2.6 Project Alternatives

Victory Nickel Inc. sees no feasible alternative to Minago Project. The project is the principle asset of VNI and although there are other mineral deposits in the Minago Area, VNI does not own any interest in them and therefore cannot effect the evaluation of the possible co-development with the Minago deposit. Similarly, currently it is not possible to consider the potential addition of other deposits that may be discovered through exploration. Given the current and future global market for Nickel, the proposed project is the best available option to achieve the business goals of the company.

VNI has assessed a number of alternatives in coming to the proposed design of the Minago Project. The alternatives considered include the various ways that the project could be implemented or carried out, including alternative locations in the project area, routes and methods of development, implementation, and mitigation.

Examining the main project alternatives involved answering the following three questions:

1. What alternatives are technically and economically feasible?
2. What are the environmental effects associated with the feasible alternatives?
3. What is the rationale for selecting the preferred alternative?

Throughout the Minago Project design process, various mining concepts were developed, analyzed, refined and eventually focused down to preferred alternatives. This section describes alternatives that were considered by VNI, and the rationale for selecting the preferred alternative.

The decisions made by VNI and its consultants for the purposes of project design and mine planning are based on feasibility level information. This information provides a reasonable basis for detailed design.

2.6.1 Mining Method

A conventional open pit with seven years of full production and two years of partial ore production life is envisaged after dewatering the overburden and overlying limestone and sandstone. Twelve metre bench heights will be used. A contractor will be employed to remove the overburden and some limestone during the two pre-production years. Equipment will be purchased to utilize the favourable electric power costs in Manitoba. Electric hydraulic shovels will load ore and waste into 218 tonne haul trucks.

Underground operations have been considered but were deemed to be uneconomical due to poor ground control and low-grade aspects. Open pit mining is the only feasible means of extracting the Minago deposit. There will be two products mined from the open pit – frac sand and nickel ore. Frac sand will be mined after the overburden materials (peat and clay and dolomitic limestone) have been removed. The removal of the Frac sand will expose the nickel ore. Open pit mining method is the most optimal extraction method to extract both Frac sand and nickel ore.

2.6.2 Pit Location

The pit is located where the ore is and therefore, there is no viable alternative.

2.6.3 Ore and Waste Haulage

VNI will use 218 tonne trucks to move ore to the mill and waste rock to the waste rock dumps. The 218 tonne trucks are the most economical mode of transportation bearing in mind the waste-to-ore ratio of 6.7 to 1 for mining the nickel sulphide ore and the frac sand. Transportation of ore and waste rock using high capacity equipment is the most viable approach and therefore, there is no viable alternative.

2.6.4 Ore Processing

Conventional flotation will be employed by VNI to process the ore, as there is no viable alternative. The process flowsheet will consist of crushing plant, grinding circuit and a concentrator.

2.6.5 Waste Rock Disposal

The locations of the waste rock dumps and overburden stockpile are selected to optimize hauling costs and are located in the vicinity of the open pit. The waste rock dumps (Dumps #1, 2 and 3) and overburden stockpile locations were selected based on geotechnical investigation results and for the following reasons:

- they are located near the pit to optimize haul distances;
- the overburden is largely clay;
- there will be large waste rock volumes;
- the waste will be Non-Acid Generating (NAG).

The existing facilities have adequate storage capacities for the waste rock that will be generated from pit during development and operational phases and as such, no alternative to the existing infrastructure were examined. During the operations phase, waste rock will be disposed into the dumps. The Overburden, Dolomite and Country Waste Dumps with store approximately 11 Mt of overburden, 111.1 Mt of limestone waste and 122 Mt of granitic (country rock) waste, respectively. Approximately 35.67 Mt of ultramafic waste rock will be co-disposed with tailings in a Tailings and Ultramafic Waste Rock Management Facility (TWRMF). Co-disposal will minimize metal leaching and increase the stability of the tailings management area.

2.6.6 Tailings Disposal

Sub-aerial disposal of liquid tails (slurry) was selected for the property. An alternative method involving the on-land disposal of dry tailings in paste form was assessed. Advantages of paste tailings disposal are:

- A tailings dam does not have to be constructed, removing a significant capital cost item.
- Water does not have to be managed to prevent the oxidation of potentially acid generating materials.

The disadvantages of this option are:

- Dust can be generated from the tailings.
- Pumping is more difficult and expensive than for liquid tailings.
- Operating costs are higher due to the pumping and, potentially, the need to add minimal cement to the tails to retain its form as paste.

The most significant reason for selecting sub-aerial disposal of liquid tailings is that VNI prefers to adopt proven technology rather than embark on a pioneer project. While numerous operations have elected to select paste tailings disposal in favour of sub-aerial disposal, these are primarily gold operations with benign tailings.

2.6.7 Tailings Facility Location

There are numerous interdependencies among facilities that dictated the order in which they would be located. VNI located the tailings facility based on results of site surveys, test pits and reviews of past work. Wardrop Engineering Inc. conducted an assessment of potential tailings facility (TF) locations in 2007 and 2008. The Tailings and Ultramafic Waste Rock Management Facility (TWRMF) is located reasonably close to the mill.

The TWRMF location is the preferred location for the following reasons:

- The dam will be cost effective to construct as it is near the open mine, which is earmarked to be the source of the construction materials.
- Co-disposal of tailings and ultramafic waste rock will minimize the potential for ARD and metal leaching and will increase the stability of the facility.

VNI’s closure objective is to design and manage the TWRMF to enable the site to be left without requirements for long-term water treatment.

2.6.8 Camp Location (Operational and Construction Camps)

The following two alternatives were considered for the camp location:

- Off site (South of the property near the existing William River Camp); and
- On site.

VNI selected the on site option as the preferred site for the camp. VNI assumes that the differences in the two locations, from an economic and technical perspective were significant so as other factors, such as health and safety aspects, were considered.
Locating a camp on site would be closer to the working area and will minimize travel time and eliminates the carbon footprint. The chosen site has the advantage that personnel can walk to or from the industrial complex to the camp and additional transportation will not be necessary.

The main disadvantage of locating a camp at the existing site in the vicinity of William River is that it is too far from the Minago site and VNI would have to provide transportation to the project site. This would increase the carbon footprint and may be a problem during winter storm events.

2.6.9 Power Supply

The Minago project will require a continuous power supply for the industrial complex, the camp and supporting facilities. The type of the energy sources used in the operation will have an immediate impact on the capital requirement and the on-going cost of the project. The three energy sources considered for the project and their limitations are as follows:

- Connection to the Main Grid - the connection to the existing Manitoba Hydro power grid will require a high voltage line located approximately 300 metres from the site access. Based on the proximity of the power grid, this option is considered viable.
- Natural gas power generation - previous studies of other mines have indicated that the natural gas and diesel based power generation systems have comparable reliability. However, the diesel generators seem to be 5% to 10% more efficient than natural gas. Diesel fuel is quite expensive and will result in significant operating costs and therefore, the genset option is not considered viable. Natural gas turbines are economical for processes that require high heat or where natural gas supplies, such as pipelines and wells, are nearby. Since there are no gas sources in the area of the project and the diesel-based system provides higher efficiency, the natural gas power generation is not considered viable.
- Hydropower generation - generally hydropower provides the environmentally cleanest operation with the lowest operating cost structure. There are disadvantages; however, such as very high initial capital cost investment, long payback period and complex regulatory requirements with a possible four to five year approval period. In addition, there are no water bodies in the immediate area that can be used for hydropower development. This option is not considered viable.

Therefore, power required for the operations will come from Manitoba Hydro.

2.6.10 Site Access Road Location

The Minago Nickel Property (Property) is located 485 km north-northwest of Winnipeg, Manitoba, Canada and 225 km south of Thompson, Manitoba on NTS map sheet 63J/3. The property is approximately 100 km north of Grand Rapids off Provincial Highway 6 in Manitoba. Provincial Highway (PTH) 6 is a paved two-lane highway that serves as a major transportation route to northern Manitoba (Figure 2.6-1).

The Minago Project is located just off PTH6 and to access the proposed industrial area will require a maximum of 4 kilometres of road development. The road network to be constructed at the Minago Project will be located in the VNI Mineral Lease Parcel. VNI commissioned environmental baseline studies to determine current baseline conditions. The assessment included air photo and map reviews, and paper route projections. Helicopter reconnaissance and selective ground truthing was conducted. The key design and assessment requirements that were considered included:

- land tenure;
- the avoidance of environmentally sensitive areas such as streams, and wildlife critical habitat areas;
- alignment gradient and length; and
- the presence of bedrock and blasting requirements.

Based on these assessments, VNI optimized the design of the main access road to minimize environmental impacts and construction costs.

Grand Rapids, the closest community to the Property, is located where the Saskatchewan River flows into Lake Winnipeg. In 1996, Grand Rapids had 404 residents (1996 census). The economy of Grand Rapids is based on commercial fishing, hydroelectric generation, tourism, forestry, trapping.

Grand Rapids is served by an RCMP detachment, a nursing station, daily bus and truck transportation to Winnipeg and a 1.02 km grass/turf airstrip in addition to a number of small supply and service businesses.

Provincial Highway 6 crosses a portion of the Property and a network of diamond drill roads enables pickup truck travel on the Property in the winter and all terrain vehicle (Argo) travel in the summer.

The Omnitrax Canada railway line connecting the southern prairie region of western Canada to Churchill, Manitoba (a seasonal seaport) crosses Provincial Highway 6 approximately 60 km north of the Property.

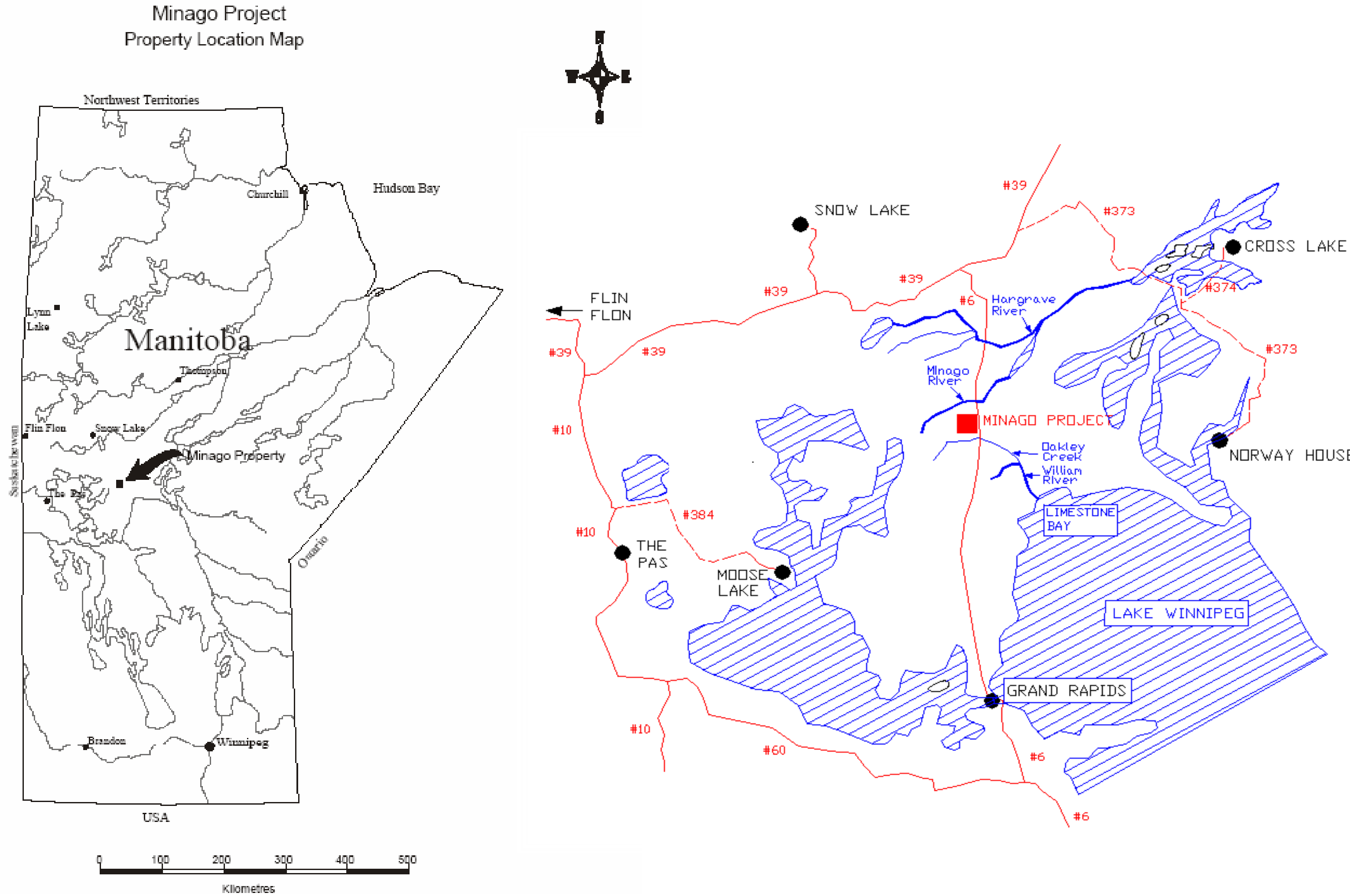

Figure 2.6-1 Site Location Map

2.7 Project Geology

2.7.1 Introduction

Wardrop (2009b) assembled the historic project geological data for the Minago Project to establish a resource estimate that conforms to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Mineral Resource and Mineral Reserves definitions, referred to in NI 43-101, Standards of Disclosure of Mineral Projects.

Wardrop conducted a mineral resource estimate of the sedimentary and intrusive rocks hosted nickel sulphide mineralization, and the Paleozoic Winnipeg Sandstone Formation immediately above. The estimation was completed for total nickel (Ni%), nickel sulphide (NiS%) and Frac Sand using data from historic and recent drilling.

Wardrop (2009b) estimated that the Minago deposit contains a measured resource of 11 Mt, grading 0.56% Ni, above a cutoff grade of 0.25% Ni. In addition, the deposit contains 43 Mt of Indicated Resource at 0.51% Ni above a 0.25% Ni cutoff grade. An Inferred Resource of 15 Mt at 0.53% Ni above a 0.25% Ni cutoff has also been estimated.

In order to better define the recovery potential on the nickel, Wardrop also estimated the nickel sulphide resource within the total nickel resource. The nickel sulphide resource is contained within the total nickel resource, and is not an additional resource. Nickel in sulphide is considered a more reliable method of determining the nickel content as only a single stage assessment is required. Wardrop (2009b) estimated that the Minago deposit contains a measured resource of 9.1 Mt, grading 0.47% NiS, above a cutoff grade of 0.2% NiS. In addition, the deposit contains 35 Mt of Indicated Resource at 0.42% NiS above a 0.2% NiS cutoff grade. An Inferred Resource of 12 Mt at 0.44% NiS above a 0.2% NiS cutoff has also been estimated (Wardrop, 2009b).

