samples 1310108-1310109 were from 12TK0158 (MSU). Sample 1310110 was a typical blank, and samples 1310111-1310112 were medium and high grade standards. Generally the low to medium grade samples compared favourably as seen in Table 12-3 and Figures 12-4 to 12-6. However, the higher grade samples (Figure-12-5) incurred a little more variation but this is likely due to sample volume variance (Kennecott samples were ½ core while Golder used ¼ core) than due to analytical concerns. All assay results were found to fall within acceptable tolerances of the Kennecott results and no grade bias was evident.

The specific gravity measured from sample pulps showed some variance to the measurements taken from whole core by ALS Chemex. SG measurements from ALS Chemex were only available for the MSU and SMSU domains. Kennecott collected field SG measurements from select sections of core in the 138 Zone. These values were not used by Golder because there was concern regarding how representative they were with respect to the sample interval.

Table 12-3: Sample Validation Check

		Cu %		Ni%		Co%		Au ppm (g/t)		Pt ppm (g/t)		Pd ppm (g/t)		Spec Grav	
Golder No.	Kennecott No.	GOLDER	Kennecott	GOLDER	Kennecott	GOLDER	Kennecott	GOLDER	Kennecott	GOLDER	Kennecott	GOLDER	Kennecott	GOLDER	Kennecott
1310101	40064017	1.8	1.71	2.23	2.08	0.045	0.042	0.242	0.427	0.287	0.316	0.251	0.258	2.87	0
1310102	40064027	0.967	0.892	1.03	0.924	0.027	0.025	0.114	0.313	0.202	0.186	0.114	0.117	2.89	0
1310103	40064076	1.75	1.645	1.64	1.67	0.039	0.039	0.215	0.246	0.395	0.4	0.273	0.286	2.78	0
1310104	40064087	0.704	0.671	0.835	0.769	0.025	0.024	0.096	0.108	0.214	0.1945	0.139	0.137	2.78	0
1310105	40031592	1.1	1.525	1.81	2.62	0.044	0.058	0.15	0.227	0.197	0.348	0.312	0.469	2.92	3.29
1310106	40031612	1.64	1.59	4.08	4.15	0.097	0.1	0.182	0.101	0.471	0.543	0.371	0.338	3.28	3.38
1310107	40031616	1.58	1.475	3.4	3.54	0.09	0.096	0.141	0.142	0.371	0.293	0.352	0.339	3.37	3.45
1310108	40067371	1.67	1.595	6.07	5.11	0.125	0.107	0.385	0.249	0.346	0.543	0.61	0.504	3.44	0
1310109	40067377	2.59	1.88	5.47	4.73	0.121	0.102	0.33	0.445	0.497	0.872	0.651	0.483	3.37	0
1310110	blank	0.006	0	0.008	0	0.008	0	< 2	0	< 5	0	< 5	0	2.78	0
1310111	standard	1.35	1.35	3.35	3.34	0.087	0.0087	0.149	0.134	0.386	0.364	0.26	0.272	3.28	0
1310112	standard	4.35	4.52	6.26	6.607	0.162	0.179	0.227	0.265	1.2	1.2	0.794	0.778	4.18	0

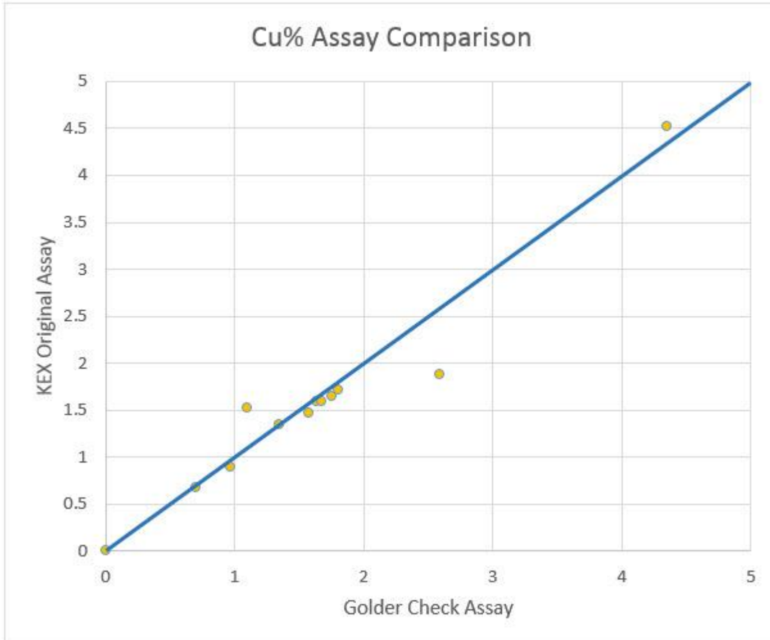


Figure 12- 4: Validation Check of Copper Assays

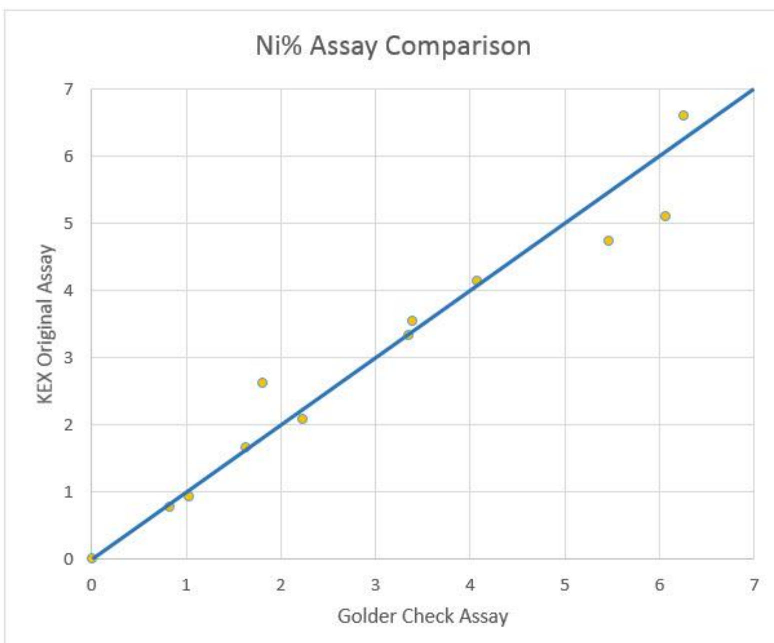


Figure 12- 5: Validation Check of Nickel Assays

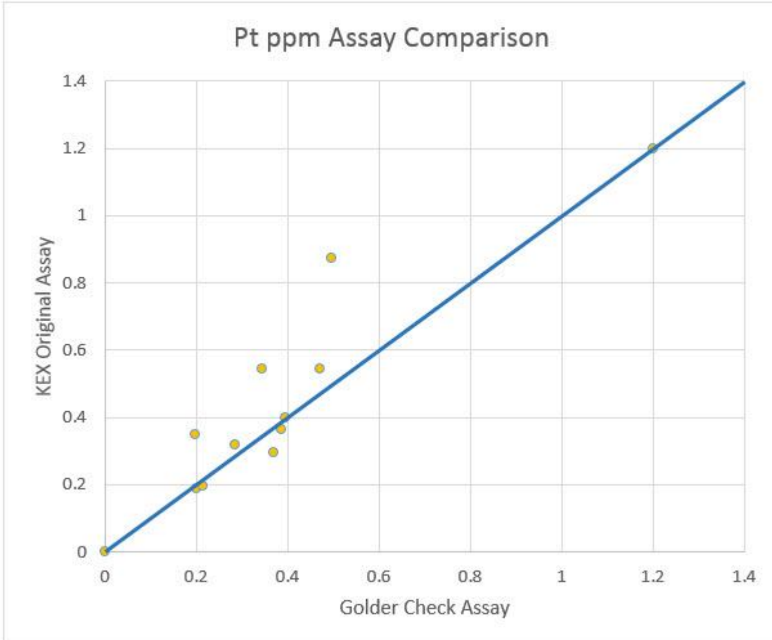


Figure 12- 6: Validation Check of Platinum Assays

On completion of the data validation, site visit and verification sampling, Golder has concluded that the quality of the assay data is of suitable quality to support the mineral resource estimate. Golder recommends that specific gravity measurements are completed from sample pulps where data is currently only available from field measurements.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

Metallurgical testing of 24 drill core samples (including three composite samples) from the Tamarack North Project was carried out in two phases between 2006 and 2012. Metallurgical testing of the Tamarack North Project was carried out in two phases: From 2006-2010 samples consisting of high grade mineralization from the SMSU hosted in the CGO and low grade mineralization from the CGO were submitted to SGS Minerals Services for mineralogical and metallurgical testing, while the 2012-2013 program focussed only on low grade mineralization in each of the intrusions.

This report describes the testwork conducted to date on both the high grade mineralization in the SMSU and the low grade mineralization in the CGO.

All testwork was conducted by SGS Minerals Services (SGS) at their facility in Lakefield, Ontario, Canada.

13.2 Sample Preparation and Characterization

The first batch (Batch No.1) of samples was received by SGS on May 8, 2008. The samples were stage crushed to -10 mesh. Four sub composite samples were produced as directed by Kennecott. These were identified with the labels: 40014750, 40014751, 40014752 and 40014753. A master composite was also prepared, made up with an equal weight (5kg) of material from each of the four composites. The four sub composite samples as well as the master composite sample were split into 1 kg charges and a head sample. Each charge was purged with nitrogen and placed into freezer storage.

The second batch (Batch No.2) of samples were received by SGS in September, 2008. A total of four sub composite samples were received in the form of ¼ split core samples, packaged in bags in four pails. The samples were identified as 40029025, 40029026, 40029027 and 40029034. The individual bags from each pail were combined to form each of the four sub composite samples. The samples were stage crushed to -6 mesh. Approximately 8 to10 kg were rifled from each for a Bond ball mill Work Index test. Another five kilograms of each were riffled out for the production of a master composite. The remaining mass from each as well as the master composite was rotary split into 1 kg charges and a head sample. Each was purged with nitrogen and placed in a freezer for storage.

13.3 Chemical Analysis

The four sub-composites and master composite head samples from Batches No. 1 and No. 2 were submitted for head analysis. An ICP was used for most metals, a Leco was used for sulphur determinations and Pt, Pd and Au were analyzed by fire assay. The results for Batch No.1 are presented in Table 13-1.

Table 13-1: Head Analysis of Batch No. 1 Composite Samples

Element	Batch No. 1 Composites				
	40014750	40014751	40014752	40014753	Master
	CGO	SMSU	SMSU/CGO	CGO	SMSU/CGO
Cu%	0.29	2.05	1.69	0.6	1.17
Ni%	0.42	3.63	1.53	0.84	1.61
S %	1.3	14.5	4.8	3.04	5.88
Mg %	16	11	15	14	13
Au g/t	0.15	0.62	0.27	0.09	0.27
Pt g/t	0.22	0.31	0.91	0.23	0.42
Pd g/t	0.11	0.35	0.5	0.29	0.38
Ag g/t	<2	5	7	3	3
Bi g/t	<20	<20	<20	<20	<20
Co g/t	140	810	310	200	320
Cr g/t	870	1500	1700	1000	1600
Pb g/t	31	86	74	51	54
Se g/t	<30	<30	<30	<30	<30
Zn g/t	63	95	80	59	68

The data in the table above does not highlight any problematic concentrations of deleterious elements.

The head analyses for Batch No. 2 are presented in Table 13-2.

Table 13-2: Head Analysis of Batch No. 2 Composite Samples

Element	Batch No. 2 Composites				
	40029025	40029026	40029027	40029034	Master
	CGO	SMSU	SMSU/CGO	CGO	SMSU/CGO
Cu%	1.63	1.24	0.29	1.25	1.14
Ni%	3.9	2.64	0.42	3.42	2.62
S %	17.7	11.1	1.17	14.2	10.8
Mg %	12	13	15	13	13
Au g/t	0.17	0.16	0.05	0.12	0.19
Pt g/t	0.37	0.31	0.35	0.33	0.31
Pd g/t	0.29	0.28	0.08	0.3	0.24
Ag g/t	3	5	<2	<2	2
Bi g/t	<20	<20	<20	<20	<20
Co g/t	960	680	120	850	660
Cr g/t	1300	1500	1000	1800	1400
Pb g/t	<200	<200	<200	<200	<200
Se g/t	<40	<40	<40	<40	<40
Zn g/t	120	90	64	89	96

As with Batch No.1 composites, the data in the table above does not highlight any problematic concentrations of deleterious elements.

13.4 Minerology

All composites samples from Batch No. 1 and No. 2 were submitted for Quantitative Evaluation of Materials by Scanning Electron Microscope (QEMSCAN) to determine the mineral abundance, liberation and associations. The samples were ground to approximately 80% passing (P_{80}) 130 µm and screened. The -106 to + 38 µm fraction from each sample was submitted for analysis. The -106 to + 38 µm fraction was assumed to be indicative of the distribution of copper and nickel minerals within the feed samples. The chemical assays of head sample and the -106 to + 38 µm fraction are compared in Table 13-3 (Batch No.1) and Table 13-4 (Batch No. 2) and show a close correlation for both batches.

Table 13-3: Batch No.1 - Comparison of Chemical Head Analysis vs -106+38 µm Fraction

Sample	Grade %Cu		Grade %Ni		Weight%
	Head	-106+38µm	Head	-106+38µm	-106+38µm
40014750	0.29	0.24	0.42	0.4	44.8
40014751	2.05	2.13	3.63	4.18	27.1
40014752	1.69	1.88	1.53	1.82	21.8
40014753	0.6	0.6	0.84	0.99	24.9

Table 13-4: Batch No.2 - Comparison of Chemical Head Analysis vs -106+38 µm Fraction

Sample	Grade %Cu		Grade %Ni		Weight%
	Head	-106+38µm	Head	-106+38µm	-106+38µm
40029025	1.63	1.78	3.9	4.12	39.4
40029026	1.24	1.16	2.64	2.28	31.3
40029027	0.29	0.25	0.42	0.29	25.2
40029034	1.25	1.5	3.42	3.52	47.9
Master	1.14	0.99	2.62	2.42	36.3

13.4.1 Microprobe Analysis

The same samples of Batch No.1 composites that were used for QEMSCAN analysis were also subjected to Electron Microprobe Analysis to determine the average nickel grade of selected minerals. The average Ni values were:

- 17 pentlandite grains at 31.5%.
- 20 pyrrhotite grains at 0.15%.
- 21 olivine grains at 0.26%.
- 12 chlorite grains at 0.22%.
- 19 serpentine grains at 0.28%.
- 20 mica grains at 0.23%.
- 20 orthopyroxene grains at 0.08%.
- 23 amphibole grains at 0.05%.

No microprobe work was done on Batch No. 2 composites.

13.4.2 Mineral Mass

Using the QEMSCAN, the average modal abundance of the minerals in the two master composite samples is shown in Table 13-5.

Table 13-5: Modal Mineral Abundance (%) in the Master Composite Samples

	Master Composite	
	Batch 1	**Batch 2**
Chalcopyrite	3.4	2.8
Pentlandite	5.0	7.0
Mackinawite	0.5	0.2
Cubanite	0.4	0.1
Pyrrhotite	8.9	24.7
Other Sulphides	0.1	0.1
Clinopyroxenes	8.8	7.4
Orthopyroxenes	9.4	6.5
Olivines	7.2	6.6
Amphibole	17.3	15.5
Micas	1.5	0.7
Mg-Fe Chlorite	3.4	1.4
Epidote	0.3	0.1
Serpentine	19.4	15.9
Talc	4.0	1.9
Plagioclase	6.4	4.9
K-feldspar	0.1	0.1
Other silicates	1.1	0.9
Carbonates	0.4	0.3
Fe-Ti oxides	1.9	1.5
Chromite	0.5	1.3
Other	0.1	0.1
Total	**100.0**	**100.0**

The dominant copper sulphide is chalcopyrite. However, in the master composite for Batch No.1, cubanite represented 10% of the total copper sulphides.

Pentlandite was the dominant nickel sulphide with minor amounts of mackinawite. Violarite was not found in either master composite sample.

The dominant sulphide mineral in both master composites was pyrrhotite with 8.9% in Batch No.1 and 24.7% in Batch No.2. The pyrrhotite to pentlandite ratio was 1.8 for Batch No.1 and 3.5 for Batch No.2. The ratio of pyrrhotite to pentlandite is a measure of the importance of rejecting pyrrhotite to tailings to achieve high nickel concentrate grades. The higher the ratio, the higher the proportion of the pyrrhotite that must be rejected to tailings to achieve a target nickel concentrate grade.

For the non-sulphide minerals, olivine, serpentine and amphiboles were the dominant silicate minerals, typical of ultramafic deposits. Talc and chlorite, which can be problematic, were a minor constituent in both master composites.

13.4.3 Mineral Liberation

The QEMSCAN data was also used to provide an indication of the degree of mineral liberation in the -106 to +38 µm fraction. The results are shown in Table 13-6 and Table 13-7 for nickel and copper sulphide, respectively.

Table 13-6: Liberation of Nickel Sulphides (Mass %)

Mineral Association	Master Composite	
	Batch 1	**Batch 2**
Free Ni sulphide	56.2	72.2
Ni Sulp:Po	7.5	3.3
Ni Sulp:Mafic Silicates	0.2	3.5
Ni Sulph: Cu sulphides	3.9	0.1
Ni Sulph:Serp/talc	4.8	5.6
Ni Sulp:other	1.1	0.5
Ni Sulph:Complex	26.3	14.8
Total	**100**	**100**

Nickel liberation was 56.2% for Batch No.1 master composite with a range for the four sub composites of 12.1% to 69.2%. For Batch No. 2 master composite, nickel liberation was 72.2% with a range of 47.4% to 77.4% for the four sub composites. The average values are considered acceptable for a roughing operation but suggest some regrinding will be required to achieve better liberation and higher grade final products.

The main association of nickel sulphides was in complex particles (26.3% for Batch No.1 master composite and 14.8% for Batch No.2 master composite). A complex middling particle is any particle having three or more mineral phases and <95% by area of nickel.

Table 13-7: Liberation of Copper Sulphides (Mass %)

Mineral Association	Master Composite	
	Batch 1	**Batch 2**
Free Cu sulphide	33.4	58.7
Cu Sulp:Po	6.1	3.1
Cu Sulp:Mafic Silicates	0.6	2.1
Cu sulph: Ni sulphides	3.3	1.7
Cu Sulph:Serp/talc	0.7	0.1
Cu Sulp:other	11.4	7.1
Cu Sulp:Complex	44.5	27.2
Total	**100**	**100**

Copper liberation was 33.4% for Batch No.1 master composite with a range for the four sub composites of 16.6% to 69.4%. For Batch No. 2 master composite, copper liberation was 58.7% with a range of 52.1% to 62.2% for the four sub composites. The average values are considered low to moderate for a roughing operation and suggest a finer primary grind (<130 µm) may be beneficial for copper. Also, the data suggest some regrinding will be required to achieve better liberation and higher grade final products.

The main association of copper sulphides was in complex particles (44.5% for Batch No.1 master composite and 27.2% for Batch No.2 master composite). A complex middling particle is any particle having three or more mineral phases and <95% by area of copper.

13.4.4 Nickel Deportment

The nickel deportment (distribution of nickel values between mineral types) for the samples was calculated from the nickel contents of the minerals from the electron microprobe analyses and the mineral distributions as determined from QEMSCAN analysis. The results are shown in Table 13-8 for the two master composite samples.

Table 13-8: Nickel Deportment (%)

Mineral Association	Master Composite	
	Batch 1	Batch 2
Pentlandite	91.0	95.6
Mackinawite	4.9	1.2
Pyrrhotite	0.3	0.8
Olivine	0.8	0.6
Amphibole	0.4	0.3
Micas	0.1	0
Mg-Fe Clorite	0.3	0.1
Serpentine	2.2	1.4
Total	**100**	**100**

Pentlandite accounts for most of the nickel in the two master composite samples (91.0% in Batch No.1 and 95.6% in Batch No.2). Pyrrhotite contains only a very small proportion of the total nickel (0.3% in Batch No.1 and 0.8% in Batch No.2). This suggests it should theoretically be possible to reject high levels of pyrrhotite with minimal nickel losses.

The proportion of nickel associated with silicates was 3.8% for Batch No.1 and 2.4% for Batch No.2. This nickel is in solid solution in the silicate matrix and is not recoverable by any mineral processing technique. This is termed "unrecoverable nickel".

The same methodology as described above has been used to determine the level of unrecoverable nickel in all 24 Tamarack samples tested between 2006 and 2012. The results are shown in Figure13-1 as a function of head grade.

