# GM 65904

TECHNICAL REPORT ON THE GEOLOGICAL MAPPING AND GEOCHEMICAL SAMPLING OF THE MOOSE CLIFF PROPERTY

# Technical report on the geological mapping and geochemical sampling of the Moose Cliff property, Canton Cranbourne

For:

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## Summary

The Moose Cliff property is located about 100km southeast of Quebec City and about 30km northwest of the Quebec-Maine boundary. Mineral rights are 100% owned by *Golden Hope Mines Limited.*

Detailed geological mapping and sampling were conducted during summer of 2010 fieldwork on the property. A total of 225 outcrops were prospected and described. From these, 25 samples were taken and sent for trace element geochemistry to Activation Laboratories (Ancaster, Ontario).

From these 25 samples, 10 returned gold values ranging from 6 to 51 ppb Au and 2 returned copper values between 1520 ppm and 5200 ppm.

Sampling allowed the identification of an anomalous gold region near the south-western contact of the mafic volcanics breccia with the hematized mafic volcanics breccia. Two new copper showings were also identified; both of them being located near the contacts between the hematized rocks and the mafic volcanics breccia (**Einna**: 1520 ppm Cu; **Eilime**: 5200 ppm Cu). All showings seem to point towards mineralization related to deposition processes linked to the precipitation of Cu ±Au following the encountering of oxidized mafic rocks by migrating metals-rich fluids.

It is recommended that *Golden Hope Mines Limited* continues its exploration campaign on the Moose Cliff property with more detailed mapping and sampling specifically around the anomalous gold region and the copper showings. It is also recommended to map the newly acquired claims juxtaposed to the west of the Moose Cliff claims block. Ground geophysics (Mag, VLF, IP) might also be performed in the swamp next to the Rivière Etchemin since there is no outcrop in this area.

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## 1. Introduction

The Beauce region in southern Quebec was the site of the first gold rush in Canada in 1828. Since 1986, the junior exploration company *Golden Hope Mines Limited* has been very active in the region with strategic land position covering up to 80% of the known Bellechasse Mineral Belt. In the last four years, in addition to the significant amount of work done on the Bellechasse-Timmins gold deposit, the company focused on locating new targets for exploration as well as re-evaluating known mineral showings with extensive regional field mapping. Fieldwork conducted during summer of 2010 included the mapping and rock sampling of the Moose Cliff property which includes the Cranbourne base metal showing. Moose Cliff property is part of the new land acquired in order to investigate geophysical and prospecting anomalies together with serpentinite targets (high potential for gold as well as potential for copper, nickel, cobalt and platinum group metals). This report presents the results of the mapping/sampling/soil gas geochemistry campaigns together with recommendations for the subsequent steps of the exploration program with a goal of evaluating the gold and/or base metal potential of the Moose Cliff property.

## 2. Land tenure, location and property characteristics

The Moose Cliff property is located about 100km southeast of Quebec City and about 30km northwest of the Quebec-Maine boundary (Figure 1). The towns and villages closest to the property are Lac-Etchemin, St-Odilon-de-Cranbourne and St-Léon-de-Standon. They are all to be found in a 10 km-radius of the claim block, which can represent a 10 minutes car ride on paved or unpaved road.

The property consists of 19 claims (CDC) over an area of 1127.42 hectares (Table 1) which are 100% owned by *Golden Hope Mines*. The claims are mainly located within the NTS 1:50 000 map sheet 21L07 (Figure 2). The area covered by the claim block is positioned between the UTM coordinates 367 750m E – 374 290m E and 5 137 250m N – 5 141 580m N. The surface rights are government lands or private woodlots/recreational properties so the access for exploration on the private lands requires getting the permission of the local surface rights holders.

**Table 1 – List of claim numbers and areas (GESTIM)**

| Claim # | Area (ha) | Claim # | Area (ha) | Claim # | Area (ha) |
|---|---|---|---|---|---|
| CDC 2132083 | 59.36 | CDC 2213037 | 59.35 | CDC 2213045 | 59.34 |
| CDC 2132085 | 59.35 | CDC 2213039 | 59.34 | CDC 2213046 | 59.33 |
| CDC 2143410 | 59.34 | CDC 2213040 | 59.34 | CDC 2213047 | 59.33 |
| CDC 2143411 | 59.33 | CDC 2213041 | 59.34 | CDC 2213048 | 59.33 |
| CDC 2143412 | 59.33 | CDC 2213042 | 59.34 | CDC 2213049 | 59.33 |
| CDC 2143413 | 59.33 | CDC 2213043 | 59.34 | Total (19) | 1127.42 |
| CDC 2143414 | 59.33 | CDC 2213044 | 59.34 | | |

The best way to access the property from Quebec City is to take the Autoroute 73-S for approximately 60km and then take exit 72 for highway #276. From there, travel another 25km on highway #276-E. The south-eastern section of the claims is accessible from this road. To access the northwest section of the block of claims, continue on highway #276-E to the junction with highway #277 then turn left on highway #204. After 350m, turn left on Rang de la Grande Rivière and travel about 3km. From there, Rang de la Grande Rivière/Route du Rang Ste-Marie as well as several woodlot trails gives access to many of the claims.

The topography of the property is moderate with elevations ranging from about 320m to 610m, the Mont-Orignal being the highest point. It is characterized by hills and associated cliffs which are included in the Notre-Dame Mountains Range. The water system is mainly defined by the meandering Rivière Etchemin (and associated swamps) which flows along the property from the northeast to the southwest and then cross-cuts the claims toward the northwest. Bedrock exposure is good with outcrops mainly located on topographic highs.

## 3. Previous work

The first mapping in the region of the Moose Cliff property goes back to the 1930s and was made by C. Tolman (Tolman, 1936). Cousineau (1990) then synthesized all the work conducted in this area by the geologists of the Quebec government. Virtually no mineral exploration or prospecting has been made in the area of the property. Only one showing was reported by D. Duplessis (Table 2, Table 3).

The Cranbourne showing was discovered in 1998 by the prospectors C. Vachon and L. Fecteau following a prospecting campaign under the prospector financial assistance program introduced by the Quebec government. The showing is located at the northeast extremity of the property and is characterized by chalcopyrite in epidotized/hematized basalt, spatially associated with quartz veins. Three grab samples have returned values of 4.3% Cu – 8.8 g/t Ag, 1.5% Cu – 5.4 g/t Ag and 1.6% Zn – 0.3% Cu – 0.2% Pb – 720ppm Cd (SIGEOM Examine).

**Table 2 – Showing surrounding the Moose Cliff property (SIGEOM Examine)**

| Showing | Coord. | Substance | Mineralization type | Comments |
|---|---|---|---|---|
| Cranbourne | 377631 E 5141592 N | Cu-Ag-Zn ±Pb | Unknown | Chalcopyrite in epidotized/hematized basalt, spatially associated with quartz veins |

**Table 3 – Previous reported work on the Moose Cliff property**

| Company/prospector | Year | Work performed |
|---|---|---|
| Claude Vachon/Laurier Fecteau | 1998 | Sampling/Beep Mat (GM 58385) |

## 4. Geological setting

### 4.1. Regional geology

The Moose Cliff property is located near the boundary between the tectonostratigraphic Humber and Dunnage Zones of the Québec Appalachians. The Humber Zone consists of volcanic and Cambrian-Ordovician sedimentary rocks deposited on the margin of the Palaeozoic Laurentian basement. It is divided into two units: the External and Internal Zones (St-Julien and Hubert, 1975; Tremblay and Castonguay, 2002). The External Zone comprises low grade metamorphosed sedimentary rocks and mafic volcanic rocks which were deformed and emplaced as a series of imbricated northwest-directed thrust nappes. The Internal Zone is composed of greenschist to amphibolites facies metamorphic rocks (Sutton-Bennet Schist; Figure 4) which are the distal facies equivalent of the External Zone units (St-Julien and Hubert, 1975; Tremblay and Castonguay, 2002). Among these, only rocks from the Caldwell Group of the Internal Zone outcrop in the property area. The Dunnage Zone is represented by rocks formed in the Iapetus oceanic domain including ophiolitic complexes, tectonic and sedimentary mélanges, volcanic arc sequences and marine flysch deposits. In southern Québec, the Dunnage Zone is subdivided into four distinct lithotectonic units (Figure 4): (1) the Early Ordovician ophiolitic massifs, (2) the Ascot Complex volcanic arc, (3) the Saint-Daniel Mélange, and (4) the Magog Group forearc sedimentary sequence (Tremblay et al., 1995; Schroetter et al., 2003, 2006). Only the Saint-Daniel Mélange is observed in the area covered by the claim block. The Québec Appalachians Humber and Dunnage Zones are separated by a major deformation lineament, the Baie Verte-Brompton Line (BVBL; St-Julien and Hubert, 1975) which is interpreted to be the surface expression of a major tectonic boundary (Williams, 1979; Tremblay et al., 1995; Hébert and Bédard, 2000). Québec ophiolitic slivers specifically occur along this line as well as several ultrabasic intrusives.

The Québec Appalachians history can be summarized by three major tectonic events, the Taconian, Salinian and Acadian orogenies. The Middle to Late Ordovician Taconian orogeny is related either to the obduction of a large ophiolitic segment onto the Humber Zone units of continental affinity or is the result of an arc-continent collision (Williams, 1979; Tremblay, 1992;

Pinet and Tremblay, 1995; Huot et al., 2002). The Silurian to Early Devonian Salinian orogeny is attributed to the backthrusting and exhumation of the Taconian crustal wedge as well as the coeval formation of fault-bounded sedimentary basins (Tremblay and Castonguay, 2002). The Devonian Acadian orogeny finally led to the complete destruction of the Iapetus Ocean when Gondwana-related terranes collided with the paleo-Laurentian margin. This orogeny is related to the regional deformation and metamorphism of the Dunnage Zone units.

### 4.2. Local geology

The most recent geological compilation of the area of St-Joseph-de-Beauce (21L07) from the Québec's Ministry of Natural Resources and Wildlife (MRNF) dates back to 2002 (CG SIGEOM21L). The main geological units identified in the area of the property are, from the youngest to the oldest:

1. Unclassified (Early Ordovician): Serpentinite
2. St-Daniel Mélange (Ordovician): Chaotic argillite containing calcareous siltstone, black sandstone, black clayrock pebbles and blocks, clayslate with few black sandstone beds as well as interbedded green and black clayslate.
3. Caldwell Group (Neoproterozoic to Cambrian): Feldspar sandstone and green mudslate (with few pale green sandstone and quartz pebbles conglomerate), red and green pelite (few red sandstone) as well as brecciated, pillowed and massive mafic volcanics.

## 5. Technical approach

Detailed geological mapping and sampling were conducted during summer of 2010 fieldwork on the Moose Cliff property. On the claims covering the property a total of 225 outcrops were prospected and described (Appendix 1). From these, about 25 samples were taken and sent for trace element geochemistry (package 1H2 "Au + 53 elements"; Appendix 2) to Activation Laboratories (Ancaster, Ontario). This package is appropriate for exploration since it provides a trace element scan for virtually all type of mineralization.

# 6. Results

## 6.1. Geological mapping

The new mapping on the Moose Cliff property allowed for the observation and description of 7 distinct lithologic units (Figure 5). These are, from the youngest to the oldest, (1) serpentinite, (2) black mudslate with mudrock or calcareous siltstone pebbles or blocks, (3) quartz sandstone/schist, (4) red-purple mudrock/mudslate/siltstone, (5) mafic volcanics, (6) hematized mafic volcanics breccia and (7) mafic volcanics breccia. The orientation of the lithologic units defined by the lithologic contacts agrees with the general attitude of the units of the regional geological units except for the western part of the mapped area. They strike roughly NE-SW (040°) in the eastern portion of the property and about E-W (090°) in the western portion. They dip steeply mostly to the SE. The majority of the rocks at the Moose Cliff property show a schistosity subparallel (041°/68) to the pseudo-stratification (Figure 6). Quartz veins or veinlets are either roughly oriented parallel to schistosity and regional structure (~ 030°/040°) or at 260°.

Serpentinite is observed essentially as pinched/trapped bodies at the contact between the black mudslate with mudrock or calcareous siltstone pebbles/blocks and the quartz sandstone/schist. One serpentinite body is actually trapped/intruded(?) within the quartz sandstone/schist unit of the Caldwell Group. The serpentinites are dark green-black and are much altered. They are more or less deformed and sheared. These serpentinite can be associated to the Early Ordovician serpentinites reported in the MRNF's compilation.

The black mudslate with mudrock or calcareous siltstone pebbles or blocks is located at the south-eastern boundary of the property. The mudslate is dark gray-black and shows a well-developed schistosity. It is composed of up to 40% clasts/pebbles of paler mudrock (~ 1-2 cm) and/or up to 20% gray calcareous siltstone/mudrock blocks. Locally the mudslate contains between 1-2% of pyrite chunks (2-4cm). It is also locally rusty. This lithologic unit can be associated to the chaotic argillite facies of the Ordovician St-Daniel Mélange.