An indicated resource of 15 Mt of Frac Sand within the Winnipeg Sandstone Formation has also been identified. Approximately 10% to 20% of the Frac Sand will report to the 20/40 size fraction, while approximately 68% to 83% will report to the 40/140 size fraction (Wardrop, 2009b).

The Minago deposit has demonstrated potential as a large tonnage low-grade nickel sulphide deposit amenable to open pit, and possibly to underground bulk tonnage mining methods. Significant parts of the deposit below a depth of 400 m require additional drilling to upgrade the resource class from inferred to indicated (Wardrop, 2009b).

The sandstone layer must be removed to access the mineralization within the proposed open pit mine.

2.7.2 Regional Geology

The regional geology comprises the eastern edge of the Phanerozoic sediments of the Western Canada Sedimentary Basin that unconformably overlie Precambrian crystalline basement rocks including the Thompson Nickel Belt. The Western Canada Sedimentary Basin tapers from a maximum thickness of about 6,000 m in Alberta to zero to the north and east where it is bounded by the Canadian Shield. The Property is located near the northeast corner of the Western Canada Sedimentary Basin. At the Minago site, Phanerozoic sediments are comprised of approximately 53 m of Ordovician dolomite underlain by approximately 7.5 m of Ordovician sandstone (Wardrop, 2009b).

The Precambrian basement rocks of the Thompson Nickel Belt form a northeast southwest trending 10 to 35 km wide belt of variably reworked Archean age basement gneisses and Early Proterozoic age cover rocks along the northwest margin of the Superior Province. Lithotectonically the Thompson Nickel Belt is part of the Superior Boundary zone. The Archean age rocks to the southeast of the Thompson Nickel Belt include low to medium grade metamorphosed granite greenstone and gneiss terranes and the high grade metamorphosed Pikwitonei Granulite Belt. The Pikwitonei Granulite Belt is interpreted to represent exposed portions of deeper level equivalents of the low to medium grade metamorphosed granite greenstone and gneiss terranes. The Superior Province Archean age rocks are cut by mafic to ultramafic dikes of the Molson swarm dated at 1883 Ma. Dikes of the Molson swarm occur in the Thompson Nickel Belt, but not to the northwest in the Kisseynew domain. The early Proterozoic rocks to the northwest of the Thompson Nickel Belt comprise the Kisseynew domain that is interpreted to represent the metamorphosed remnants of a back arc or inter arc basin (Wardrop, 2009b).

The variably reworked Archean age basement gneisses constitute the dominant portion (volumetrically) of the Thompson Nickel Belt. The Early Proterozoic rocks that occur along the western margin of the Thompson Nickel Belt are a geologically distinguishable stratigraphic sequence of rocks termed the Opswagan Group (Wardrop, 2009b).

2.7.3 Property Geology

There is no outcrop on the Property. Bedrock geology is interpreted from geophysical data, diamond drill hole core, and regional structural and isopach trends.

2.7.4 Surficial Geology

The surface cover typically comprises 1.0 to 2.1 m of muskeg and peat that is underlain by 1.5 to 10.7 m of impermeable compacted glacial lacustrine clays. The clays are dark brown to grey and carbonate rich (Wardrop, 2009b).

2.7.5 Ordovician Stratigraphy

The Phanerozoic geology comprises the north-eastern edge of the sediments of the Western Canada Sedimentary Basin that unconformably overlie Precambrian crystalline basement rocks, which includes the Thompson Nickel Belt. The Western Canada Sedimentary Basin tapers from a maximum thickness of about 6,000 m in Alberta to zero to the north and east where it is bounded by the Canadian Shield. The Williston Basin strata, in Manitoba, form a basinward-thickening, southwesterly-sloping wedge, with the strata reaching a thickness of 2.3 km in the extreme southwestern corner of the province (Wardrop, 2009b).

Underlying the surficial cover are flat lying Ordovician dolomite and sandstone. The dolomite is fine grained, massive to stratified and varies in color from creamy white to tan brown to bluish grey. Dolomite thickness ranges from 42 to 62 m with thickness increasing southward. The upper 24 m of the formation is stratified with horizontal clay/organic beds 1 to 5 mm in thickness, spaced at intervals ranging from millimetres to one metre. A stratified zone of dolomite breccia and microfracturing characterized by dolomite clasts in a carbonate clay matrix and varying in thickness from 0.3 to 3.0 m is located 15 m to 21 m below the surface of the formation. Scattered throughout the dolomite are occasional soft clay seams ranging from 1 to 2 centimetres (cm) in thickness. The seams may contain dolomite fragments and sand grains and vary in orientation from semi horizontal to semi vertical (Wardrop, 2009b).

The Ordovician sandstone (Winnipeg Formation) occurs stratigraphically below the dolomite approximately 46 to 73 m below surface. The sandstone ranges in thickness from 5.1 to 15.9 m. Cohesiveness varies from consolidated and carbonate cemented to semi consolidated, friable and clay/silt rich to unconsolidated sand. Clay/silt rich zones are brown grey in color while white zones are carbonate cemented (Wardrop, 2009b).

The deposition of the Winnipeg sand in the Williston Basin is thought to be controlled by tectonics in the Williston Basin to the south and the ancestral Sweetgrass Arch (in Saskatchewan) to the west. The bulk of the sediments were derived from the erosion of the Cambrian Deadwood Formation sediments (present in the extreme southwestern portion of Manitoba and into Saskatchewan) and deposition occurred in marine beach to offshore bar environments. The sandstone is distinguished from all other sediments in the basin on the basis of being quartzose and well rounded with variable cementation. The quartz grains are thought to have undergone both fluvial and aeolian transport. They show distinctive frosting caused by wind transport. It has been suggested that these sediments may have been partially derived from the Upper Proterozoic Athabasca Group in northern Saskatchewan (Paterson, 1971; Gent, 1993).

The Ordovician clastic and carbonate sequence in the Minago area was part of a large cratonic depositional platform that extended from the Hudson Platform in the northeast to New Mexico to the south (Norford et al., 1994). The lowermost Paleozoic unit on the Property is the Ordovician Winnipeg Formation (Figure 2.7-1) which is composed of Lower and Upper units in the southern portion of the basin in Manitoba (a lower continuous, poorly consolidated, quartz-rich sandstone sheet overlain by an upper unit of shale with interbedded sandstone). The Lower Unit was deposited in a marine beach to off-shore bar environment. Near-shore, high-energy, shallow-marine to shoreline conditions, possibly at times terrestrial, prevailed in the northern margin of the basin. The northern edge probably approximates the average shoreline position during early Winnipeg time. The Lower Unit rapidly thins to a sandstone sheet to the northern portion of the basin, at the sacrifice of the upper shale unit. The shale is not present in the Minago Sandstone Deposit area.

The Winnipeg Formation varies in content from 90% sand to 90% shale (Wardrop, 2009b). The formation has a maximum thickness of 68.6 m in southwestern Manitoba and thins to zero metres to the north, at a rate of least 17% per 100 km, with the sandstone content increasing relative to shale from south to north (Figure 2.7-2). The Winnipeg Formation sandstone that overlays the Minago deposit averages 8.9 m vertical thickness in the proposed pit area, occurring as highly cemented competent rock to loose, and unconsolidated sand size grains (Wardrop, 2009b).

The Ordovician Red River Formation dolomite conformably overlies the Winnipeg Formation in the Project area. There is some debate whether the contact between the Winnipeg and Red River formations is erosional (Norford et al., 1994).

2.7.6 Precambrian Lithologies

Below the Paleozoic sandstone the Precambrian rocks are intensely weathered typically over distances ranging from 0.6 to 32.8 m sometimes with complete obliteration of original textures. Alteration minerals include kaolin, sericite, chlorite, biotite and carbonate. The alteration is whitish green to bluish green in color, soft, and can be semi consolidated, friable and/or unconsolidated. Weathering persists along zones of intense fracturing down to depths of 60 m below the Paleozoic-Precambrian interface. At depth the weathering is most apparent in granitic rocks where fracture cleavage is prominent resulting in alternating zones of altered fractured rock, and unaltered rock that vary in width from 0.15 m to greater than 3 m. The alteration varies from weak to intense with intensely altered rock being poorly consolidated (Wardrop, 2009b).

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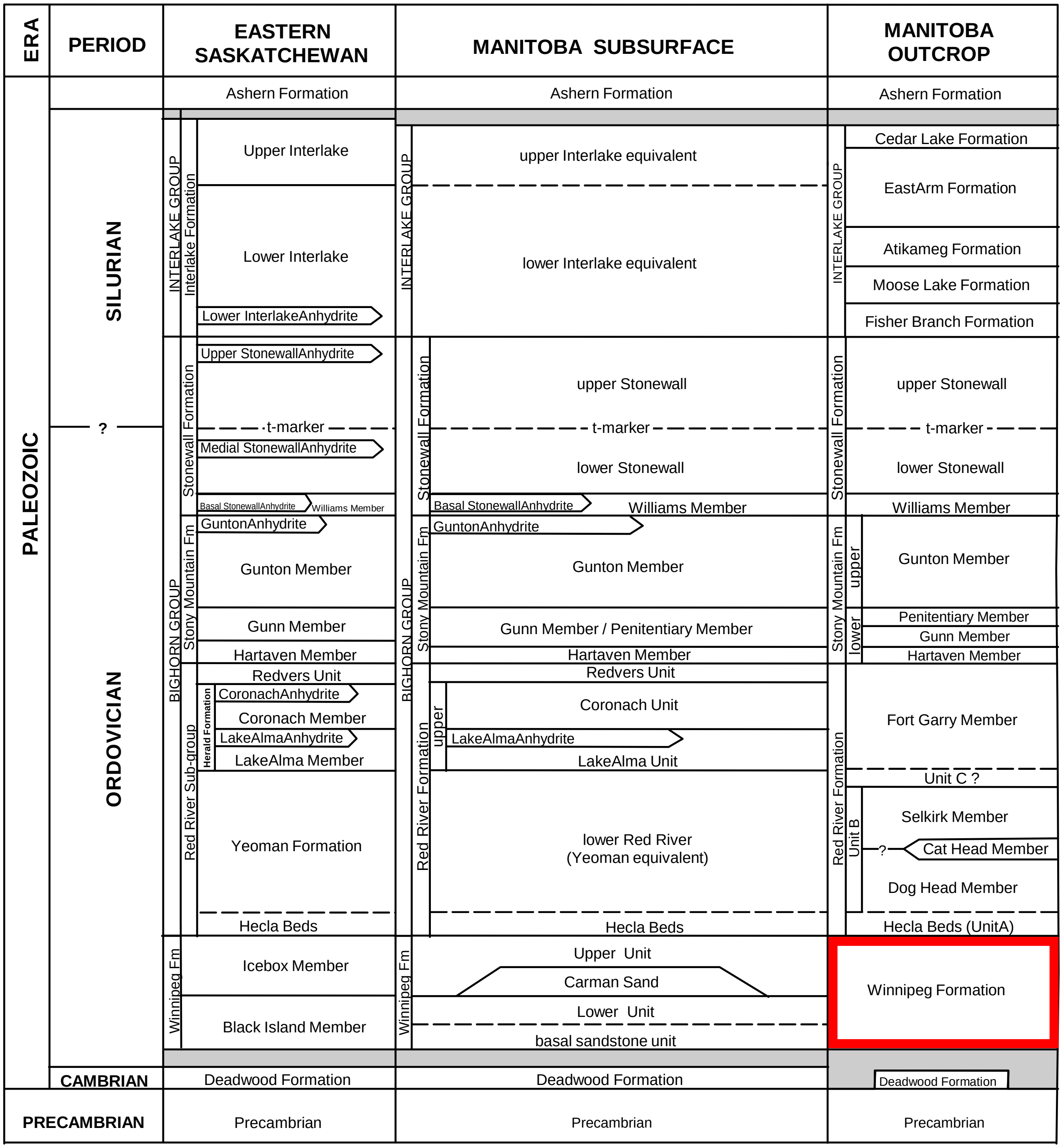
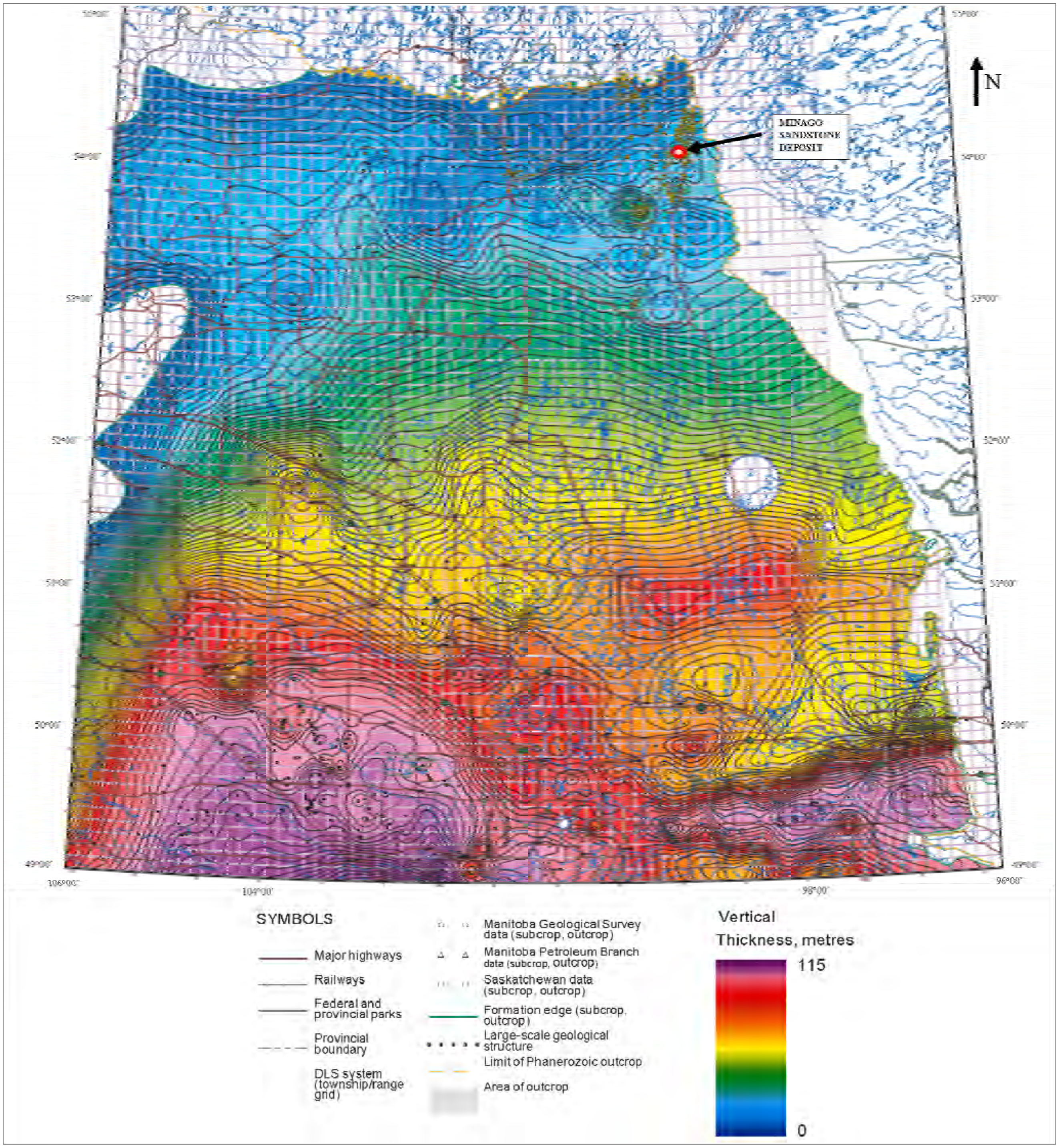


Source: Nicolas and Barchyn, 2008

Figure 2.7-1 Stratigraphic Column for Manitoba and Eastern Saskatchewan



Basemap Source: Manitoba Science, Technology, Energy and Mines, Manitoba Geological Survey. 2008. Targeted Geoscience Initiative (TGI). Williston Basin Architecture and Hydrocarbon Potential. Ordovician Winnipeg Formation: Isopach. Stratigraphic Map SM2008-OW-I.