The absolute concentration of nickel in silicates is largely independent of the nickel head grade. Consequently the proportion of nickel in silicates increases exponentially as the head grade decreases.

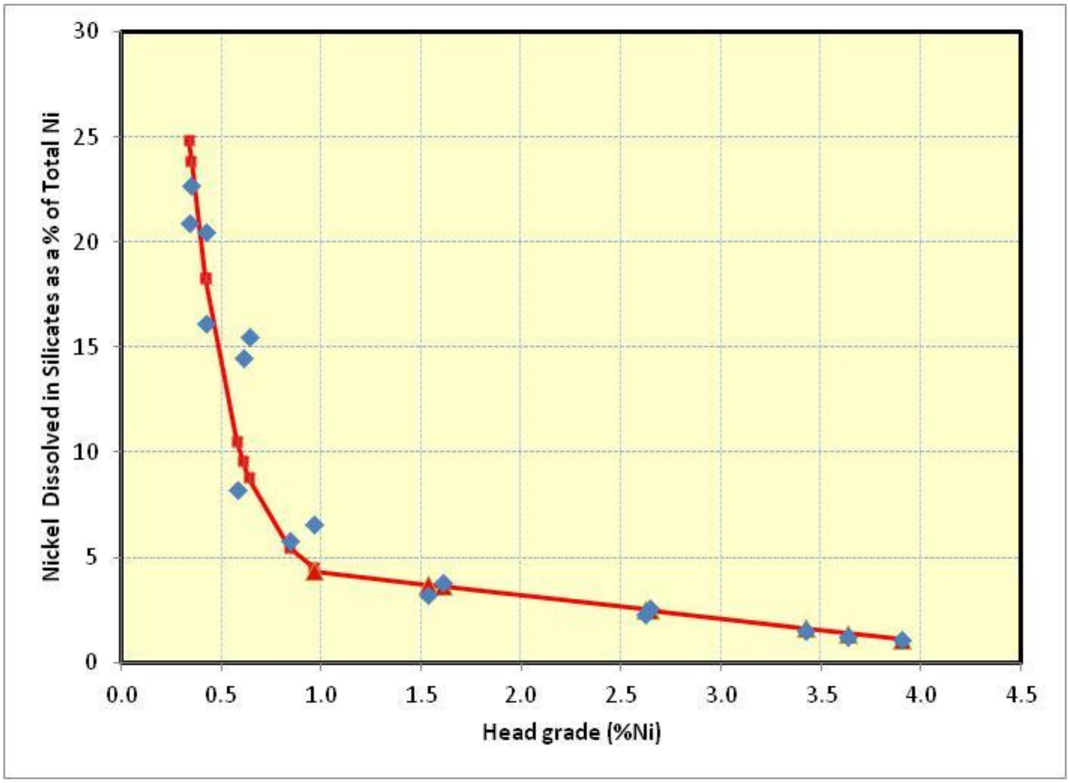


Figure 13- 1: Proportion of Unrecoverable Nickel (in Solid Solution in Silicates) as a Function of Nickel Head grade

13.4.5 Physical Characterization

The Bond ball mill grindability test is a closed circuit dry grindability test performed in a standard laboratory ball mill to calculate the net power requirements for ball milling. The tests were completed at a closing particle size of 150 mesh. Tests so far have only been carried out on the sub composites of the Batch No.2 samples.

The results, shown in Table 13-9 indicate that the Bond ball mill work index (BWi) ranges from 13.0 to 19.0 kWh/t (metric). The highest value was for the lowest sulphur grade sample (40029027). This is to be expected as the lower the sulphide content of a sample (as indicated by the sulphur grade), the higher the rock content of the sample. As rock is harder to grind than sulphides, the work index will increase as the ratio of sulphides to rock decreases.

Table 13-9: Bond Ball Mill Work Index

Sample ID	Feed %S	BWI (kWh/t)
40029025	15.7	13.0
40029026	11.1	15.8
40029027	1.2	19.0
40029034	14.2	13.5

Bond ball mill work index values of 13.0 to 15.8 kWh/t (metric) would be considered to be in a normal range for sulphide ores. An ore with a work index value of 19.0 kWh/t would be considered a "hard ore".

Future test programs will greatly expand the grindability data on samples and will include crushability, rod milling and SAG milling testwork.

13.5 Flotation Testwork

13.5.1 Bulk Rougher Flotation

The rougher flotation testwork was designed to investigate the effect of primary grind size on rougher flotation recoveries. While reagent conditions were standardized for the grinding tests, other tests explored the rougher flotation response to pH and pH modifiers.

Reagents used in these tests were sodium isopropyl xanthate (SIPX) as a collector, methyl isobutyl carbinol (MIBC) as frother, Depramin C (Carboxy Methyl Cellulose used to control naturally floatable silicates) and Metso (sodium metasilicate – a dispersant). No pH modifier was used in the roughing stage. The natural pH of the sample was 9.2. The results of the tests on the master composite (Batch No.1) are shown in Figure 13- 2 for the nickel response and Figure 13-3 for the copper response.

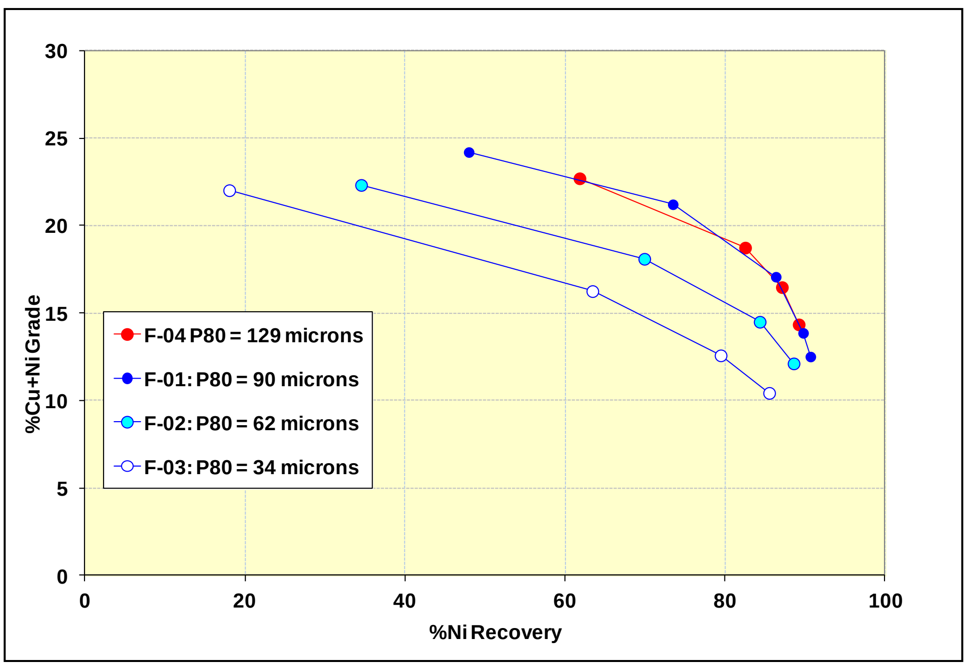


Figure 13- 2: Effect of Grind on the Nickel Grade Recovery Curve (Batch No. 1)

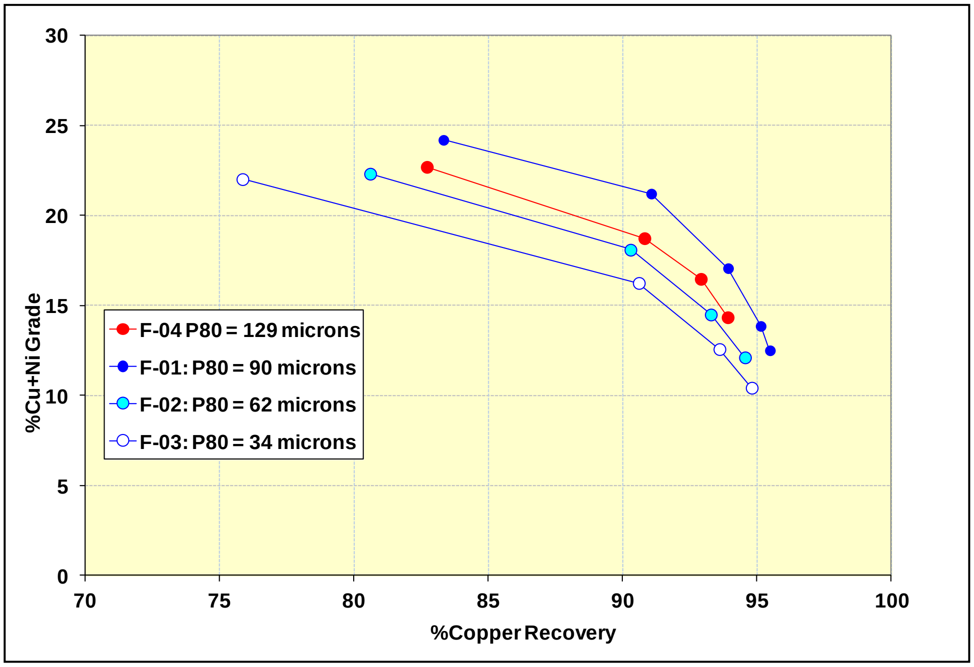


Figure 13- 3: Effect of Grind on the Copper Grade Recovery Curve (Batch No. 1)

The optimum grade recovery relationships for both nickel and copper were achieved at grinds having a P_{80} of between 90 and 129 µm (Figure 13-2 and Figure 13-3). As the grind got finer (P_{80} of 62 and 34 µm), the flotation kinetics for both chalcopyrite, pentlandite and pyrrhotite decreased while that of rock (non sulphide gangue) increased (Figure 13-4). Hence there was a deterioration in the grade recovery curve for both copper and nickel. At the end of rougher flotation, at the optimum grind of 90-129 µm) the recovery of nickel was 89.2% to 90.7% while copper was 93.9% to 95.5%. Initial rougher concentrate grades in excess of 20% Cu+Ni were readily achieved.

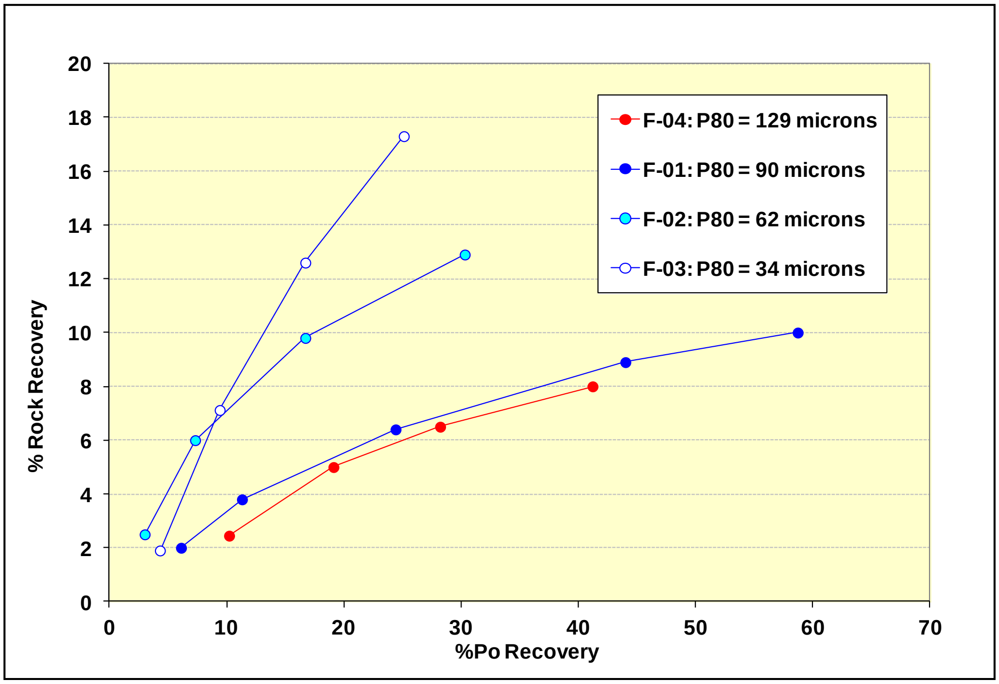


Figure 13- 4: Effect of Grind on Pyrrhotite and Rock Kinetics (Batch No. 1)

Pyrrhotite recoveries were low at 25.1% at a P_{80} of 32 µm to 44.0% at a P_{80} of 90 µm. While low pyrrhotite recoveries are desirable in the context of maximizing concentrate grade, it is important not to reject the pyrrhotite with the rock tailing as this could lead to acid generation in the tailings area. In one test (F-1), acid was added at the end of the rougher flotation to decrease the pH from 9.2 to 7.5 in an attempt to activate the pyrrhotite. The pyrrhotite recovery increased from 44.0% to 58.7%. As the sulphur grade of the tailings was 1.81%, further test work is recommended (see section 13.8) to increase pyrrhotite recovery.

The results of the rougher flotation tests on the master composite from Batch No.2 are shown in Figure 13-5 for nickel and in Figure 13-6 for copper.

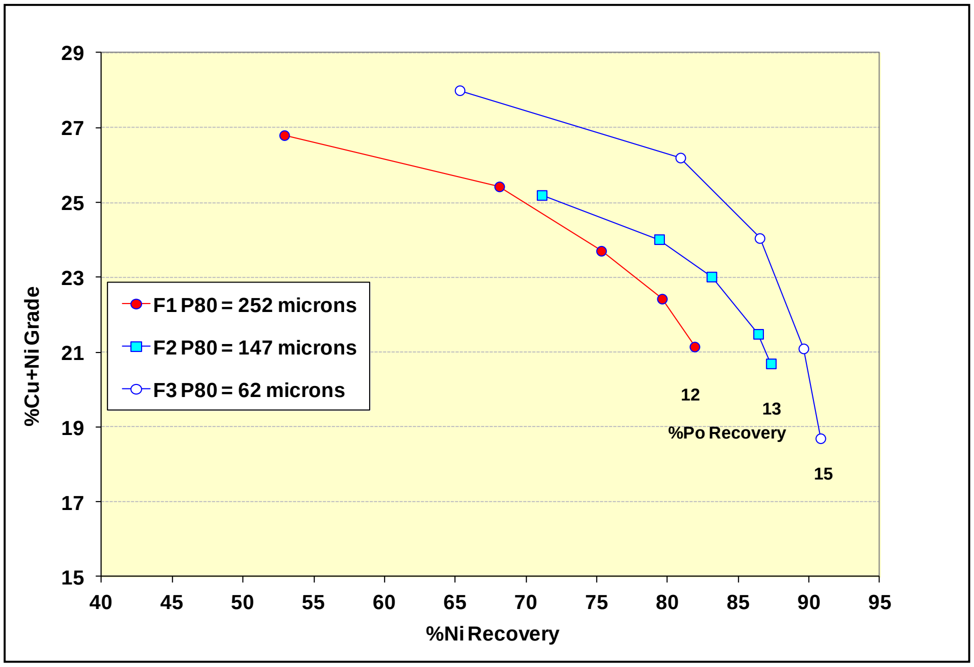


Figure 13- 5: Effect of Grind on the Nickel Grade Recovery Curve (Batch No. 2)

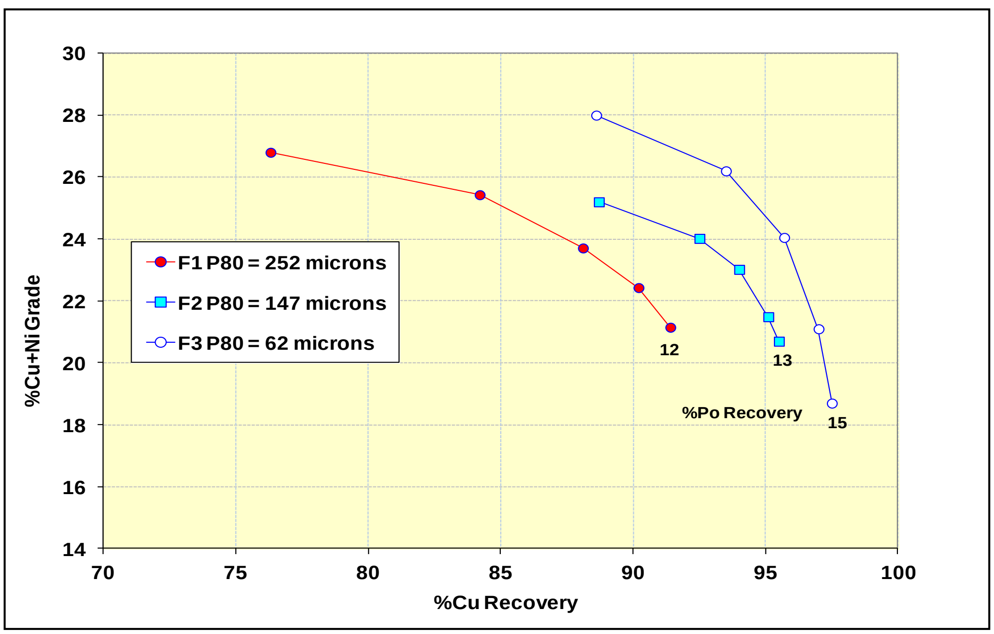


Figure 13- 6: Effect of Grind on the Copper Grade Recovery Curve (Batch No. 2)

The reagent regime used for Batch No.2 was the same as that used for the rougher flotation tests on the master composite sample for Batch No.1.

The poorest results were achieved at the coarsest grind (P_{80} of 252 µm) and the best results at the finest grind (P_{80} of 62 µm). At this grind, the overall recovery was 90.8% for Ni, 97.5% for Cu and the final rougher concentrate grade was (18.7% Cu+Ni). However, pyrrhotite recovery remained low in all three tests at 12 to 15%. No acid was used in these tests to try and improve the recovery of pyrrhotite.

It is noteworthy that the metallurgy improved with finer grinding with Batch No.2 whereas it decreased with finer grinding in Batch No.1. The reason for this is not certain at this point. However, it is known from other ultramafic nickel deposits that certain minerals found in these deposit can coat the surface of the pentlandite and pyrrhotite (slime coating), seriously retarding their flotation kinetics. This effect can be countered by adding sufficient quantities of Carboxy Methyl Cellulose. The addition of CMC to Batch No.1 (90 g/t) was likely inadequate. Dosages of 500 g/t or higher are sometimes required in some ultramafic milling operations.

The rougher responses of the sub composite samples in Batch No.2 were examined for a constant grind time, selected to achieve a target grind of approximately 130 µm. Actual grind size varied according to the hardness of each sample, the results are shown in Figure 13-7.

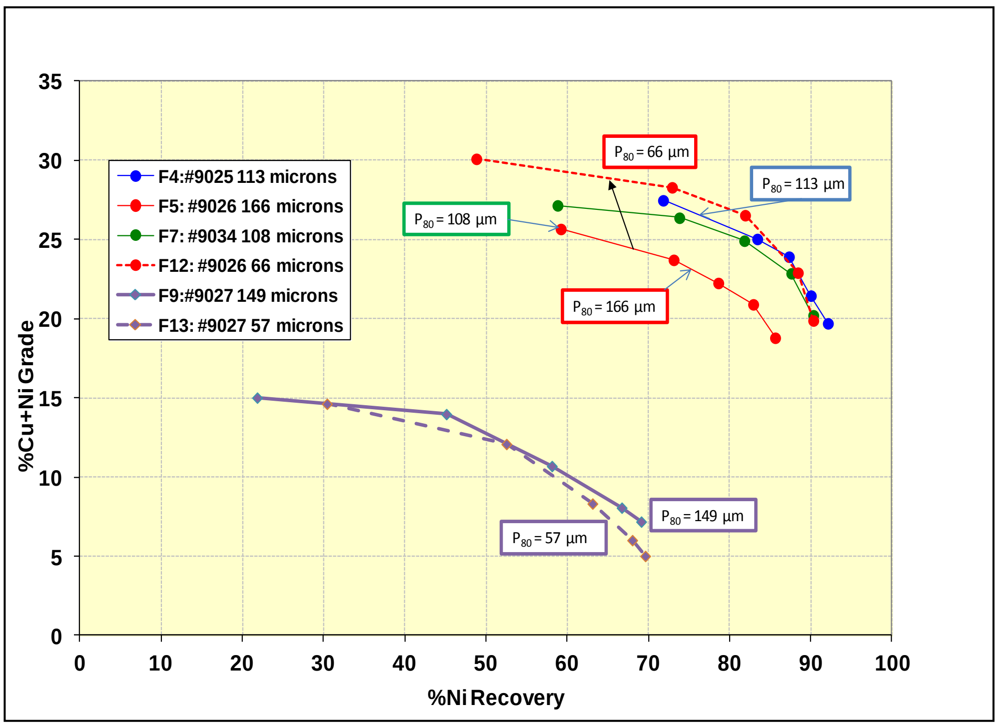


Figure 13- 7: Effect of Grind Size on Rougher Flotation of Sub Composite Samples (Batch No.2)

For sub composite samples 40029025 and 40029034, the response at grinds of 108 to 113 µm was very similar to that of the master composite with nickel recoveries of 90.3% to 92.1% at concentrate grades of 19.7% to 20.2% Cu+Ni. For sample 40029026, the P_{80} of the grind was 166 µm. This yielded a poorer response with a nickel recovery of only 85.6%. The test was repeated with a longer grind resulting in a P_{80} of 57 µm. The performance improved markedly to yield a final nickel recovery of 90.3% at a concentrate grade of 19.9% Cu+Ni, very similar to the master composite response.