The quartz sandstone/schist lithologic unit occurs at the northwest contact of the black mudslate with mudrock or calcareous siltstone pebbles or blocks as well as embedded within the hematized mafic volcanics breccias of the Caldwell Group. It is characterized by green to gray to light purple quartz sandstones interbedded with thin beds of green schist. The sandstones are composed of up to 30-40% quartz clasts. Some of them show good cross-laminations even though a well-defined schistosity is generally observed. The quartz sandstone/schist is cross-cut by up to 20% quartz (± chlorite; 1mm-2cm) veinlets and/or by up to 10% chlorite veins. The rocks are also locally rusty and may contain up to 1% sulphides crystals or pyrite chunks. According to the MRNF's compilation this lithologic unit could be associated with one of the Neoproterozoic to Cambrian Caldwell Group facies (i.e. feldspar sandstone and green mudslate).

The red-purple mudrock/mudslate/siltstone is commonly found at the north-western contact of the quartz sandstone/schist lithologic unit. It can also be embedded within the hematized mafic volcanics breccias. The contact between these two lithologic units is quite sharp and seems to be concordant. The mudrock/mudslate/siltstone is mostly red brick to red-purple in color and is fine-grained to very fine grained. The rocks show a well-developed schistosity and contain up to 10% quartz veins which are more or less parallel to the schistosity. These rocks are included in the Caldwell Group and can possibly be related to the red and green pelites.

The mafic volcanics are observed at the north-western boundary of one red-purple mudrock/mudslate/siltstone strip. The contact with the latter is very sharp and is subparallel to schistosity. The mafic volcanics are medium green in color and contain up to 20-30% epidote ± quartz ± carbonate veins. This lithologic unit is probably a derivative facies of the Neoproterozoic to Middle Cambrian Caldwell Group.

The hematized mafic volcanics breccia is the main rock type outcropping at the Moose Cliff property. These rocks cover up to 75% of the mapped claims. They are generally medium to dark green fine-grained ± magnetic copper-rich rocks (50-500 ppm) with a more or less intense purple-red alteration impregnation. These mafic volcanics are always brecciated and often pillowed. The hematized mafic volcanics breccia is composed of an average of 60-80% angular mafic clasts (1mm-10cm, few hyaloclastite clasts) within a more or less cherty hematized ± chloritized ± epidotized matrix. The brecciation seems to be related to the occurrence of epidote-quartz (±chlorite ± carbonate) veins which may form a stockwork-style/breccia texture. The hematization is usually restricted between the pillows or the clasts (i.e. in the matrix) but sometimes it is more pervasive and goes through the clasts (Liesegang alteration/onion-skin alteration texture) (Figure 7A). Locally there is a strong carbonate alteration which is also concentrated between the pillows (Figure 7B). There is some evidence that the epidotization may post-date the hematization/oxidation event. Locally the rocks are rusty and it is possible to observe disseminated sulphides (~ 1%, usually). The hematized mafic volcanics breccia can be included in the the Neoproterozoic to Middle Cambrian Caldwell Group.

The mafic volcanics breccia occurs as unaltered patches embedded within the hematized mafic volcanics breccia rocks. There is also a stripe of these rocks in the northern portion of the property. These rocks are clearly the un-hematized counterpart of the hematized mafic volcanics breccia and share the same characteristics. However, there are possibly more disseminated sulphides (pyrite, up to 10% in one sample) within the mafic volcanics breccia than in the hematized mafic volcanics breccia.

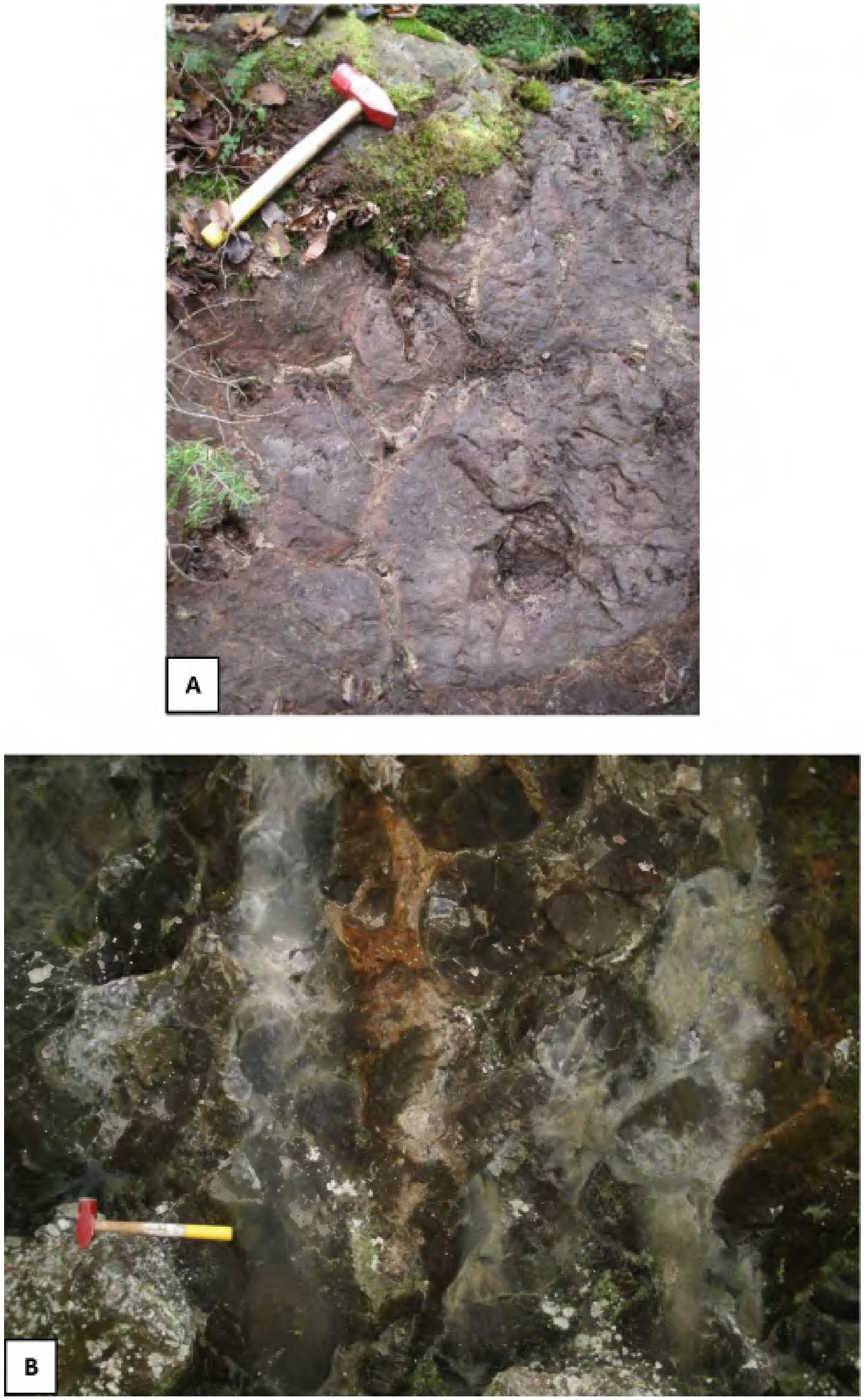



**Figure 7 – Photographs. A) Slightly brecciated hematized mafic volcanics (5 139 958m N, 375 663m E), B) Brecciated hematized mafic volcanics with carbonate filling between the pillows (5 139 596m N, 375 977m E).**

## 6.2. Sampling

Figure 6 shows the location of the samples sent for trace element geochemistry. From these 25 samples, 11 returned gold values ranging from 6 to 51 ppb Au (Table 4) and 2 returned copper values between 1520 ppm and 5200 ppm (Table 5).

**Table 4 – Anomalous Au results from mapping at the Moose Cliff property**

| Station | ActLabs # | East | North | Au (ppb) | Main Rock type |
|---|---|---|---|---|---|
| 1834 | 407519 | 376740 | 5140015 | 33 | Volcanic breccia |
| 1835 | 407520 | 376725 | 5140040 | 21 | Volcanic breccia |
| 1846 | 407521 | 376660 | 5139969 | 22 | Volcanic breccia |
| 1849 | 407522 | 376689 | 5140259 | 27 | Volcanic breccia |
| 1851 | 407523 | 376768 | 5140063 | 23 | Volcanic breccia |
| 1894 | 407527 | 376716 | 5139934 | 51 | Pillow breccia |
| 1898 | 407529 | 376642 | 5139955 | 28 | Volcanic breccia |
| 1929 | 407531 | 377513 | 5140068 | 16 | Qtz wacke |
| 1936 | 407534 | 377447 | 5139875 | 6 | Qtz wacke |
| 2040 | 451003 | 377959 | 5141341 | 22 | Volcanic breccia |
| 2047 | 451006 | 377339 | 5141120 | 47 | Volcanic breccia |

**Table 5 – Anomalous Cu results from mapping at the Moose Cliff property**

| Station | ActLabs # | East | North | Cu (ppm) | Main Rock type |
|---|---|---|---|---|---|
| 1898 | 407529 | 376642 | 5139955 | 1520 | Volcanic breccia |
| 2047 | 451006 | 377339 | 5141120 | 5200 | Volcanic breccia |

Anomalous gold seems to be largely restricted to the area near the south-western contact of the biggest mafic volcanics breccia patch with the hematized mafic volcanics breccia (Figure 8). The area near this contact is particularly interesting since it is a zone where there is either a strong chemical contrast between the hematized mafic volcanics and the un-hematized rocks and/or a physical contrast between two distinct volcanic flows. Such a contrast zone is often the key to the precipitation of metals during the migration along permeable strata of metals-rich fluids. This is especially the case for volcanic red-bed copper deposits. Rocks at the Moose Cliff property share several characteristics with rocks from the volcanic red-bed model: continental to shallow marine volcanic setting (highlighted by the occurrence of hematized/oxidized pillowed lavas), sub-greenschist metamorphic grades, basaltic lavas associated with siltstone and sandstone host rocks, locally minor malachite staining (Lefebure and Church, 1996). Gold is often a by-product of Cu in volcanic red-bed copper deposits. Anomalous gold on the Moose Cliff property could also be related to the serpentinization of the ultramafic bodies since gold occurrences related to this process can be observed up to several thousand meters from the outcrop of serpentinites (El Ash and Arksey, 1990; Ghorfi et al., 2006).

Anomalous copper results for the Moose Cliff property all meet the government standards for new showings in the Appalachians (1000 ppm). Two new copper showings have thus been identified: Einna and Eilime. The Einna showing (station 1898, 1520 ppm Cu) is characterized by hematized purple-red mafic volcanics breccia containing some sulphides, locally. The showing is located less than 25m from the contact with the mafic volcanics breccia. The Eilime (station 2047, 5200 ppm Cu) showing is located near the north-eastern contact of the biggest mafic volcanics breccia patch with the hematized mafic volcanics breccias, about 500m southeast of the Cranbourne showing. It is characterized by rusty veinlets/zones rich in sulphides (associated with quartz veinlets ?) in a strongly chloritized matrix-poor mafic volcanics breccia. Considering the main rock types on the Moose Cliff property, the Einna and Eilime showings (and Cranbourne) could be the product of the copper deposition resulting from the encountering of oxidized rocks by copper-rich fluids migrating along permeable strata or structures to the margins of basins. Copper showings on the Moose Cliff property could also be hydrothermal veins related to the movement of fluids associated with the serpentinization and alteration of the ultramafic bodies or a combination of both.

## 7. SGH – Soil gas hydrocarbon geochemistry

A soil gas hydrocarbon (SGH) geochemistry campaign was conducted as an exploration tool in order to evaluate a prospective area for gold and/or VMS based deposits. The complete SGH report can be found at the end of this report (Appendix IV).

The sampling grid for this SGH project consists of 4 parallel N-S trending lines that are 50m apart with samples spaced at approximately 20m along each line. The samples are 400 to 500g soil samples recovered from the B horizon with a soil auger. A total of 65 samples were recovered for the Moose Cliff SGH campaign. Sample locations as well as sample characteristics (depth, soil horizon, color, texture and surface slope direction) were submitted to Activation Laboratories (Ancaster, Ontario) for analysis and interpretation.

The result of this geochemical sampling project is the identification of two anomalous zones. The gold anomalous zone is located approximately at 5 139 725 – 5 139 825m N/376 480m E while the anomalous region for a VMS deposit is located around 5 139 775m N/376 450m E. These zones are situated exactly in the extension of the line connecting the three copper showings (Einna, Eilime and Cranbourne)(Figure 9).