Figure 2.7-2 Ordovician Winnipeg Formation Isopach for Manitoba and Eastern Saskatchewan

The Precambrian basement comprises a variety of lithologies briefly described and listed below, in decreasing order of abundance (Wardrop, 2009b):

1. Granitic rocks include granite, granitic gneiss (foliated granite) and pegmatite sills and dikes. Typically grey to pink, the granitic rocks range from almost white to almost red in colour. Grain size ranges from fine to coarse with medium to coarse grain size predominating. Textures vary from massive to strongly foliated. The granitic rocks are mostly potassium (K) feldspar rich, may contain up to 15% biotite and appear to intrude all other rock types.

2. **The fine to coarse grained ultramafic rocks that host the nickel deposit include serpentinized dunite, peridotite (harzburgite, Iherzolite, wehrlite) and pyroxenite (orthopyroxenite, websterite, clinopyroxenite)**. The ultramafic rocks dip vertical to near vertical with individual bodies having strike lengths up to 1,525 m and widths up to 457.2 m. Serpentinization varies from intense to weak and appears to decrease with depth, most markedly a change is observed at approximately 400 m below surface. Scoates (2008) attributes the change in serpentinization to a change from retrograde metamorphism (serpentine-talc-tremolite-calcite) in the upper part of the ultramafic to prograde metamorphism (tremolite-hornblende-phlogopite) at depth. Zoned contact alteration on a centimetre to metre scale occurs adjacent to granite and some fractures. From most intense (adjacent to granite or fracture) to least intense (furthest from granite or fracture) the alteration typically comprises biotite/phlogopite-chlorite-tremolite. Varying abundances (<1% to >50%) of fine to coarse grain pseudomorphs of olivine, orthopyroxene and clinopyroxene occur over core intervals ranging from several centimetres to several tens of metres. Magnetite concentrations up to 50% occur locally. Sulphide tenor is usually <15%.

3. Metavolcanic rocks, interpreted to be Bah Lake Formation, include chlorite-biotite schist and amphibolite. Amphibolite is dark green to black, fine to medium grained, foliated and lineated.

4. Metasedimentary rocks, interpreted to be Pipe Formation, comprise sillimanite paragneiss, siliceous sediments, skarn, iron formation, graphitic sediments, semi pelite and calc silicate. Distinctive minerals include graphite, sillimanite, garnet, diopside, carbonate, muscovite and very fine grain quartz. Sulphide facies iron formation comprises semi massive to massive pyrite and pyrrhotite, sometimes nodular, and associated with detrital metasediments often containing siliceous fragments and includes sulphide breccia in zones of cataclastic deformation.

5. Molson dikes and sills that are olivene rich.

The Precambrian lithologies have undergone complex multiphase ductile and brittle deformation. Interpretations of magnetic data suggest that the ultramafic rocks containing the Minago deposit have undergone dextral strike slip fault movement which resulted in a large Z shaped drag fold and that the deposit flanks the axial plane of an eastern limb. Vertical longitudinals of the mineralized zones indicate that the folded limb plunges steeply towards the southeast (Wardrop, 2009b).

Observations of the mineralized lenses indicate lateral/vertical displacement resulting in the development of drag folds and boudins. In some cases, the mineralization appears to have been folded creating ore zones with true widths over 24.4 m or has been folded and pulled apart creating two parallel zones of the same lense (Wardrop, 2009b).

Cataclastic deformation with lateral and vertical displacement is indicated by fault gouge and fault breccia zones in both ultramafic rocks and granitic rocks. These zones range in width from 1 mm to 10 cm, are subvertical to vertical, and parallel the trend of the ultramafic rocks. Fault gouge is characterized by clay rich seams with or without fragments. Fault breccia is characterized by angular fragments in a matrix of serpentine, carbonate and clay minerals (Wardrop, 2009b).

Cataclastic zones in serpentinitized ultramafic rocks are grey in color, soft, and associated with massive and fine grained units, whereas in granitic rocks they are red to brown in color and associated with fracture cleavage. Cataclastic deformation confined to relatively fresh ultramafic rocks has a ground appearance, is brittle and poorly consolidated. Mylonite has an aphanitic to vitreous texture and is light to dark in color. Mylonitization in granitic rocks is proximal to contacts between the granitic rocks and serpentinized ultramafic rocks (Wardrop, 2009b).

Fracture cleavage occurs adjacent to zones of cataclastic deformation and folding. More readily observed in granitic rocks, the fractures also occur in serpentinites as open fractures and minor shears that are schistose and contain talc, chlorite, phlogopite and biotite. Two fracture cleavage orientations are indicated: parallel to foliation; and acute to approximately perpendicular to foliation. Fractures filled with carbonate and serpentine are cohesive. Fractures filled with sericite and clay minerals lack cohesion and possess slickensides (Wardrop, 2009b).

Sedimentary and intrusive rock hosted nickel sulphide mineralization are recognized as two distinct and economically important deposit types in the Thompson Nickel Belt. Often intimately spatially related due to interaction of sedimentary, magmatic, metamorphic and deformational processes, the deposit types can be distinguished on the basis of field observations, structural, textural, mineralogical and chemical criteria (Wardrop, 2009b).

Sulphide enrichment also occurs in pegmatites and breccias derived from existing sedimentary or magmatic sulphides (Wardrop, 2009b).

The Ospwagan Group hosts the nickel deposits of the Thompson Nickel Belt. Within the Ospwagan Group almost all of the nickel deposits of the Thompson Nickel Belt are found within lower Pipe Formation (Wardrop, 2009b).

Bleeker and Macek proposed a stratigraphic nomenclature for the Proterozoic rocks within the Thompson Nickel Belt that is summarized in the stratigraphic column shown in Figure 2.7-3.

The rocks of the Thompson Nickel Belt have been complexly folded. Three major periods of folding are commonly recognized. The earliest structures due to compressional tectonism are isoclinal F1 folds that may be of regional extent. F1 preceded the emplacement of Molson dikes. The metamorphic regime during F1 is unknown. F1 is overprinted by F2 isoclinal folds that developed under high temperature and caused folding of the Molson dikes. The thermal peak of regional metamorphism overprinted F2. At least 30 million years later and at much lower temperatures intense sinistral transpression produced high amplitude, nearly upright, doubly plunging F3 folds that transposed the pre-existing recumbent fold pile into a steep gneiss and schist belt (Wardrop, 2009b).

The main phase of mylonitization occurred late during or overprints F3 and is confined to shear zones that tend to be parallel to the steeply dipping limbs of the upright F3 folds (Wardrop, 2009b).

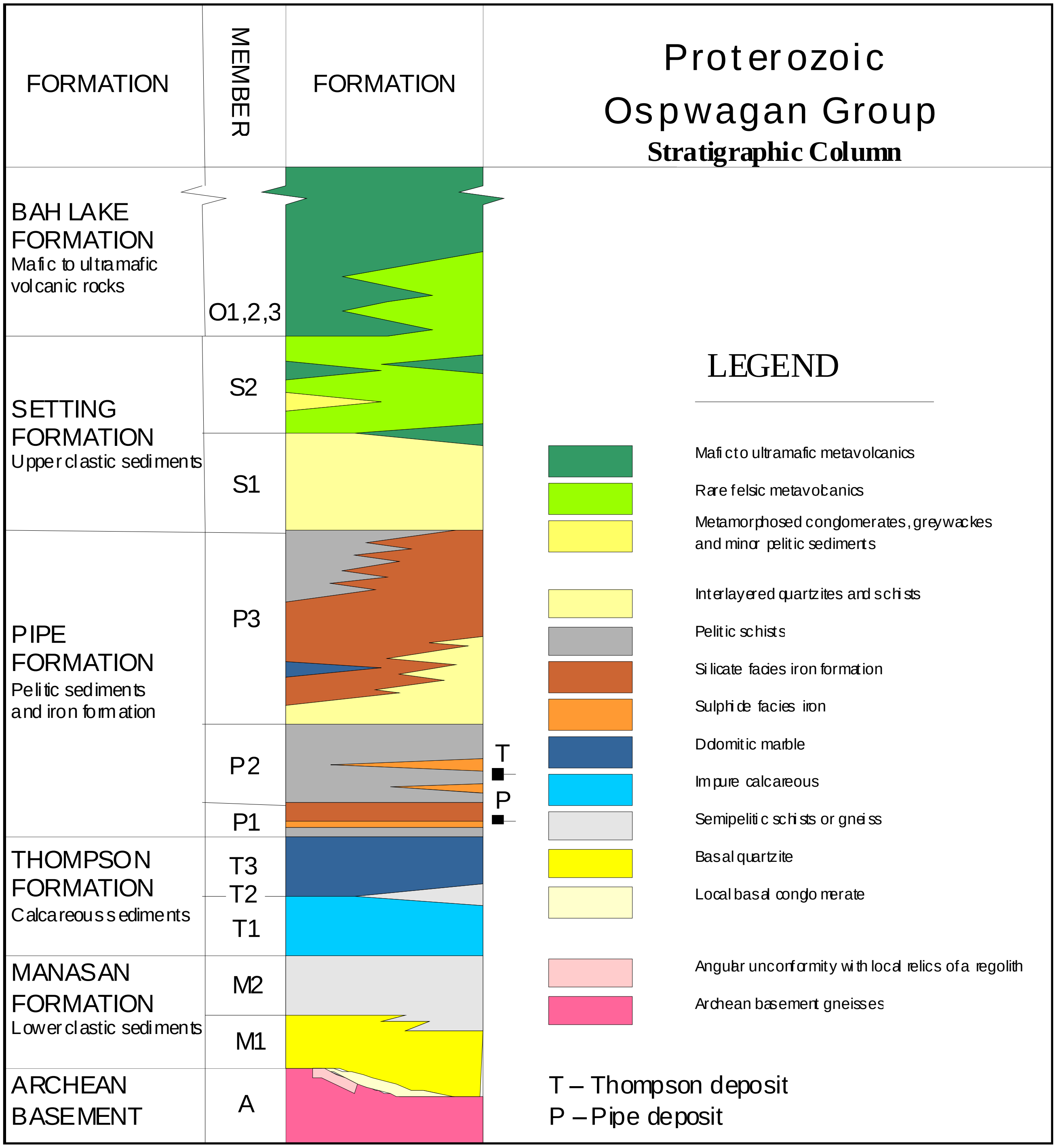
2.7.7 Sedimentary Sulphide Mineralization

Sedimentary sulphides may be barren or enriched in nickel. Barren sulphides characterized by nickel concentrations below 500 parts per million (ppm) occur beyond the immediate vicinity of significant nickel enriched zones. Sedimentary sulphides enriched in nickel by later magmatic processes are visually indistinguishable from barren sedimentary sulphides but occur in close proximity to more significant nickel enriched zones (Wardrop, 2009b).

The dominant geological feature of economic interest underlying the Property is a series of boudinaged nickeliferous ultramafic bodies folded in a large Z shaped pattern. The ultramafic bodies contain intraparental magmatic nickel sulphide mineralization, and intrude mafic metavolcanic and metasedimentary rocks interpreted to be lower Pipe Formation stratigraphy (Wardrop, 2009b).

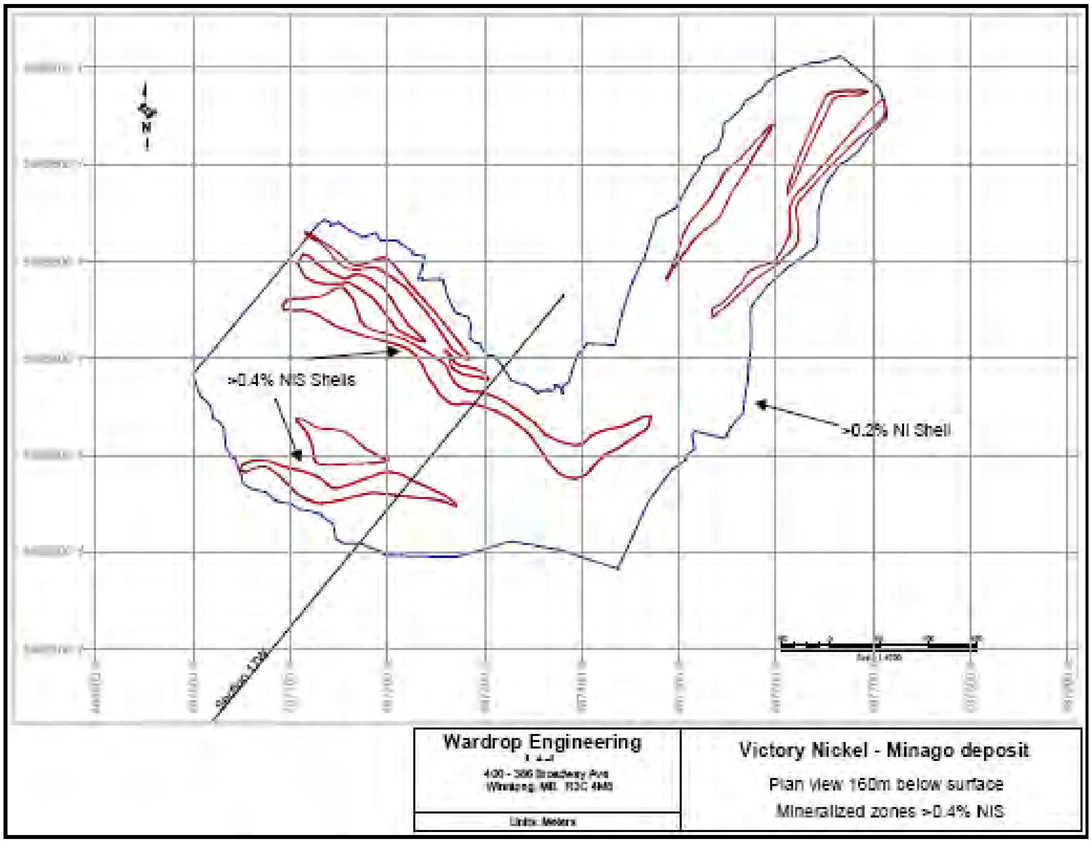
Within the ultramafic rocks, the nickel sulphides are concentrated in several tabular lenses that parallel the trend of the ultramafic bodies (Figures 2.7-4 and 2.7-5). Lower grade nickel occurs between and adjacent to the higher grade lenses. Typically sulphides are fine grained varying in size from <0.5 to 4 mm (generally 1 to 2 mm) and range in volume from 2 to 15% (generally 2 to 7%). The sulphides predominantly occur as disseminated crystals, small aggregates (<5 mm) and occasionally are net textured. The dominant sulphide species are nickel bearing pentlandite with lessor violarite and millerite. Minor amounts of pyrite, pyrrhotite and chalcopyrite are present (Wardrop, 2009b).