These results suggest that coarse grinds with a P_{80} of >150 µm yield lower recoveries and grades compared with grinds of 60 - 110 µm. This data does not allow the optimum grind size to be better defined at this time. For subsequent testwork, a grind target of 100 to 130 µm was used.

The one low grade sub composite in Batch No.2, sample 40029027 with a head grade of only 0.42% Ni, yielded a substantially poorer metallurgical response with a nickel recovery of only 69.1% at a concentrate grade of only 7.2% Cu+Ni. The P_{80} in this test was 149 µm. Grinding substantially finer to a P_{80} of 57 µm did not improve the result.

The effect of using different pH modifiers was examined on the master composite sample of Batch No.1. The addition of soda ash (to pH 9.9) and lime (to pH 9.6) were compared to the response at the natural pH (9.4). The results are shown in Figure 13-8.

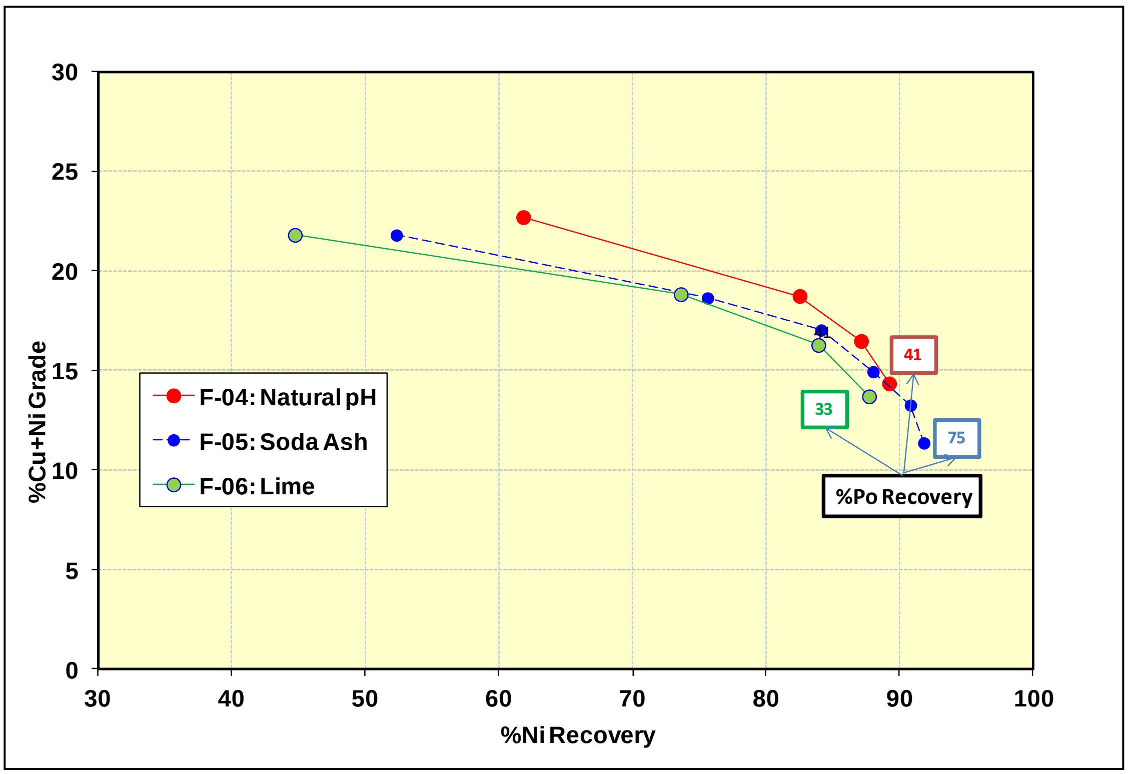


Figure 13- 8: Response of Master Composite (Batch No.1) to pH Modifiers

The best selectivity was achieved with no pH modifier, using a natural pH of 9.4. Lime slowed down the kinetics of flotation for both pentlandite and pyrrhotite. Although it appears that the pyrrhotite recovery was improved to 75% with soda ash (at pH 9.9), this was primarily because the rougher flotation time was extended in this test from 13 to 21 minutes and an additional 200 g/t of collector (SIPX) was added to the extended rougher flotation stage over the 120 g/t that was used in the first 13 minutes. However, this result does show that the pyrrhotite recovery can be increased with additional flotation time and collector dosage. The sulphur grade of the final tailings was 1.24%. Despite the improved pyrrhotite recovery, the high pH of 9.9 in this test likely inhibited the flotation of pyrrhotite. A combination of extended flotation time, higher collector dosage and lower pH (possibly adjusted down with acid) should be explored to produce a very low sulphur (non-acid generating) tailings.

13.5.2 Batch Cleaner Flotation Tests

Batch cleaner flotation tests were carried out on all composites to establish the recoveries and grade of a final bulk Cu-Ni concentrate. In some tests, the potential for producing separate, high grade copper and nickel concentrates from this bulk concentrate was also explored.

13.5.2.1 Master Composite, Batch No. 1

In the first series of tests on the master composite from Batch No.1, the number of cleaning stages was explored as well as regrinding of the rougher concentrate. The results are shown in Table 13-10.

Table 13-10: Cleaning of Master Composite from Batch No.1

Test	No. Bulk Clnr Stages	Regrinding of Rghr Conc	Final Bulk Concentrate			
			%Cu+Ni	%S	%Cu Recy	%Ni Rec'y
F-04	0	No	14.4	21.4	93.1	89.2
F-10	1	No	20.7	24.6	91.2	74.5
F-08	3	No	24.1	29.7	89.6	73.4
F-11	1	Yes	24.9	27.2	89.5	44.4

One stage of cleaning in test F-10 increased the concentrate grade from 14.4% to 20.7% Cu+Ni and the recoveries to final concentrate declined from 93.1% to 91.2% for copper and from 89.2% to 74.5% for nickel. Two more cleaning stages were added in test F-08 and the concentrate grade increased further to 24.1% Cu+Ni at 89.6% copper recovery and 73.4% nickel recovery. It is not unusual to see large drops in nickel recoveries in batch cleaner tests. In a continuous operation, the cleaner tailings are typically recycled to another or earlier flotation stage and recovery losses are typically reduced substantially. It is noteworthy that the sulphur grade of the final concentrate increased from 21.4% in test F-04 (no cleaning) to 29.7% after three stages of cleaning in test F-08. A high sulphur grade means there is less non-sulphide gangue (i.e., silicate minerals) present. This indicates that cleaning by itself is quite effective in rejecting this non sulphide gangue. The production of a high sulphur (low non-sulphide gangue) concentrate is important. The non-sulphide gangue in ultramafic deposits is high in magnesia (MgO). A high magnesia content can incur smelting penalties as it increases the viscosity of the slag, thereby raising metal losses into the slag.

A regrind of the rougher concentrate was attempted in test F-11. The rougher concentrate was reground for 15 minutes in a pebble mill. There was insufficient product to do a size determination. One stage of cleaning was employed after the regrind. The results shown in Table 13-9 indicate that although a very high final bulk concentrate grade was achieved (24.7% Cu+Ni), the nickel recovery declined sharply to 44.4%. The high loss of nickel to tailings following the regrind may be related to the earlier observation that a fine primary grind sharply slowed the flotation of pentlandite. Regrinding appears to be important to achieve very high concentrate grades.

However, future tests need to focus on strategies to reduce the subsequent nickel losses. Adding more collector and CMC should be explored.

13.5.2.2 Sub Composite Samples, Batch No. 1

Batch cleaning tests were also carried out on the sub composite samples from Batch No. 1. The same conditions as was used in test F-10 on the master composite were used for these tests (one stage of cleaning, no regrind of rougher concentrate), the results are shown in Table 13-11.

Table 13-11: Cleaning of Sub Composite Samples (Batch No. 1)

Test	Sample:	P_{80} µm	Rougher Concentrate			Cleaner Concentrate		
			%Cu+Ni	%Cu Recy	%Ni Rec'y	%Cu+Ni	%Cu	%Ni
V-05	40014750	99	6.6	96.5	69.2	14.3	94	64.6
V-06	40014751	168	20.0	95.7	87.6	23.5	94.2	83.1
V-07	40014752	190	16.0	92.4	72.8	20.7	90.9	68.3
V-09	40014753	172	14.9	92.7	81.0	20.3	91.4	77.1

The three medium to high grade sub composite samples (40014751, 40014752 and 40014753 with nickel head grades of 3.63%, 1.53%, 0.84% respectively) all achieved cleaner concentrate grades in excess of 20% Cu+Ni after one stage of cleaning. Copper recoveries were in excess of 90% and nickel recoveries were 83.1%, 68.3% and 77.1% respectively. Nickel recoveries in tests V-06 to V-09 were likely adversely affected by coarser than optimum primary grinds.

The low grade composite (40014750 with 0.42% Ni) yielded a final concentrate grade of 14.3% Cu+Ni with recoveries of 94.0% for Cu and 64.6% for Ni.

13.5.2.3 Master Composite, Batch No. 2

The primary grind and roughing tests were based on the best conditions as established in the roughing tests (grind P_{80} of 65 - 70 µm). No regrinding of the rougher concentrate was employed and only one cleaning stage was used. All three cleaning tests (F-10, F-11 and F-14) were carried out under similar conditions. The results are shown in Table 13-12 where the results are compared to those in test F-3, where no cleaning was carried out.

Table 13-12: Cleaning Tests on Master Composite (Batch No. 2)

Test	No. Bulk Clnr Stages	P_{80} µm	Final Bulk Concentrate			
			%Cu+Ni	%S	%Cu Recy	%Ni Rec'y
F-3	0	62	18.7	24.1	97.5	90.8
F-10	1	62	25.8	27.6	93.7	83.8
F-11	1	71	27.6	29.4	95.2	86.4
F-14	1	66	25.6	30.5	92.8	79.8

With no regrinding and only one stage of cleaning, concentrate grades in excess of 25% Cu+Ni were achieved with good recoveries of both copper and nickel. The sulphur grade of the concentrate varied from 27.6% to 30.5% suggesting that an additional cleaning step would have been beneficial to help reject additional non-sulphide gangue.

13.5.2.4 Sub Composites, Batch No.2

Batch cleaning tests were also carried out on the four sub composite samples of Batch No. 2. The same flowsheet as used above was employed with no regrind of the rougher concentrate and only one stage of cleaning. The results are presented in Table 13-13.

Table 13-13: Cleaning Tests on Sub Composite Samples, Batch No. 2

Test	Sample	P_{80} µm	Rougher Concentrate			Final Bulk Concentrate			
			%Cu+Ni	%Cu Recy	%Ni Rec'y	%Cu+Ni	%S	%Cu Recy	%Ni Rec'y
Var-C1	40029025	51	18.4	95.0	91.3	25.2	29.9	90.9	84.5
Var-C2	40029026	72	17.4	94.8	89.6	24.4	28.0	93.0	85.3
Var-C3	40029027	81	5.8	96.1	66.2	17.4	21.3	92.1	49.5
Var-C4	40029034	53	17.6	96.0	92.4	24.5	30.1	93.0	86.6

For the three high grade samples (40029025, 40029026 and 40029034 with nickel head grades of 3.90%, 2.64%, and 3.42% respectively), cleaning in one stage upgraded the rougher concentrate from a range of 17.4% to 18.4% Cu+Ni to 24.4% to 25.2% Cu+Ni. Copper recoveries remained over 90% and nickel recoveries ranged from 84.5% to 86.6%. The sulphur grade of the final concentrate ranged from 28.0% to 30.1% suggesting an additional cleaning stage would have been helpful in rejecting some additional non-sulphide gangue.

The one low grade sub composite in Batch No. 2 was sample 40029027 with a head grade of 0.42% Ni. Cleaning in a single stage upgraded the rougher concentrate from 5.8% Cu+Ni to 17.4% Cu+Ni. The copper recovery remained over 90% but the nickel recovery declined from 66.2% to 49.5%. The sulphur grade of the final concentrate was low at 17.4% suggesting it contained a lot of non-sulphide gangue. A regrind stage followed by at least two stages of cleaning would appear to be required for this low head grade sample. Additionally, higher levels of CMC and collector would also likely be required to minimize losses to the cleaner tails.

13.5.3 Copper - Nickel Separation Tests

All the cleaning tests described in Section 13.5.2 employed a copper-nickel separation stage following the cleaner flotation stage. The flowsheet used in these tests is shown in Figure 13-9.

Typically the goal in copper nickel separation is to produce a copper concentrate with a grade of at least 30% Cu and less than 0.7% Ni. Copper recovery to this concentrate should be maximized. The nickel concentrate should have a Cu:Ni ratio of 0.2 or lower to meet the typical North American nickel smelter specifications.

Following roughing and one stage of bulk cleaning, the final bulk concentrate was reground in a pebble mill. Lime to pH 12 was added to the regrind stage. The reground product was then aerated for 5 minutes to help restore chalcopyrite flotation. The aerated pulp was then subjected to two stages of flotation: a copper rougher and a copper cleaner.

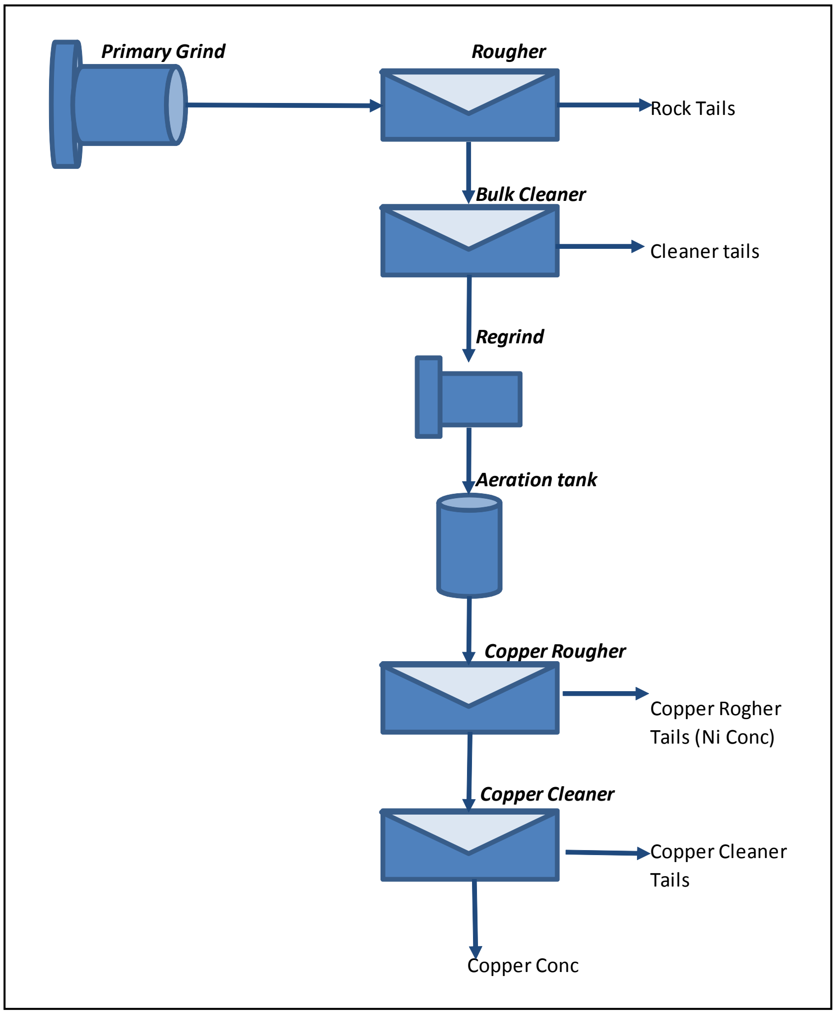


Figure 13- 9: Batch Flotation Flowsheet Used for Rougher and Cleaner Flotation and Copper-Nickel Separation

13.5.3.1 Copper Nickel Separation on Master Composite, Batch No. 1

The first test on the master composite from Batch No. 2 did not involve a regrind nor a copper cleaner stage, only a copper rougher, the results, are shown in Table 13-14.

Table 13-14: Copper Nickel Separation Tests on the Master Composite (Batch No. 1)

Test	No. of Cu Clnr. Stages	Cu Regrind	Quebracho g/t	Cu Concentrate			Ni Concentrate		
				%Cu	%Ni	%Cu Recy	%Ni	Cu:Ni	%Ni Recy
F-08	0	No	5	19.8	7.73	69.3	16.2	0.29	41
F-10	1	Yes	no	29.1	1.55	67.0	15.2	0.05	51.4
F-11	0	Yes*	no	28.9	1.82	66.7	14.3	0.77	15.2

*Regrind on rougher concentrate, not of feed to CuNi separation

The nickel grade of the copper concentrate was 7.73% (target 0.7% or less). The absence of a regrind prior to copper nickel separation and only one cleaner stage were likely factors contributing to this poor separation.

In test F-10, a regrind was used as well as one stage of copper cleaning. The copper concentrate graded 29.1% Cu and 1.55% Ni with 67% copper recovery. This represents a significant improvement over the first test. The nickel concentrate had a very favourable Cu:Ni ratio (0.05) with 51.4% Ni recovery.

In test F-11, there was a regrind on the bulk rougher concentrate (not on the feed to Cu-Ni separation). The copper concentrate graded 28.9% Cu and 1.82% Ni. This result was likely adversely affected by the absence of a copper cleaning stage. The low nickel recovery to the nickel concentrate was the result of high nickel losses to the first and second bulk cleaner tails. As previously discussed, this was possibly due to the presence of liberated ultramafic fines that slowed the flotation of pentlandite following the regrind stage.

13.5.3.2 Copper Nickel Separation on Sub Composite samples, Batch No. 1

The same flowsheet that was used for the master composite sample (Figure 13-9) was also used for the copper nickel separation tests on the sub composite samples of Batch No. 1. No aeration was used in the first two tests (V-05 and V-06). Quebracho, a starch that was used for one of the Master Composite tests, was used to reduce the nickel level in the copper concentrate, and was added at a dosage of 12.5 g/t to the copper cleaner in tests V-06, V-07 and V-09. The results are shown in Table 13-15.

Table 13-15: Copper Nickel Separation Tests on the Sub Composites (Batch No. 1)

Test	Sample:	No. of Cu Clnr. Stages	Cu Regrind	Quebracho g/t	Aeration	Cu Concentrate			Ni Concentrate		
						%Cu	%Ni	%Cu Recy	%Ni	Cu:Ni	%Ni Recy
V-05	40014750	1	Yes	No	No	30.7	0.89	83.6	9.09	0.10	63.1
V-06	40014751	1	Yes	12.5	No	30.5	1.86	72.8	18.1	0.15	80.6
V-07	40014752	1	Yes	12.5	Yes	29.7	1.12	51.4	10.7	0.65	66.2
V-09	40014752	1	Yes	12.5	Yes	27.6	1.61	62.8	11.8	0.42	73.2

Despite the low grade of sample 40014750 (0.29% Cu and 0.42% Ni), a high grade copper concentrate with 30.7% Cu, 0.89% Ni and with 83.6% copper recovery was produced. The nickel concentrate also had a favourable Cu:Ni ratio of 0.10 with 63.1% Ni recovery.

The first high grade sub composites (40014751 with a head grade of 2.05% Cu and 3.63% Ni) yielded a copper concentrate grading 30.5% Cu and 1.86%Ni with 72.8% copper recovery. The nickel concentrate had a favourable Cu:Ni ratio of 0.15.

The second high grade sub composite (40014752 with a head grade of 1.69% Cu and 1.53% Ni) produced (Test V-07) a copper concentrate grading 29.7% Cu and 1.12% Ni with 51.4% copper recovery. This test was adversely affected by an unusually coarse primary grind (P_{80} of 190 µm) and so was repeated in Test V-09.