## 8. Conclusions and recommendations

Fieldwork conducted during summer of 2010 on the Moose Cliff property initially led to the reconfiguration of the local geological map. Sampling allowed the identification of an anomalous gold region near the south-western contact of the biggest mafic volcanics breccia patch with the hematized mafic volcanics breccia. Two new copper showings were also identified; both of them being located near the contacts between the hematized rocks and the mafic volcanics breccia. All showings seem to point towards mineralization related to deposition processes linked to the precipitation of Cu ±Au following the encountering of oxidized mafic rocks by migrating metals-rich fluids.

It is recommended that *Golden Hope Mines Limited* continues its exploration campaign on the Moose Cliff property with more detailed mapping and extensive sampling specifically around the anomalous gold region and the copper showings. It is also recommended to map the newly acquired claims juxtaposed to the west of the Moose Cliff claims block. Ground geophysics (Mag, VLF, IP) might also be performed in the swamp next to the Rivière Etchemin since there is no outcrop in this area.

## 9. References cited


Ash, C.H., Arksey, R.L., 1990. The listwanite – lode gold association in British Columbia. British Columbia Geological Survey Branch, Geological Fieldwork 1989, Paper 1990-1, 359-364.

Cousineau, P.A., 1990. Le Groupe de Caldwell et le domaine océanique entre Saint-Joseph-de-Beauce et Sainte-Sabine. Ministère de l'Énergie et des Ressources, Québec, MB 87-02.

Duplessis, D., 1998. Campagne de prospection 1998, Rapport des activités, Projet Cranbourne. Assessment report file GM-58385.

El Ghorfi, M., Oberthür, T., Melcher, F., Lüders, V., El Boukhari, A., Maacha, L., Ziadi, R., Baoutoul, H., 2006. Gold-palladium mineralization at Bleïda Far West, Bou Azzer-El Graara Inlier, Anti-Atlas, Morocco. Mineralium Deposita 41, 549-564.

Hébert, R., Bédard, J.H., 2000. Les ophiolites d'avant-arc et leur potentiel minéral : exemple des complexes ophiolitiques du sud du Québec. BRGM, Chronique de la recherche minière 539, 101-117.

Huot, F., Hébert, R., Turcotte, B., 2002. A multistage magmatic history for the genesis of the Orford ophiolite (Quebec, Canada) : a study of the Mont Chagnon massif. Canadian Journal of Earth Sciences 39, 1201-1217.

Lefebure, D.V., Church, B.N., 1996. Volcanic Redbed Cu. In: Lefebure, D.V., Hoy, T. (Eds.), Selected British Columbia Mineral Deposit Profiles, Volume 1- Metallic Deposits, Open File 1996-13. British Columbia Ministry of Employment and Investment, pp. 5-7.

Pinet, N., Tremblay, A., 1995. Tectonic evolution of the Québec-Maine Appalachians : from oceanic spreading to obduction and collision in the northern Appalachians. American Journal of Science 295, 173-200.

Schroetter, J.-M., Pagé, P., Bédard, J.H., Tremblay, A., Bécu, V., 2003. Forearc extension and sea-floor spreading in the Thetford-Mines Complex. In: Dilek, Y., Robinson, P.T. (Eds.), Ophiolites in Earth History, Special Publications 218. Geological Society of London, London, pp. 231-251.

Schroetter, J.-M., Tremblay, A., Bédard, J.H., Villeneuve, M.E., 2006. Syncollisional basin development in the Appalachian orogen – The Saint-Daniel Mélange, southern Québec, Canada. Geological Society of America Bulletin 118, 109-125.

St-Julien, P., Hubert, C., 1975. Evolution of the Taconian Orogen in the Québec Appalachians. American Journal of Science 275 (A), 337-362.

Tolman, C., 1936. Lake Etchemin Map-area. Geological Survey of Canada, Memoir 199, 20 p.

Tremblay, A., 1992. Tectonic and accretionary history of Taconian oceanic rocks of the Quebec Appalachians. American Journal of Science 292, 229-252.

Tremblay, A., Malo, M., St-Julien, P., 1995. Dunnage zone – Quebec. In: Willliams, H. (Ed.), Geology of the Appalachian/Caledonian Orogen in Canada and Greenland. Geological Survey of Canada, Geology of Canada, no.6, (also Geological Society of America, The Geology of North America, Vol. F-1, pp. 179-187.

Tremblay, A., Castonguay, S., 2002. Structural evolution of the Laurentian margin revisited (southern Quebec Appalachians): Implications for the Salinian orogeny and successor basins. Geology 30, 7-82.

Williams, H., 1979. Appalachian Orogen in Canada. Canadian Journal of Earth Sciences 16, 792-807.

## 10. Certificate

I, *Émilie Bédard*, resident at 275A rue Principale, Sainte-Justine, Qc, G0R 1Y0, do hereby certify that:

1. I am an independent geologist.

2. I have received a B.Sc. in Geology in 2006 from the Université Laval, Quebec and a M.Sc. in Earth Sciences in 2009 from Université Laval, Quebec.

3. I have practised my profession since 2008.

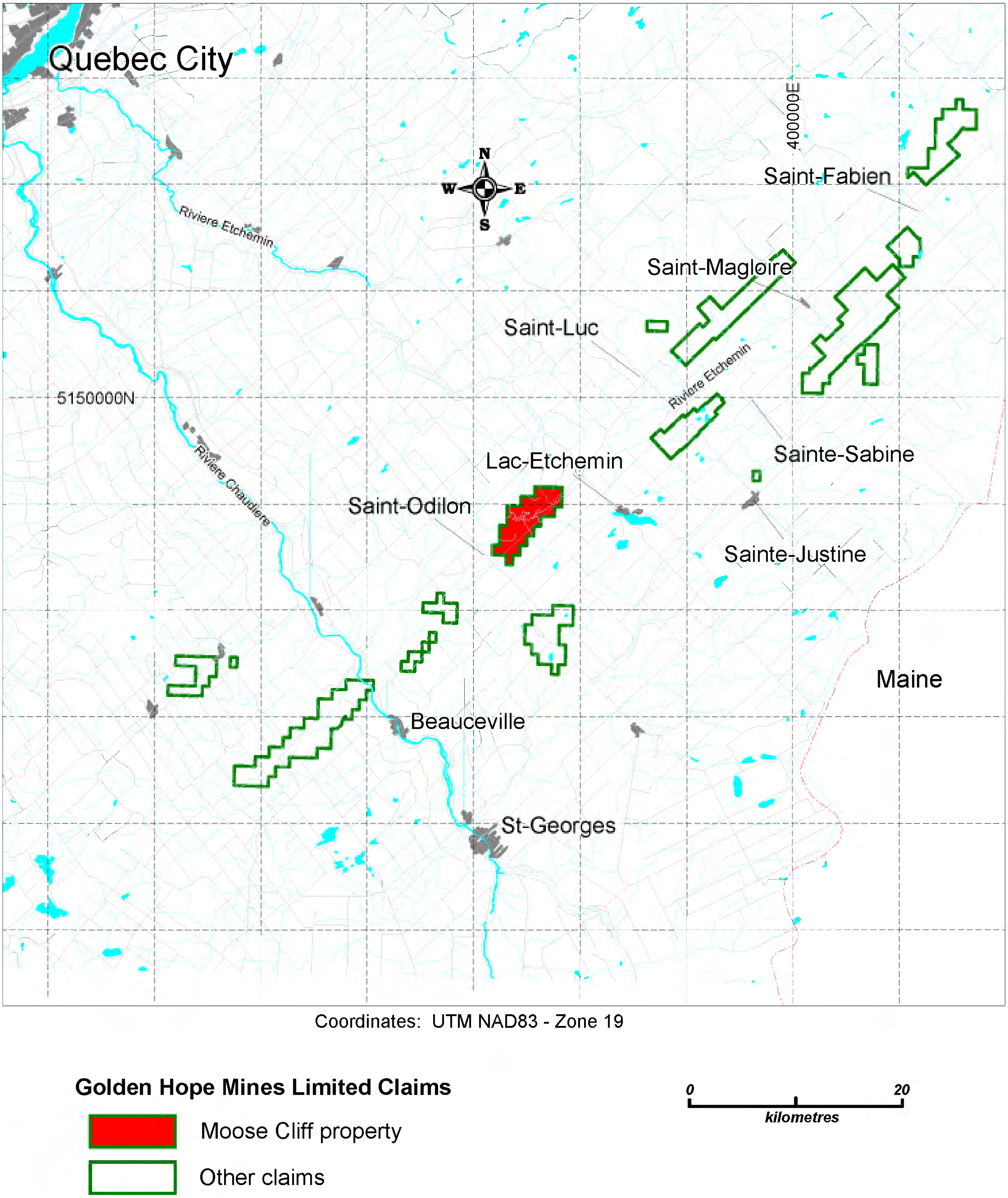
4. I am a professional geologist presently registered to the board of the « Ordre des Géologues du Québec », member #1282.

5. I am an author of this report which is based on data generated by Golden Hope Mines Limited and data available from various sources as summarized in the reference section.

6. I have participated in the work program described in this report. I also revised and verified the data compiled in this report.

