# Surficial Geology of the Mount Polley Property: Summary of 2005 Exploration Work

Pertaining to mineral claims owned and operated by the Mount Polley Mining Corporation, located within NTS Map Sheets 093A/12 and 093A/5, centered at latitude 52º 33'N, longitude 121º 38'W, or at approximately UTM 592600E, 5823100N, in Zone 10 (NAD 83).

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## Statement of Qualifications

I, Patrick McAndless, P.Geo., am a Professional Geoscientist, Vice-President, Exploration of Imperial Metals Corporation of Suite 200 – 580 Hornby Street in the City of Vancouver in the Province of British Columbia.

I am a member of the Association of Professional Engineers and Geoscientists of British Columbia. I graduated from the University of British Columbia with a Bachelor of Science degree in geology in 1970.

I have practiced my profession continuously since 1970 and have been involved in: mineral exploration for base and precious metals, uranium and industrial minerals in Canada, United States, Latin America and Africa.

As a result of my experience and qualifications, I am a Qualified Person as defined in NI 43-101.

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# 1.0 Introduction

## 1.1 Background and Purpose

The claims upon which this report is based were acquired by Imperial Metals as part of ongoing exploration and development work related to the 100% owned Mount Polley mine (Note: Work was also completed on the core of the property which has been held for many years). The Mount Polley copper-gold mine is operated by Mount Polley Mining Corporation, a wholly owned subsidiary of Imperial Metals Corporation. The mine originally operated from 1997 to 2001, at which point low metal prices forced suspension of mining. After the original mining activity, remaining reserves were estimated to be 31.9 million tonnes grading 0.36% copper and 0.34 grams per tonne gold, mainly in the unmined Springer deposit and remaining reserves in the Bell.

In August 2003, a new, high-grade deposit, the Northeast Zone, was discovered in an under-explored part of the property. Between then and the end of 2004, intensive exploration was carried out on the Northeast Zone, including trenching, diamond drilling, and geophysics. As of February, 2005, reserves in the Northeast Zone were estimated to be to 9.1 Mt grading 0.88% copper, 0.29 g/t gold, and 6.4 g/t silver.

Following the discovery and favourable assessment of the Northeast Zone from 2003 to early 2005, mining of the Northeast Zone began in February 2005, a mere 18 months after its discovery. The Northeast Zone discovery renewed exploration interest in similarly underexplored areas across the Mount Polley property, and from 2003 to 2005 exploration of both surficial and bedrock geology was done in these areas.

Since bedrock exposure is poor to moderate across the Mount Polley property, surficial geology is the only available practical exploration tool in many of the topographically depressed locales. In particular, sampling of basal tills, where available, has proven to be a useful marker of bedrock mineralization, given an understanding of glacial iceflow directions. In addition to the exploration applications, surficial mapping is also useful with regards to aggregate volume estimation in support of mining infrastructure development and maintenance. As such, the surficial exploration program also supported mining production activities.

In order to expand exploration beyond the contiguous claims surrounding the Mount Polley mining leases, a new series of non-contiguous claims were acquired in 2005 to the north and northwest of the 2004 claims. A reconnaissance surficial geology program was undertaken on these claims in order to prospect these areas. Surficial geology, including tills and various Quaternary glaciolacustrine and morainal sediments, was sampled in hand-excavated pits and analyzed for grain size and geochemistry. Bedrock was classified and assayed for copper where intercepted. Estimates were also made of available surficial material resources in order to support infrastructure development.

This report contains a summary of the surficial geology as presently understood, and an account of surficial exploration on the property up to the end of 2005.

### 1.2 Location and Access

The Mount Polley mine is situated 56 km northeast of Williams Lake in south-central British Columbia (**figure 1**). The centre of the Mount Polley property is at *ca.* latitude 52º 33'N, longitude 121º 38'W, or *ca.* UTM 592600E, 5823100N, in Zone 10 (NAD 83). The nearest settlement is the village of Likely, at the western end of Quesnel Lake located 8 km to the NE of the mill complex. The property in 2003-2004 is within NTS Map Sheet 093A/12, except for a narrow east-west strip in the extreme south which falls within Sheet 093A/5.

The magnetic declination in 2005 was 20º 2'E (Natural Resources Canada, online geomagnetism calculation). The base map on the property is registered to the UTM grid, which is about 1º east of true north. As a result, compass measurements in the field were made using an effective declination of about 19ºE.

Mount Polley is road-accessible all year round, via the paved highway between 150 Mile House (15 km southeast of Williams Lake on B.C. Highway 97), and Likely. A well-maintained, 12 km-long gravel road to the mine site, Bootjack Forest Access Road, branches off the Likely highway 68 km north of 150 Mile House (1.5 km north of the Morehead Lake resort), or 13 km west of Likely. Access to the far south of the property is also possible from the Likely highway via the Gavin Lake forestry road, 52 km north of 150 Mile House. However, gates are used to control vehicle access from this road onto the property near the tailings dam area.

A good forestry road branches off the Bootjack access road at the 7-km marker. It provides access to the west and south of the property, with additional branch roads. This road is blocked before it connects with the Gavin Lake road, but not inside the property.

Logging roads and old drill roads are present across most of the property, although their condition varies, with the older ones being overgrown or washed out. In areas of recent exploration, new roads have been built and some of the older roads improved.

The northern claims are located near the hamlet of Hydraulic along Highway 97. The centre of these claims is approximately defined by Little Lake, and sits at *ca.* UTM 586000E, 583100N in Zone 10 (NAD 83). The claims are also within NTS Map Sheet 093A/12. As is the case for the Mount Polley property itself, the area is accessible all year round by Highway 97, and by a paved and gravelled road running along the north shore of Little Lake. Numerous seasonally available minor roads and paths also cross the area.

The nearest airport to Mount Polley is in Williams Lake. Driving time to these claims from there is between 60 and 90 minutes, depending on road conditions.

### 1.3 Physiography

The northern non-contiguous claims and the nearby Mount Polley property are situated along the eastern margin of the low-lying Fraser Plateau of the British Columbia interior, flanked to the east by the Quesnel Highlands, and the Cariboo Mountains beyond.

A significant valley containing Little Lake and Prior Lake strikes east-west through the northern claim blocks. This valley is relatively deeply incised, with topographic highs to the north and south. The southern topography culminates a few kilometers to the south in Mount Polley peak, at the Mount Polley mine site. Natural rock exposure is limited to outcroppings on hillsides and cliff faces of the valley sides.

The high point in the immediate area is Mount Polley (hereafter distinguished as 'Mount Polley peak'), a small mountain 1266 m (4155 feet) a.s.l., with relatively steep slopes to the west and east towards Bootjack (el. 986 m) and Polley lakes (el. 921 m), respectively. The terrain slopes away from Mount Polley peak more gradually towards the north and south, into subdued topography composed of moraines, till sheets and other fluvio-glacial landforms. West of Bootjack Lake, the topography rises again to a series of hills around 1150 m, east of Trio Lake at the western edge of the property. Bootjack Mountain is the highest peak in this area (the same height as Mount Polley peak). The southern end of Morehead Lake is just outside the property in the extreme northwest.

Due to the nature of the underlying volcanics and intrusions, there is not a well-defined topographic 'grain' on the property, except that produced by the effects of glacial transport and post-glacial deposition, which have a consistent northwestern direction. This is reflected in the trends of the largest lakes and the streams. The largest drainage is Morehead Creek. A few small creeks drain in a transverse direction, northeast or southwest.

Mean monthly temperatures range from 13.7°C in July to –10.7°C in January. Precipitation averages 755 mm, with 300 mm falling as snow. Forest cover consists of red cedar, Douglas-fir and sub-alpine fir, with lesser black cottonwood, trembling aspen and paper birch. Spruce is locally common on the valley floors, in the boggy lowlands surrounding Prior Lake and Little Lake. Some the area has been clearcut by commercial logging.

### 1.4 History

The area has historically witnessed numerous small placer workings, and has hosted significant water-channelling and containment works related to nineteenth century mining activities in the Bullion Pit on the nearly Quesnel River. Together with nearby Morehead Lake, the village of Hydraulic which the northern claims contain, was at the

centre of an extensive engineering project that controlled water supply to the hydraulic mining operations at the Bullion Pit, and the area was once host to a population that numbered in the thousands.

After the discovery of the Mount Polley porphyry copper mineralization in the 1963-1966 period, most of the surrounding land has been claimed at one time or another by a number of exploration and mining companies. Surficial geology was not examined beyond the limited scope of soil metals analysis work before Blackwell and Stubley (2005) summarized results of the 2003-2005 Imperial Metals exploration program.

### 1.5 Previous Work

The principal geological source of reference for the region containing these claims is the provincial government's geological survey report on the Central Quesnel Belt by Panteleyev *et al*. (1996). This comprehensive study contains many more details of the physical, historical, geological and economic aspects of the region than can be included in the present report.

More recently, Rees et al. (2005) have produced a detailed account of the local geology and surficial geology of the Mount Polley area based on exploration work in the 2003 to 2005 field seasons.

### 1.6 Land Tenure

The Mount Polley property, exclusive of mining lease claims, comprises 43 mineral claims, including the non-contiguous claim block acquired in 2005 to the north of the main property (**figure 1**). A table of claim names is provided in **Table 1**. Until December 2005, all claims and leases are 100% held by Mount Polley Holding Company Limited, an indirect, wholly-owned subsidiary of Imperial Metals Corporation. All claims are now held by Mount Polley Mining Corporation. There are no underlying royalties or other interests.

### 1.7 Acknowledgements

This report derives exclusively from the excellent work of Jacqueline Blackwell and Tim Stubley. Their detailed fieldwork and data analysis have made a pioneering contribution towards the understanding of the Quaternary geology in the Mount Polley area.