Graphitic, coarse grained and sometimes nodular sedimentary and extraparental nickeliferous sulphide mineralization occurs sporadically along the southeast margin of the Minago deposit.



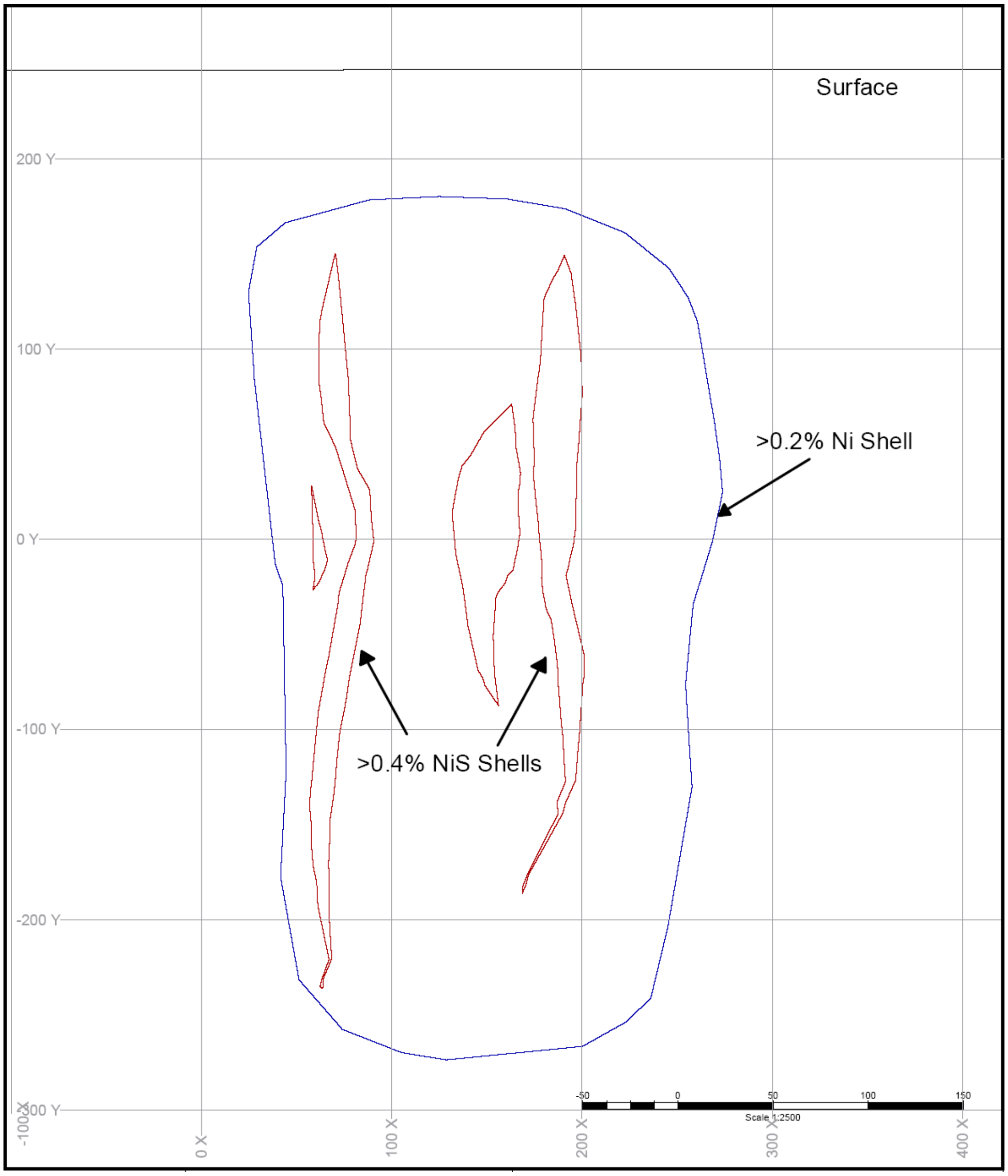
Source: Wardrop, 2009b (Secondary source: Bleeker and Macek, 1990)

Figure 2.7-3 Proterozoic Ospwagan Group - Stratigraphic Column



Source: Wardrop, 2009b

Figure 2.7-4 Minago Deposit at 160m Below Surface Showing Mineralization >0.4% NiS (red) in Lower Grade Envelope



Source: Wardrop, 2009b

Figure 2.7-5 Section 17W Showing Mineralization >0.4% NiS (red) in Lower Grade Envelope

Limited shallower diamond drilling in the North Limb has intersected a number of boudinaged ultramafic bodies that contain nickel mineralization similar to that at the Minago deposit (Figure 2.7-6).

The southern part of the claim block has not had any work done on it since 1972. A number of intersections of nickel bearing ultramafic rock have been encountered (Figure 2.7-7). Based on the limited available information, the nickeliferous ultramafic rocks appear to be irregularly distributed.

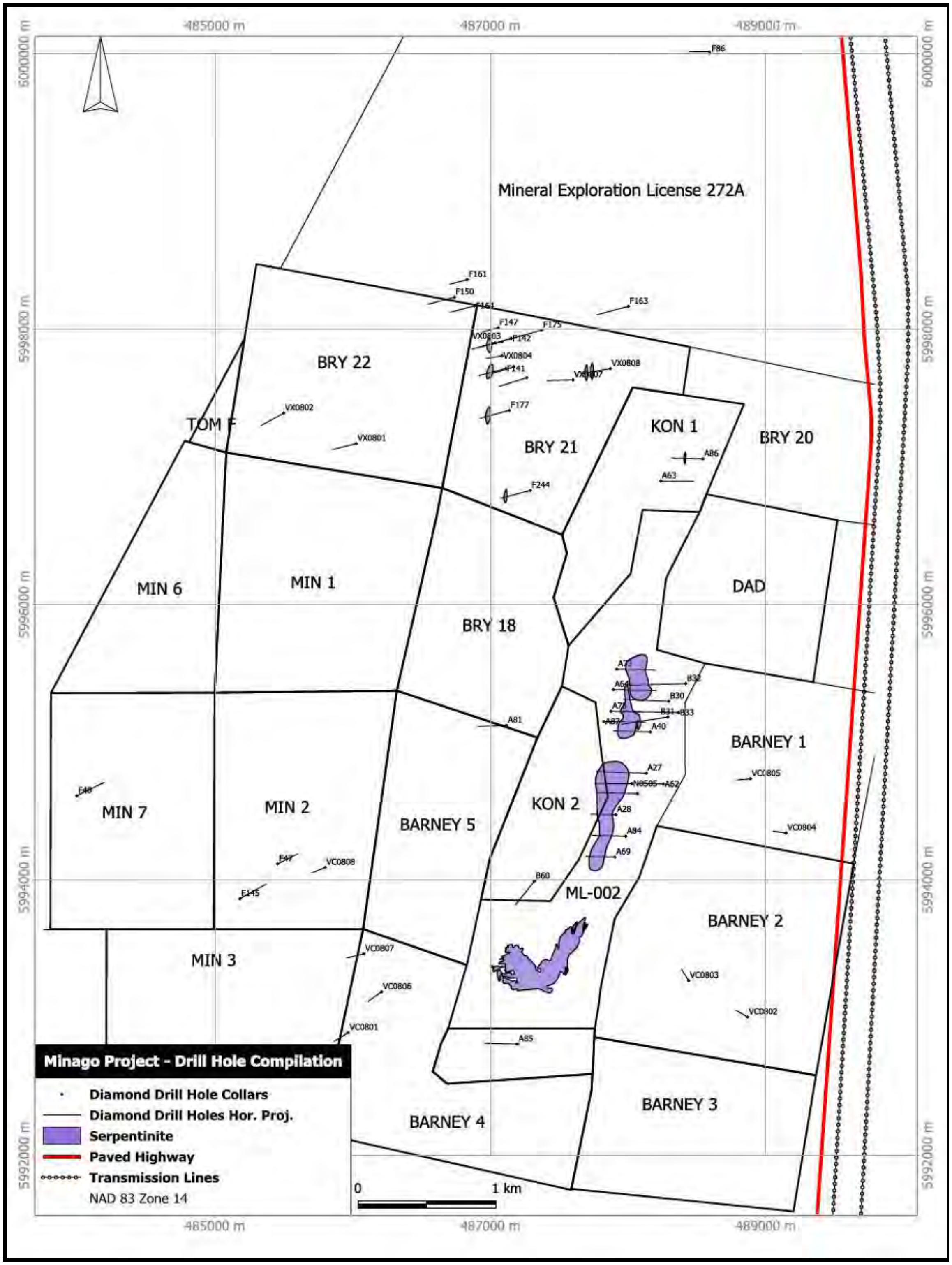
2.7.8 Magmatic Sulphide Mineralization

Magmatic nickel sulphide mineralization can be intraparental or extraparental based on whether it occurs within or external to the ultramafic parent rocks. Typically massive, extraparental mineralization occurs as pods and lenses of variable size within host pelitic schist adjacent to ultramafic boudins. The interpretation of the magmatic affinity of the extraparental mineralization is based on certain shared chemical characteristics with the intraparental mineralization. Intraparental mineralization occurs as lower abundances of interstitial sulphide and semi massive to massive concentrations of sulphide in veins and breccias all within ultramafic rocks (Wardrop, 2009b).

2.7.9 Exploration History of the Minago Deposit

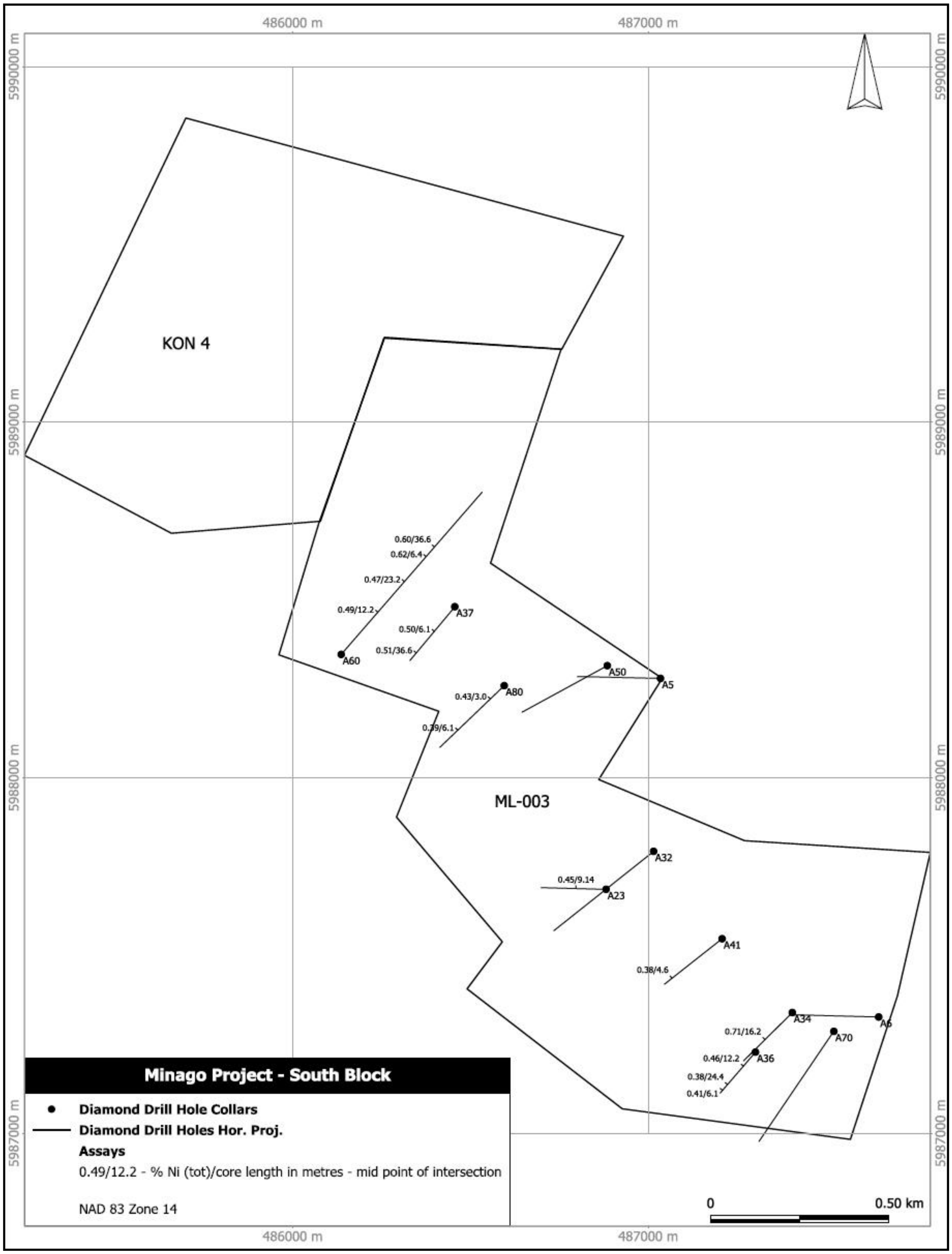
Geophysical Reservation 34 (GR 34) covering an area of 19.2 km by 38.4 km was granted to Amax Potash Ltd. (Amax) on November 1, 1966 for a period of two years and extended in 1968 to April 30, 1969 (reference to Amax in this report includes the subsidiaries and successor companies of Amax Potash Limited, namely Amax of Canada Limited, 121991 Canada Limited and Canamax Resources Inc.).