GÉOLOGUE / GEOLOGIST
ÉMILIE BÉDARD
# 1282
QUÉBEC

Émilie Bédard, P. Geo.
June 25, 2011




***Golden Hopes Mine Limited***

*Bellechasse Project*

**Location map**

January 2011

Figure 1

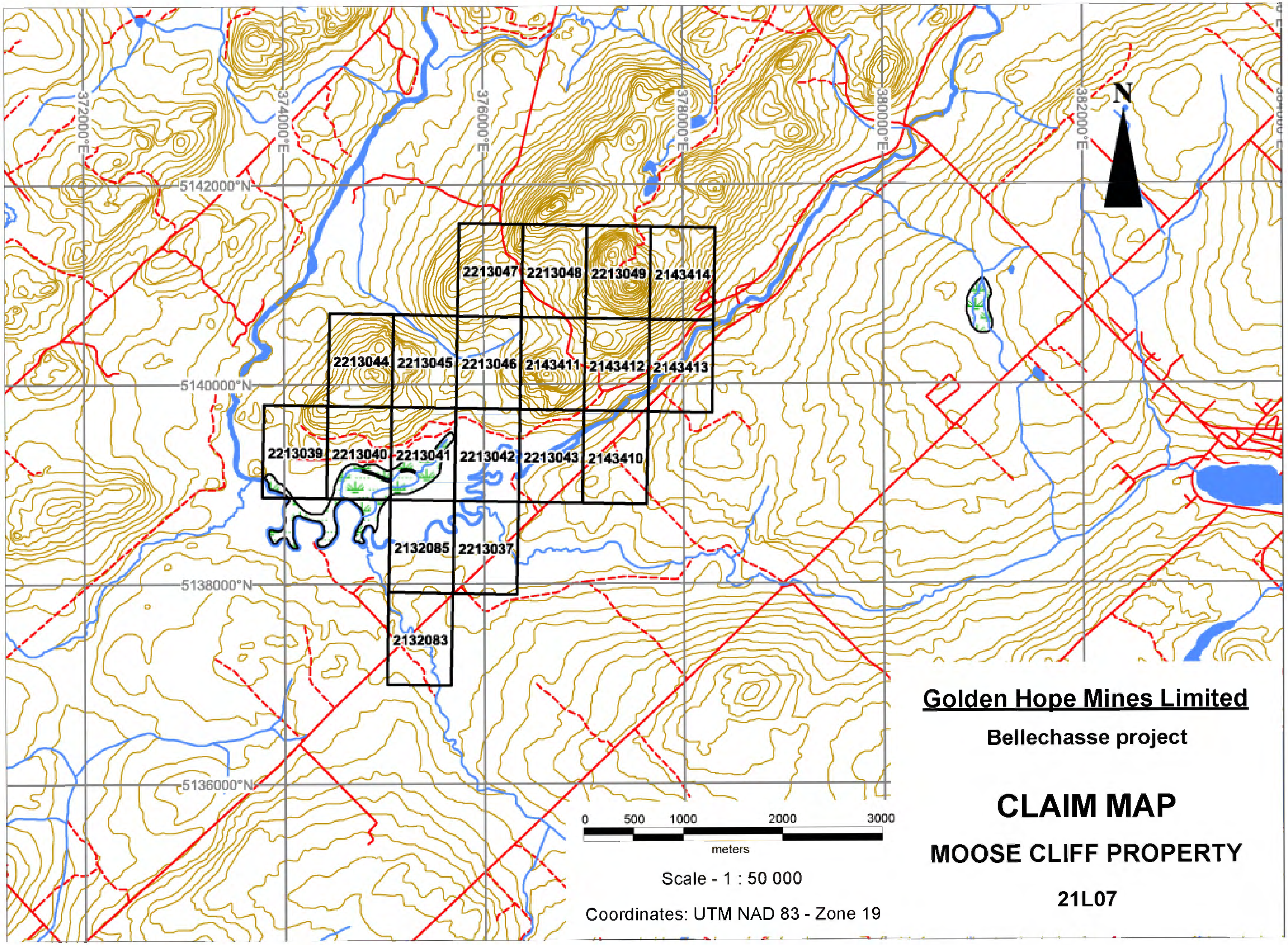



**Figure 2 - Location of claims for the Moose Cliff property**

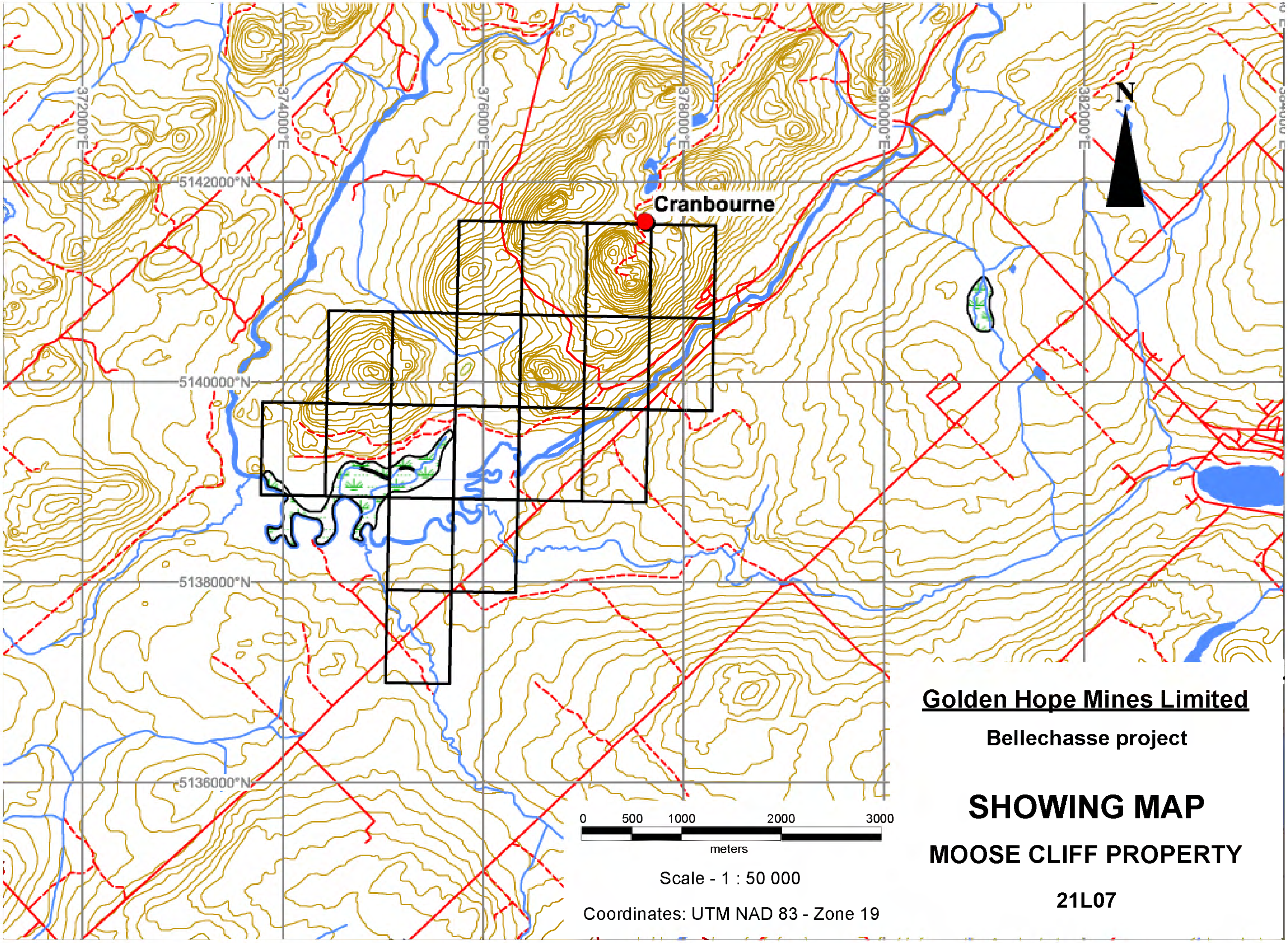



**Figure 3 - Showing in the vicinity of the property**

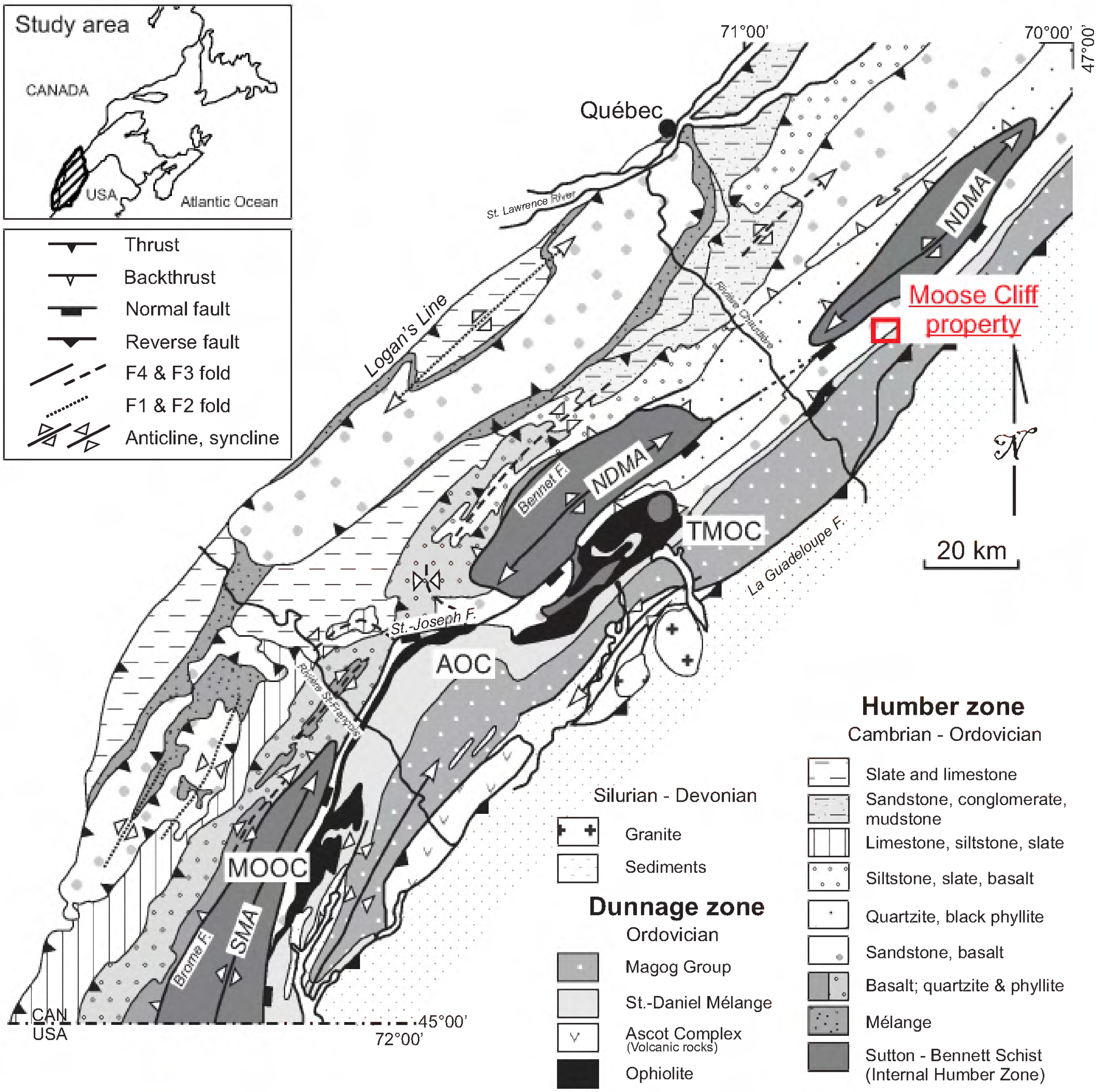



Figure 4 - Geological and structural map of the main tectonostratigraphic zones of the Québec Appalachians showing the approximate location of the property. (Modified after Schroetter et al., 2006). BBL – Baie Verte-Brompton line; SMA – Sutton Mountains anticlinorium; NDMA – Notre-Dame Mountains anticlinoria