Other contributions from Chris Rees are also gratefully acknowledged.

Jacqueline and Tim were assisted in the field by Kim Grey, who they would like to thank for her first-rate assistance and perseverance in difficult field conditions.

## 2.0 Surficial Geology

Panteleyev et al. (1996) indicate that regionally a northwesterly ice flow direction predominates, and that the area hosts widespread glaciofluvial deposits, tills and morainal deposits. The Quaternary geology of the explored claims is otherwise unstudied, outside of the report work of Blackwell and Stubley (2005), included in Rees et al. (2005).

### 2.1 Deposit Geology

The following is summarized after Rees et al. (2005).

The Mount Polley Complex (henceforth referred to herein as the MPC) represents a volcanic-plutonic centre that developed during the later stages of the Quesnellia island arc. At the time of formation, in the Late Triassic, marginally silica-undersaturated, shoshonitic arc magmas were evolving from basaltic to more intermediate compositions. A relatively sodic-alkalic phase of basaltic volcanism apparently marked the transition to more felsic magmatism.

Alteration of the rocks is extensive and polyphase, and includes sodic, potassic, magnetite and garnet alteration events. Some potassium feldspathization probably occurred throughout construction of the MPC, consistent with the general potassic geochemical signature of the arc. However, the most significant magnetite, albite and possibly garnet alteration appear to be signatures of the mineralization process.

Mineralization is generally situated in or adjacent to breccias attributed to hydrothermal and/or volcanoclastic processes. Breccia genesis and relation to various mineralization and alteration phases is a subject of ongoing academic debate.

## 3.0 Surficial Exploration Program 2005

Field exploration was completed between May and September of 2005 and was dominated by foot traverse exploration with aid from air photo mapping and road access where available. The field crew was led by Tim Stubley with assistance from Kim Grey.

Surficial materials on the property are dominantly covered by a thick organic forest floor. A one metre hole was hand-excavated to expose underlying sediment. Depending upon the nature of the material, the hole was then hand augured to obtain a representative sample.

### 3.1 Mapping methodology

Surficial mapping was assisted by the use of specially designed, small and lightweight tablet computers, made by Panasonic. The computers are weather-proof and rugged, and loaded with GIS-capable software including a mapping and logging program by Lagger (Northface Software), and ArcPAD (ESRI). Mapping was done using a digital aerial photograph loaded into ArcPAD, with station locations etc. automatically linked with geological data entered directly in the field into the Lagger database. All plotting can be done on-screen, without the need for map digitizing. A GPS unit built into the computer allowed accurate and precise location (usually within 5 metres) of field stations. Files can be downloaded and shared between users on a daily basis, providing them with current data at all times. When mobile GIS was not available, surficial mapping was also accomplished using handheld GPS and airphotos.

The large size of the newly acquired claimed land led to an exploration schedule where four square kilometre (2 km x 2 km) areas were covered in 2 field days. Division of the property into 33 distinct areas based on this system is presented in **figure 2**. Exploration was conducted upon this basis, along with more detailed examination of previously-defined named areas of interest derived from earlier bedrock and surficial mapping work, as shown in **figure 3**. The 33 target areas and detailed sampling patterns in predefined targets were selected to be representative of the property as a whole, and to pursue possible targets where favourable geological constraints were available, respectively. Sampling was undertaken in a grid with site spacing as close to 25 to 50 metres as terrain allowed. Assays were submitted to ACME Analytical Laboratories where 32 element ICP and copper-gold fire assay analysis was completed.

## 4.0 Discussion of Results

### 4.1 General Purpose

The surficial geology program executed in 2005 functioned on two levels: 1) as a mineral exploration tool, and 2) as support for infrastructure development. Of these two purposes, only the exploration work is pertinent to this report and will be discussed in detail. Exploration work is divided between general surficial mapping and till geochemical surveying. For the results of the aggregate material estimates supporting infrastructure development, please refer to **Appendix A**. Stubley and Blackwell (2005) should be consulted for more information, including detailed maps and cross sections, and photographs. A summary of the main points is provided here.

### 4.2 Surficial Mapping Results

The Mount Polley property lies in a region affected by extensive glacial erosion and deposition, and the mapping provided valuable information on the nature of glacial processes and post-glacial deposits.

#### 4.2.1 Surficial Materials

Surficial materials on the property are categorized as morainal, glaciolacustrine, glaciofluvial, organic, colluvium, bedrock, and anthropogenic (**figure 4**). The property can be roughly divided into two geographic areas based on surficial geology. The first of these is a glaciolacustrine facies present in the southern areas, and the second in a mixed glaciofluvial and morainal facies that dominates in the central and northern non-contiguous claim areas. The central and northern areas are generally more topographically elevated and variable, and also contain most of the bedrock exposure on the property.

**Glaciofluvial materials**

Glaciofluvial materials are varied, but are dominantly non-sorted and non-bedded, and form hummocky, irregular landforms with moderately steep slopes. They are interpreted to have been rapidly deposited at an ice front. Less common are well-sorted, stratified gravels expressed as terraces. Glaciofluvial materials were sampled for a grain size analysis (see Blackwell and Stubley, 2005). These materials are especially common extending northwest from Bootjack Lake along the valley that contains Bootjack and Morehead Lakes, and in the valley that contains the non-contiguous northern claims and Prior and Little Lakes. Gravels are common in glaciofluvial eskers, channels and gullies.

**Glaciolacustrine materials**

Glaciolacustrine materials consist of grey to brown clays and silts. They are commonly laminated and contain glaciofluvial lenses and ice-rafted stones. Landforms are hummocky and irregular with gentle to moderately steep slopes, and are indicative of material collapse due to melting of buried or partially buried ice.

The topographically depressed area south of the tailings dam evidently contained a large portion of what was the Pleistocene precursor to Quesnel Lake. The overwhelming predominance of glaciolacustrine material in this area supports this view, but the thick lacustrine cover sequence undermines the utility of surficial mineral exploration in this area, as most tills and other minerallogically-useful surficial deposits are effectively buried and inaccessible.

**Till materials**

Three dominant till materials were identified: a grey basal till, a maroon basal till, and a moraine till. The grey basal till occurs as a thick blanket at depth (locally >12 m) and directly overlies bedrock. More recent surficial materials often overlie this till. The maroonish basal till is expressed as a mantle of variable thickness and occurs directly above bedrock. The moraine till is the most dominant and variable till on the property. Its surface expression is also variable, ranging from ridges to an undulating mantle of variable thickness, or locally a thin veneer. This till often occurs in contact with glaciolacustrine and glaciofluvial deposits.

**Organic Material**

Organic material occurs in bogs, fens and swamps. It is dark (reddish) brown to brown coloured, and water saturated within the humic stage of decomposition.

**Anthropogenic Material**

As an active exploration project and later a working mine, the central Mount Polley area has sustained a great deal of disturbance, including logging, since the 1960s. Removal and re-location of rock and unconsolidated deposits has been extensive, and could be underestimated due to regrowth of vegetation. It is probably safe to classify all surficial materials around mine infrastructure as anthropogenic except within or close to areas covered by mature forest. At the time of mapping, the Northeast Zone area had not yet been extensively affected.

### 4.2.2 Ice Flow Directions

Ice flow directions on the property were recorded from glacial striae and crag and tail features on polished bedrock surfaces. The ice flow had small-scale variations but was dominantly around 320º. On a larger scale, lineaments, flutings, and drumlins indicate a dominant ice flow direction of around 310º.

## 4.3 Till Geochemistry Results

### 4.3.1 Introduction and Procedure

Extensive glaciation and a variable thickness of glacial drift on the Mount Polley property have made it unsuitable for soil geochemical exploration in all but the highest topographic levels in and around the open-pit mining operations themselves. However, mineralized bedrock has been eroded and the debris transported and dispersed in the direction of glacial flow, such that till geochemistry can be used as an exploration tool.

Results of an orientation survey undertaken in 2004 over the Northeast Zone orebody indicated that till geochemistry was a viable mineralization vectoring tool, with offsets loosely predictable by till textural maturity, and usually on the order of 50 to 200 metres (Blackwell and Stubley, 2005).

Till samples were analysed by Acme Analytical Laboratories Ltd. in Vancouver. Samples were prepared by drying to 60ºC, and sieving to –230 mesh. Multi-element analysis was done on 37 elements by ICP-MS (mass spectrometry) on 15-gram samples after aqua regia digestion.

### 4.3.2 Results and Discussion

Three main zones were targeted for till sampling in 2005, based on results of the 2004 surficial exploration program. These were: 1) Joe's Creek, 2) the Junction Zone, and 3) the Pond Zone. Based on bedrock mapping, four areas with mineral potential were identified: Areas A, B, C, and D. Locations of these zones are presented in **figure 3**. The morainal materials of these six areas were sampled extensively on a 25 to 50 metre spaced grid. Spacing was determined by sample quality and terrain.

Results are represented in **figure 5**. The complete results are presented in **Appendix B**.

**Joe's Creek:**

The Joe's Creek area has an inhospitable, sloping environment where the morainal materials are eroded by post glacial gullying and/or were mixed with colluviated materials. Morainal materials graded eastward into glaciolacustrine materials. Good copper traces occurred in uncompromised morainal materials.

**Junction Zone:**

The Junction Zone comprises hummocky terrain that represents a thick morainal drift deposit overlain by a variable glaciofluvial blanket. Tills here were found to occur in excess of 8m depth and as a result are interpreted to be significantly transported (probably greater than 1 kilometre). Transported rocks did contain traces of malachite and are described as pinkish-orange breccias.