In this repeat test on sample 40014752, the copper concentrate graded 27.6% Cu and 1.61% Ni with 62.8% copper recovery. The nickel concentrate had a Cu:Ni ratio of 0.42 with 73.2% nickel recovery.

There was insufficient sample remaining of composite 40014753 on which to perform a copper-nickel separation test.

13.5.3.3 Copper-Nickel Separation on Master Composite, Batch No. 2

The same flowsheet as shown in Figure 13-6 was used for these batch flotation tests on Cu-Ni separation. This involved a regrind of the bulk cleaner concentrate followed by two stages of flotation: a copper rougher and a copper cleaner. A primary grind with a P_{80} of 65-70 microns was chosen. The results are presented in Table 13-16 below.

Table 13-16: Copper Nickel Separation Tests on the Master Composite (Batch No. 2)

Test	No. of Cu Clnr. Stages	Cu Regrind	Quebracho g/t	Aeration	Cu Concentrate			Ni Concentrate		
					%Cu	%Ni	%Cu Recy	%Ni	Cu:Ni	%Ni Recy
F-10	1	yes	0	No	31.2	1.05	78.5	23.1	0.05	80
F-11	1	yes	0	No	23.8	7.09	90.9	25.4	0.02	71.8
F-14	1	yes	yes	No	32.4	0.72	71.4	21.5	0.09	78.5

Test F-10 yielded a copper concentrate grading 31.2% Cu and 1.05% Ni with 78.5% copper recovery. The nickel concentrate had an excellent Cu:Ni ratio of 0.05 with a nickel concentrate grade of 23.1% Ni. Nickel recovery to this concentrate was 80.0%.

Test F-11 carried out under the same conditions as F-10 but with twice the sample weight yielded surprisingly poor results for the copper concentrate. The grade was only 23.8%Cu with 7.09% Ni. The copper recovery was 90.9% which means that pulling rates in the copper rougher and cleaner were likely too high. It is not clear though what caused this unusual result.

Test F-14 produced the best result of the three tests and, in fact, of any Cu-Ni separation test on Tamarack samples. The copper concentrate graded 32.4% Cu with 0.72% Ni with 71.4% copper recovery. The nickel concentrate graded 21.5% Ni with a Cu:Ni ratio of 0.09. Nickel recovery to this concentrate was 78.5%. The only difference in this test was that a small amount of Quebracho was added to the copper cleaner. Quebracho is a starch and some starches have been successfully used in milling operations to reduce the nickel content of copper concentrates.

13.5.3.4 Copper Nickel Separation on Sub Composite Samples, Batch No.2

The same flowsheet as shown in Figure 13-9 was employed except there was no aeration step following the copper regrind. The results are shown in Table 13-17.

Table 13-17: Copper Nickel Separation Tests on the Sub Composites, Batch No.2

Test	Sample	P_{80} µm	No. of Cu Clnr. Stages	Copper Regrind	Quebracho g/t	Aeration	Cu Concentrate			Ni Concentrate		
							%Cu	%Ni	%Cu Recy	%Ni	Cu:Ni	%Ni Recy
Var-C1	40029025	51	1	yes	15	No	30.4	1.18	65.8	22.1	0.06	79.9
Var-C2	40029026	72	1	yes	15	No	31.2	1.27	57.2	20.3	0.09	75.6
Var-C3	40029027	81	0	yes	15	No	25.9	2.38	64.6	9.53	0.41	45.5
Var-C4	40029034	53	1	yes	15	No	31.4	1.66	74.3	21.1	0.05	79.0

For the three high grade samples (40029025, 40029026 and 40029034) good copper concentrate copper grades of +30% were obtained in all tests. The nickel grade of the copper concentrates were above the target of 0.7% Ni, varying from 1.18% to 1.66% Ni. The nickel concentrates all had very good Cu:Ni ratios of <0.1 and nickel grades above 20%. Nickel recovery to nickel concentrate was also good at >75%.

Copper-nickel separation on the low grade sub composite (40029027 – 0.42% Ni heads) yielded less than satisfactory results with the nickel grade of the copper concentrate being 2.38% and the Cu:Ni ratio in the nickel concentrate at 0.41.

Looking at all the copper nickel separation tests, the results are encouraging even though the target of <0.7% Ni in the copper concentrate was not met. The best result was in Test F-14 where the nickel grade of the copper concentrate was 0.72%. The average %Ni in all the tests on samples from the semi massive sulphide zone was 1.2% when a regrind and one stage of copper cleaning was used. Production of a high grade nickel concentrate with a Cu:Ni ratio of <0.2 looks readily achievable.

Batch copper nickel separation tests are always challenging because the quantity of material reporting to this part of the process is very small, typically less than 5% of the mass of the material in the primary grind. Future work should focus on defining the particle size target for the copper regrind stage, using two rather than one stage of copper cleaning and exploring the use of starches to achieve better depression of the nickel sulphide. It is recommended that the normal charge weight of 1 kg in the primary grind be doubled in these tests that focus on the copper-nickel separation process.

13.6 Detailed Analysis of Concentrates

13.6.1 Precious Metal Analysis of Concentrates

Precious metal analyses were carried out on blends of copper and nickel concentrates from three tests on Batch No. 1 sub composites samples and from two tests on the master composite from Batch No. 2. The results are presented in Table 13-18.

Gold tends to be concentrated in the copper concentrate whereas platinum and palladium are more concentrated in the nickel concentrate.

Insufficient samples were analyzed for precious metals to generate material balances.

Table 13-18: Precious Metal Analyses of Copper and Nickel Concentrates from the Master Composite, Batches No. 1 and No. 2

Method	Element	Cu Concentrate (Cu Clnr Conc)			Nickel Concentrate (Cu Rghr Tails)		
		Batch #1	Batch #2	Batch #2	Batch #1	Batch #2	Batch #2
		V-05, V-06, V-07	F10	F11	V-05, V-06, V-07	F10	F11
Fire Assay	Ag g/t	32	23	31.8	20	10	28.2
"	Au g/t	5.66	3.61	n/a	0.49	0.59	n/a
"	Pt g/t	1.17	1.15	1.73	4.53	2.47	3.05
"	Pd g/t	0.62	0.31	0.84	2.31	2.09	2.3
"	Rh g/t	0.09	0.09	0.11	0.07	0.11	0.12
"	Ru g/t	0.19	0.11	0.16	0.14	0.29	0.3
"	Ir g/t	0.1	0.16	0.2	0.14	0.27	0.28
XRF	Ni%	1.5*	1.02	7.09	1.53	21.4	25.4
"	Cu%	30*	30.7	23.8	13.1	1.65	0.53
Leco	S%		33.1	31.8		28.0	28.2

13.6.2 Minor and Impurity Element Analyses of Copper and Nickel Concentrates

An Inductively-Coupled Plasma (ICP) scan was carried out on a blend of copper and nickel concentrates from three tests on Batch No. 1 sub composite samples and from two tests on the master composite from Batch No. 2. The results are presented in Table 13-19.

Table 13-19: Minor and Impurity Element Analyses of Copper and Nickel Concentrates from the Master Composite (Batch No. 2)

Method	Element	Cu Concentrate (Cu Clnr Conc)			Nickel Concentrate (Cu Rghr Tails)		
		Batch #1	Batch #2	Batch #2	Batch #1	Batch #2	Batch #2
	g/t	V-05, V-06, V-07	F10	F11	V-05, V-06, V-07	F10	F11
ICP	Bi	<100	<80	<100	<100	<80	<100
"	Cd	11	<20	<10	<2	<20	<10
"	Co	300	240	1600	2600	5300	5800
"	Cr	36	55	110	330	340	240
"	Mg%	0.64	0.74	0.84	5.3	2.55	2.2
"	Pb	190	240	290	140	130	170
"	Sb	<30	<60	<60	<30	<60	<60
"	Se	92	<90	<90	52	<90	<90
"	U	<80	<40	<40	<80	<40	<40
"	Zn	500	1100	460	160	920	97

There were no concentrations of impurity elements that would be of concern during smelting or refining of these concentrates. The Mg content of the nickel concentrates from the two tests on the Master Composite from Batch No. 2 is shown to be between 2.2 and 2.5%. This corresponds to an MgO content of 3.7 - 4.2%. Nickel smelters generally want to see MgO contents below 5.0% in nickel concentrates, therefore these results are satisfactory.

However, the average Mg grade on the three nickel concentrates from Batch No. 1 sub composites was 5.3% corresponding to a MgO content of 9.0%, this is too high. The non-sulphide gangue content (% Rock) of the three individual nickel concentrates that made up this blended nickel concentrate sample from Batch No. 1 are shown in the Table 13-20.

Table 13-20: Rock Content of Nickel Concentrates from Batch No.1 Sub Composites

Test	Heads %Ni	Nickel Concentrate	
		%S	%Rock
V-05	0.42	12.9	61.9
V-07	1.53	20.5	40.2
V-06	3.71	27.0	20.6

The rock content of the nickel concentrates varied inversely with the nickel head grade. The lowest grade sample (0.42% Ni) had the highest rock content in nickel concentrate (61.9%). More rock rejection will be required in the cleaning stages to ensure the MgO grade of the nickel concentrate consistently meets expected smelter specifications. These tests employed only one bulk cleaner stage. It may be necessary to employ two or even three stages here especially if low grade ore is to be mined. Regrinding of the rougher concentrate may also be required.

13.7 Recovery Models

Recovery models have been generated for nickel and copper using data from all 24 of the composite samples tested to date from the Tamarack North Project. This data base spans head grades from 0.30 to 3.9% nickel and from 0.2 to 2.1% copper.

The models predict the recovery of nickel and copper to a bulk concentrate grading 20% Cu+Ni. This concentrate grade was achieved in almost all samples. Prudent extrapolation of the grade recovery curve was used in the few cases where this concentrate grade was not yet achieved.

13.7.1 Nickel Recovery Model

The data for nickel is presented in Figure 13-10. As is shown, there is a sharp inflection at a head grade of 0.45% Ni, separating the nickel curve into two sections. No single mathematical expression can adequately fit the data well both above and below this point. Two recovery models were therefore generated, one for head grades from 0.45% to 3.5% Ni and one for head grades below 0.45% Ni.

The model for feed grades from 0.45% Ni to 3.5%Ni:

$$\textbf{\%Ni Recovery} = 53.0 + 21.1 * (\%\text{Ni in Feed}) - 2.88 * (\%\text{Ni in Feed})^2$$

The model for feed grades below 0.45% Ni is:

$$\textbf{\%Ni Recovery} = 106.5 + 55.7 * \text{Ln}(\%\text{Ni in Feed})$$

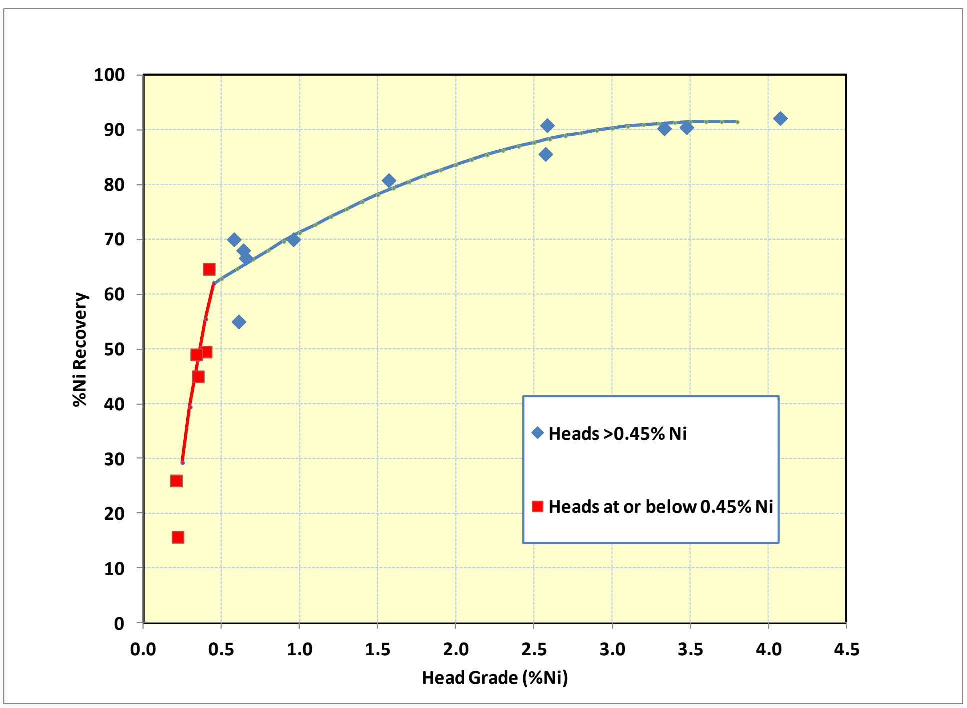


Figure 13-10: Nickel Recovery as a Function of Ni Head Grade

It should be noted that the recoveries shown in Figure 13-10 and those determined from the models reflect only the recoveries from batch flotation tests. It can reasonably be expected that tests with a continuous recycle of intermediate streams (locked cycle tests, piloting, etc) will yield slightly higher recoveries at similar concentrate grades for the same feed grade.

13.7.2 Copper Recovery Model

The data for the copper recovery models is shown in Figure 13-11. As for the nickel, the curve cannot be represented by a single mathematical expression. There are three portions to the copper curve. There is a sharp inflection at a head grade of 0.5% Cu. Furthermore, the data above 1.25% Cu is very limited and the curve appears to be flat. Three recovery models were therefore generated, one for head grades below 0.5% Cu, one for head grades from 0.5 to 1.25% Cu and one for head grades above 1.25% Cu.

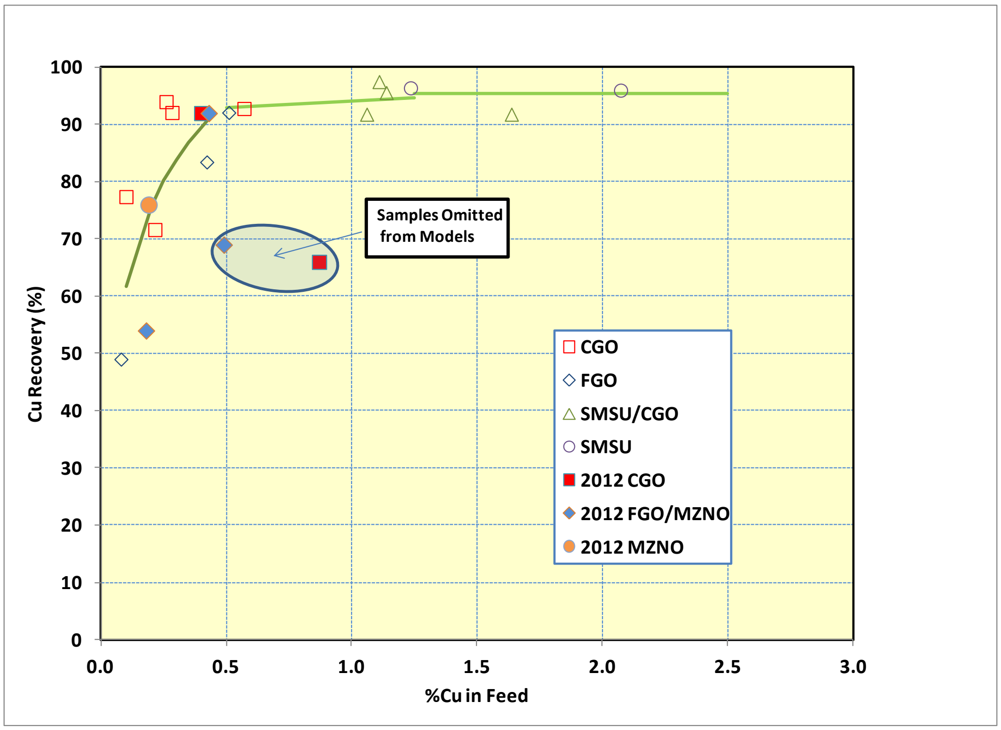


Figure 13-11: Copper Recovery as a Function of Cu Head Grade

The new copper recovery models are:

Below 0.50 %Cu,

Cu recovery = 107.9 + 20.0 * Ln (%Cu in Feed)

Between 0.50 and 1.25 %Cu in feed

%Cu Recovery = 91.9 +2.17 * (%Ni in Feed)

Above 1.25%Cu

Recovery = 95%

It should be noted that the recoveries shown in Figure 13-1 and those determined from the models reflect only the recoveries from batch flotation tests. It can reasonably be expected that tests with a continuous recycle of intermediate streams (locked cycle tests, piloting, etc) will yield higher recoveries at similar concentrate grades for the same feed grade.

It should also be noted that the data for two of the 2012 composites are not included in this copper model; these composites are 40065076 and 40065077. These are low nickel head grade samples from the 2012 campaign. They represented material from the FGO, CGO and mixed zone mineralization from the 138 Zone. Both samples were characterized by QEMSCAN as having a high proportion of complex copper sulphide associations. Their data points are shown but they fall way off the curve for the other composites. Not enough is known about these two samples to explain conclusively why their copper recovery was anomalously low. Until this issue is resolved, there remains a degree of uncertainty in the copper models below 1% copper head grade.

13.8 Future Testwork

Future testing of samples from the Tamarack North Project should be focused on examining the following issues:

- Test a wider range of samples, including those in very high grade zone (MSU) and the low grade (>0.5% Ni) zones within the CGO and mixed zone mineralization in the 138 Zone areas.
- Establish crushability and grindability of samples.
- Confirm optimum primary grind size between a P_{80} of 60 and 120 µm.
  - Rougher flotation at natural pH and no CMC.
- Test production of a non-acid generating tailings by scavenging rougher tailings at pH 7.5 with acid and with a powerful collector such as amyl xanthate.
  - Confirm tailings are non-acid generating by performing acid based accounting tests.
- Evaluate regrinding of rougher concentrate with and without CMC (300 g/t) and xanthate, followed by two stages of bulk cleaning.
- Define optimum particle size for regrinding feed to copper nickel separation.
  - Lime to be added to copper rougher to pH 12 with and without the addition of Quebracho at a dosage of 20 g/t.
  - Follow with two stages of copper cleaning.
  - Examine dextrin as an alternative to Quebracho.
- To minimize the amount of complex copper sulphide particles reporting to Cu-Ni separation, consider a copper prefloat prior to roughing to scalp off the liberated and simple binary copper sulphide particles and only do copper nickel separation on this stream.
- Establish if scavenger concentrate needs to be reground.

- Carry out sufficient analyses to generate mass balances for the precious metals.
- Conduct locked cycle tests on preferred flowsheet.
- Conduct self-heating tests on both copper and nickel concentrates.
- Metallurgical testing should be conducted to determine the approximate expected recoveries of PGE metals (Pt, Pd) and Au.

The proposed flowsheet for future testing with the optional prefloat stage is shown on Figure 13-12 below.