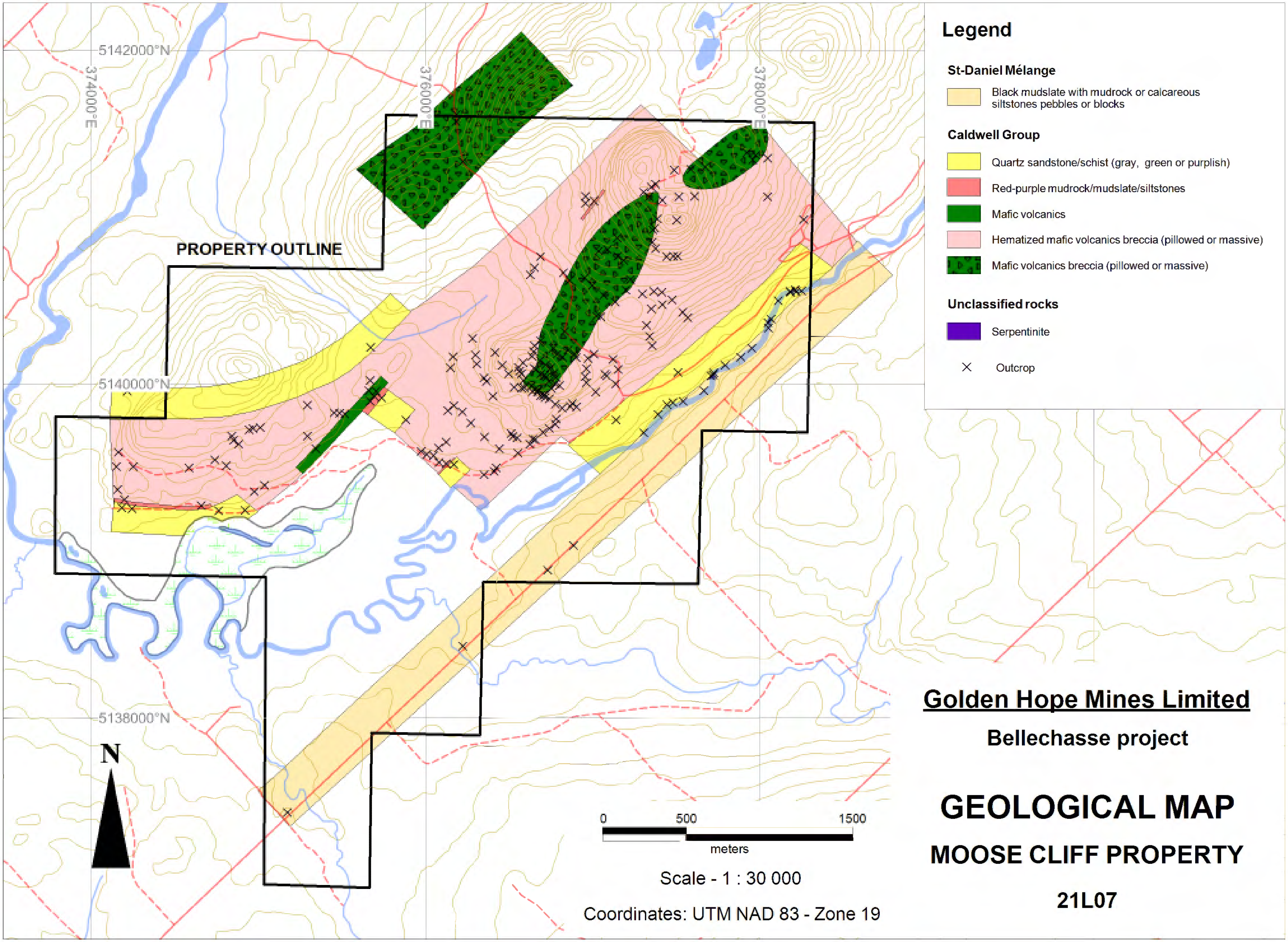



**Figure 5 - Geological map of the Moose Cliff property showing the outcrop locations**

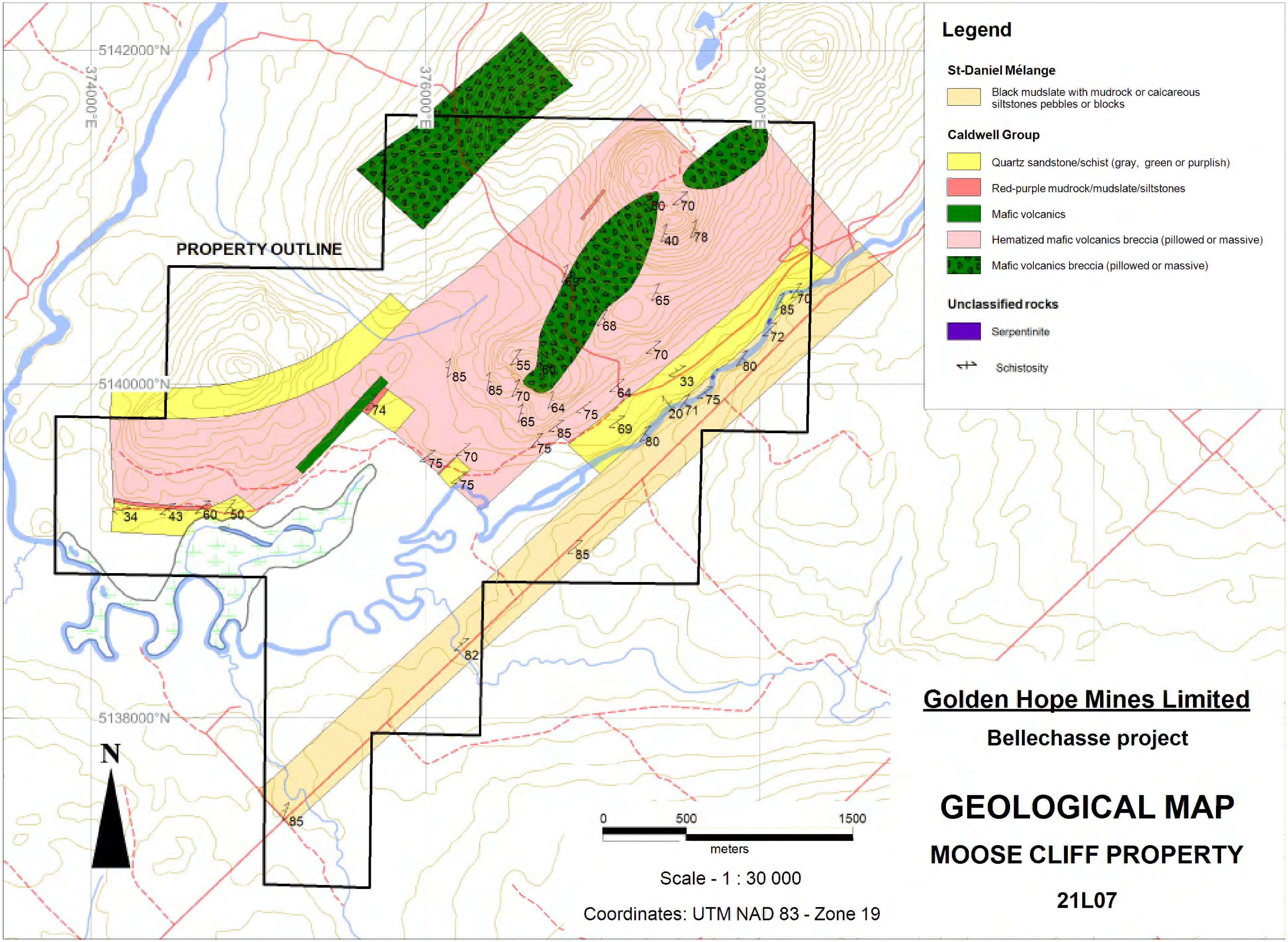



Figure 6 - Geological map of the Moose Cliff property showing the schistosity structures

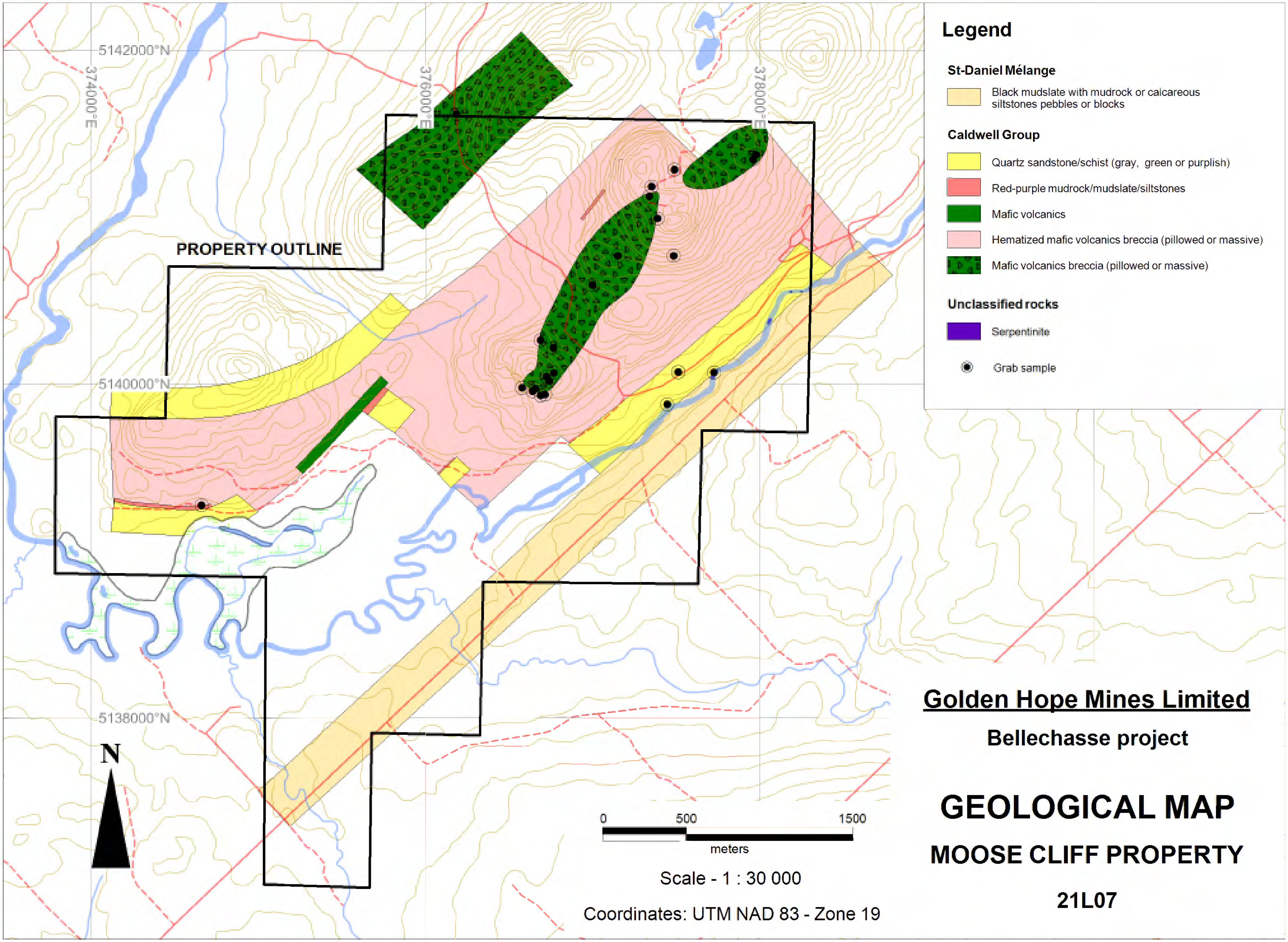



**Figure 8 - Geological map of the Moose Cliff property showing the sample locations**

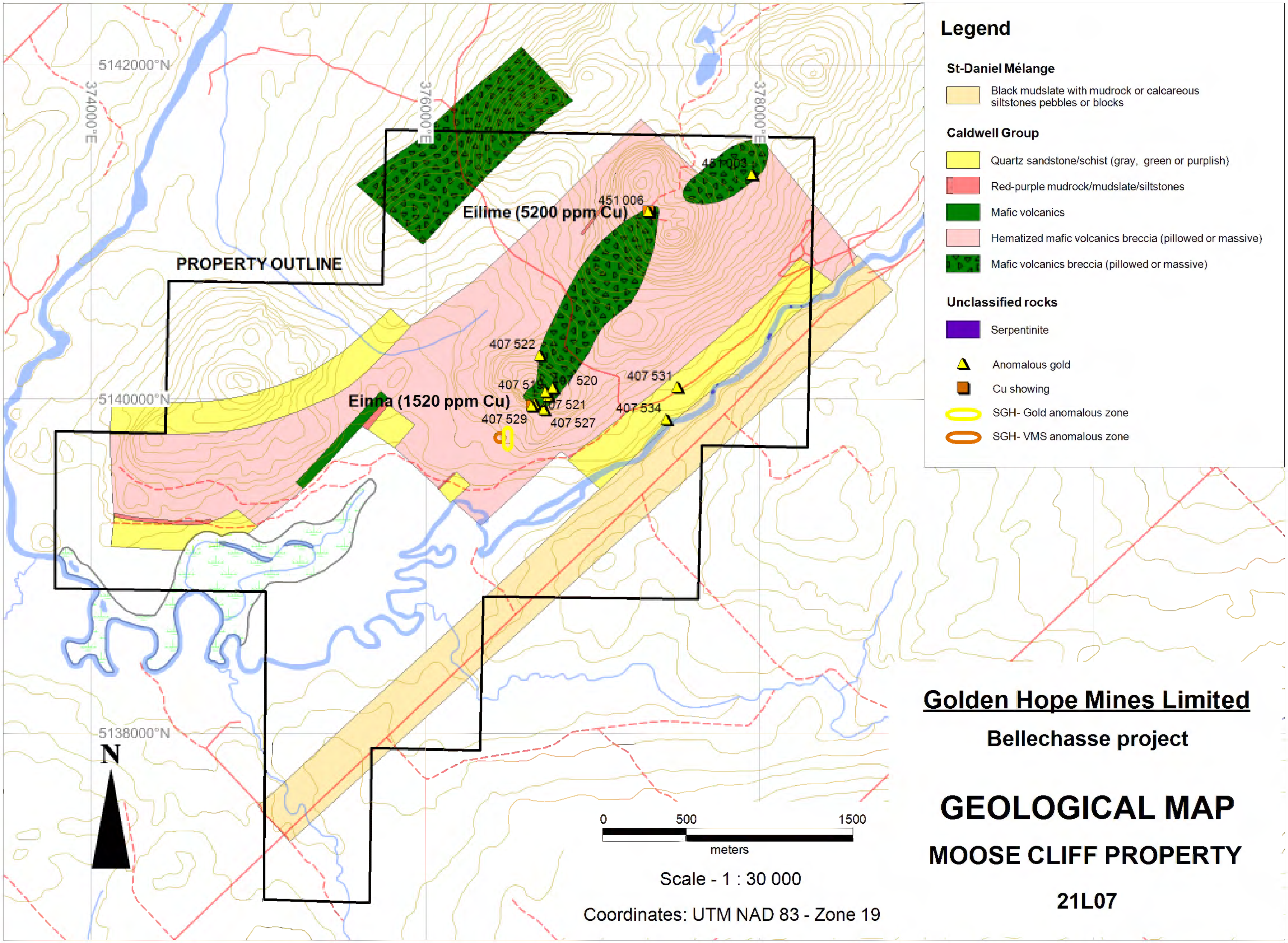



**Figure 9 - Geological map of the Moose Cliff property showing the anomalous gold results and the new copper showings**

# Appendix I

## Outcrop locations, rock descriptions and sample locations

(«A» refers to the main rock type, always described first in the comments while «B» is always the second rock type described in the comments)

(Right-hand rule for the structural measurements)