**The Pond Zone:**

The Pond Zone has been anthropogenically altered and undisturbed till is difficult to locate. Morainal materials are very sandy, layered, and do have an inhomogeneous distribution of clay materials. The tills in the Pond Zone are interpreted to have undergone a substantial degree of reworking and remobilization and are generally unsuitable for sampling.

**Area A:**

Area A is a low lying area that is largely covered by glaciolacustrine sediments, yielding few till samples. Bedrock is exposed by roadways in the northwest portion of the

area and a bedrock outcrop with a malachite showing was found near the centre of the area.

**Area B:**

Area B is expressed as a hummocky terrain and generally slopes eastwards towards Polley Lake. Materials are variable as the region appears to lie on a glaciolacustrine – morainal boundary. Some quality tills were encountered and sampled, yielding positive results.

**Area C:**

Area C hosted morainal materials in close proximity and overlapping with glaciolacustrine materials making sampling difficult.

**Area D:**

Area D was dominated by glaciofluvial materials and no suitable morainal materials were encountered.

Potentially mineralized areas are indicated in **figure 3**. Area 9 (of **figure 2**) hosts tills that contain malachite bearing breccia clasts and the till geochemistry yielded copper results in the 95$^{th}$ percentile range relative to the average property Cu values. The Junction zone, Joe's Creek, and Area B all yielded high copper results within quality tills. Copper anomalies were also recorded south of the Pond zone. This is interpreted to indicate copper-bearing bedrock 200 to 300 metres south of the known mineralization.

# 5.0 Conclusions and Recommendations

## 5.1 Conclusions

The 2005 surficial geology program has yielded several positive results regarding further exploration on the Mount Polley property. Of primary importance is the conclusion that the surficial geology of the Mount Polley property is hospitable to using till geochemical techniques for mineral exploration in the central, topographically elevated portions of the claim blocks. Also of interest is the local iceflow direction of 320°, and the division of the property into a northern bedrock and glaciofluvial dominated system and a southern glaciolacustrine dominated system.

### 5.1.1 Results of the Surficial Mapping Program

The northern claim area is dominated by glaciofluvial deposits and the southern portion of the claim area is dominated by a large glacial lake deposit that masks the bedrock signature. Although there are morainal deposits found property wide, caution should be used when interpreting these sediments, as transport distances vary widely.

### 5.1.2 Results of the Till Geochemistry Program

Till geochemistry yielded elevated copper levels in several areas. These results were extrapolated back to possible sources based on the inferred glacial transport direction, using till thickness and textural characteristics to estimate transport distances. Based on these results, the top exploration targets are: Area 9, Joe's Creek, the Junction Zone, and south of the Pond Zone. Area B also warrants follow up work as high copper anomalies in the tills were recorded there.

## 5.2 Recommendations for Future Work

Further surficial geology work on the Mount Polley property should involve refinement of the results presented in this study, particularly in areas where glaciofluvial and morainal facies sediments demonstrate rapid spatial facies changes. Quantification of estimated till displacements would also be beneficial in areas with significant copper anomalies such as those observed at Joe's Creek and Areas 9 and B.

With respect to mineral exploration, till geochemistry favours further exploration work in the Joe's Creek, Junction Zone, Pond Zone, Area 9 and Area B locales. With respect to the Pond Zone, back-projecting mineralized tills along iceflow direction indicates additional mineralization may be present to the south of known mineralization in this area as observed during bedrock mapping. Although mineralized clasts in tills outside of the mining leases is rare, malachite showings at the "IM" zone and TS05-238 also warrant further exploration.

## References

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Rees, C., Bjornson, L., Blackwell, J., Ferreira, L., and Taylor, C. (2005): Geology of the Mount Polley Property, Rees, C. ed., report for Imperial Metals Corporation.

Stubley, T. and Blackwell, J. (2005): Surficial geology of the Mount Polley property, report for Imperial Metals Corporation.

## Software Used

The following software was used during data collection, analysis and report preparation:

Lagger (Northface), ArcPad (ESRI), ArcGIS 9.0 (ESRI) including ArcMap 9.0 and ArcCatalog 9.0, Excel (Microsoft), Word (Microsoft), Acrobat 5.0 (Adobe).

**Table 1: Mount Polley Claims Examined During Surficial Exploration**

**Northern Claims**

| Claim Name (if applicable) | Tenure | Area (Hectares) | Good to Date |
|---|---|---|---|
| MPMC10 | 502017 | 490.64 | 2008/JAN/31 |
| MPMC11 | 502067 | 490.59 | 2008/JAN/31 |
| MPMC12 | 502095 | 490.67 | 2008/JAN/31 |
| MPMC9 | 501942 | 490.89 | 2008/JAN/31 |
| MPMC13 | 502162 | 490.86 | 2008/JAN/31 |
| MPMC14 | 502212 | 490.82 | 2008/JAN/31 |
| MPMC15 | 502239 | 392.65 | 2008/JAN/31 |