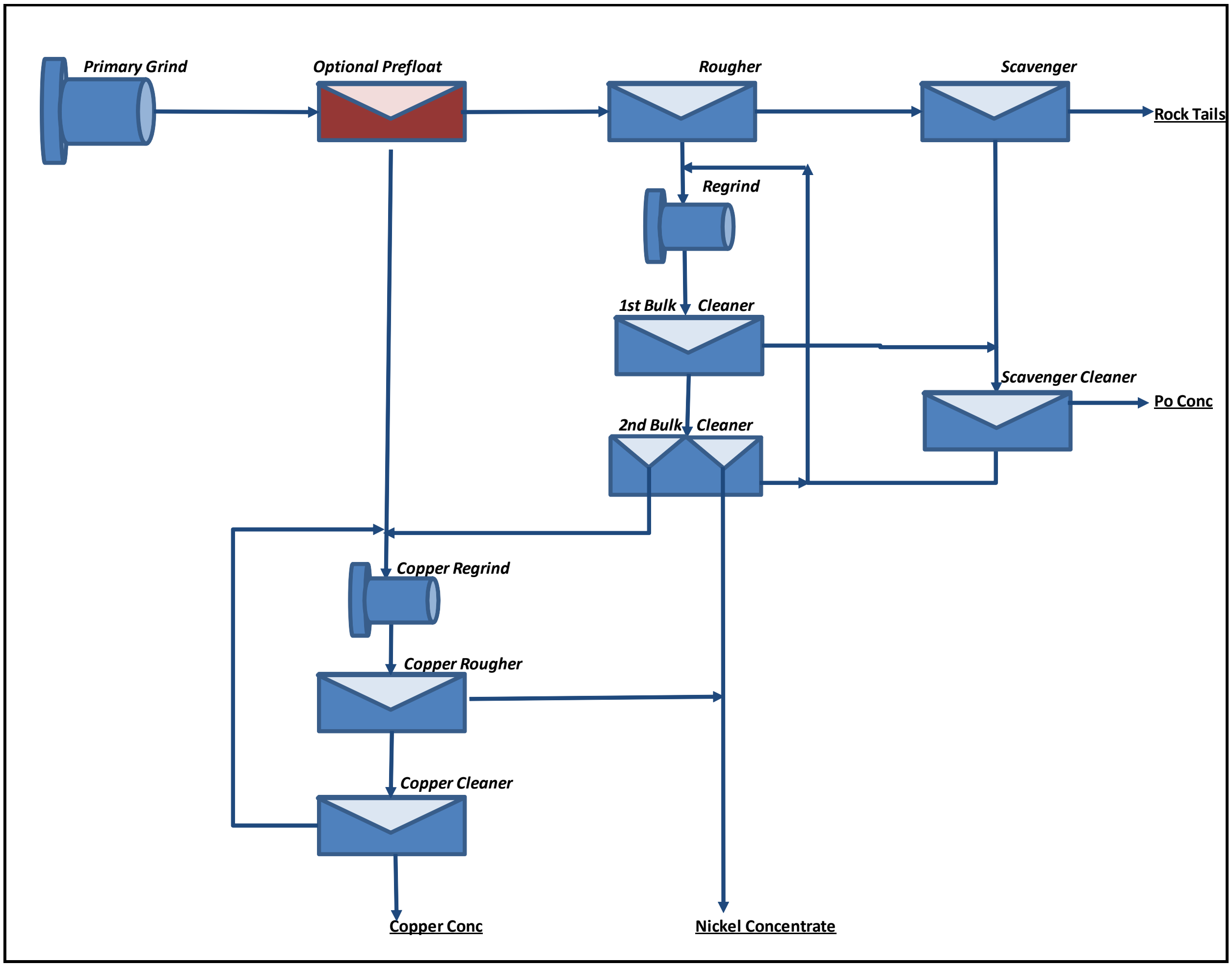


Figure 13-12: Conceptual Flow sheet for Tamarack Showing Optional Prefloat (Copper Scalping) Stage

14.0 MINERAL RESOURCE ESTIMATES

14.1 Introduction

The 2014 mineral resource estimate for the Tamarack North Project was completed by Mr. Brian Thomas, P.Geo., Senior Resource Geologist with Golder with senior peer review provided by Mr. Paul Palmer, Principle, P.Geo., P.Eng. The estimate is based on assay data from drill programs completed by Kennecott between 2008 and 2013. The Tamarack North Project mineralization consists of three distinct geological domains, including the SMSU hosted in CGO, the MSU hosted in meta-sediments, and the 138 Zone hosted in mixed FGO and CGO. Block model grade variables include nickel (Ni), copper (Cu), cobalt (Co), platinum (Pt), palladium (Pd) and gold (Au) as well as specific gravity (SG).

The software used in the creation of the Tamarack North Project block model was CAE® Studio 3, release 3.22.84.0 (Datamine). The project was completed using extended precision and all processes were documented by recording HTM scripts for future reference.

14.2 Drill Hole Data

A total of 182 holes were provided by Kennecott containing 25,360 assay intervals having a total core length of 67,387.37 m. All drill hole data was provided as of February 6, 2014.

The Tamarack drill hole data was imported from electronic CSV (comma separated values) and no errors were encountered on import.

The drill hole file was reviewed in plan and section to validate the accuracy of the collar locations, hole orientations and down hole trace, and the assay data was analyzed for out of range values. The drill hole database was determined by Golder to be of suitable quality for resource estimation purposes.

14.3 Geological Interpretation

14.3.1 Sample Selection

Three mineral domain 3D envelopes were created to represent MSU (green), SMSU (red) and 138 Zone (purple) zones occurring at the Tamarack North Project as illustrated in Figure 14-1.

An approximate 0.50% NiEq cut-off was used to constrain the 3D mineral envelopes in areas of continuous mineralization, however, some lower grade material was included to maintain continuity and some higher grade mineralization was excluded as there was little continuity observed to form the basis of a resource. Figure 14-1 illustrates the three main mineral domains and the samples within each. The Tamarack North Project mineral resource estimate is based entirely on these samples captured inside the three main domains.

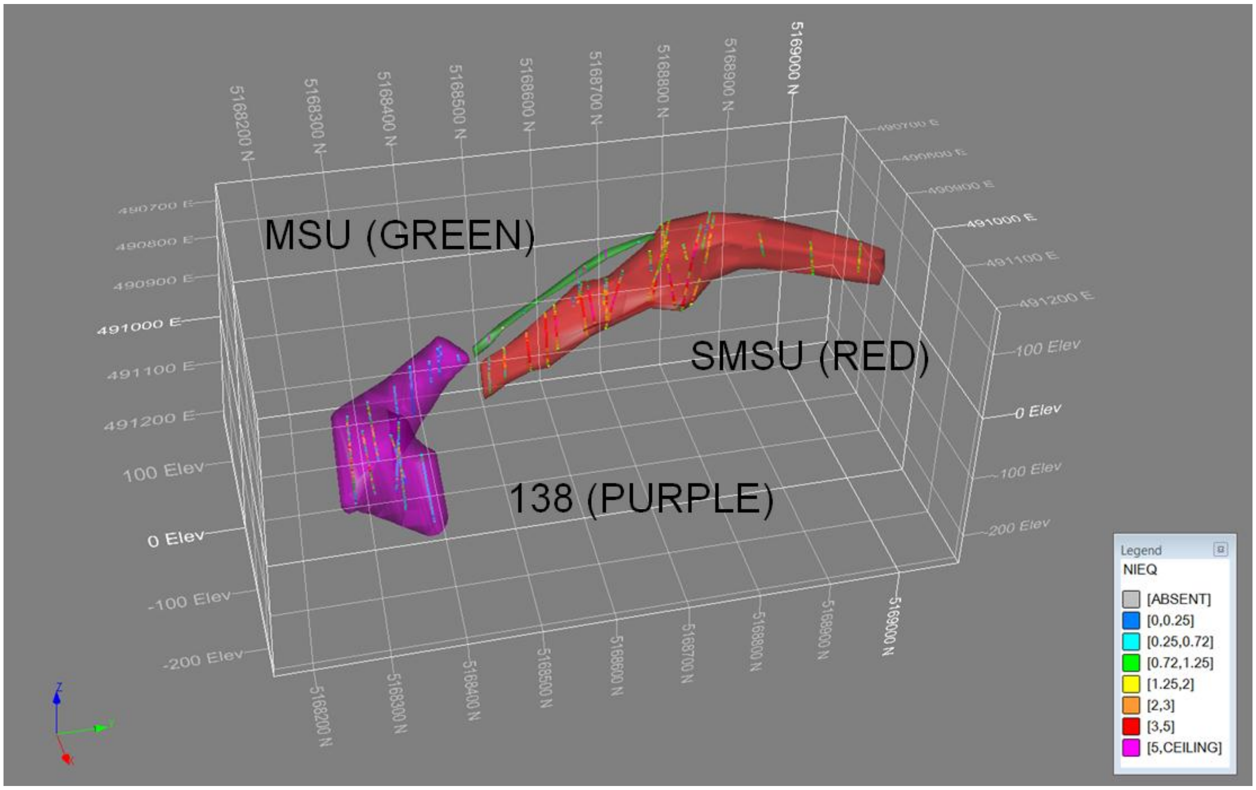


Figure 14-1: Oblique View of Mineral Domains Tamarack North Project (Facing North-West)

Raw sample intervals were captured inside each domain wireframe and verified visually to confirm the accuracy of the process. A total of 46 holes and 2,058 samples were captured for all 3 domains, having a total sample length of 2,998 m. Table 14-1 provides the sample break down by domain.

Table 14-1: Summary of Captured Samples Tamarack North Project

Domain	# of Holes	# of Samples	Total Sample Length (m)
SMSU	24	1,161	1,746
MSU	9	46	67
138 Zone	13	851	1,185
Total	46	2,058	2,998

14.4 Exploratory Data Analysis (EDA)

Descriptive statistics combined with a series of histograms and X-Y scatter plots were used to analyze the grade distribution of each sample population and to determine the presence of outliers and correlations between metals for each domain.

14.4.1 Descriptive Statistics

Table 14-2 provides a summary of the descriptive statistics for the sample populations captured from within each mineral domain.

Table 14-2: Descriptive Statistics of the Tamarack North Project Sample Population

Domain	Field	Samples	Minimum	Maximum	Mean	STD Deviation	Skewness	Coefficient of Variation
SMSU	Ni	1161	0.09	5.06	1.39	1.22	1.09	0.88
SMSU	Cu	1161	0.01	2.98	0.79	0.59	0.99	0.75
SMSU	Co	1161	0.01	0.13	0.04	0.03	1.11	0.77
SMSU	Pt	1161	0.00	3.10	0.37	0.35	1.89	0.95
SMSU	Pd	1161	0.00	1.25	0.23	0.18	1.26	0.81
SMSU	Au	1161	0.00	1.27	0.18	0.15	1.75	0.87
SMSU	SG	897	2.35	7.49	2.97	0.28	5.21	0.10
MSU	Ni	46	0.01	9.50	5.12	2.52	-0.56	0.49
MSU	Cu	46	0.01	4.64	2.50	1.22	-0.68	0.49
MSU	Co	46	0.00	0.19	0.10	0.05	-0.45	0.49
MSU	Pt	46	0.00	2.56	0.70	0.56	1.35	0.81
MSU	Pd	46	0.00	0.95	0.47	0.25	-0.17	0.54
MSU	Au	46	0.00	0.73	0.24	0.17	0.67	0.70
MSU	SG	34	2.77	4.51	3.67	0.52	-0.17	0.14
138 Zone	Ni	851	0.045	9.89	0.59	0.62	5.50	1.06
138 Zone	Cu	851	0.0025	7.56	0.42	0.56	4.79	1.33
138 Zone	Co	851	0.0043	0.20	0.02	0.01	5.23	0.55
138 Zone	Pt	851	0.0086	100.00	0.21	2.06	48.02	9.88
138 Zone	Pd	851	0.004	4.88	0.10	0.13	21.37	1.34
138 Zone	Au	851	0.002	1.06	0.10	0.11	3.79	1.11
138 Zone	SG	NA	NA	NA	NA	NA	NA	NA

Note:Sample statistics weighted by Length for all domains.

Figures 14-2 to 14-4 provide examples of the frequency distribution of the nickel sample populations of each domain. The nickel population was found to be being weakly bi-modal in the SMSU and MSU domains and positively skewed in the 138 Zone.

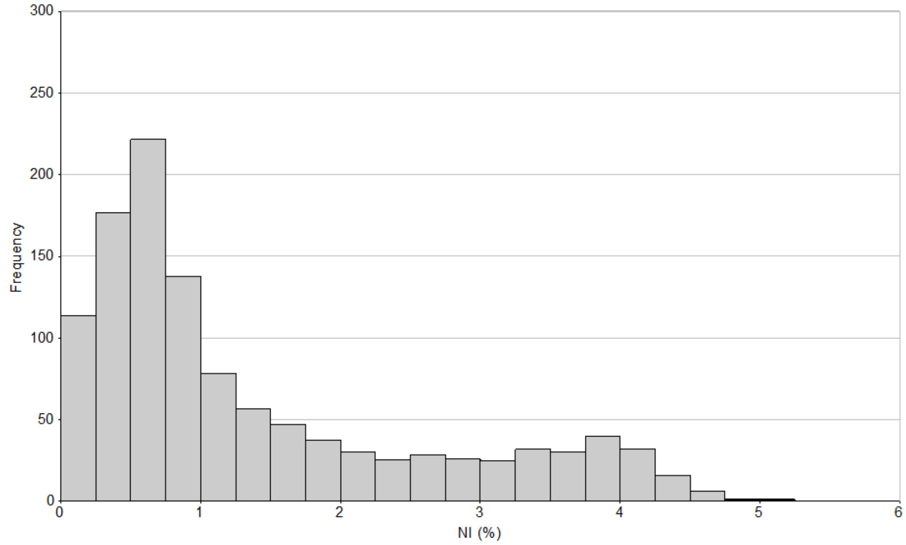


Figure 14-2: Histogram of Ni for SMSU

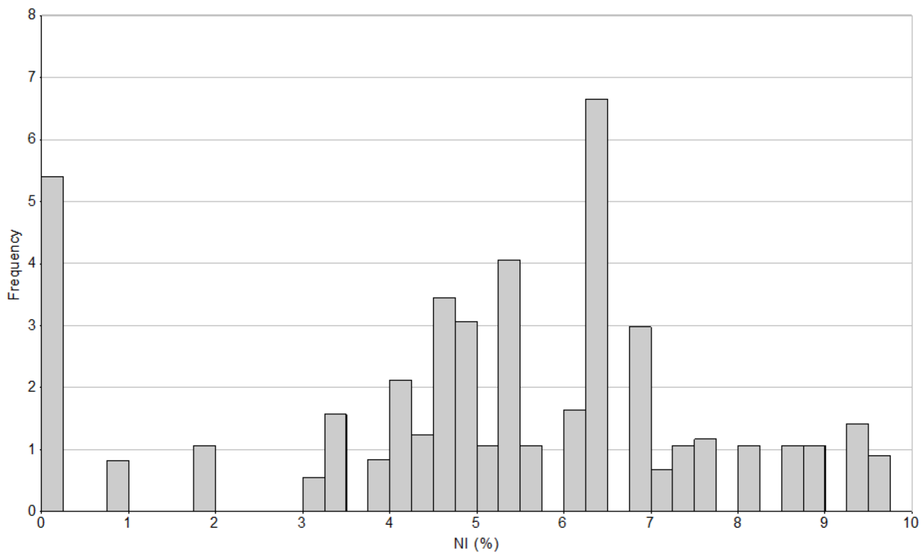


Figure 14-3: Histogram of Ni for MSU

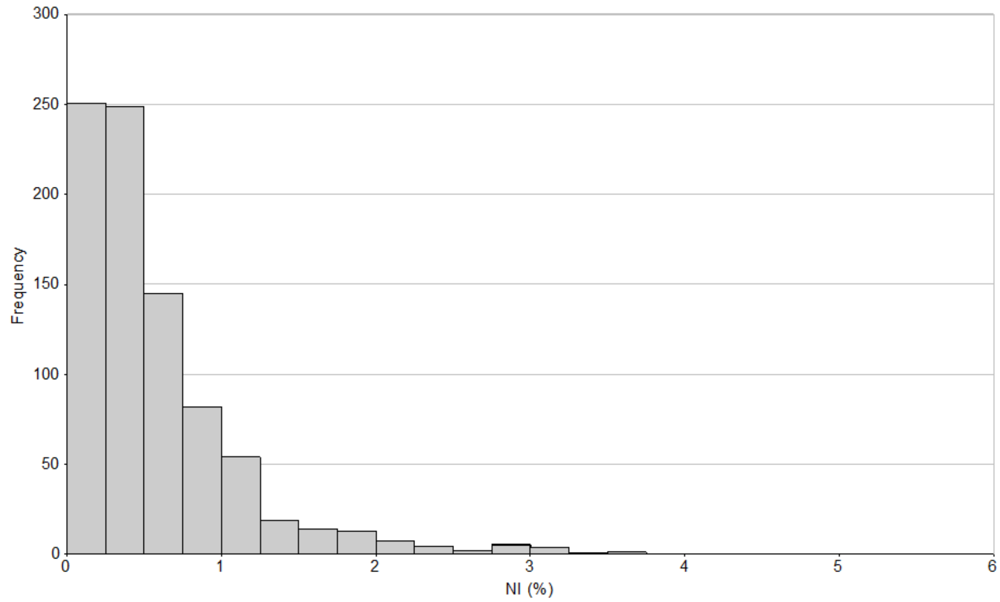


Figure 14-4: Histogram of Ni for 138 Zone

Un-assayed intervals were assumed to be waste and assigned a metal value of ½ the detection limit for each metal as listed in Table 14-3. There was only one interval with absent metal assays for the entire captured sample population.

Table 14-3: Default Grades for Absent Data

Metal	Default Value
Ni	0.0025 (%)
Cu	0.0025 (%)
Co	0.001 (%)
Pt	0.0025 (ppm)
Pd	0.0025 (ppm)
Au	0.005 (ppm)

14.4.2 Correlations

A correlation matrix was generated for each domain in order to determine the relationship between all metal and specific gravity (dry bulk density) values as illustrated for the SMSU domain in Table 14-4.

Table 14-4: Correlation Matrix of the SMSU

	Ni	Cu	Co	Pt	Pd	Au	S	SG
Ni	1							
Cu	0.9072	1						
Co	0.9877	0.8635	1					
Pt	0.1432	0.2809	0.092	1				
Pd	0.3041	0.4087	0.2487	0.8856	1			
Au	0.1536	0.3525	0.0871	0.7707	0.7846	1		
S	0.9873	0.8744	0.995	0.0911	0.2447	0.0919	1	
SG	0.6345	0.5307	0.659	0.0521	0.1553	0.0068	0.6584	1

Nickel was found to have a strong correlation with Cu, Co, S, and a reasonably good correlation with measured specific gravity values. Cu was found to have a marginally higher correlation with the PGM metals than Ni in the SMSU, but that is not necessarily the case in the MSU and 138 Zone domains. These are typical relationships generally associated with magmatic nickel sulphide deposits. The correlation between S and SG was used as the basis to calculate SG for absent intervals in the SMSU domain as described further in this section. These correlations were also used to make assumptions that cobalt and SG have the similar spatially continuity as Ni as described in the variography section.

14.4.3 Bulk Density

Specific gravity (SG) data obtained from cut core (single piece taken from sample bag) lab measurements (ALS Chemex) was the main source of SG values in the supplied assay database. Field measurements were also taken on site from 10 cm core samples, taken approximately every 20 m, using the weight in air versus the weight in water method based on the following formula:

SG = weight in air / (weight in air – weight in water)

Golder elected to only use the SG measurements obtained from lab measurements and did not use the field measurements. Calculated SG values were substituted, where no lab measured data was available, based on polynomial regression formulas defined for each mineral domain. Specific gravity was assigned to absent drill hole intervals by polynomial regression for the MSU and SMSU domains based on moderate to good correlations with nickel and sulphur. No lab measured SG data was available for the 138 Zone domain. SG was later assigned to the 138 Zone model based on a regression formula derived from the SMSU domain, limited to the same Ni and Cu grade range as observed in the 138 Zone. SG data from field measurements was later compared to the model, with differences found to be less than 0.5% globally for the 138 Zone domain. The regression formulas used for each domain are listed below.

SG (SMSU) = 2.77198 + Sulphur (%) x 0.03379

SG (MSU) = 2.80013 + Ni x 0.16981

SG (138 Zone) = 2.7922 + Ni x 0.074235 (applied to block model, not estimated)

Based on reasonably good correlations with the SG data, Golder decided that it would be appropriate to weight the base metal grades (Ni, Cu & Co) by SG for estimation purposes for the SMSU and MSU domains. New grade fields QNi, QCu, and QCo were calculated by multiplying the metal grade by measured SG, if available, and calculated SG in the absence of measured data. Grades in the 138 Zone were not weighted by SG.

X-Y scatter plots were generated to illustrate the relationship between S and SG, for the SMSU domain, and Ni and SG, for the MSU domain as shown in Figure 14-5 and Figure 14-6.