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1831 | 376975 | 5140151 | | | Volcanic breccia | | | 075/85 | Trail, 1m²; Volcanic breccia (92%): 80% clasts (pale blue, ±angular), 20% matrix (red mud/fluid); chlorite-quartz veins (08%): N075/85, 1mm-2cm thick |
| 1832 | 376803 | 5139990 | | | Diabase ? | | | | Cliff, 3m²; Diabase (40%): magnetic; Volcanic breccia (60%): red stuff (matrix) looks like chert (both around and inside the clasts), lots of epidote ± quartz veins, chunks of hornblendite (<1%, magnetic, quite dense) |
| 1833 | 376779 | 5140001 | | | Volcanic breccia | | | | Same cliff as 1832, 8m²; Volcanic breccia: oxydized (all red), maybe less cherty matrix here (the clasts look more "in situ", at least locally; Locally the matrix is subtituted by epidote-quartz injection |
| 1834 | 376740 | 5140015 | A | 407519 | Volcanic breccia | | | | Near the top of the hill, 4m²; Volcanic breccia: not really oxydized here, the matrix is more like a stockwork of chlorite-mafic veins, locally rich in pyrite ?, the rock is medium to dark blue green, slightly magnetic |
| 1835 | 376725 | 5140040 | A | 407520 | Volcanic breccia | | | 270/42 | Near the top of the hill, 3m²; Volcanic breccia: less veins/breccification here, 1-2% sulphides (pyrite) in tiny veins, fractures/veining= N270/42 |
| 1836 | 376715 | 5140054 | | | Volcanic breccia | | | | Same as 1835, more injection/veins here, some pyrite in veins |
| 1837 | 376692 | 5140062 | | | Volcanic breccia | | | | Near the top of the hill, 8-9m²; Same as 1836, up to 40% quartz-chert stockwork, again some sulphides (pyrite) in veins, locally |
| 1838 | 376661 | 5140085 | | | Volcanic breccia | | | | Top of the hill, 5-6m²; Same as 1837, 10% quartz-epidote veins, no sulphides here |
| 1839 | 376651 | 5140095 | | | Volcanic breccia | | | | Less veins than in 1838, looks breccified, maybe a little oxydized, no sulphides |
| 1840 | 376586 | 5140127 | | | Volcanic breccia | | | | Other side of the hill, 3m²; Volcanic breccia: up to 35-40% matrix (red chert/epidote veins), clasts (3cm-1mm), very angular |
| 1841 | 376557 | 5140099 | | | Volcanic breccia | 015/60 | | | 20m², covered with moss; Same as 1840, very rich in epidote |
| 1842 | 376565 | 5140075 | | | Volcanic breccia | 035/70 | | | Volcanic breccia: red chert matrix, clasts seem more rounded and deformed |
| 1843 | 376575 | 5140061 | | | Volcanic breccia | | | | Other side of the hill, 15m²; Same as 1841, some carbonate veinlets, locally |
| 1844 | 376587 | 5140021 | | | Volcanic breccia | | | | |
| 1845 | 376636 | 5139988 | | | Volcanic breccia | | | | |
| 1846 | 376660 | 5139969 | A | 407521 | Volcanic breccia | | | | Top of the hill; Volcanic breccia: like 1844, locally rusted (pyrite, <1%) |
| 1847 | 376678 | 5139964 | | | Volcanic breccia | | | | Volcanic breccia (80%): same as 1846; Diabase dike ? (20%) |
| 1848 | 376756 | 5139972 | | | Volcanic breccia | | | | Same as 1834 |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1849 | 376689 | 5140259 | A | 407522 | Volcanic breccia | | | | 4m²; Volcanic breccia (85%): matrix is characterized by a stockwork of chlorite veins, some sulphides (disseminated, ± in veins); 15% quartz veins (in shear zone) |
| 1850 | 376782 | 5140037 | | | Volcanic breccia | | | | 20m²; Volcanic breccia (95%): up to 85-90% clasts which are fine-grained volcanic rock, probably basalt with a subophitic texture (like diabase) so the dikes I have seen yesterday are probably not dikes, the matrix is ± cherty (white); 05% quartz vein ± epidote |
| 1851 | 376768 | 5140063 | A | 407523 | Volcanic rock | | | | 3m²; Volcanic rock: basalt/diabase, fine-grained-medium-grained, ± brecciated, ± altered/chloritized, 2-3% sulphides (disseminated, pyrite, locally) |
| 1852 | 376750 | 5140097 | | | Volcanic breccia | | | | Volcanic breccia (95%): basalt/diabase; 05% quartz-epidote veins: stockwork-like texture |
| 1853 | 376721 | 5140115 | | | Volcanic breccia | | | | 4m²; Volcanic breccia: up to 80% clasts (angular, 2-3cm), matrix seems to be chloritic/mafic, some sulphides (pyrite, disseminated) |
| 1854 | 376688 | 5140139 | | | Volcanic breccia | 005/60 | | 145/15 | 20m²; Volcanic breccia: less brecciated than elsewhere, same rock, fracture set= 145/15 |
| 1855 | 376638 | 5140164 | | | Volcanic breccia | | | | 7-8m²; Volcanic breccia: matrix here is cherty (red-purple), epidote+quartz+chlorite veins, carbonate veinlets, same as we have seen elsewhere |
| 1856 | 376650 | 5140194 | | | Volcanic breccia | | | | Same as 1855 |
| 1857 | 376654 | 5140228 | | | Volcanic breccia | | | | Same as 1856: locally there are some very rounded lapillis? Or clasts ? Or porphyroblasts (0.5cm-0.2cm, paler with a white rim) |
| 1858 | 376767 | 5140214 | A | 407524 | Volcanic breccia | | | | 4-5m²; Volcanic breccia: matrix here is not red (chlorite/mafic), epidote-quartz veins, some sulphides (1%, pyrite, disseminated) |
| 1859 | 376789 | 5140177 | | | Volcanic breccia | | | | 20m²; Volcanic breccia: like 1858, up to 20% carbonate-epidote + quartz veins |
| 1860 | 376823 | 5140160 | | | Volcanic breccia | | | | Same as 1859 |
| 1861 | 376904 | 5140158 | | | Volcanic breccia | | | | 5m², blocks; Volcanic breccia: either a reddish (±purple) matrix or a green chlorite-rich mafic matrix |
| 1862 | 376893 | 5140180 | | | Volcanic breccia | | | | 3m²; Volcanic rock (80%): basalt/diabase; quartz-epidote veins (20%): stockwork-style |
| 1863 | 376855 | 5140204 | | | Volcanic breccia | | | | 20m²; Volcanic breccia: 60% clasts, 40% chloritic mafic matrix, up to 20% epidote-quartz veins |
| 1864 | 376185 | 5141569 | | | Volcanic breccia | | | | Side of the main road, 1m²; Volcanic breccia: 75% huge clasts (± rounded) which are themselves slightly brecciated, 25% chloritic mafic matrix |
| 1865 | 376186 | 5141614 | A | 407525 | Volcanic breccia | | | | Side of the main road, 1m²; Same as 1864, locally there are some sulphides in veins or disseminated |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1866 | 376224 | 5141332 | | | Volcanic breccia | | | | Side of the main road, 4-5m²; Same as 1864: rounded clasts= pillows ?!, 5% epidote-quartz veins |
| 1867 | 376690 | 5140763 | | | Pillow breccia | | | | Side of the main road, 7m²; Pillow breccia: brecciated (reddish matrix, oxydizing fluids?), between the pillows= chloritic mafic matrix ± epidote |
| 1868 | 376828 | 5140665 | | | Pillow breccia | 020/69 | | | Side of the main road, 2m², dirty, covered with lichens; Probably the same thing as 1867 |
| 1869 | 376864 | 5140619 | | | Basalt/diabase | | | | Side of the road, 3-4m²; Basalt/diabase: fine-grained-medium-grained, subophitic texture, probably brecciated, quartz-epidote veins |
| 1870 | 376834 | 5140314 | | | Volcanic breccia | | | | Side of the road, 7-8m²; Volcanic breccia: here the matrix seems mainly chloritic mafic, maybe some reddish spots, locally |
| 1871 | 377011 | 5140177 | | | Volcanic breccia | | | | Same as 1870 |
| 1872 | 377123 | 5140148 | | | Pillow breccia | | | | Side of the road, 5-6m²; Same as 1867 |
| 1873 | 377139 | 5140000 | | | Mafic schist | 050/64 | | 260/24 | Side of the road, 6-7m²; Mafic schist (99%): up to 30% quartz veins, ± parallel to schistosity, light to medium green; 01% quartz-chlorite veins: N260/24 |
| 1874 | 377141 | 5139784 | | | Mafic schist/wacke | 055/69 | | | <1m²; Looks similar to 1873, but the rock is more gray. Looks like a wacke or metwacke or schist. There are still a lot of quartz veins |
| 1875 | 377085 | 5140047 | | | Volcanic breccia | | | | Side of a hill, 6-7m²; Volcanic breccia: 60% clasts (10-20cm, angular, mafic volcanics, very magnetic), 40% matrix (red chert/mudrock) |
| 1876 | 377077 | 5140058 | | | Pillow breccia | | | | Same as 1875, here it is maybe possible to see relics of pillows |
| 1877 | 376963 | 5140091 | | | Pillow breccia | N260 | | | 12m²; Looks similar to 1876. Really magnetic here. |
| 1878 | 376957 | 5140042 | | | Pillow breccia | | | | Same as 1877 |
| 1879 | 376965 | 5140007 | | | Volcanic breccia | | | | Cliff, 20-25m²; Same kind of rock than 1878, less brecciatd here, less oxydizing matrix, more masive, some quartz-carbonate-epidote veinlets |
| 1880 | 377019 | 5139951 | | | Pillow breccia | | | | Same as 1877, really oxydized here. 10m to the south, pillow breccia ? |
| 1881 | 376905 | 5139862 | | | Volcanic breccia | | | | Huge cliff, 30m²; Same as 1880 |
| 1882 | 376880 | 5139884 | | | Volcanic breccia | | | | Same as 1881 |
| 1883 | 376867 | 5139865 | | | Volcanic breccia | 055/75 | | | Basically the same as elsewhere |
| 1884 | 376820 | 5139856 | | | Pillow breccia | | | 280/73 | Same as 1876, pillow breccia ?, fault= N280/73 |
| 1891 | 376779 | 5139879 | | | Pillow breccia | | | | 2-3m²; Volcanic breccia: pillow breccia, purple matrix, magnetic, 20-25% quartz-epidote veins |
| 1892 | 376742 | 5139912 | | | Pillow breccia | 020/64 | | | |
| 1893 | 376718 | 5139918 | | | Volcanic breccia | | | | Looks similar to 1891 and 1892 but probably more brecciated here. Clasts are smaller, really angular. White alteration: carbonate "stalactites" |
| 1894 | 376716 | 5139934 | A | 407527 | Volcanic breccia | | | | Cliff, block at the bottom; Same as 1893, only a little rusted (sulphides ?) |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1895 | 376708 | 5139932 | | | Volcanic breccia | | | | Cliff, 20m²; Volcanic breccia: less red matrix here, less brecciated, clasts are bigger and "in situ" |
| 1896 | 376690 | 5139929 | A | 407528 | Volcanic breccia | | | | Cliff, same as 1895; More large ep± quartz veins (5cm): malachite alteration (chalcopyrite, ± pyrite), N270/10, white carbonate crust |
| 1897 | 376671 | 5139952 | | | Volcanic breccia | | | | Cliff; Volcanic breccia: angular volcanic clasts in a paler siliceous matrix, some rusted spots ± sulphides |
| 1898 | 376642 | 5139955 | A | 407529 | Volcanic breccia | 015/65 | | | Cliff; Looks similar here, maybe more deformed, good schistosity, the clasts are probably smaller here and maybe more chloritized also, there are some sulphides locally |
| 1899 | 376594 | 5139978 | | | Volcanic breccia | | | | Huge block near the cliff; Volcanic breccia: more red stuff/matrix here + tiny epidote-quartz veins |
| 1900 | 376577 | 5139975 | A | 407530 | Volcanic breccia | | | | Block in a "debris cone"; Volcanic breccia: locally the matrix is completely replaced by sulphides (pyrite), the outcrop nearby also shows the same texture than the block= seems to be a zone of deformation of some kind |
| 1901 | 376533 | 5139980 | | | Volcanic breccia | 025/70 | | | Here the matrix is definetely purple/red. Lots of clasts, some of them show a weird circular alteration pattern. Carbonate crust. |
| 1903 | 376500 | 5140062 | | | Pillow breccia | 035/55 | | | Cliff; Pillow breccia: red/purple matrix in between the pillows, pillows (10cm-40cm), as usual here, s0/s1= N035/55 |
| 1904 | 376462 | 5140111 | | | Volcanic breccia | | | 25 | Bump near the cliff; Volcanic breccia: red/purple matrix, epidote/quartz veins, magnetic, fault= N025 |
| 1905 | 376417 | 5140188 | | | Volcanic breccia | | | | Bump near the cliff, 15m²; Volcanic breccia: matrix is siliceous and pale green, lots of epidote veins |
| 1906 | 376282 | 5140272 | | | Volcanic rock | | | 035/80 | Side of the bump, 4m²; Volcanic rock (20-30%); Epidote-quartz veins (70-80%): N035/80 |
| 1907 | 376301 | 5140172 | | | Volcanic breccia | | | | Small bump, 5m²; Volcanic breccia with red/purple matrix/alteration |
| 1908 | 376309 | 5140118 | | | Volcanic breccia | | | | Same as 1907 |
| 1909 | 376352 | 5140036 | | | Pillow breccia | | | | Same as 1908: clasts here look like pillows |
| 1910 | 376368 | 5140015 | | | Volcanic breccia | 010/85 | | | Volcanic breccia: up to 65-70% red matrix, really deformed |