In March 1969, Amax converted the most prospective area of GR 34 to 844 contiguous claims; in April of 1969, an additional 18 claims were staked. In 1973, the claims covering ground deemed to have the most potential for economically viable nickel mineralization were taken to lease status as Explored Area Lease 3 (North Block) and Explored Area Lease 4 (South Block). In an agreement dated December 12, 1973, Granges Exploration Aktiebolag (Granges) was granted an option on the Explored Area Leases. Reference to Granges in this report includes the subsidiaries and successor companies of Granges Exploration Aktiebolag namely Granges



Source: Wardrop, 2009b

Figure 2.7-6 North Limb (from Victory Nickel)



Source: Wardrop, 2009b

Figure 2.7-7 South Block Nickel Intersections (from Victory Nickel)

Exploration Ltd. and Granges International Ltd. In 1977, Granges became a passive partner with a 25% interest and a 0.5% NSR royalty in the leases. On May 18, 1989 Black Hawk Mining Inc. (Black Hawk) purchased the Amax interest in the explored area leases. On August 2, 1989 Black Hawk purchased the Granges interest and NSR royalty in the explored area leases. On April 1, 1992 Explored Area Lease 3 and Explored Area Lease 4 were converted to Mineral Lease 002 and Mineral Lease 003 respectively. On March 18, 1994 a portion of Mineral Lease 002 was converted to mineral claims KON 1, KON 2 and KON 3, also on March 18, 1994 a portion of Mineral Lease 003 was converted to mineral claim KON 4. On November 3, 1999 Nuinsco purchased the Black Hawk interest in the Property subject to a graduated NSR royalty based on nickel prices. In 2008, Victory Nickel acquired Independent Nickel and effectively eliminated the royalty (Wardrop, 2009b).

2.7.9.1 Amax Exploration Work from 1966 to 1972

Amax conducted a regional scale exploration program on the southern extension of the Thompson Nickel Belt, and concluded that the corporate threshold for deposit size justifying production would not be achieved on the Property. A brief summary of work conducted on the Property by Amax follows (Wardrop, 2009b):

- an AFMAG airborne survey with nominal 1,609 m line spacing;
- a helicopter airborne magnetic survey with nominal 402 m line spacing;
- a Turair electromagnetic survey;
- linecutting at 305 m line spacing with ground geophysical surveys including; magnetic (Askania magnetometer), electromagnetic (Radem VLEM), dipole-dipole induced polarization (McPhar) and gravity surveys;
- drilling of eighteen holes plus one wedged hole were diamond drilled at the deposit;
- drilling of fourteen holes elsewhere on the North Block (Figure 2.7-6); and
- diamond drilling of twelve holes on the South Block (Figure 2.7-7).

2.7.9.2 Granges Exploration Work from 1973 to 1976

Granges focused their efforts on the Minago Nickel deposit conducting resource estimates, mining, metallurgical and milling studies. Eight holes were diamond-drilled at the Minago Nickel Deposit; limited in-hole surveys were also conducted (Wardrop, 2009b).

Granges concluded that the deposit was sufficiently confirmed and that further delineation and exploration should be conducted from underground workings (Wardrop, 2009b).

2.7.9.3 Black Hawk Exploration Work from 1989 to 1991

Black Hawk conducted a deep penetrating ground electromagnetic survey, resource estimates, mining, metallurgical and milling studies. A helicopter-borne electromagnetic and magnetic survey covering the Property was obtained from Falconbridge Limited and interpreted (Wardrop, 2009b).

Forty holes were drilled in the vicinity of the deposit. Collars were surveyed for location and in-hole orientation surveys were conducted on most holes using an ABEM fotobor. Five holes were diamond drilled elsewhere on the North Block (Wardrop, 2009b).

2.7.9.4 Nuinsco Work in 2005

Between mid-January, early April 2005, 3,027.78 m were drilled in 6 holes (N-1 to N-6). All holes, except N-5, were drilled to verify earlier diamond drill results, provide infill data and extend previously intersected mineralizaton. Hole N-5 was drilled 900 m northeast of the Minago deposit to explore the North Limb (Wardrop, 2009b).

In-hole surveys were performed by Major Drilling and Reflex Instrument North America. During the drilling of each hole, Major Drilling collected Reflex EZ-Shot data approximately every 50 m down the hole. Reflex EZ-Shot measures the following six parameters in one single shot: azimuth, inclination, magnetic tool face angle, gravity roll angle, magnetic field strength and temperature. However, the azimuth data is not reliable due to the magnetic properties of the rocks (Wardrop, 2009b).

Reflex Instrument North America personnel traveled to the property on three occasions to conduct surveys using the Reflex Maxibor. The Reflex Maxibor calculates the spatial coordinates every three metres along the drill hole path based on optical measurements of dip and direction changes. All holes except N-3 were surveyed. Holes were not surveyed in their entirety due to considerable difficulty in getting the instrument down the hole inside the BQ rods (Wardrop, 2009b).

Drill hole collars from N-1 to N-6 were surveyed for location, azimuth and dip by Pollock and Wright, Land Surveyors utilizing a Trimble RTK5700 dual frequency GPS survey instrument (Wardrop, 2009b).

Each hole was logged for rock quality designation (RQD). Samples were shipped by commercial trucking to the ALS Chemex laboratory to Thunder Bay, Ontario for sample preparation; thereafter the pulps were shipped by ALS Chemex to their laboratory for analysis (Wardrop, 2009b).

2.7.9.5 Nuinsco Work in 2006

Two holes totalling 1,533.57 m were drilled from March 4 to April 21, 2006. The drilling was undertaken in order to confirm and upgrade the resource estimates of deposit, enable geotechnical observations and measurements required to revise preliminary open pit shell designs, and provide additional material for metallurgical testing (Wardrop, 2009b).

It was necessary during the drilling of the Minago Deposit to employ NQ size rods to drill through the Ordovician strata and into the upper Precambrian basement. The remainder of the drill holes were reduced to BQ rod size. Due to the drill hole lengths required to cut a section through the sand deposit, changing the drill bit midway through each hole was necessary. If it were not for the reduction in rod size shortly below the unconformity, removal of the NQ rods from the hole to change a bit would have invariably resulted in collapse of unconsolidated Winnipeg Formation sand into the hole, and the near certain loss of the hole below the unconformity (Wagg, 2006).

In-hole surveys were performed by Major Drilling personnel utilizing a Reflex EZ-Shot instrument. During the drilling of each hole the drill crew collected Reflex EZ-Shot data approximately every 50 m down the hole (Wardrop, 2009b).

Drill hole collars were surveyed for location, azimuth and dip by Pollock and Wright, Land Surveyors, with a Trimble RTK5700 dual frequency GPS survey instrument. Dip values for the drill holes are not valid due to droop in the survey rod however location co-ordinates and azimuths are considered reliable (Wardrop, 2009b).

Drill project supervision and core logging and assay interval selection were conducted by the project geologist. Geotechnical parameters recorded included: RQD values, core recovery, fracture pattern orientations, abundance, nature (open or filled), type of fill, marginal alteration, cohesiveness, wetness, and strength estimates utilizing the R0-R6 scale wherein R0 represents extremely weak rock, and R6 represents extremely strong rock (Wardrop, 2009b).

An industry-standard point load test apparatus manufactured by Rokworth Corporation was employed for unconfined compressive strength testing that was routinely undertaken every 3.0 m for all drill core recovered. The lithology tested was recorded as well as the failure point in pounds per square inch. Diametral and less frequent axial tests were recorded for each lithology (Wardrop, 2009b).

In 2006, an NI 43-101 compliant mineral resource estimate for the Minago deposit was conducted by P. Vasak, P.Eng. of Mirarco. The Mirarco procedures and results are contained in a report titled “Resource Modelling of the Mineralized Zone of the Minago Nickel Deposit”, December 24, 2004 (Vasak, 2004). The Mirarco resource estimates were undertaken on behalf of and supervised by independent Qualified Person P.J. Chornoby, P.Geo., and P. Jones, P. Geo., Vice President of Exploration, Victory Nickel. This resource estimate summarizes the results of exploration conducted during the period from 1966 to 1991 and the work conducted by Nuinsco from 2004 to October 31, 2006. The resource model is for all mineralized zones in the Minago Deposit to a depth of 944.88 m below surface and provides resource classification and block models for deposit evaluation purposes. The primary scope was to build a resource block model based on a 0.2% Ni cut-off resource wireframe. The mineral resource estimates were optimised to evaluate resources mineable using open pit techniques to a depth of 411.5 m below surface based on the analysis of a qualified mining engineer (Wardrop, 2009b). The model utilizes a block size of 7.6 m x 7.6 m x 7.6 m.

2.7.9.6 Victory Nickel Work in 2007

Victory Nickel carried out a diamond drill program on the property commenced by Nuinsco in January and completed by Victory Nickel in May 2007. Major Drilling was contracted to perform the drilling.

The 2007 drill program was designed to upgrade inferred resource estimates above the pit bottom used in the PEA study (Wardrop, 2006). Mirarco and Victory designed 29 holes for this purpose. Five holes were drilled to provide material for metallurgical testing. These five holes were logged for geology, sample intervals were selected and tagged but the core was not split (Wardrop, 2009b). Wardrop designed ten of the holes specifically to examine final pit wall stability and logged a total of 24 holes for comprehensive geotechnical data complete with point load testing. Orientated core measurements were also performed on portions of two holes (Wardrop, 2009b).

As per industry norms each hole was logged, with sample intervals based on the following hierarchy (Wardrop, 2009b):

- rock type;
- alteration (style and intensity); and
- sulphide content (type and abundance).

A total of 7,260 nickel samples representing 13,217 m of NQ core were selected from the holes drilled in 2007. Five sandstone samples were also submitted for frac sand quality analysis and an additional 25 sandstone samples were identified and submitted for density measurement (Wardrop, 2009b).

All of the ultramafic rock intersected in each drill hole was sampled as was the immediately adjacent barren and included barren rock. Nickel samples varied in length from 0.13 m to a maximum of 3.45 m with a mean sample length of 1.21 m. Core recoveries in the Precambrian were generally 95% to 100% for each 3.0 m run with only rare intervals of lost core. Sandstone quality samples varied in length from 7.86m to 13.41m, and were limited to drill holes with >90% recovery (Wardrop, 2009b).

All ultramafic lithologies encountered were sampled and assayed except for some composited material required for crushing and grinding testwork (Wardrop, 2009b).

Drill hole collars were surveyed for location by Pollock and Wright of Winnipeg. Ongoing in-hole surveys were performed by Major Drilling personnel every 50 metres in all holes using a Reflex Easy Shot instrument. In addition, holes greater than 200 m long were in-hole surveyed by Victory contractors/employees using a Reflex Maxibor II instrument. A total of 3,752 measurements were taken (Wardrop, 2009b).

2.7.9.7 Victory Nickel Work in 2008

Victory Nickel conducted a diamond drill program including 26 holes on the property between January and May 2008. The 2008 drill program was designed to upgrade inferred resource estimates below the pit bottom used in the PEA study (Wardrop, 2006). Ten holes were designed by Wardrop for this purpose. Victory Nickel planned eight holes to explore the property where Wardrop proposed future mine construction, and eight holes to satisfy the expenditure requirement of at least $500,000 for the Xstrata option on claims BRY 18, BRY 20, BRY 21, BRY 22, TOM F and DAD, illustrated in Figure 2.7-6 (Wardrop, 2009b).

Twenty six holes totalling 11,748 metres were drilled in 2008, 10 holes totalling 7,505 m were targeted on the known Minago mineralized zone, 2,517 m were drilled to satisfy the requirements of the Xstrata option, and the remaining 1,726 m were drilled for property exploration (Wardrop, 2009b).

A total of 2,106 nickel samples representing 2,783.6 m of NQ core were selected from 10 holes drilled in 2008. The sample intervals were determined by the geologist during core logging. Twenty one sandstone samples were collected for density measurements.

As per industry norms each hole was logged, with sample intervals based on the following hierarchy (Wardrop, 2009b):

- rock type;
- alteration (style and intensity); and
- sulphide content (type and abundance).

All of the ultramafic rock intersected in each drill hole was sampled as was the immediately adjacent barren and included barren rock. Core recoveries in the Precambrian were generally 95% to 100% for each 3.0 m run with only rare intervals of lost core. Samples varied in length from 0.14 m to a maximum of 4.4 m, with a mean sample length of 1.32 m (Wardrop, 2009b).

The program was also designed to provide material for metallurgical testing, especially as the serpentinization appears to decrease with depth and there may be an accompanying change in the metallurgical response (Wardrop, 2009b).

Drill hole collars were surveyed for location by Pollock and Wright of Winnipeg. Ongoing in-hole surveys were performed by Major Drilling personnel every 50 m in all holes using a Reflex Easy Shot instrument. In addition, holes greater than 200 metres long were in-hole surveyed by Victory contractors/employees using a Reflex Maxibor II instrument. A total of 2,109 measurements were taken (Wardrop, 2009b).

As the holes were being drilled, the core was transported to Victory's core room in Grand Rapids, Manitoba and securely stored indoors for processing. The core was photographed and logged initially for geotechnical data, then the core was subsequently logged for lithology, alteration and mineralization (Wardrop, 2009b).

2.7.10 Data and Tools Used in the Mineral Resource Estimate

A detailed mineral resource estimate of the frac sand and the nickel sulphide mineralization at the Property was prepared by Wardrop (2009b). The estimation was completed for total Ni%, NiS% and frac sand quality using data from historic and recent drilling.

Gemcom version 6.1.3 was used for the resource estimate (wireframing and block modeling) in combination with Sage 2001 for the variography. WinStat software was used to identify the regression curves for grade-density and NiS-Ni relationships. Historically, total nickel analysis was carried out on the core. Additional analysis for nickel sulphide was requested by Wardrop, so that the recoverable portion of the nickel could be estimated.

Traces of Cu, Pt and Pd are also present at Minago. The Cu model was estimated using the same parameters as the NiS model. Cu grades are very low, but may become part of a smelter credit.

The frac sand resource was estimated using all the available data. The size and continuity of the Winnipeg sandstone were well established by 141 drill holes in and around the proposed pit shell. Frac sand quality data and metallurgical testing data were available for 5 of the holes.

The metallurgical test program at Minago established that the Minago deposit contains a significant amount of nickel in the form of nickel silicates, which are not recoverable by froth flotation (Wardrop, 2008a). Thus, the deposit defined using the total nickel assay is not reliable in terms of determination of mineable sections, pit design, and economic analysis of the mining and mill operation. Therefore, Minago's head grade-recovery curve was based on the grade of nickel sulphide (Wardrop, 2008a).

2.7.10.1 Total Nickel

There were 78 drillholes from the historical dataset that were used for the resource estimation (Wardrop, 2009b). An additional 44 drillholes from the 2006-07 winter drill campaign, and 10 holes from the 2008 program, were added. A total of 132 drillholes in the vicinity of the sulphide mineralization were used for the resource estimation (Wardrop, 2009b). The drillhole database comprised of collar, survey, lithology and assay information as summarized in Table 2.7-1.