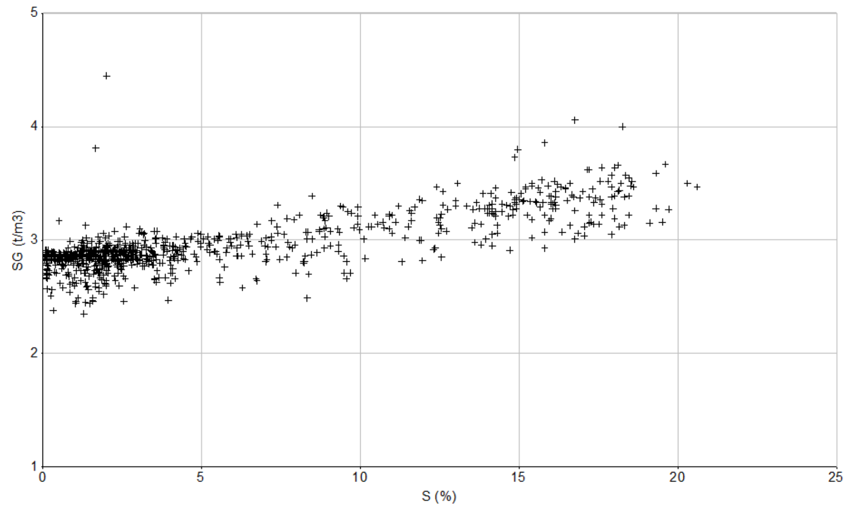


Figure 14-5: Scatter Plot of S vs SG in SMSU

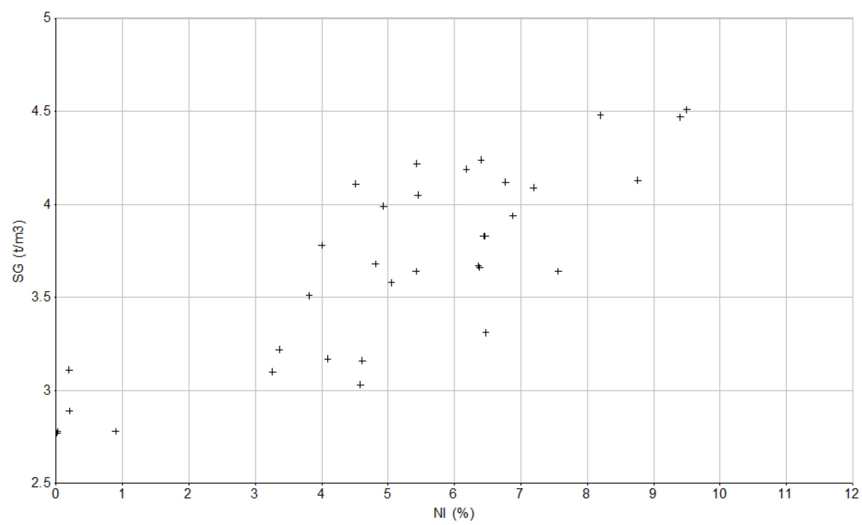


Figure 14-6: Scatter Plot of Ni vs SG in MSU

14.4.4 Outliers

X-Y scatter plots were generated in order to assess the sample population for outlier values. High grade outlier data has the potential to bias the block model grades if they are not handled by top cutting or otherwise restricting their influence through other estimation criteria. A minor number of high grade outliers were identified in the Pt, Pd and Au populations of each domain as shown in Figure 14-7 and Figure 14-8.

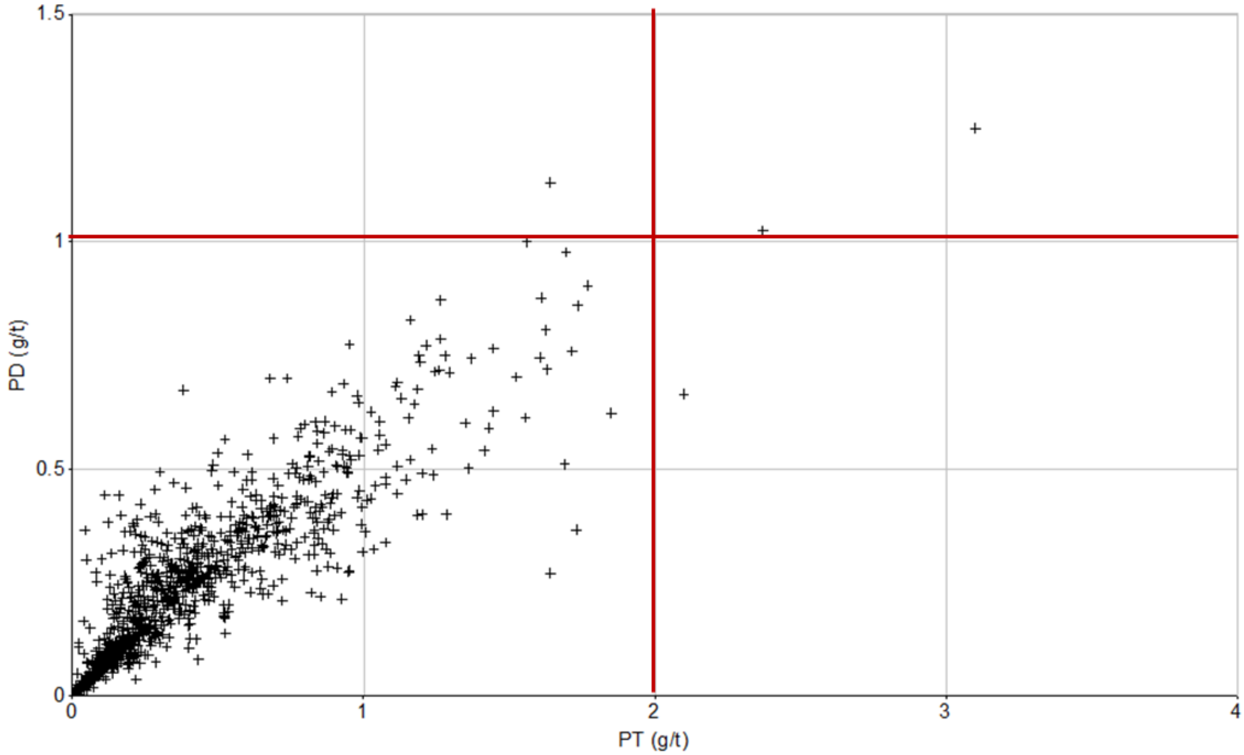


Figure 14-7: Scatter Plot of Pt vs Pd (SMSU)

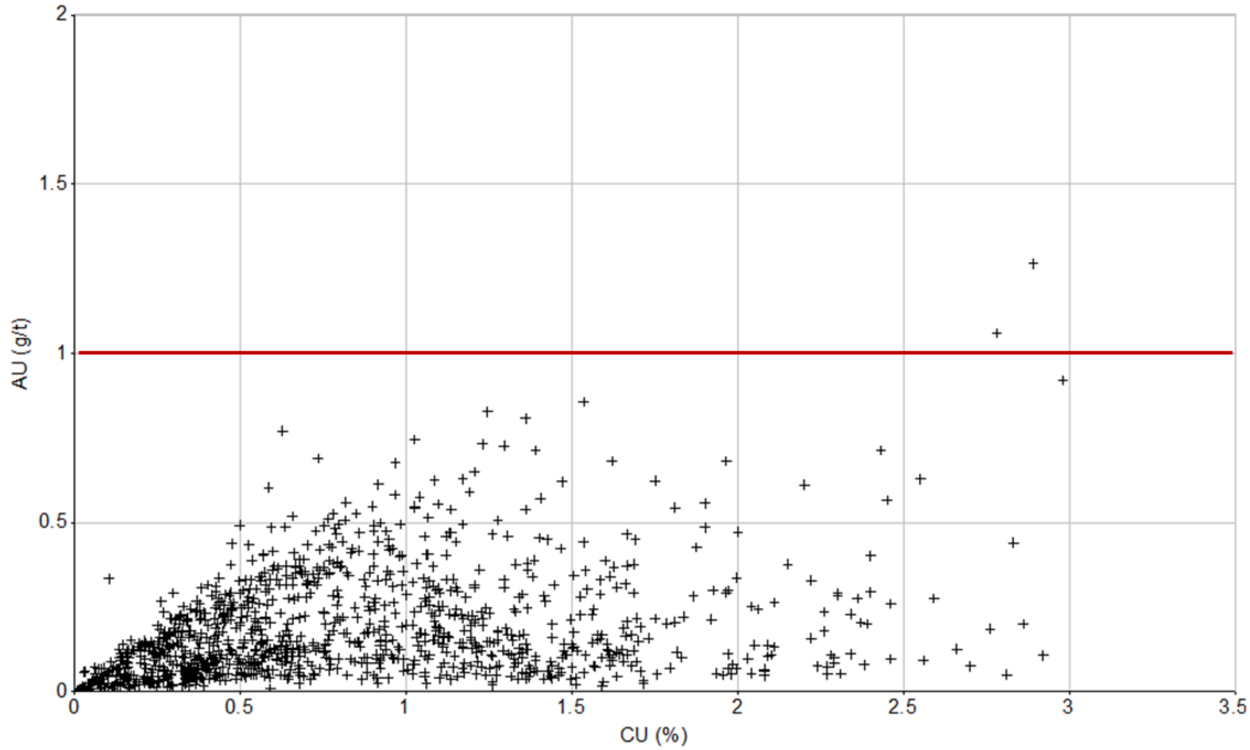


Figure 14-8: Scatter Plot of Au vs Cu of SMSU

The identified PGM outliers were top-cut as listed in Table 14-5. Top cutting reduces the value of an outlier to a set maximum value.

Table 14-5: Summary of Top Cuts

Domain	Metal	Top Cut Value	# Samples Cut
SMSU	Pt	2	3
SMSU	Pd	1	3
SMSU	Au	1	2
MSU	Pt	2.5	1
MSU	Pd	1.0	0
MSU	Au	0.6	1
138 Zone	Pt	1.5	1
138 Zone	Pd	1	1
138 Zone	Au	1	1

14.5 Compositing

Compositing samples is a technique used to give each sample a relatively equal length weighting in order to reduce the potential for bias due to uneven sample lengths. A histogram of raw sample length was generated for each domain in order to determine the most common sample length used at the Tamarack North Project as illustrated in Figure 14-9.

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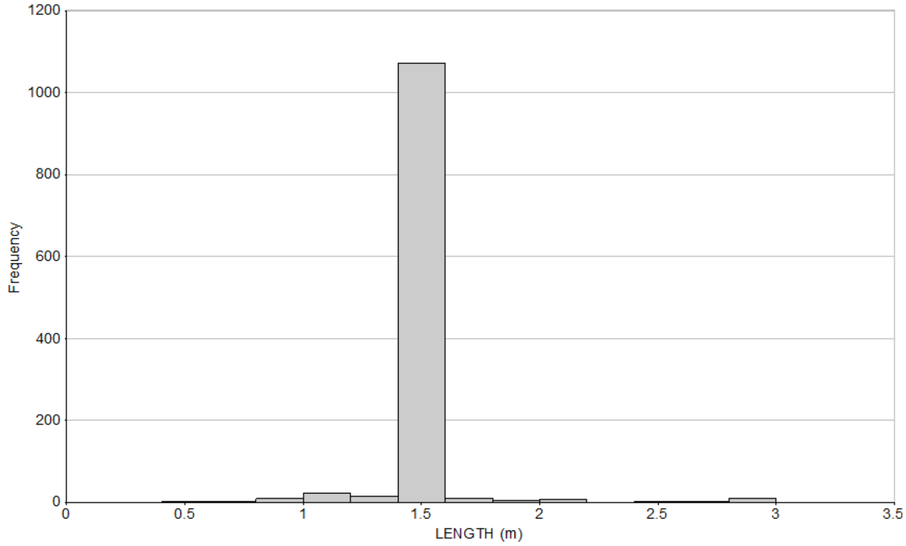

Figure 14-9: Histogram of Raw Sample Length (SMSU)

Samples captured within each mineral domain were composited to an average length of 1.5 m. This interval was chosen because it is the most common sample length and provides a reasonable level of sample support. An option to use a variable composite length was chosen in order to prevent the creation of short composites that are generally created when using a fixed length.

The composite samples were validated visually in plan and section and a histogram of composite length was generated in order to confirm that the compositing was completed as expected. The histogram displayed a normal distribution around the chosen composite length of 1.5 m and the total lengths of the composites were found to match that of the raw captured samples.

14.6 Resource Estimation

14.6.1 Unfolding

The “Unfold” process within Studio 3 was used to transform the composite sample data from Cartesian coordinates into an unfolded coordinate system (UCS), as defined by the geometry of the footwall and hanging wall contacts of each 3D mineral wireframe. This transformation essentially removes bends, pinches and swells in the mineral model, allowing for more robust variogram calculations and grade estimation. This was considered an appropriate process to employ given the variable orientations of each 3d mineral wireframe.

Strings representing the footwall and hanging wall contacts of the deposit were constructed and tagged in plain view, as shown in Figure 14-10. These strings are then used to transform the composite samples into the unfold coordinate system. The same unfold strings are used in the grade estimation process to unfold the blocks into the same transformed system as the composite samples. The process unfolds discretization points from the prototype model and estimates the grades for each in the unfold co-ordinate system. The process then assigns the estimated grades back to the corresponding cell in the Cartesian model. In the unfold coordinate system, the X-axis is assigned to UCSA which represents the thickness of the zone, the Y-axis is assigned to UCSB representing the down-dip direction of the zone and the Z-axis becomes UCSC and representing the strike direction of the zone.

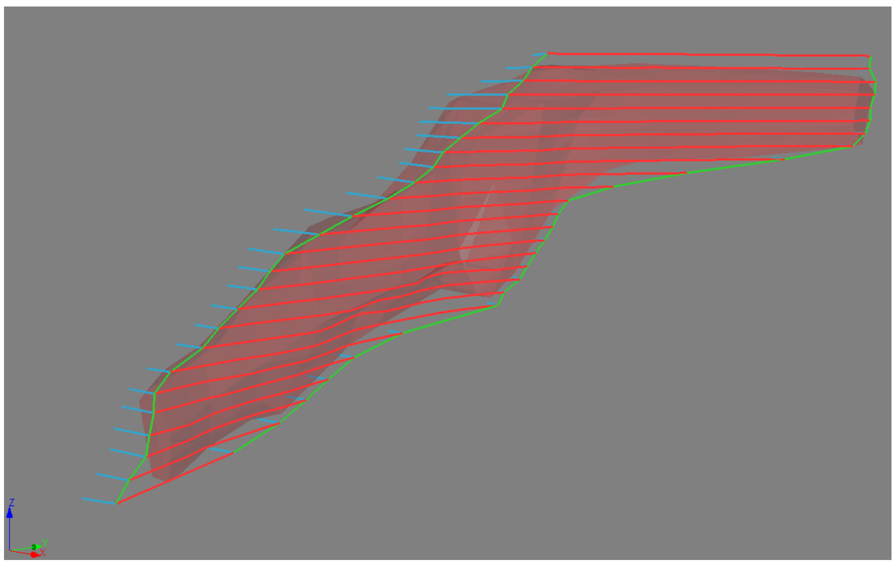

Figure 14-10: SMSU Unfold Strings, Oblique View Facing North-West

The unfolded samples were validated visually in unfold space for each zone. Quadrilateral strings created during the process were inspected to confirm that unfolding had performed as expected.

Visual inspection of the Nearest Neighbour (NN) model confirmed that the unfolding process had worked as expected for all zones.

14.6.2 Grade Variography

Experimental grade variograms were generated from the unfolded composite data for each metal and SG, in order to assess the spatial variability of the variables for the purpose of assigning Kriging weights to the composite samples. Samples situated in the directions of preferred geological continuity receive higher Kriging weights resulting in a greater influence on the block estimate.

Pairwise Relative experimental grade variograms were generated based on the parameters outlined in Table 14-6. Variograms were not generated for the MSU domain due to insufficient data.

Table 14-6: Grade Variogram Parameters

Elements	SMSU	138
Rotations	0	0
Lag Distance	20 m	30 m
Number of Lags	15	10
Sub-lag Distance	5 m	15 m
Number Lags to be Sub-lagged	5	4
Regularization angle	22°	22°
Number of Azimuths	2	2
Cylindrical search radius	30	30

A set of two structure spherical variogram models were fitted to the data. An example of the variogram model for Ni in the SMSU and 138 domains is provided in Figure 14-11 and Figure 14-12. Summaries of all the variogram models are provided in Table 14-7.

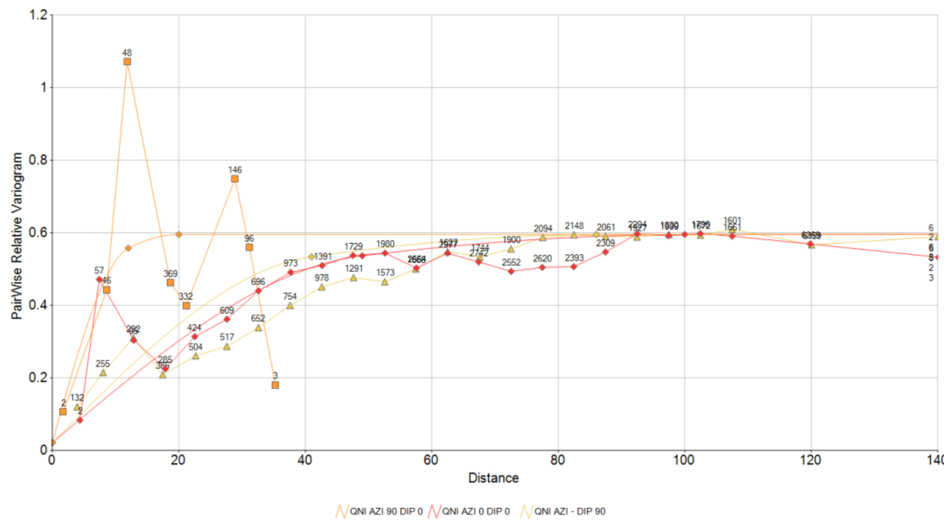

Figure 14-11: SMSU Ni Variogram Model

Table 14-7: SMSU Grade Variography (unfolded)

ELEMENT	NUGGET	1st Structure				2nd Structure			
		X-Range	Y-Range	Z-Range	Variance	X-Range	Y-Range	Z-Range	Variance
Ni	0.021	12	49	41	0.39	20	100	86	0.18
Cu	0.053	12	36	25	0.34	20	100	86	0.17
Pt	0.073	9	30	10	0.22	20	63	40	0.16
Pd	0.075	5	30	16	0.14	20	65	40	0.15
Au	0.074	11	32	9	0.33	20	65	40	0.07

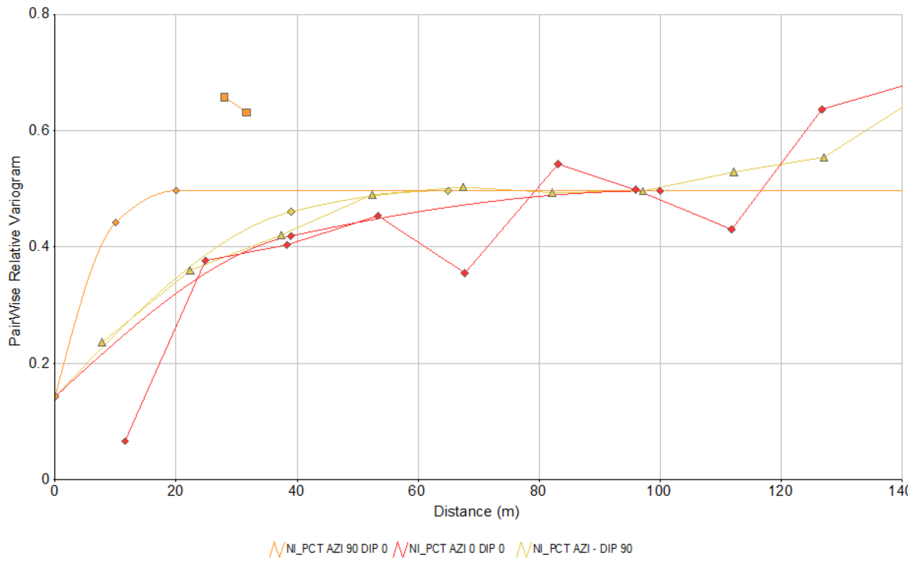

Figure 14-12: 138 Ni Variogram Model

Table 14-8: 138 Zone Grade Variography

ELEMENT	NUGGET	1st Structure				2nd Structure			
		X-Range	Y-Range	Z-Range	Variance	X-Range	Y-Range	Z-Range	Variance
Ni	0.143	10	39	39	0.18	20	100	65	0.18
Cu	0.218	10	53	21	0.18	20	101	72	0.40
Pt	0.218	10	31	21	0.10	23	80	50	0.22
Pd	0.218	10	31	21	0.10	23	80	50	0.22
Au	0.232	10	52	21	0.16	23	100	71	0.27

Note:
In the unfolded coordinates, X (vertical) is across the mineralization, Y is down-dip, and Z is along strike.

The down-dip (Y-Range) and along strike (Z-Range) directions of the mineralization were determined to be the directions of greatest grade continuity. The second structure range of each axis was used as the basis to define the search ellipse dimensions used for interpolating into the 3D mineral resource block model.

14.6.3 Block Model Definition

The Tamarack North Project proto-type model covers a 3D block in UTM NAD 83 grid co-ordinates from 490,650 East to 491,200 East, 5,168,150 North to 5,169,100 North, and -250 to 150 m Elevation. Block shape and size is typically a function of the geometry of the deposit, density of sample data, and expected potential smallest mining unit (SMU). On this basis, a parent block size of 7.5 m (E-W) by 7.5 m (N-S) by 7.5 m (Elevation) was chosen. The block model definition parameters are summarized in Table 14-9.