| 1911 | 376405 | 5139925 | | | Volcanic breccia | | | | Side of the mountain, 10-15m²; covered with moss; Volcanic breccia: same as 1908, lots of epidote-quartz veins |
| 1912 | 376515 | 5139703 | | | Volcanic breccia | | | | Smaller cliff, 10m², continuous outcrop; Volcanic breccia: red/purple matrix/alteration, very magnetic |
| 1913 | 376524 | 5139684 | | | Volcanic rock | | | | Same cliff; Volcanic rock: brecciated ?, looks more massive here, lava flows or joint system= N280/55, the red/purple alteration seems really pervasive here |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1914 | 376549 | 5139677 | | | Volcanic breccia | | | 290/80 285/24 | Same cliff; Same rock as 1913: looks really brecciated here even if the outcrop itself looks more massive, pillow relics ?, joint systems= N290/80 N285/24 (don't think it is a kind of lava flow) |
| 1915 | 376625 | 5139639 | | | Volcanic breccia | | | 195/70 | ± the same cliff; Less fractured thant 1914, looks brecciated again ("in situ" breccification, same rock as 1914), epidote/chlorite/quartz intense veining (N195/70, seems to rotate), carbonate veinlets |
| 1916 | 376644 | 5139669 | | | Volcanic breccia | | | | Same cliff; Extremely brecciated (smaller clasts), red/purple alteration matrix, a lot of epidote veins ± quartz |
| 1917 | 376659 | 5139667 | | | Volcanic breccia | 040/75 | | 110/80 | Same cliff; Looks brecciated (there are probably pillow relics again), Big fault (N110/80): only a big depression in the rock, no fault gauge or anything, schistosity is parallel to veining |
| 1918 | 376705 | 5139709 | | | Volcanic breccia | 030/85 | | 300/35 | Same cliff; Same rock as 1917: joint= N300/35, schistosity/veins= N030/85 |
| 1919 | 376744 | 5139733 | | | Volcanic breccia | | | 040/75 | Same cliff; Volcanic breccia (70%): samething as 1918, 30% 2-3m thick zone of highly deformed and highly veined rock (N040/75, maybe a zone between two pillow flows?), very rich in red/purple stuff (jaspe?)= sedimentary environment ? |
| 1920 | 376778 | 5139759 | | | Pillow breccia | 055/85 | | | Same cliff; Same as 1917: pillow relics here, above the pillows (towards the south) it is possible to see the deformed/schistose stuff |
| 1921 | 376784 | 5139790 | | | Pillow breccia | | | 015/65 | Same cliff; Volcanic breccia: pillows?, red/purple alteration +chlorite +epidote, fault/joint= N015/65 |
| 1922 | 377154 | 5140087 | | | Pillow breccia | | | | Side of the road, 5m², ugly; Volcanic breccia: pillow relics?, red/purple matrix/alteration, epidote/quartz veins, chloritized, carbonated |
| 1923 | 378112 | 5140498 | | | Quartz wacke | 030/85 | | 100/30 | Side of the Etchemin river, 1m²; quartz wacke: 5% quartz clasts, medium green, very good schistosity, joint= N100/30 |
| 1924 | 378183 | 5140554 | | | Quartz wacke | 035/79 | | | Side of the river, 20m²; quartz wacke (60%): like 1923A; Ultramafic intrusion (40%, really an intrusion ?): altered, ± talc, 5m², ± round intrusion |
| 1925 | 378214 | 5140565 | | | Quartz wacke | 035/70 | | | Side of the river, 50m²; quartz wacke (70%): like 1924A, here it is more an alternance of green/gray/light purple wacke schist, good schistosity, still possible to see cross-laminations; Mafic volcanic (20%): medium green, fine-grained, ±massive, dark green phenocrysts, carbonate veinlets; Deformation zone (10%): between A&B, green medium green, N042. |
| 1926 | 377956 | 5140214 | | | Mudshale | N035 | | | Side of the river, <1m²; Mudshale: black, with up to 40% clasts (paler, ± beige), seem to be sedimentary |
| 1927 | 377889 | 5140159 | | | Mudshale | 035/80 | | | Mudrock/mudshale with clasts: matrix is dark gray-black, clasts are brown or beige, really deformed/broken |
| 1928 | 377796 | 5140112 | | | Mudshale | | | | Same as 1927 |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1929 | 377513 | 5140068 | A, B | 407531, 407532 | Quartz wacke/schist | 035/80 240/33 | | | Side of the river; quartz wacke/schist (60%): ±sandstone, pale gray green, small layer of thin phyllosilicates, locally rusted; Ultramafic white rock (10%): altered ultramafic rock, white chromite or pitchblende ?; Ultramafic rock (30%): enclaves in A, or intrusions ?, really deformed, seems to be in A |
| 1930 | 377727 | 5140066 | A | 407533 | Quartz wacke/sandstone/schist | | M 015/05 | 320/65 140/10 | Same as 1929A, locally rusted, some sulphides; Locally, the sandstone changes to a more cherty stuff, still with the green phyllosilicates layers; M fold axis= N015/05, joint set: N320/65, N140/10 |
| 1931 | 377723 | 5140054 | | | UM rock | | | | Side of the river, 30m²; Ultramafic rock (60%): dark green-black, altered, ±chromite, ±pyroxene, huge intrusion squeezed in the host rock; quartz wacke-sandstone/schist (35%): same as 1930; Ultramafic white rock (05%): represents the contact between the ultramafic rock and the mudrock (N040/70) |
| 1932 | 377711 | 5140048 | | | Mudshale | 045/85 | | | Side of the river, continuous outcrop; Contact between the black mudshale/ultramafic rock; Mudshale (80%): dark gray-black-blue, locally chunks of py (2-4cm, 1-2%); Ultramafic rock (20%): the contact between A&B is a deformed zone (N045, 1cm-thick) |
| 1933 | 377668 | 5139959 | | | Black-blue mudshale | 055/75 | | | Side of the river; Black-blue mudshale |
| 1934 | 377543 | 5139895 | | | Black-blue mudshale | 035/71 050/70 | | | Same as 1933 |
| 1935 | 377482 | 5139887 | | | Quartz wacke/lapilli tuff | 035/70 | | | Side of the river, continuous outcrop; Quartz wacke/lapilli tuff (80%): light green, up to 40% quartz clasts, some rust, 1% sulphides; quartz veins (20%): 1mm-2cm |
| 1936 | 377447 | 5139875 | A | 407534 | Quartz wacke/lapilli tuff | 325/20 | E 200/85 | | Same as 1935: veins are folded/deformed (20%, ± parallel to schistosity, otherwise no particular orientation), locally rusted (py chunks), elongation lineation= N200/85 |
| 1937 | 377393 | 5139817 | | | Quartz wacke/sandstone/schist | | | | Looks more like the quartz sandstone/silstone/schist of 1930, not a lot of quartz clasts here |
| 1938 | 377308 | 5139707 | | | Black-blue mudshale | 035/80 | | | Side of the river, 20m²; Black-blue mudshale: locally rusted, spots= chunks |
| 1939 | 378253 | 5140556 | | | UM altered rock | | | N220, N025 | Side of the river, continuous outcrop; Ultramafic altered rock (85%): ± massive, contains some high deformation zone (N220, N025); quartz sandstone/siltstone/schist (15%): light gray-green (towards the west); Contact between A&B looks ± gradual/abrupt |
| 1940 | 378220 | 5140552 | | | Purple/green quartz wacke/schist | | | | Side of the river, in front of 1925; Purple/green quartz wacke/schist: good schistosity, purple mudshale laminae (1-5cm) |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1941 | 378186 | 5140548 | | | Quartz wacke | | | | Same rock as 1924 except there is no ultramafic rock here; quartz wacke (feldspar?) + up to 20% quartz-chlorite veins |
| 1942 | 378069 | 5140389 | | | Altered serpentinite | | | | Side of the river, 10-12m²; Altered ultramafic rock: dark green-black, not very deformed/broken, rich in pyroxene (20%) |
| 1943 | 378051 | 5140366 | | | Altered serpentinite | | | | Same as 1942 |
| 1944 | 378054 | 5140336 | | | Black-blue mudshale | 045/72 | | | Side of the river, continuous outcrop; Black-blue mudshale: to the west the rock is locally more massive= more rich in quartz laminae, ± rusted |
| 1945 | 376554 | 5139586 | | | Volcanic breccia | | | | Side of the trail, 12-15m²; Volcanic breccia: red/purple matrix/alteration, epidote veins |
| 1946 | 376426 | 5139497 | | | Volcanic breccia | | | | Same as 1945 |
| 1947 | 376414 | 5139476 | | | Pillow breccia | | | 030/85 | Side of the trail, 7-8 m²; Volcanic breccia: pillow relics, extremely purple/red, lots of epidote veins + chlorite, deformation/veins= N030/85 |
| 1948 | 376353 | 5139457 | | | Volcanic breccia | | | | Side of the trail, 4m²; Volcanic breccia: "in situ", no purple/red alteration, several epidote veins= stockwork, 5m to the west, we see the purple alteration again |
| 1949 | 376171 | 5139517 | | | Quartz wacke | 055/75 | | | Near the trail, 10m²; quartz wacke (85%): medium green, up to 40% quartz clasts, 15% quartz veins: several orientation but N080/55 is the main one |
| 1950 | 376126 | 5139523 | | | Red mudrock/shale/siltstone | 050/70 | | | Near the trail, 15m²; Red mudrock/shale/siltstone (40%); quartz wacke (20%): green, up to 35% quartz veins; Volcanic breccia (40%): pillow relics, purple/red alteration, epidote/chlorite veins; The contact between A&B is quite neat (more quartz veins though) while the contact between A&C is not visible. |
| 1951 | 376083 | 5139530 | | | Volcanic breccia | | | | Near the trail, 8m²; Volcanic breccia: red/purple alteration/matrix, maybe some very red clasts are really red sedimentary rock? Incorporated in the breccia. |
| 1952 | 376009 | 5139577 | | | Pillow lavas | 055/75 | | | See 1953. We found a chunk of wacke in-between the "alleged pillows" the outcrop 1953 is clearly a pillow lava sequence so 1952 is the same. |
| 1953 | 375977 | 5139596 | | | Pillow lavas | | | | Near the trail, 50m², huge cliff; Pillow lavas: does not seem brecciated or it is only "in situ" breccification; Between the pillows, it is either a pale purple stuff (sed?) or it is filled with carbonates; Locally the rock is really rusted (near the carbonates); it is not possible to identify the top of the sequence; Again, pillows are really purple but they look way more volcanic than the stuff of 1952. |
| 1954 | 375039 | 5139393 | | | Volcanic breccia | | | | Side of a ski-doo trail; Volcanic breccia: dark green, epidote veins, + small red/purple alteration veins |
| 1955 | 374978 | 5139355 | | | Volcanic breccia | | | | Same as 1953 but no purple alteration here. |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1956 | 374811 | 5139510 | | | Pillow lavas | | | | Looks like 1953, not a lot of carbonates though |
| 1957 | 374742 | 5139544 | | | Pillow lavas | | | | Same as 1956. |
| 1958 | 374852 | 5139661 | | | Volcanic breccia | | | | Near the trail, 15-20m², wet and dirty; Volcanic breccia: pillow relics, same as usual |
| 1959 | 374884 | 5139640 | | | Volcanic breccia | | | | Same as 1958: pillow relics?, green-purple |
| 1960 | 376653 | 5140697 | | | Volcanic breccia | | | | 1m², wet-dirty; Volcanic breccia: purple and green, deformed; |
| 1961 | 376630 | 5140653 | | | Volcanic breccia | | | 020/65 | 4m², wet; Volcanic breccia (50%): green; Epidote veins (50%): parts of the outcrop are completely covered with ep veins (N020/65) |
| 1962 | 376166 | 5140162 | | | Volcanic breccia | | | | Cliff, 20m², wet-ugly; Volcanic breccia: purple and green, epidote veins; |
| 1963 | 376151 | 5140096 | | | Volcanic breccia | 190/85 | | | Same as 1962. |
| 1964 | 375674 | 5140219 | | | Mafic volcanics | | | | Side of the trail, 3m²; Mafic volcanics: dark blue, strongly magnetic, carbonate veinlets, epidote veins, does not seem brecciated |
| 1965 | 375295 | 5139874 | | | Mafic volcanics | | | | Side of the trail, 2m²; Mafic volcanics: purple veinlets, seem to be the same rock as 1964, tiny sulphides (<1%), ±brecciated (purple veinlets), epidote-carbonate veins |
| 1966 | 375012 | 5139738 | | | Mafic volcanics | | | | Side of the trail, 1m²; Same as 1965: chlorite veinlets + chloritized phenocrysts |
| 1967 | 374970 | 5139734 | | | Pillow breccia | | | | Side of the trail, 2m²; Pillow breccia: between pillows= chlorite+epidote+purple stuff, pillows are breccified (chlorite+epidote) |
| 1968 | 374946 | 5139726 | | | Pillow breccia | | | 260/30 | Side of the trail, 5m², cliff-wet; Same as 1967: veins= N260/30, pillow relics ? |