**Southern Claims**

| | | | |
|---|---|---|---|
| | 501047 | 1414.94 | 2014/APR/08 |
| MPMC2 | 501143 | 19.66 | 2009/JAN/12 |
| PM13 | 207244 | 300.00 | 2015/APR/08 |
| PM7 | 206452 | 300.00 | 2015/APR/08 |
| MPMC8 | 501888 | 98.21 | 2009/JAN/12 |
| POL1 | 392620 | 500.00 | 2015/APR/08 |
| MP2 | 407182 | 75.00 | 2015/APR/08 |
| MP1 | 407181 | 100.00 | 2015/APR/08 |
| CB8 | 204473 | 200.00 | 2014/APR/08 |
| PM5 | 206450 | 500.00 | 2014/APR/08 |
| IMC3 | 340019 | 125.00 | 2015/APR/08 |
| MPMC3 | 501182 | 334.39 | 2009/JAN/12 |
| MPMC1 | 501124 | 472.01 | 2009/JAN/12 |
| | 514044 | 1238.99 | 2014/APR/08 |
| POL2 | 411010 | 125.00 | 2009/MAY/22 |
| CB16 | 204475 | 500.00 | 2015/APR/08 |
| MPMC4 | 501337 | 314.85 | 2009/JAN/12 |
| MPMC5 | 501423 | 491.95 | 2009/JAN/12 |
| | 514039 | 1889.42 | 2015/APR/08 |
| PM-9 | 206798 | 150.00 | 2014/APR/08 |
| PM-10 | 206799 | 150.00 | 2015/APR/08 |
| MPMC49 | 501972 | 98.39 | 2009/JAN/12 |
| MPMC51 | 502054 | 196.66 | 2009/JAN/12 |
| MPMC41 | 501479 | 491.94 | 2009/JAN/12 |
| MPMC40 | 501385 | 492.20 | 2009/JAN/12 |
| MPMC42 | 501594 | 492.22 | 2009/JAN/12 |
| MPMC43 | 501657 | 492.39 | 2009/JAN/12 |
| MPMC52 | 502071 | 19.70 | 2009/JAN/12 |
| MPMC45 | 501800 | 374.39 | 2009/JAN/12 |
| MPMC44 | 501761 | 394.05 | 2009/JAN/12 |
| MPMC46 | 501872 | 394.19 | 2009/JAN/12 |
| MPMC47 | 501910 | 433.56 | 2009/JAN/12 |
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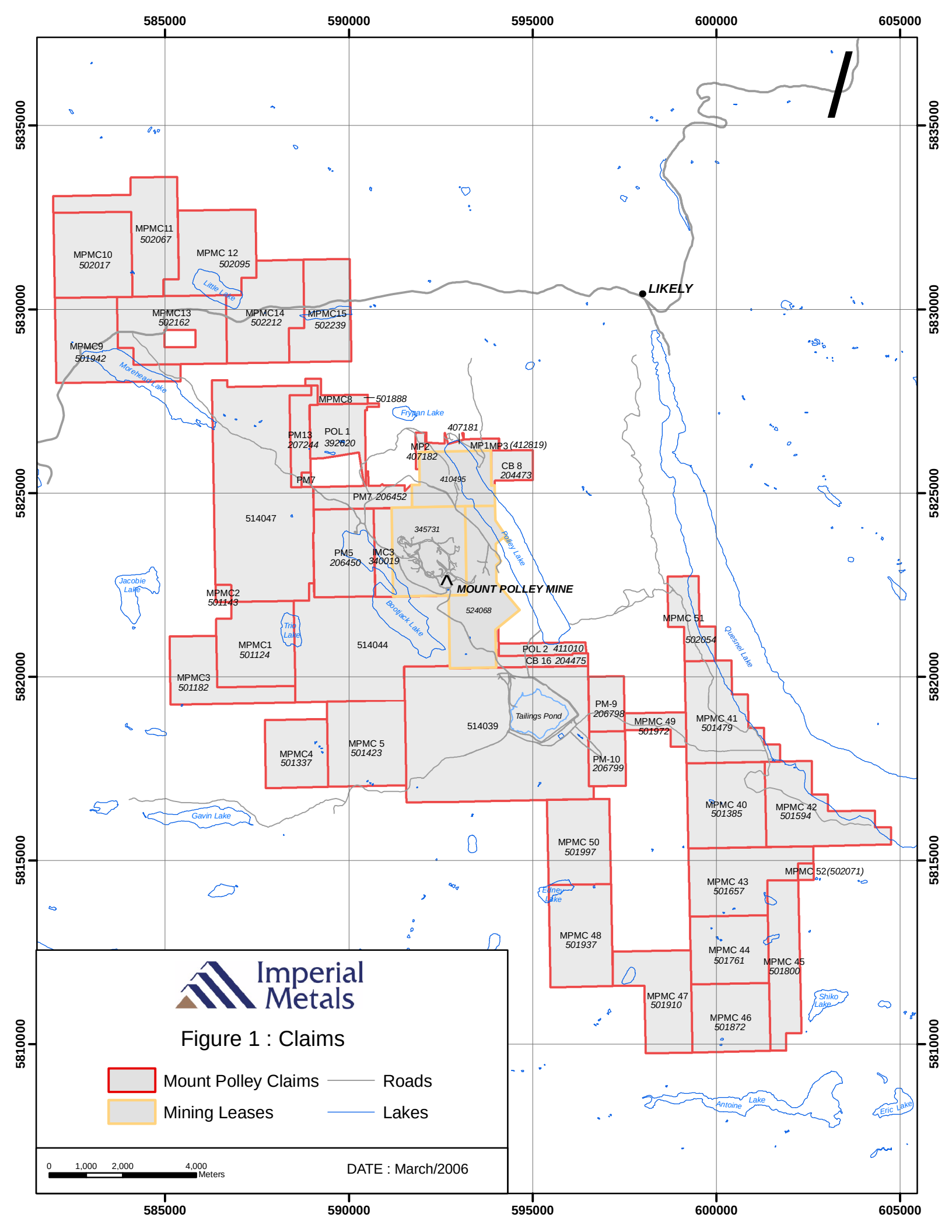
| MPMC50 | 501997 | 393.89 | 2009/JAN/12 |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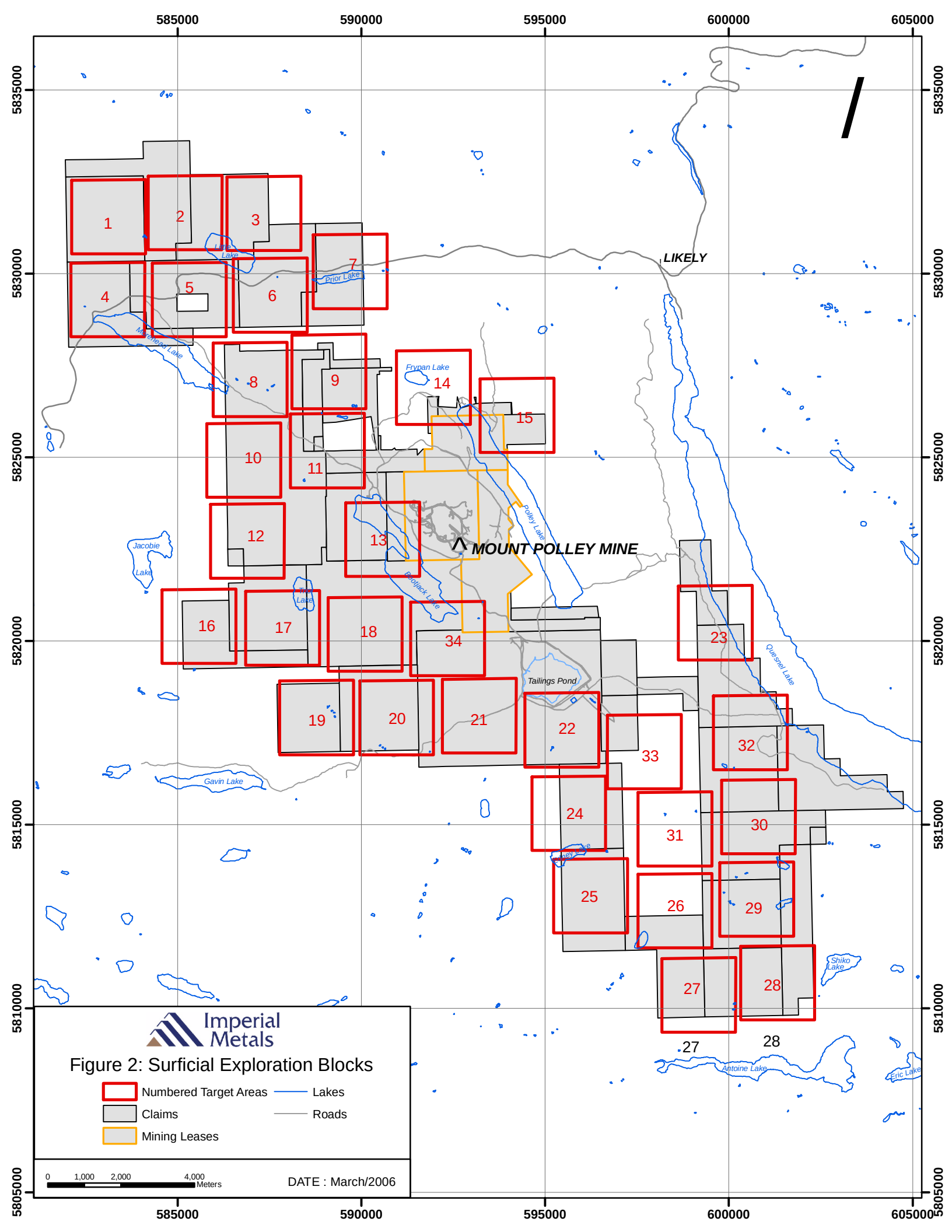
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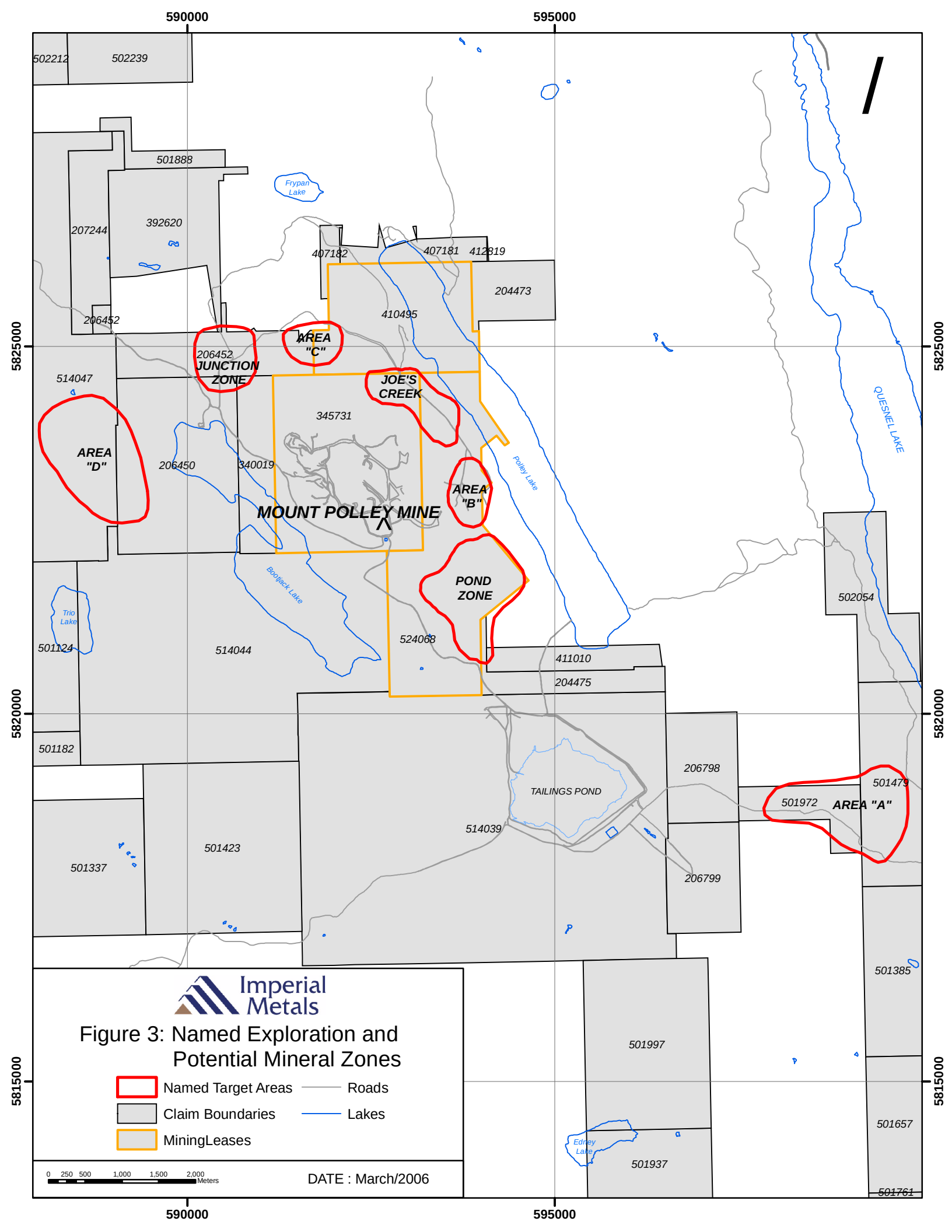
5805000
LIKELY
MOUNT POLLEY MINE
Tailings Pond
Frypan Lake
Prior Lake
Polley Lake
Jacobie Lake
Gavin Lake
Quesnel Lake
Shiko Lake
Antoine Lake
Eric Lake
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
Imperial Metals
Figure 2: Surficial Exploration Blocks
Numbered Target Areas
Claims
Mining Leases
Lakes
Roads
0 1,000 2,000 4,000 Meters
DATE : March/2006