Table 14-9: Block Model Proto-type Summary

Origin			Block Size (m)			Number of Blocks			Extent (m)		
X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
490,650.0	5,168,150.0	-250.0	7.5	7.5	7.5	73	127	53	547.5	952.5	397.5

The 3 mineral domain volumes were filled with blocks using the parameters described in Table 14-9. Cell splitting (2X) was used for improved definition of boundaries. The 3 wireframe volumes were then compared to the filled model volumes to confirm there were no errors during the process.

14.6.4 Estimation Methodology

Ordinary Kriging (OK) was the interpolation method chosen to estimate grades in the SMSU and 138 domains. This method is based on the variogram modeling to assign weights to the samples based on the modeled spatial continuity of the sample data. The MSU domain did not have sufficient data for variogram modeling so the Inverse distance Squared (ID2) interpolation method was chosen. This method assigns weights to samples based on the distance from the block centroid, with closer samples having a higher weighting. ID2 was also used in the SMSU and 138 domains for comparative purposes, but not used for resource reporting.

Base metals (Ni, Cu and Co) were weighted by specific gravity for the SMSU and MSU zones based on observed correlations previously discussed. The 138 Zone was not weighted by SG because there was insufficient SG data to do so. All domains utilized a nested search strategy, unfolding and top-cutting as summarized in Table 14-10.

Nearest Neighbour (NN) interpolation was also used to estimate each domain for model validation purposes. NN estimates use the sample grade closest to the centroid of the block and represent declustered sample grades for use in block model validation.

Table 14-10: Summary of Estimation Methodology

Geological Domain	Interpolation Methods	SG Weighting of Base Metals	Nested Search	Unfolding	Top Cutting
SMSU	OK, ID2, NN	Yes	Yes	Yes	Yes
MSU	ID2, NN	Yes	Yes	Yes	Yes
138 Zone	OK, ID2, NN	No	Yes	Yes	Yes

Nested, anisotropic searches were performed for all domains using the modeled second structure variogram ranges for each element as a guide for each of the 3 axes, orthogonal to the unfolded plane of the deposit. The search parameters for all elements are summarized in Table 14-11. Note that as with the variogram ranges, these search parameters are used in unfolded space during the interpolation process, where X is across the deposit, Y is down-dip, and Z is in the strike direction. The search radius of the first search was restricted to one half the variogram range with the second search being the full variogram range and the third search being twice the variogram range. Search strategies for each domain used an elliptical search with a minimum of 4 samples and a maximum of 12 samples, utilizing an octant restriction of at least 3 octants with a maximum of 4 samples per octant, as well as a maximum of 6 samples per hole. Un-estimated blocks were flagged in the model and then estimated without octant or hole restrictions, along with expanded search distances. Search parameters are further summarized in Table 14-11. SMSU search parameters were assumed for the MSU domain due to insufficient data for variogram modeling.

Table 14-11: Summary of Search Parameters (unfolded)

Element	1st Search					2nd Search			3rd Search		
	X-Range	Y-Range	Z-Range	Min. Samples	Max. Samples	SVOL Factor 2	Min. Samples	Max. Samples	SVOL Factor 3	Min. Samples	Max. Samples
SMSU Ni, Cu, Co	10	50	40	4	12	2	4	12	4	2	12
SMSU Pt, Pd, Au	10	33	20	4	12	2	4	12	4	2	12
MSU Ni, Cu, Co	10	50	40	4	12	2	4	12	4	2	12
MSU Pt, Pd, Au	10	33	20	4	12	2	4	12	4	2	12
138 Zone Ni, Cu, Co	10	50	36	4	12	2	4	12	4	2	12
138 Zone Pt, Pd, Au	10	40	25	4	12	2	4	12	4	2	12

14.7 Mineral Resource Classification

Resource classifications were assigned to broad regions of the block model based on a combination of drill hole density and the search volume used to estimate the grade of the block. Areas where the drill hole spacing was on average 25 m or less and the block grade was estimated in the first or second search volume were classified as Indicated Mineral Resource. Areas where the drill hole spacing was wider than 25 m and the block grades were estimated in the second or third search volume were classified as Inferred Mineral Resource. No Measured Mineral Resource was outlined from the block model as it is Golder's opinion that the drill spacing and orientation of drilling is insufficient to adequately define the volume and extent of mineralization in order to meet that classification. Figure 14-9 outlines the mineral resource classifications assigned to the model. The green area outlined in Figure 14-19 is Indicated Mineral Resource and the blue is Inferred Mineral Resource.

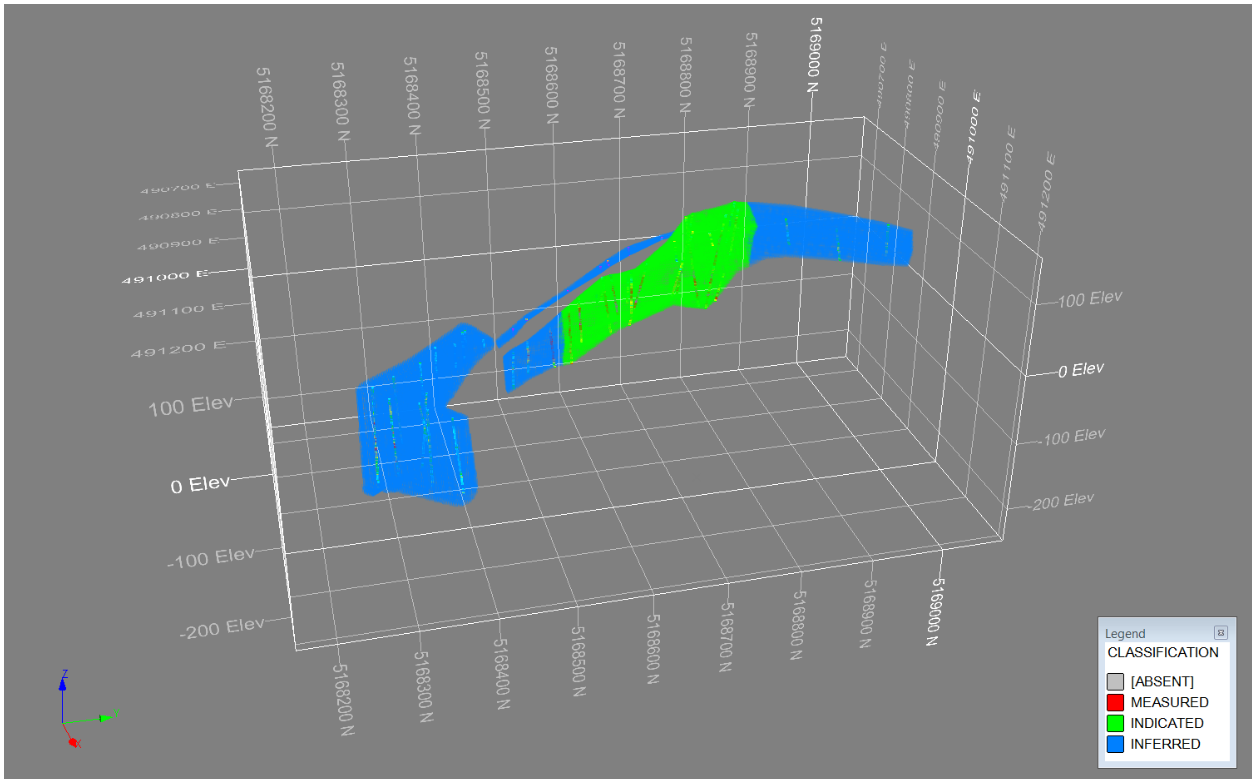

Figure 14-13: Tamarack North Project Resource Classification (Oblique View Facing NW)

Table 14-12 summarizes the data density statistics by classification and domain.

Table 14-12: Data Density Statistics

Domain	Mineral Resource Classification	Global Model Tonnage (t)	# of Holes	# of Samples	Tonnes Per Hole	Tonnes Per Sample
SMSU	Indicated Mineral Resource	4,305,340	18	940	239,186	4,580
SMSU	Inferred Mineral Resource	1,852,351	6	221	308,725	8,382
MSU	Inferred Mineral Resource	159,596	9	47	17,732	3,396
138 Zone	Inferred Mineral Resource	5,169,426	13	1,099	397,648	4,704

The number of blocks estimated in each of the three search volumes was reviewed to ensure that the proportion of cells estimated for each was relatively consistent with the spacing of the drill hole data and the classification assigned to the model. Sixty-nine percent of the blocks in the SMSU were estimated within the first search volume while the MSU and 138 Zone domains were 45% and 40% respectively as listed in Table 14-13. All of the MSU and 138 Zone resources were classified as Inferred Mineral Resource. These results are consistent with the drill density observed throughout the deposit.

Table 14-13: Summary of Tonnes per Search Volume

Domain	1st Search	2nd Search	3rd Search	4th Search	Total Tonnes	% 1st	% 2nd
SMSU	4,264,981	1,749,766	119,911	23,034	6,157,691	69.3%	28.4%
MSU	71,474	77,564	3,678	6,880	159,596	44.8%	48.6%
138 Zone	2,063,607	2,386,182	695,828	23,809	5,169,429	39.9%	46.2%

14.8 Block Model Validation

The model validation process included a visual comparison of block and composite grades in plan and section, along with a global comparison of mean grades and swath plots. Block grades were visually compared to the drill hole composite data in all domains to ensure agreement. No material grade bias issues were identified and the block grades compared well to the composite data as demonstrated in Figure 14-14 and 14-15.

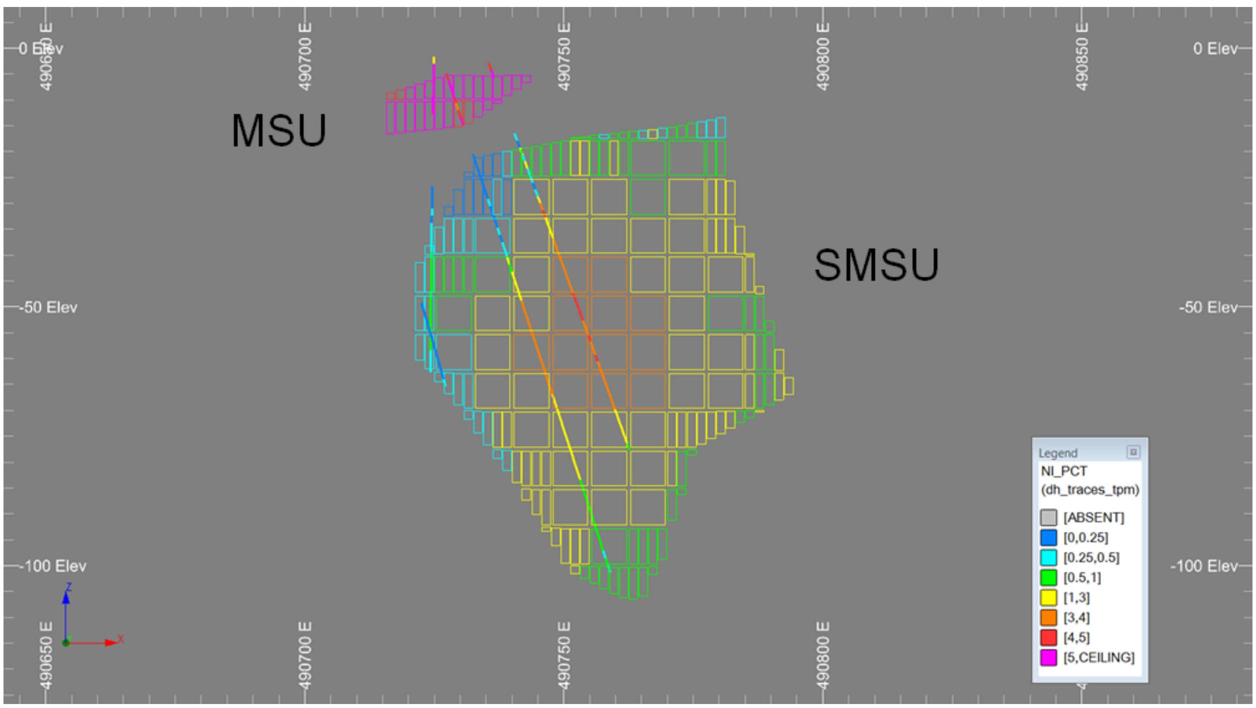

Figure 14-14: SMSU & MSU Domains – East-West Section 5168650N (Facing North)

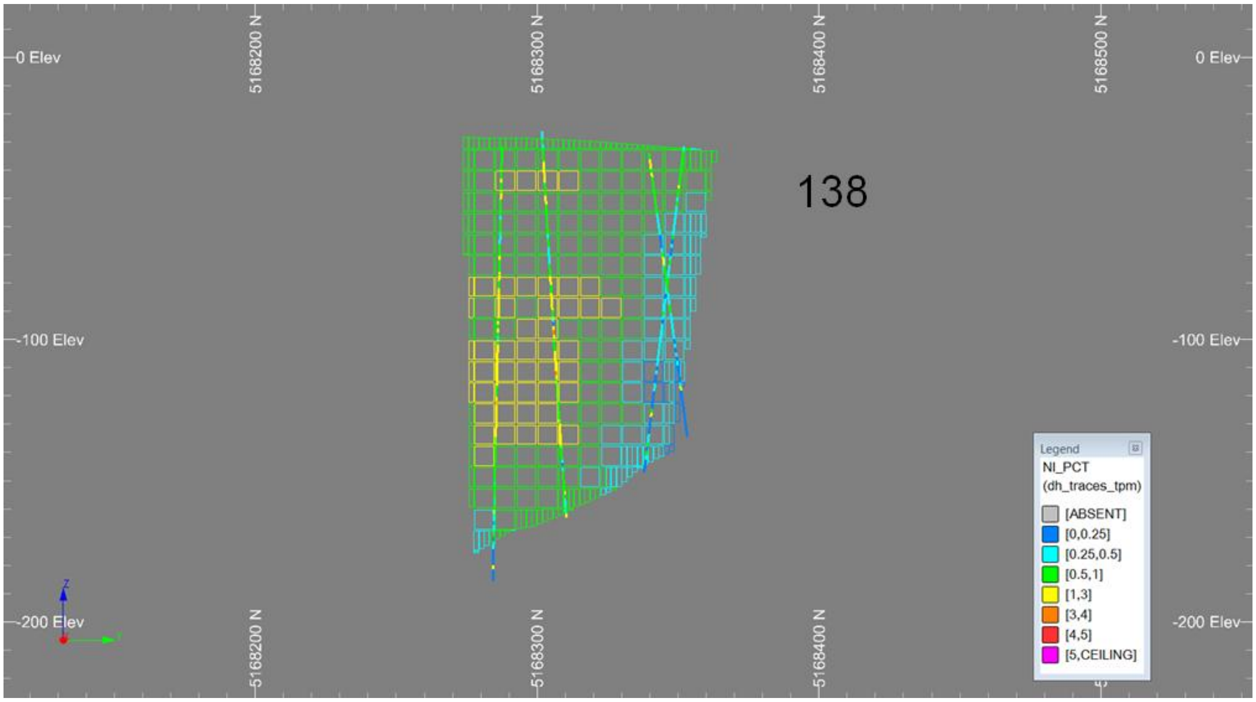

Figure 14-15: 138 Zone Domain North-South Section 491000E (Facing West)

Global statistical comparisons between the composite samples, NN estimates and OK/ID estimates for each element were compared to assess global bias. The NN model estimates represent the de-clustered composite data. Clustering of the drill hole data can result in differences between the global means of the composites and NN estimates. The global means of the NN and Kriged estimates should also be very similar to confirm that there is no global grade bias in the model. The results summarized in Table 14-14 indicate that no significant grade bias was found in the block model.

Table 14-14: Statistical Comparison of Global Mean Grades

Field	Source	SMSU	MSU	138 Zone
		Mean	Mean	Mean
Ni	Composites	1.39	4.94	0.58
	NN Model	1.36	5.09	0.61
	Final Model	1.36	5.13	0.61
Cu	Composites	0.79	2.42	0.42
	NN Model	0.76	2.34	0.45
	Final Model	0.77	2.42	0.45
Pt	Composites	0.37	0.67	0.16
	NN Model	0.31	0.60	0.18
	Final Model	0.33	0.65	0.17

Field	Source	SMSU	MSU	138 Zone
		Mean	Mean	Mean
Pd	Composites	0.23	0.45	0.10
	NN Model	0.19	0.43	0.10
	Final Model	0.20	0.43	0.10
Au	Composites	0.18	0.23	0.10
	NN Model	0.16	0.21	0.11
	Final Model	0.16	0.21	0.10

Notes:
For the purpose of calculating statistics, composite samples were weighted by length and block grades weighted by volume.

A series of swath plots of Ni grades were generated from 2D slices throughout each 3D domain model and are presented in Figures 14-16 to 14-18. The swath plots compare the model grades to the declustered composite grades in order to identify local grade bias in the model. Review of these swath plots did not identify any bias in the model that is material to the resource estimate as there was general agreement between the declustered composites (NN model) and the final model grades.

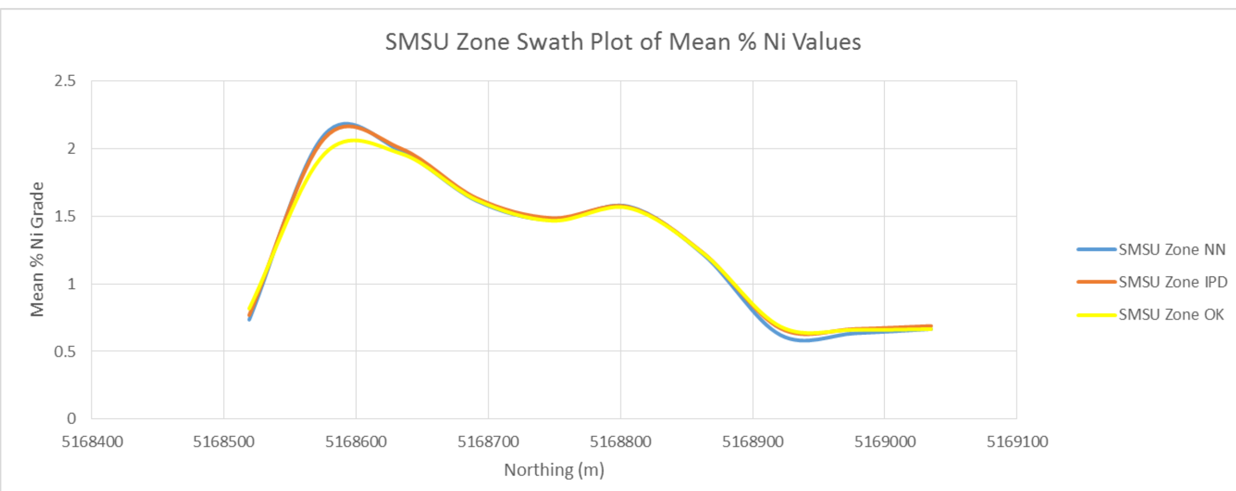

Figure 14-16: SMSU Zone Swath Plot of Mean % Ni Values for NN, IPD and OK

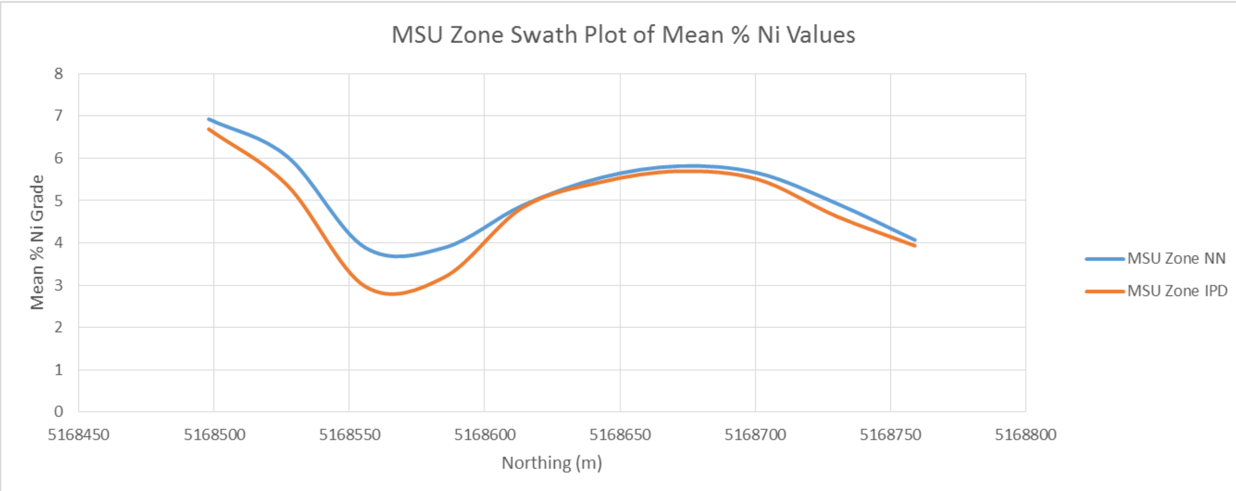

Figure14-17: MSU Zone Swath Plot of Mean % Ni Values for NN and IPD

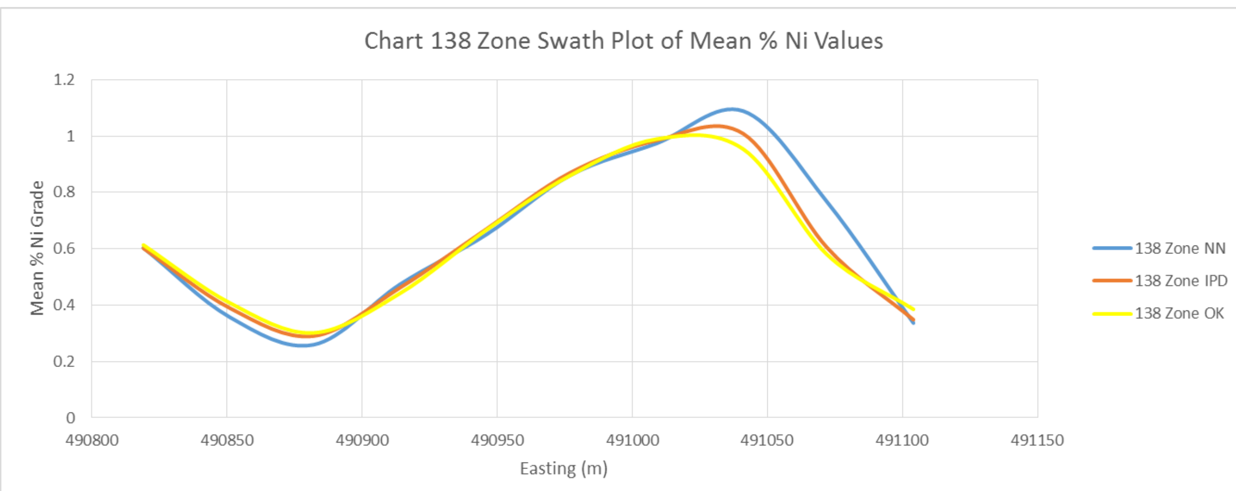

Figure 14-18: 138 Zone Swath Plot of Mean % Ni Values for NN, IPD and OK

14.9 Cut-off Grade

The cut-off grade, provided by Talon, for the 2014 mineral resource estimate in this technical report is a 0.9% nickel equivalent (NiEq). This cut-off represents the break-even OPEX mining cost of $US104 per tonne. Table 14-15 lists the current metal price and recovery assumptions used in the calculation of OPEX mining costs and NiEq cut-off.