Table 2.7-1 Total Records in Database

	Drillholes	Coordinates	Survey	Lithology	Assays
Records	132	132	8,334	3,620	19,875

Source: Wardrop, 2009b

2.7.10.1.1 Total Nickel Assays

A total of 19,875 assay intervals from 132 drillholes were selected and defined the zone of mineralization on the deposit (Table 2.7-2). Data analysis was conducted by creating probability and histogram plots of the data (Figure 2.7-8). The probability plot seems to exhibit a non-lognormal population. Probably two populations are seen in the plot as this may tie in with the serpentinite/granite mix (Wardrop, 2009b). Figure 2.7-9 shows a boxplot of nickel assays by rock type inside the selected mineralized zone (wireframe).

Non-assayed intervals were assigned a value of zero and are included with the assayed values.

Table 2.7-2 Ni% Assay Statistics

	Ni%
Minimum	0.000
Mean	0.280
Median	0.130
Maximum	5.860
N	19,875

Source: Wardrop, 2009b

2.7.10.2 Nickel Sulphide

The NiS% database consists of 4,557 assays and is summarized in Table 2.7-3.

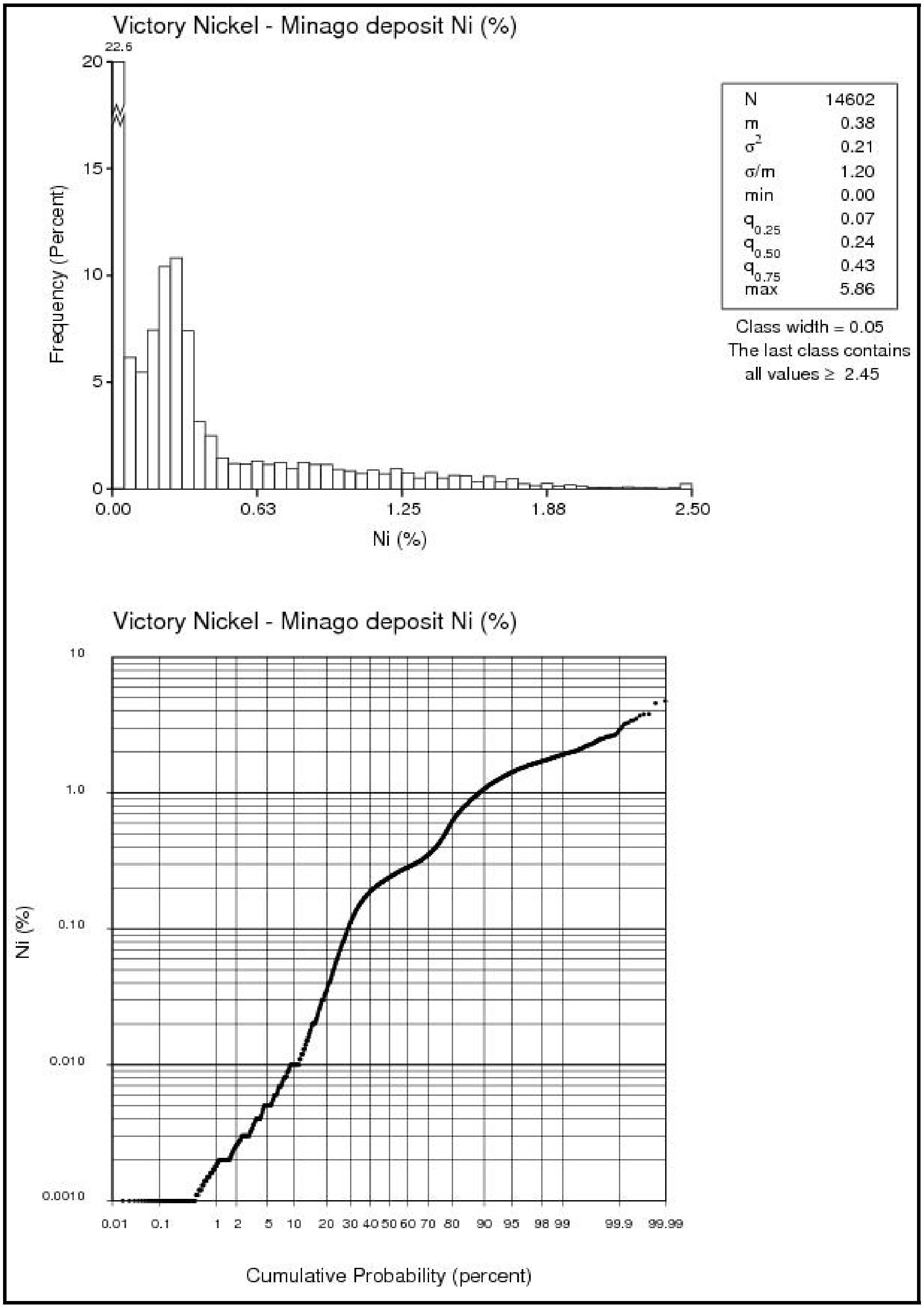
2.7.10.2.1 Nickel Sulphide Assays

A total of 4,557 NiS% assays were available compared to 14,829 Ni% assays. Data analysis was conducted by creating probability and histogram plots of the data. The probability plot seems to exhibit a non-lognormal population (Figure 2.7-10). Probably two populations are seen in the plot, as this may tie in with the serpentinite/granite mix (Wardrop, 2009b). Figure 2.7-11 shows a boxplot of NiS% assays by rock type, where 3,071 out of 3,298 NiS% assays were in the serpentinite unit.

2.7.10.2.2 NiS/Ni Ratios

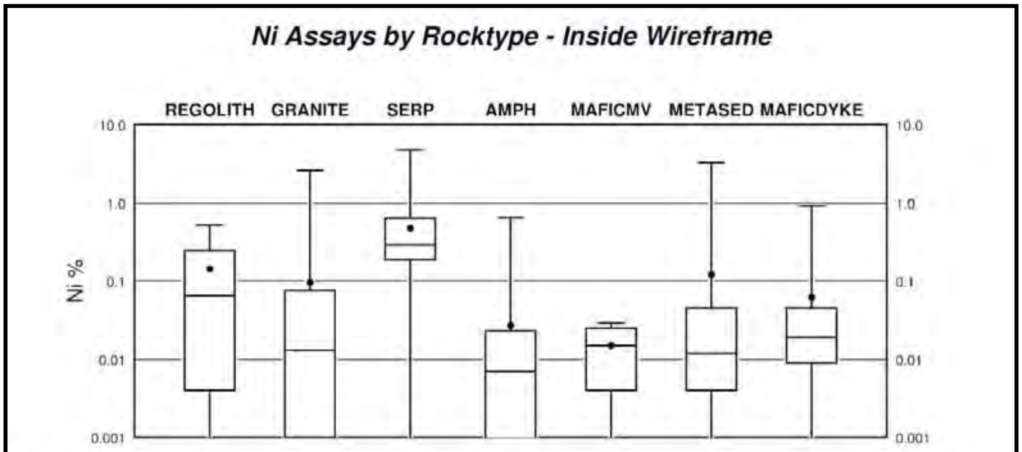
Wardrop examined in detail the relationship between the individual NiS to Ni assays. Ni to NiS scattered plots were created. Using regression information, the NiS/Ni ratio was subdivided into three groups:

- low NiS/Ni ratio <0.25;
- middle NiS/Ni ratio >0.25 and <0.5; and
- high NiS/Ni ratio >0.5.



Source: Wardrop, 2009b

Figure 2.7-8 Histogram and Probability Plot of Ni% Assay Data



	REGOLITH	GRANITE	SERP	AMPH	MAFICMV	METASED	MAFICDYKE	
Number of data	8	2838	8933	81	3	171	183	Number of data
Mean	0.143	0.096	0.475	0.027	0.015	0.121	0.062	Mean
Maximum	0.52	2.6	4.74	0.65	0.029	3.28	0.91	Maximum
Upper quartile	0.245	0.076	0.64	0.023	0.025	0.045	0.045	Upper quartile
Median	0.065	0.013	0.29	0.007	0.015	0.012	0.019	Median
Lower quartile	0.004	0.001	0.187	0.0	0.004	0.004	0.009	Lower quartile
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Minimum
Variance	0.0309	0.0522	0.2279	0.0059	0.0001	0.1709	0.0138	Variance
CV	1.226	2.375	1.005	2.86	0.807	3.427	1.89	CV
Skewness	1.1	4.554	1.768	6.812	-0.042	5.909	3.651	Skewness

Source: Wardrop, 2009b

Notes:
- SERP = Serpentinite
- AMPH = Amphibolite
- MAFICMV = Mafic Metavolcanic
- METASED = Metasediment
- MAFICDYKE = Mafic Dyke

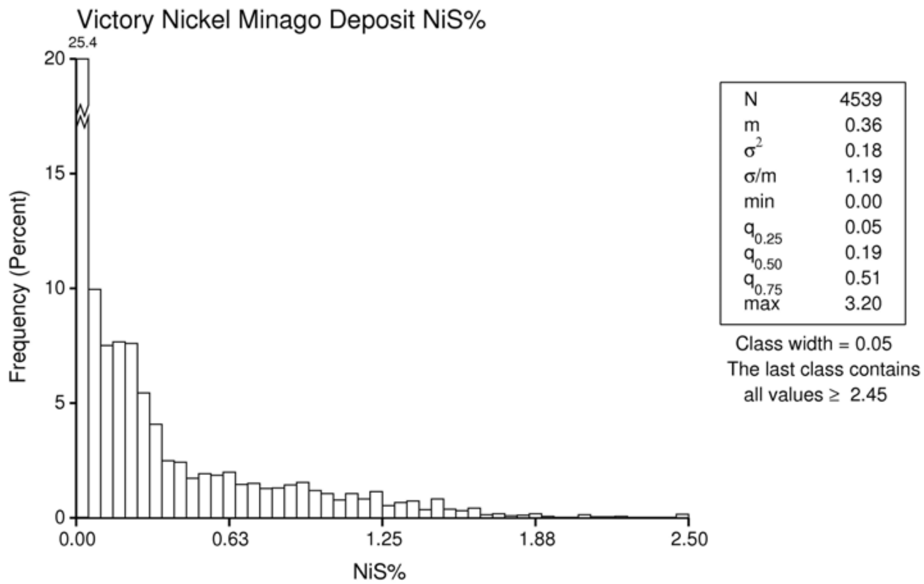
Figure 2.7-9 Boxplot of Ni Assay Data by Rock Type

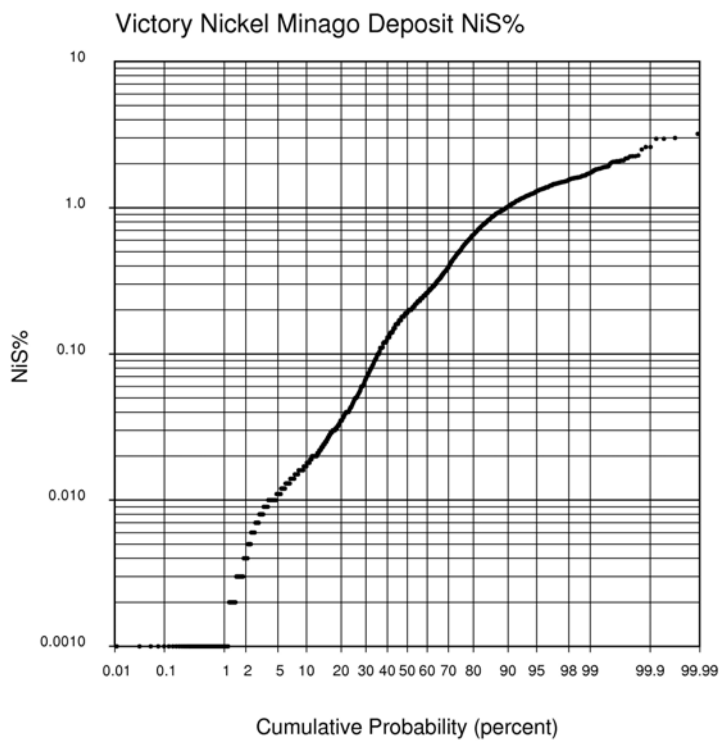
The results from the ratio analysis among other information were used to identify spatially where the low versus high NiS/Ni ratio lies. Figure 2.7-12 displays a vertical section where drillholes are plotted with their NiS/Ni ratio using the three groups. The low NiS/Ni ratio is at the top of the deposit. It is unclear what kind of geological controls govern this, however moving from west to east, the low NiS/Ni ratio can be traced (Wardrop, 2009b). On the west limb, the low NiS/Ni ratio is on the south side, whereas on the east limb the low ratio is in the middle (Wardrop, 2009b). Around the fold nose, the low NiS/Ni ratio is almost non-existent. This is probably due to the fact that higher Ni samples with high NiS content exist around the fold nose, therefore having a higher NiS/Ni ratio (Wardrop, 2009b).