590000
595000
5825000
5820000
5815000
502212
502239
501888
207244
392620
Frypan Lake
407182
407181
412819
204473
206452
410495
AREA "C"
206452
JUNCTION ZONE
514047
JOE'S CREEK
345731
AREA "D"
206450
340019
AREA "B"
MOUNT POLLEY MINE
Polley Lake
QUESNEL LAKE
Bootjack Lake
POND ZONE
Trio Lake
501124
514044
524068
502054
411010
204475
501182
206798
501479
TAILINGS POND
501972
AREA "A"
514039
501423
501337
206799
501385
501997
501657
Edney Lake
501937
501761
Imperial Metals
Figure 3: Named Exploration and Potential Mineral Zones
Named Target Areas
Claim Boundaries
MiningLeases
Roads
Lakes
0 250 500 1,000 1,500 2,000 Meters
DATE : March/2006

585000 590000 595000 600000 605000

5835000 5830000 5825000 5820000 5815000 5810000 5805000

N W E S

Little Lake

Morehead Lake

Frypan Lake

Polley Lake

MOUNT POLLEY MINE

Jacobie Lake

Trio Lake

Bootjack Lake

Quesnel Lake

Gavin Lake

Edney Lake

Shiko Lake

Antoine Lake

Eric Lake

Imperial Metals

# Figure 4: Surficial Geology Map

**Surficial Geology**

**MATERIAL**

- Anthropogenic
- Glaciofluvial
- Claim Boundary
- Glaciolacustrine
- Morainal
- Organic
- Bedrock
- Lakes

0 1,000 2,000 4,000 Meters

DATE : March/2006

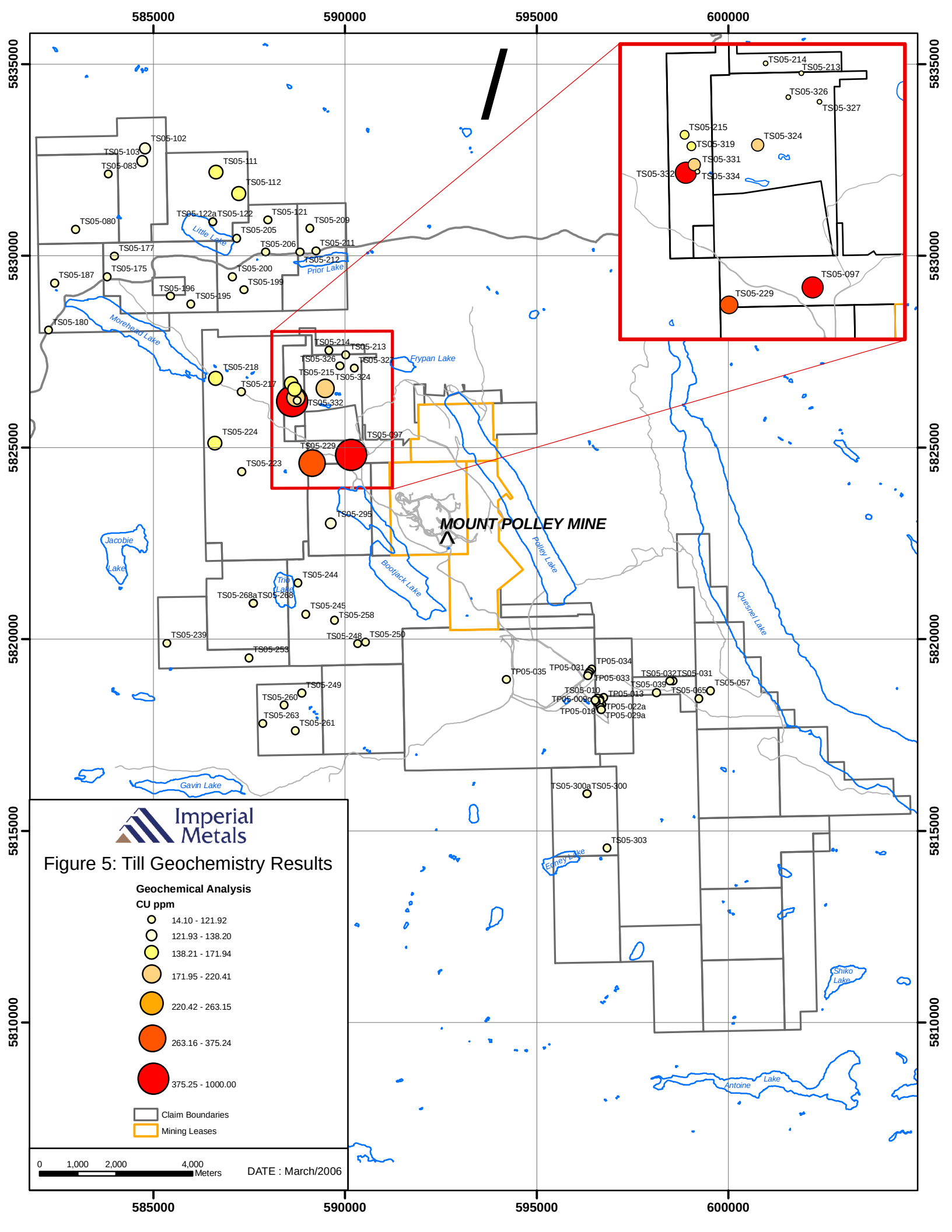

585000
590000
595000
600000
5835000
5830000
5825000
5820000
5815000
5810000
TS05-214
TS05-213
TS05-326
TS05-327
TS05-215
TS05-324
TS05-319
TS05-331
TS05-332
TS05-334
TS05-097
TS05-229
TS05-102
TS05-103
TS05-083
TS05-111
TS05-112
TS05-080
TS05-122a
TS05-122
TS05-121
TS05-209
TS05-205
TS05-206
TS05-211
TS05-212
TS05-177
TS05-175
TS05-200
TS05-199
TS05-187
TS05-196
TS05-195
TS05-180
Little Lake
Prior Lake
Morehead Lake
Frypan Lake
TS05-218
TS05-217
TS05-224
TS05-223
TS05-295
MOUNT POLLEY MINE
Jacobie Lake
Trib Lake
TS05-244
TS05-268a
TS05-268
TS05-245
TS05-258
TS05-239
TS05-248
TS05-250
TS05-253
Bootjack Lake
Polley Lake
Quesnel Lake
TP05-035
TP05-031
TP05-034
TP05-033
TS05-032
TS05-031
TS05-039
TS05-057
TS05-010
TS05-065
TP05-013
TP05-009
TP05-022a
TP05-018
TP05-029a
TS05-249
TS05-260
TS05-263
TS05-261
Gavin Lake
TS05-300a
TS05-300
TS05-303
Eaney Lake
Shiko Lake
Antoine Lake
Imperial Metals
Figure 5: Till Geochemistry Results
Geochemical Analysis
CU ppm
14.10 - 121.92
121.93 - 138.20
138.21 - 171.94
171.95 - 220.41
220.42 - 263.15
263.16 - 375.24
375.25 - 1000.00
Claim Boundaries
Mining Leases
0
1,000
2,000
4,000
Meters
DATE : March/2006

Figure 6: Till Geochemistry Mo (ppm)

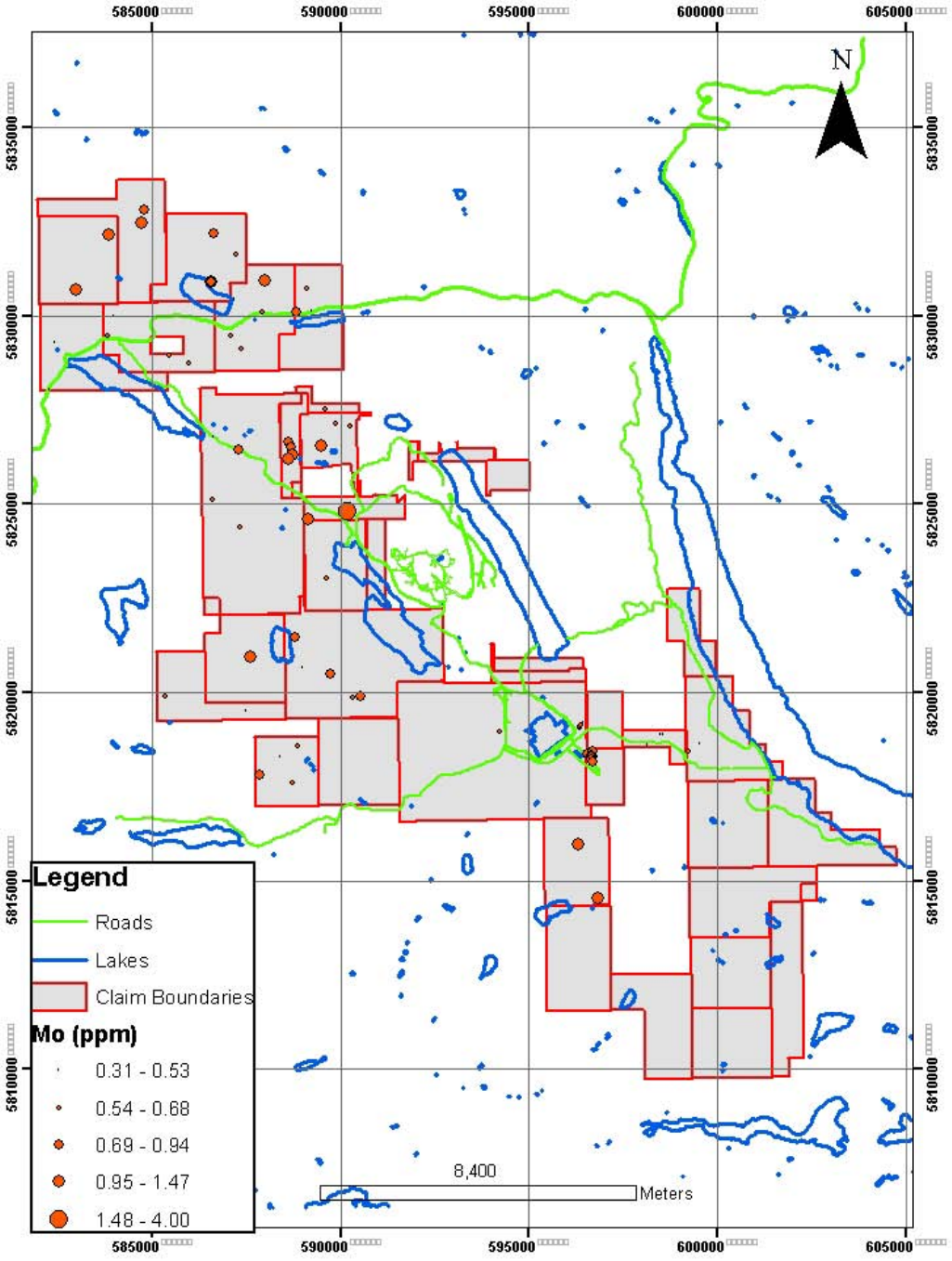


Figure 7: Till Geochemistry Ag (ppm)