Table 14-15: Talon Long Term Metal Price and Recovery Assumptions

Metal	Recovery	Price (US$)
Nickel (Ni)	78%	9.20 lb
Copper(Cu)	95%	2.91 lb
Cobalt (Co)	55%	14.00 lb
Platinum (Pt)	50%	1400 oz
Paladium (Pd)	50%	600 oz
Gold (Au)	50%	1300 oz

Based on the current metal price assumptions, the 2014 NiEq resource values were defined using the following formula:

NiEq% = Ni%+ Cu% x 2.91/9.20 + Co% x 14/9.20 + Pt [g/t]/31.103 x 1,400/9.2/22.04 + Pd [g/t]/31.103 x 600/9.2/22.04 + Au [g/t]/31.103 x 1,300/9.2/22.04

Talon's long term metal price assumptions are based on the average metal price forecast from a number of recognized financial institutions from North America and Europe.

Talon has applied payable metal recoveries in the calculation of NSR for their OPEX mining costs rather than applying it to the resource grades. The 0.9 NiEq cut-off was derived from Ni and Cu and did not include PGE metal credits resulting in a more conservative approach.

OPEX costs were estimated for underground mining as summarized in Table 14-16 and appear to be within industry norms.

Table 14-16: Summary of OPEX Assumptions

OPEX	$US/Tonne
Mining	$60.00
Milling	$24.00
G&A	$20.00
Total	**$104.00**

14.10 Mineral Resource Statements

The mineral resource1 for the Tamarack North Project are reported in accordance with NI 43-101 and have been estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserves Best Practices" guidelines.

Mineral resources are not mineral reserves and do not necessarily demonstrate economic viability. There is no certainty that all or any part of this mineral resource will be converted into mineral reserve.

Inferred Mineral Resources are too speculative geologically to have economic considerations applied to them to enable them to be categorized as mineral reserves.

The resource estimate was completed by Brian Thomas, P.Geo., (APGO #1366, APEGBC #38094), an independent QP as is defined in NI 43-101 with senior review provided by Paul Palmer, P.Geo., P.Eng. The effective date of this resource estimate is August 29, 2014.

The mineral resources are reported above a NiEq cut-off of 0.90%, while other cut-offs are listed in order to demonstrate tonnage and grade sensitivities. The resources reported are based on a 'blocks above cut-off' basis but were examined visually and found to have good continuity.

Table 14-17 reports the Indicated and Inferred Mineral Resources for the Tamarack North Project and Table 14-18 summarizes the sensitivities of other cut-offs.

Table 14-17: Tamarack North Project 2014 Resource Estimate

Domain	Mineral Resource Classification	Tonnes (000)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	NiEq (%)
SMSU	Indicated Mineral Resource	3,751	1.81	1.00	0.05	0.41	0.25	0.19	2.35
SMSU	Inferred Mineral Resource	949	1.12	0.62	0.03	0.25	0.16	0.14	1.47
MSU	Inferred Mineral Resource	158	5.25	2.47	0.11	0.66	0.44	0.22	6.42
138 Zone	Inferred Mineral Resource	2,012	0.95	0.78	0.03	0.23	0.14	0.17	1.33
Total	Indicated Mineral Resource	3,751	1.81	1.00	0.05	0.41	0.25	0.19	2.35
Total	Inferred Mineral Resource	3,119	1.22	0.82	0.03	0.26	0.16	0.16	1.63

Notes:
All resources reported above a 0.9% NiEq cut-off.
Mining recovery and dilution factors have not been applied to the estimates.
Tonnage estimates are rounded down to the nearest 1,000 tonnes.
Estimates do not include metallurgical recovery.
% - percent
g/t – grams per tonne

Table 14-18: Tamarack North Project 2014 Resource Sensitivities

Cut-Off	Mineral Resource Classification	Tonnes (000)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	NiEq (%)
0.70	Indicated Mineral Resource	4,070	1.71	0.95	0.04	0.39	0.24	0.19	2.23
0.70	Inferred Mineral Resource	4,693	0.99	0.68	0.03	0.23	0.14	0.14	1.34

Cut-Off	Mineral Resource Classification	Tonnes (000)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	NiEq (%)
0.80	Indicated Mineral Resource	3,922	1.75	0.97	0.05	0.40	0.25	0.19	2.28
0.80	Inferred Mineral Resource	3,972	1.09	0.73	0.03	0.24	0.15	0.15	1.46
0.90	**Indicated** Mineral Resource	**3,751**	**1.81**	**1.00**	**0.05**	**0.41**	**0.25**	**0.19**	**2.35**
0.90	**Inferred** Mineral Resource	**3,119**	**1.22**	**0.82**	**0.03**	**0.26**	**0.16**	**0.16**	**1.63**
1.00	Indicated Mineral Resource	3,556	1.87	1.03	0.05	0.41	0.26	0.20	2.42
1.00	Inferred Mineral Resource	2,383	1.39	0.92	0.04	0.29	0.18	0.18	1.85

Notes:
Mining recovery and dilution factors have not been applied to the estimates.
Tonnage estimates are rounded down to the nearest 1,000 tonnes.
Estimates do not include metallurgical recovery.
Bold represents the official resource.
% - percent
g/t – grams per tonne

Golder is unaware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or any other potential factors that could materially impact the Tamarack North Project resource estimate provided in this technical report. The resource is located under wetlands but this is not expected to affect future permitting.

15.0 MINERAL RESERVE ESTIMATES

The Tamarack North Project is currently in the exploration phase of development and does not meet the definition of an advanced project. No mineral reserves have been calculated for the project at this time.

16.0 ADJACENT PROPERTIES

There are no other significant mineral exploration properties directly adjacent to the Tamarack North Project.

17.0 OTHER RELEVANT DATA AND INFORMATION

Golder is unaware of any other relevant information that could materially affect the Tamarack North Project.

18.0 INTERPRETATION AND CONCLUSIONS

The mineral resource estimate in this technical report is the initial public disclosure for the Tamarack North Project. This mineral resource estimate has been prepared in accordance with CIM best practise guidelines and was prepared in compliance with NI 43-101 regulations.

Golder has outlined a mineral resource estimate consisting of 3.75 million tonnes in the *Indicated Mineral Resource category* at average grades of 1.81% Ni, 1.00% Cu, 0.05% Co, 0.41 g/t Pt, 0.25 g/t Pd and 0.19 g/t Au at a 0.9% NiEq cut-off, with an additional 3.12 million tonnes in the *Inferred Mineral Resource category* at average grades of 1.22% Ni, 0.82% Cu, 0.03% Co, 0.26 g/t Pt, 0.16 g/t Pd and 0.16 g/t Au at a 0.9% NiEq cut-off.

Mr. Brian Thomas, P.Geo., is the QP of the resource, and has visited the site, collected samples for check assay, and reviewed the Tamarack North Project data, including geological and metallurgical reports, maps, technical papers, digital data including lab results, sample analyses and other miscellaneous information. The QP believes that the data presented is an accurate and reasonable representation of the Tamarack North Project and concludes that the database is of suitable quality to provide the basis of the conclusions and recommendations reached in this report.

The Tamarack North Project is considered to be a project of merit and has the potential for increased resources through additional exploration.

18.1.1 Risks

Most holes within the outlined resource area were drilled at steeply dipping angles and did not consistently define the width of the deposit. This may affect the accuracy of the modeled volumes in the block model and resource tonnages for all domains. Golder was conservative with the projection of mineral contacts in order to mitigate the risk of over estimating the resource tonnage.

There is a risk in the MSU domain that high grade mineralization could be less continuous than expected which could impact the accuracy of the resource estimate. Golder analyzed the geology of this domain closely to ensure that only the most consistent massive sulphide intervals were included in the resource volume, but more infill drilling will be required to confirm continuity. This domain only represents 5% of the total volume of the Inferred Mineral Resource but is very high grade in % NiEq.

The Inferred Mineral Resource portions of the SMSU and 138 Zone domains are more sensitive than the Indicated Mineral Resource portions of the SMSU and 138 Zone domains to increasing cut-off grades which could materially affect the resource tonnage if mining costs were to unexpectedly increase.

The use of calculated bulk density data based on polynomial regression for the 138 Zone domain could affect the accuracy of the resource tonnage and grades. Grades can be affected because they are weight averaged by block tonnage. Golder assessed this risk by comparing the mean model density to the mean field measurements taken by Kennecott. The difference between the model values and the field measurements was found to be less than 0.5%. The field estimates were not originally used because they only collect on partial samples instead of the entire interval.

Some of the PGE metals may be hosted in silicate minerals and may not be recoverable by flotation. Limited work has been completed to date to determine the recoveries of these metals which could negatively affect the quantity of PGE metals recovered during processing. This impact is not considered material to the current resource.

Golder accounted for the above risks by being conservative with projected contacts and by assigning appropriate resource classifications to each domain. The resource classification provides a reasonably accurate summary of the risks associated with each mineral domain.

18.1.2 Opportunities

Based on the information collected to date, there is an opportunity to increase the size and confidence (resource classification) of the resource with future infill and exploration drilling. Inferred Mineral Resources in the SMSU and 138 Zone domains have a high probability of being upgraded to an Indicated Mineral Resource with the completion of adequate infill drilling.

The MSU domain could be extended another 150 m down plunge if infill drilling can confirm continuity between the existing domain and high grade massive sulphide intervals located in the footwall of the 138 Zone domain. The MSU is also open up plunge and has not been tested in this direction.

The SMSU zone has potential to be extended up plunge to the north-east with additional exploration drilling that can outline mineralization hosted in the CGO.

Lower grade mineralization hosted in the FGO, located up plunge, has yet to be modeled and quantified and this could increase the resource base if drilling is completed in this area.

The property has good exploration potential south of the 138 Zone domain (Laucamp) as there are indications of mineralization at various other locations throughout the property which have not been thoroughly explored at this point in time.

19.0 RECOMMENDATIONS

Golder notes that Kennecott is currently the operator of the Tamarack North Project pursuant to the Earn-in Agreement. Although Golder makes the following recommendations to Talon, Golder understands that Kennecott is under no obligation to follow such recommendations pursuant to the terms of the Earn-in Agreement.

Golder has the following recommendations for the next two phases of the Tamarack North Project. The goal of the first phase would be to increase the size of the resource and then the second phase would be to focus on upgrading the confidence in the resource and moving it towards development. Costs of each phase are summarized in Table 19-1.

Recommendations for phase 1 include the following:

- Continue data analysis to the north of the SMSU domain to identify drill targets in the CGO intrusive.

- Exploration drilling to: a) the north of the SMSU; b) the south and east of the 138 Zone domain; and c) confirm and expand the Laucamp target area.
- Model lower grade mineralization located up plunge, hosted in the FGO, in order to quantify the potential resource in that area.
- Develop a QA/QC reporting protocol (monthly, bi-monthly) during drilling programs in for auditing purposes and include a check on the primary assay laboratory by sending a selection of duplicate samples to second laboratory.

The second phase of recommendations may be contingent on successful results of phase 1 or could be implemented if the focus is switched from expanding the resource to developing the resource towards production.

- A preliminary economic assessment (PEA) is recommended in order to outline high level economics for the project.
- Complete infill drilling in the existing resource to increase confidence. Drilling should cross cut the mineralization in order to delineate the true width of the SMSU and 138 Zone domains.
- Measure specific gravity from existing sample pulps in the 138 Zone domain to ensure that SG values are representative of the sample intervals. Alternatively, a specific gravity formula could be developed based on calculated mineral abundances that can be applied to each sample interval. This would require additional assays for Fe to calculate the abundances of sulphide minerals.
- The estimation technique may need to include Indicator Kriging once sufficient data becomes available, in order to better represent the bimodal distributions observed in the SMSU and MSU domains.
- A resource update is recommended once sufficient infill drilling has been completed.
- Continued exploration drilling to expand the resource.

Table 19-1: Estimated Costs of Recommendations

Recommended Item	Cost $US
Phase 1	$10,000,000
Phase 2	$20,000,000
Total Expense	**$30,000,000**

Notes: Drilling costs are preliminary estimates

19.1 Metallurgical

The future testwork recommendations are listed in Section 13.8. Depending on the level of testwork, it is estimated that the costs will be $US150,000 to $US350,000, which are included in the Phase 2 costs of Table 19-1.

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Report Signature Page

The report was prepared and signed by Brian Thomas P.Geo., Paul Palmer P.Eng., P.Geo., both of Golder and Manochehr Oliazadeh Khorakchy, P.Eng. of Hatch. All authors are qualified persons as outlined by NI 43-101. The effective date of this technical report is August 29, 2014, and the signing date is October 6, 2014.

HATCH LTD.

(signed and sealed) Manochehr Oliazadeh Khorakchy

Manochehr Oliazadeh Khorakchy, P.Eng.
Senior Process Engineer, Hatch Ltd.

GOLDER ASSOCIATES LTD.

(signed and sealed) Brian Thomas

Brian Thomas, B.Sc., P.Geo.
Senior Resource Geologist

(signed and sealed) Paul Palmer

Paul Palmer, P.Eng., P.Geo.
Principal, Senior Geological Engineer

BT/PGP/kp

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APPENDIX A

Certificates of Qualifications

BRIAN THOMAS
CERTIFICATE OF QUALIFICATION

I, Brian Thomas, P.Geo., do hereby certify that:

1. I am employed as a Senior Resource Geologist at:

   Golder Associates Ltd.
   1010 Lorne Street, Sudbury, Ontario P3C 4R9
   Telephone: 705-524-6861; Fax: 705-524-1984; Email: bthomas@golder.com

2. I graduated with a Bachelor's degree in Geology from Laurentian University of Sudbury, Ontario in 1994.
3. I am a member in good standing of the Association of Professional Geoscientists of Ontario (#1366) and a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (#38094).
4. I have practised my profession continuously since graduation. My relevant background with respect to this project is over twenty years of experience in mine geology and mineral resource evaluation of mineral projects nationally and internationally in a variety of commodities including 9 years of experience with Vale Nickel in Sudbury (formerly INCO LTD.).
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (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 purpose of NI 43-101.
6. I am responsible for Sections 1.1, 1.5, 1.6, 1.8 to 1.10.0, 2, 11, 12, 14 to 19.0 and 20 of the technical report titled "First Independent Technical Report on the Tamarack North Project, Tamarack, Minnesota", effective date of August 29, 2014 (Technical Report). I have personally completed a site visit of the Tamarack North Project on July 16th, 2014.
7. I have had no prior involvement with the Tamarack North Project.
8. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all the tests in section 1.5 of the NI 43-101.
10. I have read NI 43-101 and form 43-101F1, and the parts of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.

Dated at Sudbury, Ontario, this 29 day of August, 2014.

(signed and sealed) Brian Thomas

Brian Thomas, P.Geo.

PAUL PALMER
CERTIFICATE OF QUALIFICATION

I, Paul Palmer, P.Geo., P.Eng., do hereby certify that:

1. I am employed as a Senior Geological Engineer at:

   Golder Associates Ltd.
   1010 Lorne Street, Sudbury, Ontario P3C 4R9
   Telephone: 705-524-6861; Fax: 705-524-1984; Email: ppalmer@golder.com

2. I graduated with a Bachelor's degree in Geology from Memorial University of Newfoundland. In addition, I have obtained a Bachelor's degree in Geological Engineering from University of Toronto.
3. I am a member in good standing of the Association of Professional Engineers Ontario, the Association of Professional Engineers and Geoscientists of the Province of Manitoba and the Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories.
4. I have practised my profession continuously since graduation. My relevant experience with respect to this project is over nineteen years of experience in exploration and mineral resource evaluation of mineral projects nationally and internationally in a variety of commodities.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (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 purpose of NI 43-101.
6. I am responsible for Sections 1.2 to 1.4 and 3-10 of the technical report titled "First Independent Technical Report on the Tamarack North Project, Tamarack, Minnesota", effective date of August 29, 2014 (Technical Report).
7. I have not had prior involvement with the Tamarack North Project.
8. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all the tests in section 1.5 of the NI 43-101.
10. I have read NI 43-101 and form 43-101F1, and the parts of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.
11. Dated at Sudbury, Ontario, this 29 day of August, 2014.

(signed and sealed) Paul Palmer

Paul Palmer, P.Geo., P.Eng.

MANOCHEHR OLIAZADEH KHORAKCHY
CERTIFICATE OF QUALIFICATION

I, Manochehr Oliazadeh Khorakchy, P.Eng., do hereby certify that:

1. I am employed as a Senior Process Engineer at:

   Hatch Ltd.
   2800 Speakman Drive, Sheridan Science & Technology Park, Mississauga, Ontario L5K 2R7
   Telephone: 905 403 3778; Fax: 905 855 8270; Email: moliazadeh@hatch.ca

2. I graduated with a Bachelor's degree in Mining Engineering from Tehran Polytechnic of Tehran, Iran in 1986 and a PhD's degree in Mineral Engineering from Leeds University, Leeds, UK in 1990.
3. I am a member in good standing of the Professional Engineers of Ontario (#100119302).
4. I have practised my profession continuously since graduation. My relevant background with respect to this project is over twenty years of experience in mineral processing of mining projects nationally and internationally in a variety of commodities including copper, nickel, gold and iron ore.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (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 purpose of NI 43-101.
6. I am responsible for Sections 1.7, 1.10.1, 13 and 19.1 of the technical report titled "First Independent Technical Report on the Tamarack North Project, Tamarack, Minnesota", effective date of August 29, 2014 (Technical Report).
7. I have had no prior involvement with the Tamarack North Project.
8. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all the tests in section 1.5 of the NI 43-101.
10. I have read NI 43-101 and form 43-101F1, and the parts of the technical report for which I am responsible have been prepared in compliance with that instrument and form.

Dated at Mississauga, Ontario, this 29 day of August, 2014.

(signed and sealed) Manochehr Oliazadeh Khorakchy

Manochehr Oliazadeh Khorakchy, P.Eng.

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