Table 2.7-3 NiS% Database

Company	Drillhole Number	Number of Assays
Amax Exploration	MXB-70-48	657
	MXB-70-54 TO MXB-70-58	
	MXB-71-88 TO MXB-71-99	
Thompson Core	B-16-89	273
	B-7-89	
	G-1-74	
	G-2-75	
	MXB-71-93	
Victory Nickel	N-07-01 TO N-07-04	2,368
	N-07-06 TO N-07-07	
	N-07-09 TO N-07-23	
	N-07-25 TO N-07-28	
	N-07-30 TO N-07-39	
	N-07-41 TO N-07-44	
Victory Nickel	V-08-01 TO V-08-10	1,259

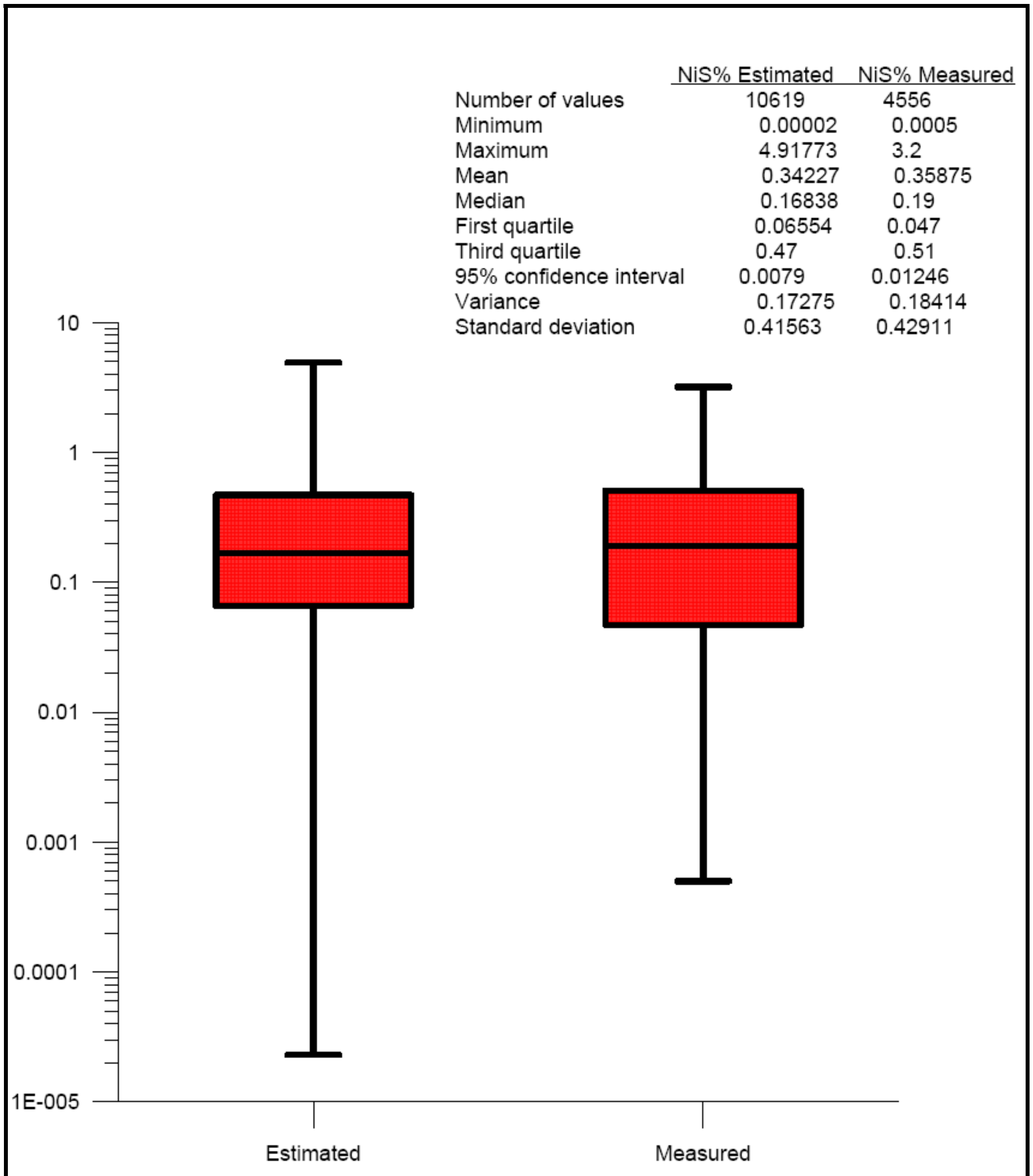
Source: Wardrop, 2009b





Source: Wardrop, 2009b

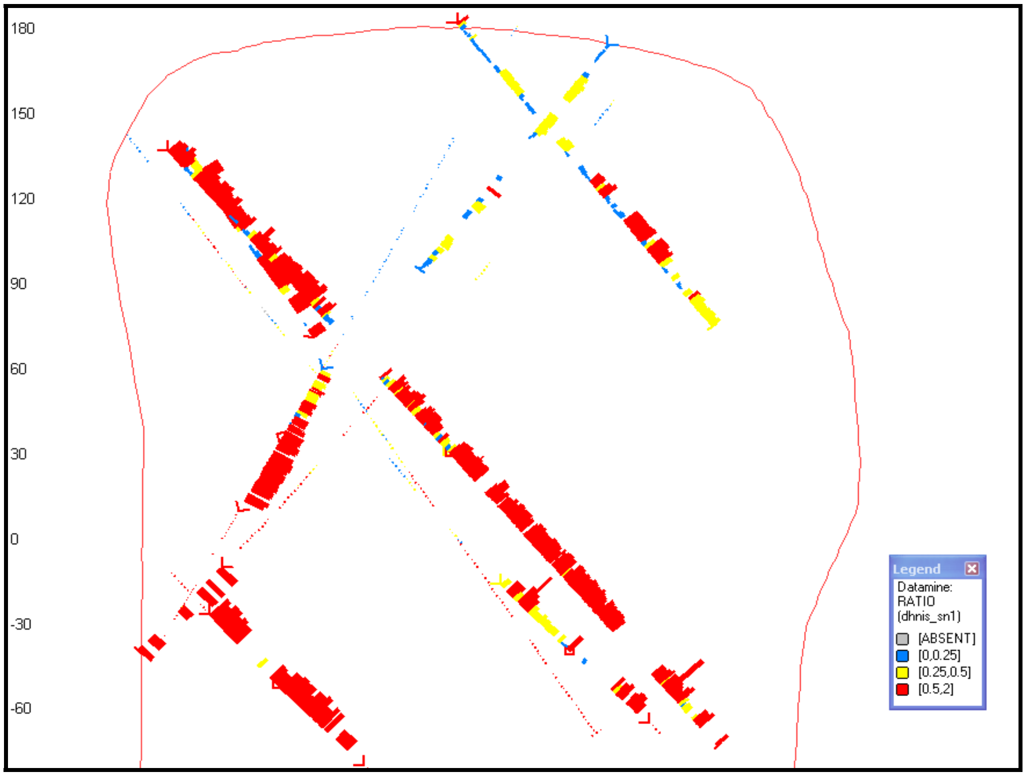
Figure 2.7-10 Histogram and Probability Plots of NiS% Assay Data



NiS% Measured sample population compared to
NiS% values estimated by regression

Source: Wardrop, 2009b

Figure 2.7-11 Boxplot of NiS% Assays by Rock Type



Source: Wardrop, 2009b

Figure 2.7-12 Vertical Section of the Wireframe and Drill holes with NiS/Ni Ratios

2.7.10.3 Frac Sand

Assay data used to evaluate the frac sand deposit was from test results performed by Loring, SRC, and TSL Laboratories Inc. (TSL). Comparison of the sand particle size distribution between the different samples submitted to Loring shows little variation across the area of the proposed pit. The size fraction data was combined into a coarse fraction (20/40) and fine fraction (40/140) for resource estimation purposes. Quality of the sand was shown to be affected by the testing method, so actual quality values will ultimately be determined by the recovery process (Wardrop, 2009b).

2.7.10.4 Solids

Mr. Chornoby standardized all the lithology codes from different drill campaigns. Lithological data from Amax, Granges, Blackhawk, Nuinsco, and Victory Nickel 2007 drilling now uses a common standardized codification system for all lithological units. Table 2.7-4 summarizes lithologies and their codes used in the model.

Table 2.7-4 Lithology Units and Rock Codes

Lithocode	Rock Code	
Overburden	OVB	10
Dolomite	DOL	20
Sandstone	SS	30
Serpentinite	SPT	40
Granite	GT	50
Amphibolite	AMP	60
Mafic Dyke	MD	70
Metasediment	MSD	80
Mafic Metavolcanic	MMV	90
Lost Core	LC	100
Regolith	R	110
Dunite/Peridotite/Pyroxenite	DPP	130

Source: Wardrop, 2009b

2.7.10.5 Bulk Density

During the 2006-07 and 2008 drill programs, TSL Laboratories (TSL) of Saskatoon conducted bulk density determinations as instructed by Nuinsco/Victory Nickel personnel. Table 2.7-5 is a compilation of the 2,050 samples that were used for density test work, out of which 779 samples were serpentinite (Wardrop, 2009b).

Table 2.7-5 Summary of 2007 Density Data

Lithology code	Number of Samples	Mean	Minimum	Maximum
Amphibolite (60)	493	3.01	2.41	3.57
Dolomite (20)	9	2.64	2.61	2.68
Granite (50)	361	2.67	2.32	3.26
Mafic Metavolcanic (90)	44	2.89	2.60	3.11
Metasediment (80)	57	2.86	2.63	3.43
Serpentinite (40)	779	2.58	2.16	3.86

Source: Wardrop, 2009b

Historically, the density for serpentinite, reported by Danley in a 1972 report, indicated a mean of 2.40 with a minimum value of 2.18 and a maximum value of 2.48 grams per cubic centimetre (g/cm^3) (Wardrop, 2009b). In the tests conducted by TSL, serpentenite had a minimum, mean, and maximum density of 2.16 g/cm^3, and 2.58 g/cm^3, 3.86 g/cm^3, respectively.

2.7.11 Geological Interpretation

The geological interpretation of the Minago deposit was conducted by Mr. Jim Chornoby, P.Geo. and Shahé Naccashian, P.Geo. The model was subsequently updated by Cliff Duke, P. Eng. Gemcom 6.1.3 software was used to build the surfaces and the solids.

The mineralization at Minago was considered as west and east domains based on the shape of the deposit. The deposit appears to consist of two limbs of a folded structure, with the apparent fold nose roughly located at UTM 487,350 East (NAD 83). The west domain was coded as 4010 and the east domain was coded as 4030. Figure 2.7-13 shows the 3D solid by domains split at the fold nose.

Figure 2.7-14 displays the geological solid at Minago. Using all drilling information, the current geological interpretation was completed and the overall mineralization continuity was maintained (Wardrop, 2009b).

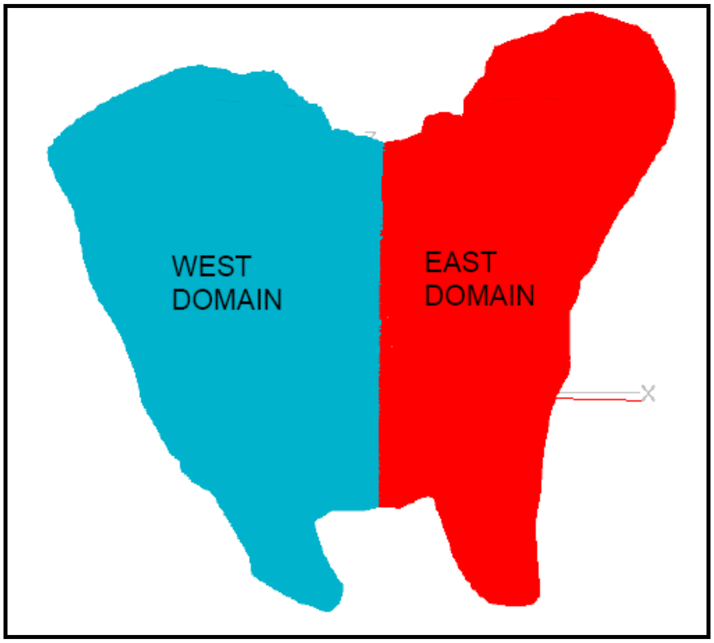
Figure 2.7-15 shows two solids: a yellow inside a large red solid. The yellow indicates areas with a low NiS/Ni ratio, whereas the red is the orebody wireframe. Transparent wireframes were plotted so that both can be visible (Wardrop, 2009b).

2.7.12 Conclusion – Resource Estimate and Geological Interpretations

The resource estimate and geological interpretations indicate that the upper portion of the Minago deposit (down to 400 m below surface) may be reasonably perceived as a large tonnage low grade nickel deposit (Wardrop, 2009b). A significant part of the lower portion of the deposit remains incompletely delineated as evidenced by the considerable tonnage of resource estimates in the Inferred category. Wardrop estimates that the Minago deposit contains a measured resource of 9.1 Mt, grading 0.47% NiS, above a cutoff grade of 0.2% NiS. In addition, the deposit contains 35 Mt of indicated resource at 0.42% NiS above a 0.2% NiS cutoff grade. An Inferred Resource of 12 Mt at 0.44% NiS above a 0.2% NiS cutoff has also been estimated (Wardrop, 2009b).

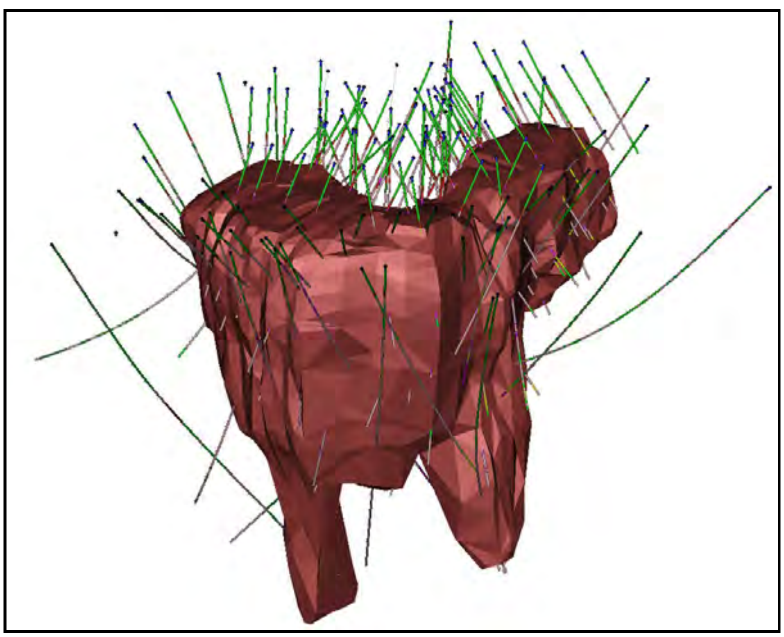
NiS% represents the recoverable part of the nickel. Unfortunately, all the samples were not analyzed for NiS, and grades for the missing assay values had to be interpolated using regression analysis from total nickel assays. For a significant part of the database, Wardrop's estimate of the missing NiS% assays was based on the relationship of NiS to Ni. The population distribution of the calculated NiS values was similar to that of the assayed NiS values (Wardrop, 2009b).

Rock density values appear to be more dependent on rock type than on grade (Wardrop, 2009b).



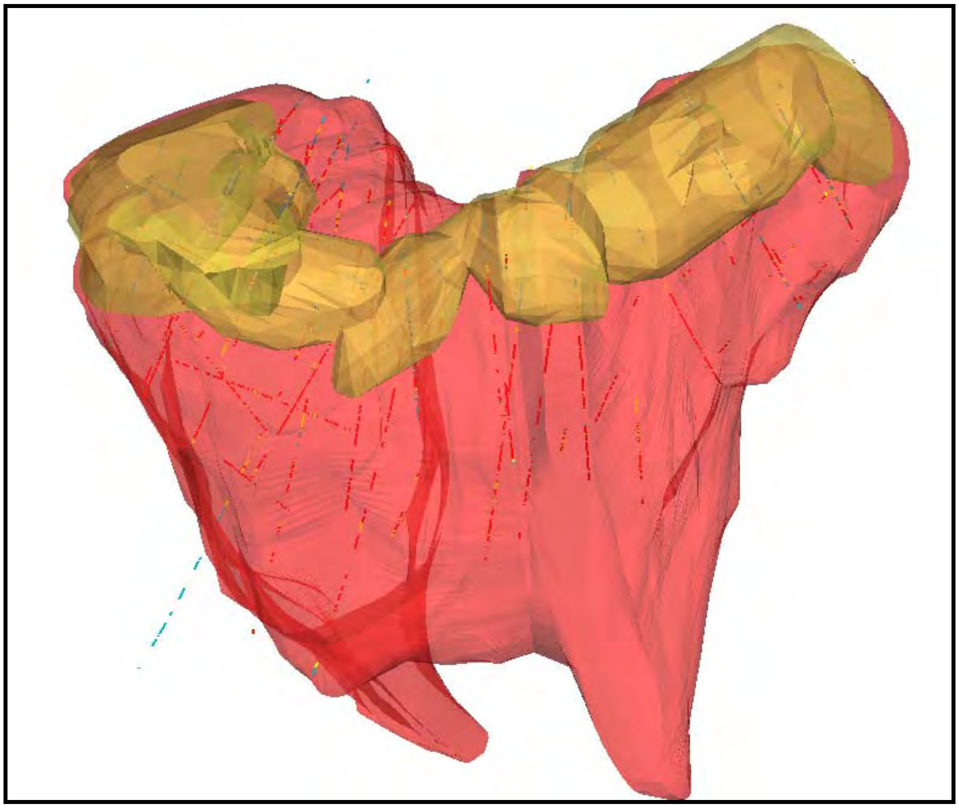
Source: Wardrop, 2009b

Figure 2.7-13 Three Dimensional Solid by Domain



Source: Wardrop, 2009b

Figure 2.7-14 Minago Deposit 3D Wireframe with Drill Holes



Source: Wardrop, 2009b

Figure 2.7-15 Low NiS/Ni Ratio Solid Inside Orebody Wireframe

Widely spaced single tier diamond drilling north of the Minago deposit and in the south block has intersected nickel mineralization similar to that found in the Minago deposit indicating exploration potential. This additional resource is not included in this study (Wardrop, 2009b).