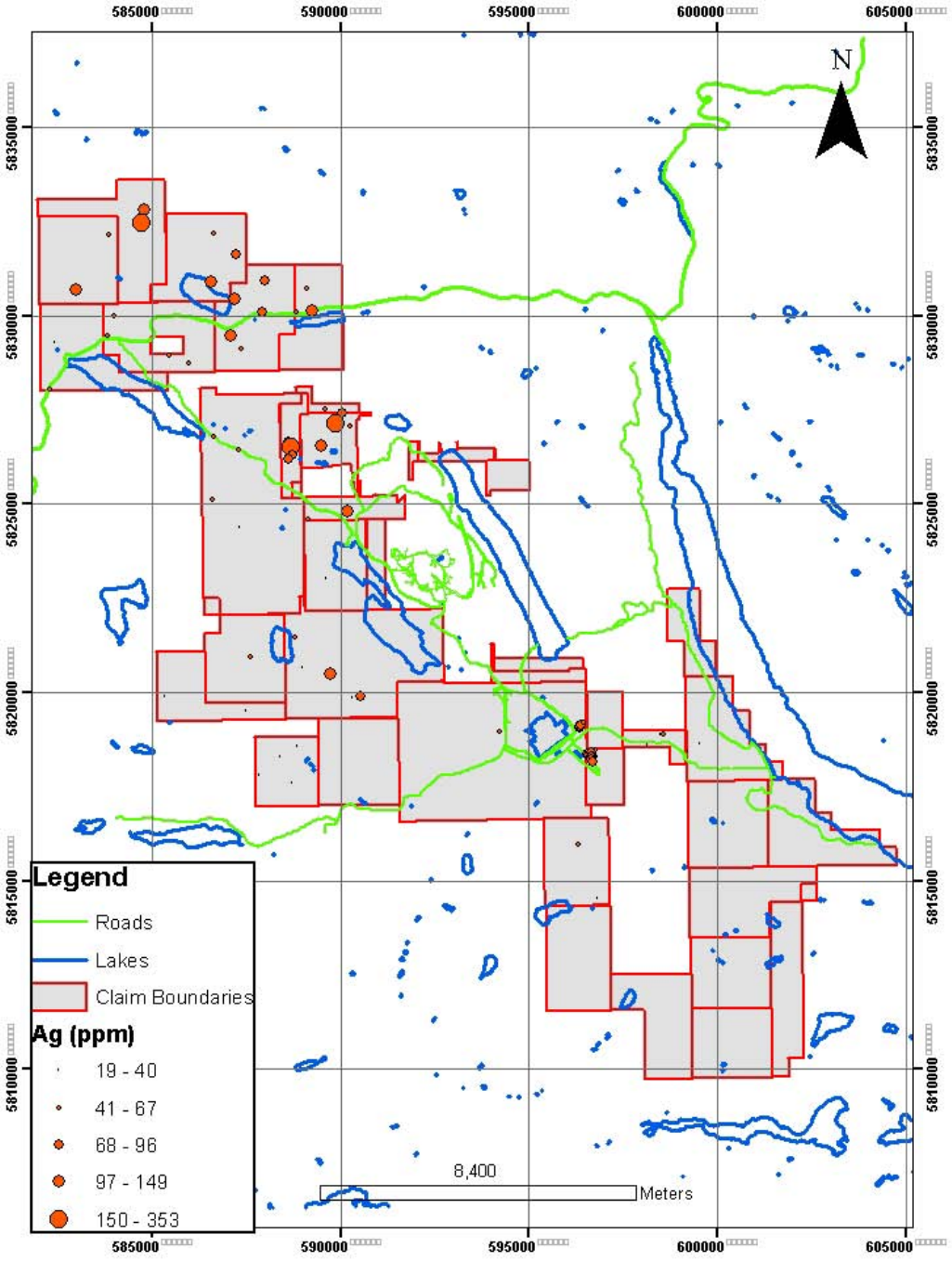
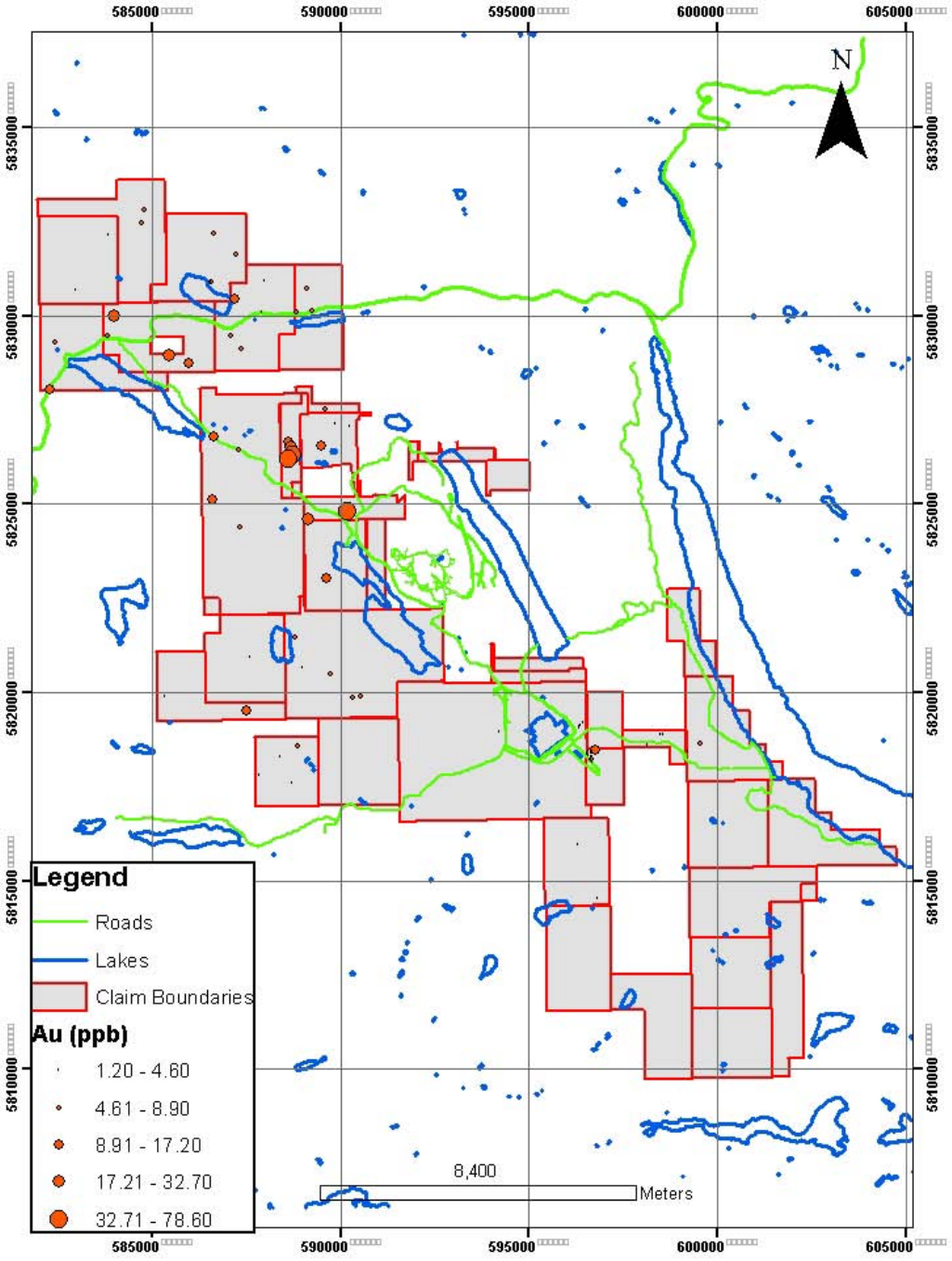


Figure 8: Till Geochemistry Au (ppb)



## Appendix A: Surficial Material Useful for Infrastructure Development

The following is taken, with only minor modifications, from Stubley and Blackwell (2005).

### Introduction and Procedure

Aggregate samples were taken at numerous occurrences of glaciofluvial materials between the north end of Polley Lake and the tailings dam area. The size of some of the deposits was determined by limited follow-up sampling. Grain size samples were analyzed in the mine's bucking room. Blackwell and Stubley (2005) contains an extensive appendix in which the results are graphed with the coarse and fine limits used in tailings dam construction standards.

### Results

Two zones of aggregate potential have been delineated (**figure A.1**). Zone 1 is northwest of Mount Polley between the Springer-Bell deposits and Polley Lake road. The samples fall within the coarse and fine limits for most of the coarse-fine engineering specifications. The Zone 1 deposit has been subjected to fluvial processes and is expressed as terrace gravels with two bench levels, ~100 m wide and separated by a ~10 m rise. The gravels are sorted, display grading, and contain copper-mineralized clasts. Preliminary calculations of this deposit suggest that its volume is approximately 1 million cubic metres.

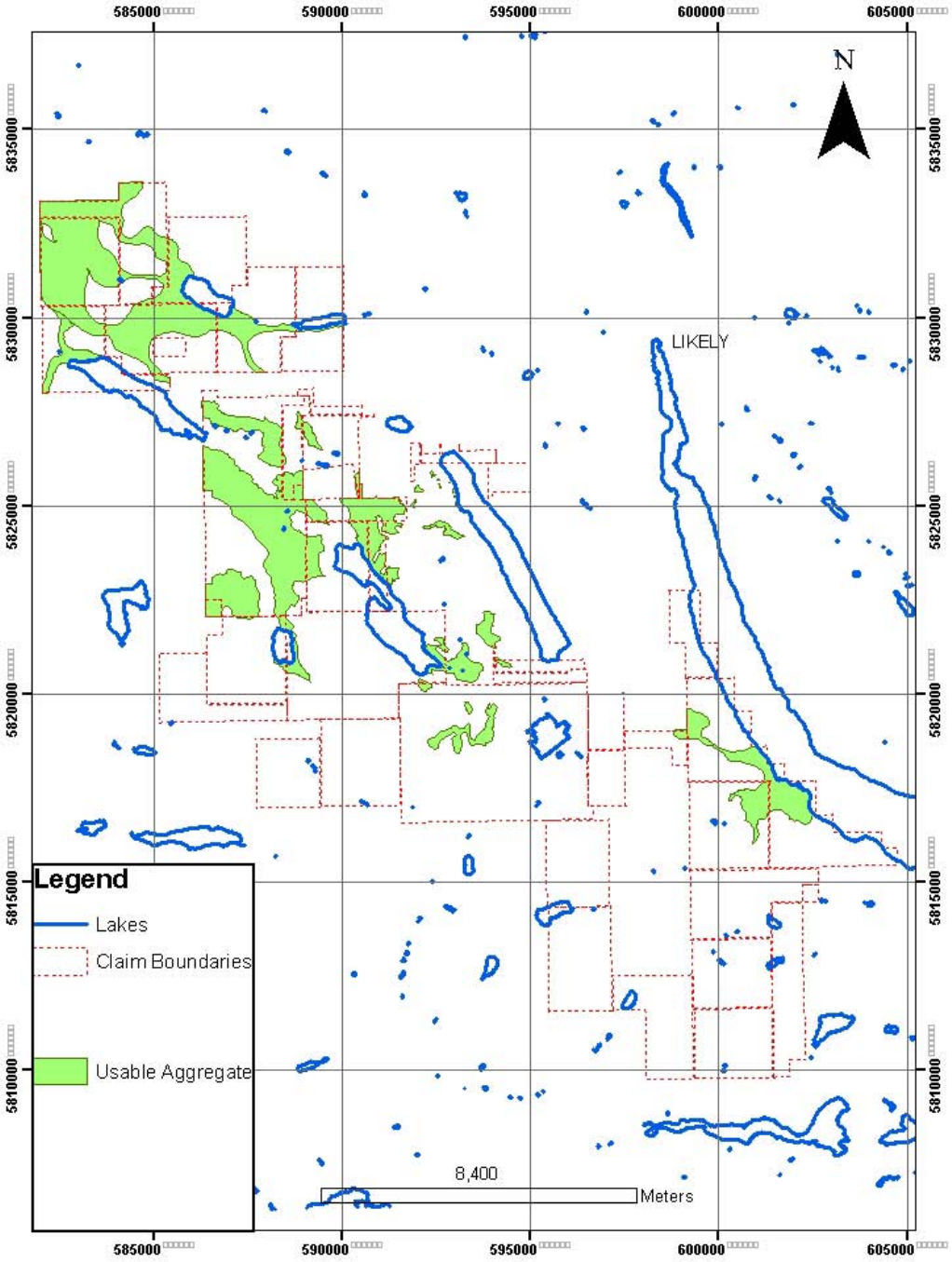
Zone 16 is immediately west of the tailings dam. Samples are dominantly outside the required coarse-fine specifications. This aggregate material appears to be more typical of the Mount Polley property in its glacial origins, reflected in its high silt content and non sorted, non-bedded nature.

A number of other grab samples were taken sporadically over the property, and need further study before defining or rejecting them as potentially useful aggregate sources.

### Discussion and Conclusions

Grain-size samples distributed over the Mount Polley property indicate that there is significant aggregate potential. Zone 1 represents an excellent aggregate volume. Several other glaciofluvial deposits have potential for use in various mine construction. They have not been delimited or fully analyzed so further investigation is warranted.

## Figure A1: Available Aggregate Supplies



## Appendix B: Till Geochemistry Results

The following table displays Mo, Cu, Ag and Au assay results for all **85** till samples collected during the 2005 surficial geology exploration program.