A pit shell proposed to recover the nickel at Minago has been used to laterally constrain the frac sand resource. Wardrop estimates that the proposed pit shell contains 15 Mt of sand. Of this, 13% is expected to report to the 20/40 size fraction, and 71% is expected to report to the 40/140 size fraction (Wardrop, 2009b).

Based on the depositional model of the Winnipeg Formation sandstone, Wardrop expects the frac sand quality of the sandstone within the confines of the proposed pit shell to be fairly uniform. The size distribution of the sand particles that have been sampled is consistent across the area of the proposed pit shell. Initial testing of a sample composite indicates that a viable frac sand product can be produced from the resource. Drill hole intersections and density measurements have been sufficient to establish the tonnage of the deposit with a reasonable degree of accuracy (Wardrop, 2009b).

2.7.13 Mineralogy

Typical sulphide mineralization of the Minago nickel deposit consist of very fine grained (<0.5 to 4 mm), disseminated (2 to 7%) and occasionally net-textured pentlandite ($(Fe,Ni)_9S_8$) with lesser violarite (Fe,Ni_2S_4), millerite (NiS) and heazlewoodite (Ni_3S_2) (URS, 2009i). Minor amounts of pyrite (FeS_2), pyrrhotite ($Fe_{1-x}S$) and chalcopyrite ($CuFeS_2$) are also present (URS, 2009i).

The dominate minerals in the deposit are serpentinite (serpentine mineral) and peridotite (olivine mineral) and both are silicates. The serpentinite ore is closer to the surface and thus more oxidized (Wardrop, 2006).

Typically sulphides on the Property are very fine-grained varying in size from < 0.5 to 4 mm (generally 1 to 2 mm) and range in volume from 2 to 15% (generally 2 to 7%). Sulphides are predominantly disseminated and occasionally net textured. The dominant sulphide species are nickel bearing pentlandite with lessor violarite and millerite. Minor amounts of pyrite, pyrrhotite and chalcopyrite are present (Wardrop, 2006).

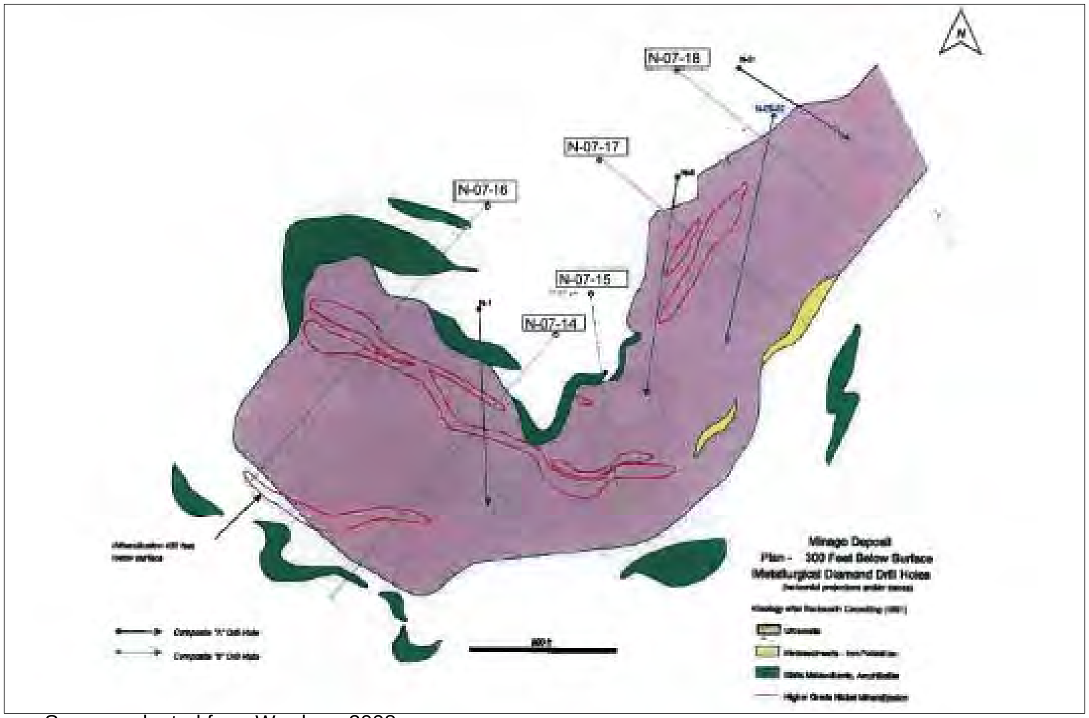
Due to the relatively high talc content in the ore, metallurgical test work focussed on processes that would result in a high nickel grade concentrate (>25% Ni), with a low talc content (<10% MgO), at the highest possible nickel recovery. Concentrates containing high talc content can be detrimental to the smelting operation and potentially unmarketable (Wardrop, 2006). Contract penalties escalate when talc values in the nickel concentrate rise above levels acceptable to smelters.

2.7.14 Metallurgical Testing

The metallurgical test program at Minago established that the Minago deposit contains a significant amount of nickel in the form of nickel silicates, which are not recoverable by froth flotation (Wardrop, 2008a). Thus, the deposit defined using the total nickel assay is not reliable in terms of determination of mineable sections, pit design, and economic analysis of the mining and mill operation. Therefore, Minago’s head grade-recovery curve was based on the grade of nickel sulphide (Wardrop, 2008a).

2.7.14.1 Drill Holes used for Metallurgical Testing

Five dedicated drill holes, identified as N-07-14, N-07-15, N-07-16, N-07-17 and N-07-18, were selected by geologists from Wardrop and Victory Nickel to generate samples for metallurgical testing for the bankable Feasibility Study on the Minago project. The five holes were located roughly even along the strike of the deposit (as shown in Figure 2.7-16) in order to represent ores from the whole open pit (Wardrop, 2008a).



Source: adapted from Wardrop, 2008

Figure 2.7-16 Location of the Five Metallurgical Drill Holes

All 1,117 drill core intervals obtained from the five metallurgical drill holes were split at SGS Lakefield Research (SGS or Lakefield) and sent for total nickel assay. The total weight of these drill cores was 4,174.2 kilograms (kg). The intervals with a total nickel assay of higher than 0.2% nickel were later assayed for sulphidic nickel (Wardrop, 2008a).

The uncrushed core splits and coarsely crushed core samples were stored in a cold room at the Lakefield site. The metallurgical testing samples were formed from these core samples based on a sample recipe designed to suite the objectives of the tests (Wardrop, 2008a).

Two Master Composite Samples for the Open Pit were prepared for the metallurgical testing. The Open Pit Master Composite No. 1 was based on the total nickel assays of the intervals of the five metallurgical holes, as the nickel sulphide assay of the intervals was not available, and the significant variation of the ratio of sulphidic nickel to total nickel was not understood at the time. The Open Pit Master Composite No. 2 was a composite sample to represent the ore from the open pit operation based on nickel sulphide. The Open Pit Master Composite No. 2 sample was generated from the metallurgical drill core intervals, based on volume of influence with consideration of the average nickel sulphide grade of the ore contained in the open pit. The

Open Pit Master Composite No. 2 was used to develop the design criteria for the Minago project. The Open Pit Master Composite No. 2, which was designed to represent the overall open pit ore, contained 0.53% total nickel and 0.36% sulphidic nickel (Wardrop, 2008a).

The sulphidic nickel assays of the drill core intervals of the five dedicated holes were provided by SGS. The sulphidic nickel assays of the intervals of other 2007 drill holes were provided by SGS and ACME Labs in Vancouver (Wardrop, 2008a).

2.7.14.2 Summary of Results of the Metallurgical Test Program

The complete metallurgical program at Minago is presented and discussed in Wardrop (2008a). Major conclusions from the metallurgical testing program are as follows (adpated from Wardrop, 2008a):

1. Geological Model: Part of the nickel (Ni) in the Minago deposit is in the form of nickel silicates; the ratio of nickel content in silicate to the nickel content in sulphides varies over the deposit. It is therefore impossible to assess the nickel recovery and project economics based on total nickel assays.

2. A locked cycle test on the Open Pit Master Composite No. 2 achieved a nickel concentrate containing 22.23% nickel and 10.43% magnesium oxide (MgO) with a nickel sulphide equivalent recovery of 77.2%. Multiplying this recovery by the average sulphidic nickel to total nickel ratio of 75.4% yields an average total nickel recovery of 58.2%.

3. The grindability testing samples had a median SPI (SAG Power Index) of 27.4 minutes; a median RWI (Rod Mill Work Index) of 9.6 kilowatt hours per tonne (kWh/t) and a median BWI (Ball Mill Work Index) of 14.9 kWh/t. These data indicate that the grinding hardness of the samples is intermediate on average.

4. The optimum grind size for the Minago sample was determined to be at P80 = 68 micrometres (μm).

5. Assays of the sulphidic nickel indicated that there is a significant portion of the nickel sulphide lost to the flotation tails. Mineralogy work (optical and QEMSCAN) indicated that the nickel sulphides lost to flotation tails were fine particles liberated or attached to silicates.

6. Three samples from Hole N-O7-14 and three samples from Hole N-O7-17 (at total nickel assay of ~0.3%, ~0.4% and ~0.5%) were selected for flotation tests to investigate the relationship between the nickel head grade and rougher tail nickel grade. The results indicated that nickel rougher recovery is lower for lower head grades, especially for samples with low nickel sulphide content. Results from these tests further confirmed that the nickel recovery of mining blocks has to be predicted from its sulphidic nickel grade.

7. Control of the magnesium oxide content in the final concentrate will likely be a challenge for the flotation of Minago samples. A series of depressants/dispersants regimes were tested. Carboxmethyl Cellulose (CMC) or CMC in combination with Calgon proved to be most effective in controlling the magnesium oxide content in the final concentrate. The overall magnesium oxide rejection achieved in the locked cycle test on the Open Pit Master Composite No. 2 was 99.61% (0.39% recovered to the final concentrate). It will be difficult to further reduce the amount of magnesium oxide in the concentrate without significant loss of nickel.

8. The Minago slurries are viscous and pulp density has to be kept low to improve the selectivity of flotation. The effect of dispersants, such as sodium silicate and sodium hexametaphosphate (SHMP), were tested and proved to be effective in improving the flotation selectivity for the Minago samples.

9. Flotation tests and sulphidic nickel assays finished by 2008 indicated that the mineralogy and the floatability of the ore in the different locations of the deposit were quite different.

10. During the test program, it was found that Hole N-O7-18 contained such a small concentration of nickel sulphide; and therefore, should not considered to be ore.

2.7.14.3 Key Results for the Open Pit Master Composite No. 2 Sample

The Open Pit Master Composite No. 2 sample is a composite sample to represent the ore from the open pit operation based on nickel sulphide. The Open Pit Master Composite No. 2 sample was generated from the metallurgical drill core intervals based on volume of influence with consideration of the average nickel sulphide grade of the ore contained in the open pit (Wardrop, 2008a).

2.7.14.3.1 Flotation Test Results for the Open Pit Master Composite No. 2

The main objective of the flotation test work was to develop the design criteria for the plant design of the Minago project based on a composite that represents the ores produced from the open pit based on the sulphidic nickel deposit block model. The test work consisted of cleaner tests to confirm and further optimize the flotation parameters and locked cycle tests to generate the mass and water balance of the flow sheet. The effect of recycled water was also tested.

The cleaner tests indicated the following:

- Addition of Potassium Amyl Xanthate (PAX) in the cleaning stage resulted in lower nickel and higher magnesium oxide assays in final cleaner concentrate.
- Carboxmethyl Cellulose (CMC) addition in rougher flotation did not have a remarkable impact on the flotation of Open Pit Master Composite No. 2.

- Addition of Calgon in grinding produced the best flotation results with the concentrate assaying 22.2% total nickel and 11.8% magnesium oxide at a nickel sulphide equivalent recovery of 68%.
- Addition of Dep. C in grinding did not show any positive effect on the flotation of the composite sample.
- Acid wash did not improve the selectivity of the flotation process.

2.7.14.3.2 Locked Cycle Results for the Open Pit Master Composite No. 2

One locked cycle test was run based on the flotation parameters of one of the cleaner tests (SMC-6; Wardrop, 2008a). Based on this test, it was inferred that a nickel concentrate containing 22.27% nickel and 10.43% magnesium oxide may be produced with a total nickel recovery of 52.28% and a nickel sulphide recovery of 77.23% (Wardrop, 2008a). Based on this test, 126 tonnes of nickel concentrate will be produced at a mill throughput of 10,000 t/d and mill feed grade of 0.364% sulphidic nickel (8 pounds (lbs) sulphidic nickel per tonne of feed) (Wardrop, 2008a).

A second locked cycle test was completed to assess the effect of recycled water on the flotation behavior of the Open Pit Master Composite No. 2. Testing indicated that recycled water did not have a significant effect on the flotation behavior of Open Pit Composite No. 2 (Wardrop, 2008a).

2.7.14.3.3 Settling Tests of Flotation Tails

Based on the results of flocculant screening, five bench scale tests were conducted to evaluate the effect of flocculant dosage and initial pulp density. It was found that at an initial pulp density of 16.38% solids, 1.732 square metres (m^2) per tonnes per day of thickener settling area is required to achieve a pulp density of 40.7% solids for the thickener underflow. Thus, a 150 m diameter conventional tailings thickener is required for a mill with a throughput of 10,000 t/d (Wardrop, 2008.