| SAMPLE | ASSAY | EASTING | NORTHING | Mo (ppm) | Cu (ppm) | Ag (ppb) | Au (ppb) |
|---|---|---|---|---|---|---|---|
| TP05-009a | 274731T | 596545 | 5818412 | 0.52 | 56.02 | 47 | 2.50 |
| TP05-009b | 274732T | 596545 | 5818412 | 0.55 | 45.27 | 65 | 3.80 |
| TP05-009c | 274733T | 596535 | 5818412 | 0.50 | 42.58 | 65 | 2.20 |
| TP05-010a | 274734T | 596566 | 5818373 | 0.61 | 51.39 | 71 | 3.20 |
| TP05-010b | 274735T | 596566 | 5818373 | 0.72 | 43.06 | 84 | 2.10 |
| TP05-011 | 274736T | 596655 | 5818439 | 0.47 | 49.99 | 54 | 1.90 |
| TP05-013 | 274737T | 596758 | 5818478 | 0.49 | 54.25 | 57 | 10.50 |
| TP05-015 | 274738T | 596680 | 5818447 | 0.69 | 58.86 | 66 | 3.80 |
| TP05-018 | 274739T | 596594 | 5818345 | 0.66 | 56.29 | 70 | 2.00 |
| TP05-019 | 274740T | 596652 | 5818388 | 0.55 | 46.16 | 72 | 3.40 |
| TP05-022a | 274741T | 596699 | 5818286 | 0.66 | 57.32 | 64 | 3.10 |
| TP05-022b | 274742T | 596699 | 5818286 | 0.75 | 54.93 | 96 | 3.10 |
| TP05-025 | 274743T | 596641 | 5818286 | 0.77 | 49.47 | 75 | 4.30 |
| TP05-026a | 274744T | 596665 | 5818213 | 0.79 | 51.65 | 75 | 3.70 |
| TP05-026b | 274745T | 596665 | 5818213 | 0.63 | 46.50 | 84 | 5.90 |
| TP05-026c | 274746T | 596665 | 5818213 | 0.70 | 45.40 | 86 | 4.00 |
| TP05-029a | 274747T | 596691 | 5818157 | 0.69 | 45.44 | 90 | 1.90 |
| TP05-029b | 274748T | 596691 | 5818157 | 0.69 | 42.91 | 91 | 2.20 |
| TP05-031 | 274749T | 596342 | 5819045 | 0.56 | 40.50 | 73 | 1.50 |
| TP05-032a | 274750T | 596358 | 5819097 | 0.59 | 46.76 | 71 | 2.30 |
| TP05-032b | 274751T | 596358 | 5819097 | 0.61 | 48.22 | 84 | 2.30 |
| TP05-033 | 274752T | 596391 | 5819144 | 0.54 | 49.45 | 71 | 2.20 |
| TP05-034 | 274753T | 596450 | 5819215 | 0.48 | 49.73 | 62 | 3.50 |
| TP05-035 | 274754T | 594217 | 5818942 | 0.68 | 56.53 | 62 | 2.10 |
| TS05-010 | 274709T | 596596 | 5818455 | 0.43 | 47.55 | 40 | 1.70 |
| TS05-031 | 274725T | 598557 | 5818901 | 0.44 | 24.23 | 50 | 1.50 |
| TS05-032 | 274726T | 598482 | 5818902 | 0.31 | 14.10 | 23 | 2.70 |
| TS05-039 | 274727T | 598135 | 5818599 | 0.43 | 52.21 | 35 | 2.40 |
| TS05-057 | 274729T | 599541 | 5818652 | 0.47 | 76.36 | 33 | 4.70 |
| TS05-065 | 274730T | 599241 | 5818449 | 0.59 | 75.16 | 36 | 3.00 |
| TS05-080 | 274757T | 582980 | 5830690 | 1.47 | 94.39 | 149 | 3.90 |
| TS05-083 | 274758T | 583839 | 5832131 | 1.13 | 104.66 | 59 | 4.60 |
| TS05-097 | 274759T | 590167 | 5824804 | 4.00 | 520.79 | 132 | 76.30 |
| TS05-102 | 274760T | 584789 | 5832803 | 0.74 | 134.55 | 133 | 6.10 |
| TS05-103 | 274761T | 584722 | 5832465 | 1.05 | 133.65 | 233 | 7.40 |
| TS05-111 | 274762T | 586642 | 5832176 | 0.85 | 159.91 | 67 | 5.60 |
| TS05-112 | 274763T | 587238 | 5831623 | 0.66 | 146.98 | 72 | 5.20 |
| TS05-121 | 274764T | 587989 | 5830926 | 1.23 | 119.61 | 76 | 4.40 |
| TS05-122 | 274765T | 586563 | 5830877 | 1.01 | 114.45 | 92 | 6.70 |
| TS05-122a | 274766T | 586563 | 5830877 | 0.90 | 92.13 | 119 | 3.10 |
| TS05-175 | 274784T | 583805 | 5829453 | 0.58 | 61.50 | 50 | 6.40 |
| TS05-177 | 274785T | 583994 | 5829984 | 0.53 | 119.08 | 51 | 19.60 |
| TS05-180 | 274786T | 582274 | 5828055 | 0.52 | 55.70 | 58 | 11.90 |
| TS05-187 | 274787T | 582430 | 5829288 | 0.45 | 52.45 | 34 | 8.40 |
| TS05-195 | 274788T | 585988 | 5828738 | 0.66 | 92.45 | 56 | 12.50 |
| TS05-196 | 274789T | 585454 | 5828941 | 0.62 | 78.57 | 51 | 22.40 |
| TS05-199 | 274791T | 587370 | 5829105 | 0.58 | 102.51 | 49 | 7.20 |
| TS05-200 | 274792T | 587070 | 5829454 | 0.67 | 109.39 | 118 | 5.70 |
| TS05-205 | 274793T | 587184 | 5830456 | 0.50 | 63.86 | 112 | 11.50 |
| TS05-206 | 274794T | 587932 | 5830088 | 0.59 | 79.56 | 81 | 3.00 |
| TS05-209 | 274797T | 589094 | 5830712 | 0.68 | 95.15 | 61 | 5.50 |
| TS05-211 | 274799T | 589247 | 5830122 | 0.47 | 111.78 | 134 | 5.80 |
| TS05-212 | 274800T | 588829 | 5830092 | 0.76 | 75.97 | 48 | 5.20 |
| TS05-213 | 274801T | 590030 | 5827414 | 0.52 | 105.59 | 72 | 3.70 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| TS05-214 | 274802T | 589595 | 5827533 | 0.62 | 108.80 | 60 | 8.90 |
| TS05-215 | 274803T | 588609 | 5826662 | 0.85 | 157.42 | 69 | 12.20 |
| TS05-217 | 274804T | 587304 | 5826446 | 0.71 | 120.31 | 46 | 7.40 |
| TS05-218 | 274805T | 586633 | 5826798 | 0.52 | 138.26 | 50 | 17.20 |
| TS05-223 | 274806T | 587314 | 5824368 | 0.65 | 61.72 | 24 | 6.40 |
| TS05-224 | 274807T | 586613 | 5825107 | 0.64 | 138.26 | 47 | 15.40 |
| TS05-229 | 274808T | 589149 | 5824591 | 1.25 | 336.15 | 60 | 32.70 |
| TS05-239 | 274809T | 585363 | 5819889 | 0.57 | 99.25 | 35 | 2.30 |
| TS05-244 | 274810T | 588785 | 5821462 | 0.76 | 90.37 | 59 | 6.80 |
| TS05-245 | 274811T | 588989 | 5820650 | 0.53 | 36.91 | 23 | 4.10 |
| TS05-248 | 274812T | 590336 | 5819874 | 0.59 | 34.52 | 31 | 6.70 |
| TS05-249 | 274813T | 588877 | 5818589 | 0.57 | 71.30 | 34 | 8.40 |
| TS05-250 | 274814T | 590545 | 5819913 | 0.69 | 93.89 | 76 | 5.70 |
| TS05-253 | 274815T | 587504 | 5819510 | 0.34 | 29.48 | 21 | 11.20 |
| TS05-258 | 274816T | 589737 | 5820495 | 0.78 | 80.94 | 113 | 5.30 |
| TS05-260 | 274817T | 588422 | 5818279 | 0.50 | 68.51 | 19 | 1.20 |
| TS05-261 | 274818T | 588713 | 5817604 | 0.55 | 84.60 | 27 | 3.20 |
| TS05-263 | 274819T | 587869 | 5817796 | 0.70 | 64.05 | 29 | 2.70 |
| TS05-268 | 274820T | 587617 | 5820926 | 0.94 | 82.47 | 50 | 3.00 |
| TS05-268a | 274821T | 587617 | 5820926 | 1.13 | 82.15 | 57 | 3.40 |
| TS05-295 | 274822T | 589637 | 5823011 | 0.65 | 125.26 | 24 | 9.80 |
| TS05-300 | 274823T | 596322 | 5815960 | 1.21 | 61.10 | 49 | 3.70 |
| TS05-300a | 274824T | 596322 | 5815960 | 0.97 | 63.32 | 49 | 2.20 |
| TS05-303 | 274825T | 596845 | 5814547 | 1.04 | 55.98 | 35 | 2.30 |
| TS05-319 | 274826T | 588692 | 5826523 | 0.85 | 145.57 | 353 | 22.10 |
| TS05-324 | 274827T | 589497 | 5826539 | 1.18 | 216.57 | 128 | 11.20 |
| TS05-326 | 274828T | 589871 | 5827121 | 0.67 | 103.81 | 218 | 3.00 |
| TS05-327 | 274829T | 590251 | 5827064 | 0.54 | 46.63 | 48 | 3.50 |
| TS05-331 | 274830T | 588727 | 5826298 | 1.11 | 219.77 | 84 | 78.60 |
| TS05-332 | 274831T | 588624 | 5826201 | 1.23 | 392.92 | 77 | 62.80 |
| TS05-334 | 274832T | 588765 | 5826214 | 0.75 | 87.56 | 56 | 24.40 |

## Appendix C: Statement of Expenditures

The total cost of the surficial geology exploration program in 2005 was **$74,288.50**. This includes the costs of personnel salaries and accommodations, transportation, assaying and miscellaneous equipment costs.

Expenditures were as follows for the surficial exploration of the **Northern claims**:

| TASK | START DATE | END DATE | TOTAL DAYS |
|---|---|---|---|
| Sampling / Fieldwork | 5-Jun-05 | 24-Jun-05 | 20 |
| Assay / Reporting | 12-Oct-05 | 21-Oct-05 | 10 |
| | | **TOTAL** | **30** |

| PERSONNEL | POSITION | DAYS WORKED | WAGE / DAY | TOTAL WAGES | ROOM & BOARD TOTAL | TOTAL |
|---|---|---|---|---|---|---|
| Tim Stubley | Technician | 30 | $180.00 | $5,400.00 | $500.00 | $5,900.00 |
| Kim Gray | Field Assistant | 20 | $160.00 | $3,200.00 | $0.00 | $3,200.00 |
| Jacqueline Blackwell | Geologist | 10 | $225.00 | $2,250.00 | $200.00 | $2,450.00 |
| | | | | | **TOTAL PERSONNEL COSTS** | **$11,550.00** |

| TRANSPORTATION | COST / DAY | DAYS USED | TOTAL |
|---|---|---|---|
| Truck Rental (F350) + Fuel | $106.67 | 30 | **$3,200.00** |

| SAMPLE ANALYSIS | NUMBER OF SAMPLES | COST / SAMPLE | TOTAL |
|---|---|---|---|
| Acme (Till) | 24 | $18.75 | $450.00 |
| Bucking Room (Sieve) | 6 | $95.00 | $570.00 |
| | | **TOTAL** | **$1,020.00** |

| TOTAL COSTS OF NORTHERN CLAIM SURFICIAL EXPLORATION | |
|---|---|
| PERSONNEL | $11,550.00 |
| TRANSPORTAION | $3,200.00 |
| SAMPLE ANALYSIS | $1,020.00 |
| **TOTAL** | **$15,770.00** |

Expenditures were as follows for the surficial exploration of the **Central/Southern claims**:

| START | END | TOTAL DAYS |
|---|---|---|
| 10-May-05 | 15-Nov-05 | **145 (Exclusive of Northern claim work)** |

Note: Assay and reporting work was completed concomitantly with field work.

| PERSONNEL | POSITION | DAYS WORKED | WAGE / DAY | TOTAL WAGES | ROOM & BOARD TOTAL | TOTAL |
|---|---|---|---|---|---|---|
| Tim Stubley | Technician | 116 | $180.00 | $20,880.00 | $2,250.00 | $23,130.00 |
| Kim Gray | Field Assistant | 21.5 | $160.00 | $3,440.00 | $0.00 | $3,440.00 |
| Jacqueline Blackwell | Geologist | 50 | $225.00 | $11,250.00 | $1,000.00 | $12,250.00 |
| | | | | | **TOTAL** | **$38,820.00** |

| TRANSPORTATION | COST / DAY | DAYS USED | TOTAL |
|---|---|---|---|
| Truck Rental (F350) + Fuel | $106.67 | 145 | **$15,467.15** |

| SAMPLE ANALYSIS | NUMBER OF SAMPLES | COST / SAMPLE | TOTAL |
|---|---|---|---|
| Acme (Till) | 66 | $18.75 | $1237.50 |
| Bucking Room (Sieve) | 17 | $95.00 | $1615.00 |
| | | **TOTAL** | **$2852.50** |

| TOTAL COSTS OF CENTRAL CLAIM SURFICIAL EXPLORATION | |
|---|---|
| PERSONNEL | **$38,820.00** |
| TRANSPORTAION | **$15,467.15** |
| SAMPLE ANALYSIS | **$2852.50** |
| **TOTAL** | **$57,955.90** |

| EXPLORED AREA | COST |
|---|---|
| **NORTHERN CLAIMS** | $15,770.00 |
| **CENTRAL/SOUTHERN CLAIMS** | $57,955.90 |
| **MISCELLANEOUS EQUIPMENT COSTS (USED IN BOTH EXPLORATION AREAS)** | $562.60 |
| **TOTAL SURFICIAL EXPLORATION COST** | **$74,288.60** |