| 1969 | 374843 | 5139687 | | | Oxydized rock | | | 230/55 | Side of the trail, 10m²; Seems to be the same rock here but it is completely oxydized/altered in red/purple, there are still pillow relics, epidote-chlorite-quartz veins; 10m to the west, the rock is amygdular (carbonate-filled vesicules), the purple alteration is also less important, joint/deformation zone (N230/55) |
| 1970 | 374587 | 5139496 | | | Oxydized rock | | | 263/40, 300/60 | Side of the trail, 5m²; Same rock as 1969: up to 10% quartz-epidote veins (N263/40, N300/60) |
| 1971 | 374254 | 5139504 | | | Oxydized rock | | | | Same as 1969. |
| 1972 | 374165 | 5139590 | | | Pillow breccia | | | | Side of the trail, 15m²; Pillow breccia: no purple alteration here, chlorite-quartz± epidote veins + filling between the pillows, breccified |
| 1973 | 374218 | 5139956 | | | Quartz wacke | | | | Side of the trail, 15m², blocks??; quartz wacke (90%): up to 40% quartz clasts, 5-10% chlorite veins; 10% quartz veins (neat) |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1974 | 374151 | 5139505 | | | Pillow breccia | | | | Ridge, $10m^2$; Volcanic breccia: pillow relics, the rock is blue-gray, epidote-chlorite veining; 10m to the south, it is possible to find the purple alteration again |
| 1975 | 374160 | 5139368 | | | Pillow breccia | | | | Looks similar to 1974: purple alteration veinlets, epidote ±chlorite ±quartz veinlets, strongly magnetic |
| 1976 | 374199 | 5139307 | | | Red mudshale | | | | $2m^2$; Red mudshale: jaspe?, red brick |
| 1977 | 374184 | 5139258 | | | Quartz wacke | 082/34 | | 005/51 | Side of the trail, 25-30$m^2$; quartz wacke (90%): same as 1973; 10% quartz vein: half are parallel to schistosity while the other half have no perpendicular orientation; Joint= N005/51 |
| 1978 | 374247 | 5139252 | | | Quartz wacke | | | 030/75 | Side of the trail, $5m^2$; quartz wacke (65%): pale green and purple (epidotized, oxydized); quartz veins (35%): 0.2-0.5 cm, N030/75, some of the quartz veins are also purple (pale); 20m to the east, there are purple mudrock clasts in the wacke, Also the quartz clasts seem to be purple in a light green matrix |
| 1979 | | | A | 407535 | Mafic schist/volc rock | 055/43 | | | Side of the trail, $20m^2$; Mafic schist/volc rock: strong schistosity, dark green to medium green, purple/red veinlets + clasts, carbonate veins, protolith?= volc or sed |
| 1980 | 374660 | 5139271 | | | Deformed volc breccia | 050/60, 060/60 | | 305/45 | Side of the trail, $15m^2$; Deformed volcanic breccia (60%): good schistosity/foliation, up to 20% epidote-quartz veins, chloritized, purple streaks or laminae, magnetic; Red mudrock (40%): red brick color; It is possible to see the contact between A&B, it is very neat/sharp but there is no evidence of what is coming first; Joint= 305/45 |
| 1981 | 374763 | 5139239 | | | Deformed volc breccia | 040/50 | | | Side of the trail, $20m^2$; Deformed volcanic breccia (60%): same as 1980A, mafic rock with purple veins?/alteration?; quartz wacke (40%): medium to pale green, chlorite veins |
| 1982 | 374921 | 5139243 | | | Quartz wacke | | | | Side of the trail, $5m^2$; quartz wacke: pale green and purple, chloritized, not particularly deformed |
| 1983 | 376958 | 5141081 | | | Volcanic breccia | | | | Side of a trail, 7-8$m^2$; Volcanic breccia: rock is dark blue-gray, strongly magnetic, purple veinlets/streaks, 3-5% epidote ± quartz veins |
| 1984 | 377010 | 5141095 | | | Volcanic breccia | | | | 10-15$m^2$; Volcanic breccia (90%): same as 1983; Red mudrock (10%): red brick to purple colored rock, good schistosity. Contact is approximately parallel to schistosity (N035/70). Red stuff is "under" the breccia. |
| 1985 | 376959 | 5141123 | | | Pillow breccia | | | 080/50 | 4-5$m^2$; Same as 1983, ep ± quartz veins (N080/50), pillow relics |
| 1986 | 376954 | 5140634 | | | Volcanic breccia | | | | Side of the trail, $4m^2$, really flat; Mafic to intermediate volcanics breccia: medium green with darker phenocrysts clasts (75%, 0.5-5cm, subangular) in a darker chloritic matrix (25%), looks like there are some epidote veins, 1% sulphides (pyrite, disseminated) |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1987 | 377000 | 5140590 | A | 407536 | Volcanic breccia | | | | Side of the trail, 6m², crap pile; Same as 1986: sulphides here also (py, <1%, diss.) |
| 1988 | 377067 | 5140531 | | | Mafic volcanics | | | | Near a trail, 30m²; Mafic volcanics: probably same composition as 1987, maybe a little more mafic, not as brecciated, up to 20% epidote veins |
| 1989 | 377201 | 5140562 | | | Mafic volcanics | | | | Side of a trail, 10m²; Probably the same kind of rock than 1988, epidotized, 10% quartz veins: ±stockwork |
| 1990 | 377229 | 5140626 | | | Volcanic breccia | | | | Side of a trail, 20m²; Same as 1986 |
| 1991 | 377188 | 5140740 | | | Mafic volcanics | | | | Side of a trail, 6m²; Mafic volanics (90%): medium green with darker phenocrysts; 10% epidote-quartz-chlorite veins |
| 1992 | 377090 | 5140806 | | | Mafic volcanics | | | | Side of a trail, 6m²; Looks similar to 1991, maybe less veins/alteration |
| 1993 | 377037 | 5140794 | | | Mafic volcanics | | | | Same as 1992, maybe more brecciated, again some sulphides (pyrite, disseminated, <1%) |
| 1994 | 377151 | 5140764 | A | 407537 | Mafic volcanics | | | 190/82 | Side of a trail, 10m²; Same as 1991: probably more brecciated, locally up to 2% pyrite (euhedral), joint= 190/82 |
| 1995 | 377149 | 5140873 | | | Mafic volcanics | | | | Big cliff near the trail, 70m²; |
| 1996 | 377300 | 5140538 | | | Volcanic breccia | | | | Side of a trail, 2m²; Volcanic breccia with purple/red alteration |
| 1997 | 377369 | 5140554 | | | Volcanic breccia | 025/65 | | | Side of a trail, 3m²; Volcanic breccia with purple alteration and purple cherty matrix + red clasts within the breccia |
| 1998 | 377417 | 5140548 | | | Volcanic breccia | | | | Side of the trail, 10m²;  Same as 1977: volcanic breccia with purple alteration |
| 1999 | 377137 | 5140490 | | | Volcanic breccia | | | | Side of a trail, 7m²; Mafic to intermediate volcanics breccia: medium green with darker phenocrysts clasts in a darker chloritic matrix |
| 2000 | 377051 | 5140400 | | | Volcanic breccia | 032/68 | | | Side of a trail, 10m²; Volcanic breccia with purple alteration/matrix/clasts (clasts seem tiny here... while some are definitely bigger |
| 2001 | 377026 | 5140406 | | | Volcanic breccia | | | | Side of the trail, 10m²; Same as 1986: Mafic to intermediate volcanics breccia |
| 2002 | 377571 | 5140397 | | | Volcanic breccia | | | 290/17 | Cliff, 30m²; Volcanic breccia with purple alteration between/in the clasts, strongly magnetic, epidote veins (<5%), joint= N290/17 |
| 2003 | 377540 | 5140428 | | | Volcanic breccia | | | | 10-15m²; Volcanic breccia with purple alteration/matrix/clasts, more epidote veins here & also some quartz veins |
| 2004 | 377477 | 5140503 | | | Volcanic breccia | | | | 1m²; Same as 2004; |
| 2005 | 377420 | 5140474 | | | Volcanic breccia | | | | 1m²; Same as 2004; |
| 2006 | 377352 | 5140449 | | | Volcanic breccia | | | | 3m²; Same as 2004; |
| 2007 | 377325 | 5140350 | | | Volcanic breccia | | | | Cliff, 15m²; Volcanic breccia with purple alteration (less important here), several epidote + quartz veins (10-15%, quartz in the inside and epidote on the outside), quartz only veins (stockwork style) |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 2008 | 377343 | 5140284 | | | Volcanic breccia | | | | 10m²; Volcanic breccia: 60% clasts (really angular, ± purple alteration), 40% matrix (cherty, ±matrix) |
| 2009 | 377357 | 5140228 | | | Volcanic breccia | 050/70 | | | Cliff, 30m²; Volcanic breccia: ±brecciated, way less matrix here, do not see the clasts here |
| 2010 | 375518 | 5139820 | | | Mafic volcanics | | | | 6m²; Mafic volcanics: medium green, up to 20-30% epidote-quartz veins (stockwork style) |
| 2011 | 375488 | 5139824 | | | Volcanic breccia | | | | 3m²; Volcanic breccia: with purple alteration, carbonate-epidote veins (10%, carbonate in the inside, epidote in the outside), magnetic |
| 2012 | 375455 | 5139826 | | | Volcanic breccia | | | | 3m²; Volcanic breccia with purple alteration: same as 2011 |
| 2013 | 375295 | 5139687 | | | Pillow breccia | | | | 5m²; Pillow breccia: looks similar to 2012, maybe a little bit less brecciated, between the clasts/pillows= chloritized stuff + purple alteration |
| 2014 | 375346 | 5139610 | | | Mafic volcanics | | | | 10m²; Mafic volcanics: medium green, similar to 2010, carbonate + epidote veins, ± brecciated |
| 2015 | 375672 | 5139896 | | | Red mudrock | 035/74 | | | In a trail, 1m², blocks; Red mudrock (50%): red brick color |
| 2016 | 375695 | 5139926 | | | Volcanic breccia | | | | Volcanic breccia: up to 20% to 30% epidote-quartz veins, the rock is green-purple, strongly magnetic |
| 2017 | 375663 | 5139958 | | | Pillow breccia | | | | 15m²; Pillow breccia: pillows are ± round (impossible to determine where is the top), 10-50cm, in between the pillows= cherty stuff + chlorite + purple alteration, pillows are breccified + purple alteration |
| 2018 | 375672 | 5140020 | | | Breccia | | | | Big bump, 4-5m²; Breccia: extremely brecciated rock (clasts are not bigger than 2cm, clasts of purple rock, quartz and green rock, 50% clasts (angular)/50% matrix (greener, chlorite), some parts are less breccified (clasts are bigger) |
| 2019 | 375706 | 5139956 | | | Mafic volcanics | | | | 2m²; Mafic volcanics: brecciated, up to 40-50% epidote-quartz veins (stockwork style) |
| 2020 | 375739 | 5139917 | | | Red mudrock | 040/65 | | | 3m²; Red mudrock (50%): red brick color, good schistosity, up to 10% quartz veins parallel to schistosity; quartz wacke (50%): up to 40% quartz clasts; quartz is to the south of the red mudrock |
| 2021 | 375884 | 5139783 | | | Quartz wacke | | | | 5m²; Quartz wacke: same as 2020B |
| 2022 | 376049 | 5139571 | | | Volcanic breccia | | | | 4m²; Volcanic breccia: lots of chlorite-purple-carbonate alteration, really brecciated |
| 2023 | 376080 | 5139616 | | | Mafic volcanics | | | | 5m²; Mafic volcanics: chloritized, up to 40-50% epidote-quartz veins |
| 2024 | 376125 | 5139652 | | | Pillow breccia | | | | 30m²; Pillow breccia: like 2017, sometimes in between the pillows the filling stuff seem to be sedimentary (±silstone) |
| 2025 | 376137 | 5139841 | | | Pillow breccia | | | | 40m²; Pillow breccia: same as 2024 |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 2026 | 376171 | 5139869 | | | Pillow breccia | | | | 20m²; Pillow breccia (90%); 10% quartz veins (too dirty to see where exactly the quartz is here) |
| 2027 | 376222 | 5139832 | | | Pillow breccia | | | | 10m²; Pillow breccia: same as 2026, epidotization seem to postdate the purple alteration |
| 2028 | 376272 | 5139766 | | | Pillow breccia | | | | 5m²; Probably the same thing, purple alteration, some quartz veins (2%) |
| 2029 | 376354 | 5139683 | | | Volcanic breccia | | | | 25m²; Volcanic breccia: purple alteration-breccia, don't seem to be pillowed here |
| 2030 | 376444 | 5139610 | | | Volcanic breccia | | | | Same as 2029 |
| 2031 | 376224 | 5138431 | | | Clasts mudstones | 230/82 | | | Side of the road; Clasts mudstones: up to 30-35% clasts (mudstone (green to gray), laminated carbonated rock/mudrock (up to 5cm, rotated)), gray matrix (± metallic gray) |
| 2032 | 375175 | 5137434 | | | Mudstone with mudrock chunks | 200/85 | | | Side of the road; Mudrock with big mudrock chunks: similar to 2031 without the small green-gray clasts, 1% chunks of pyrite |
| 2033 | 376734 | 5138884 | | | Mudstone with mudrock chunks | | | | Side of the road; The rock is very similar to 2032, but is probably more deformed/heterogeneous, 10-20% mudrock clasts |
| 2034 | 376888 | 5139031 | | | Mudstone with mudrock chunks | 050/85 | | | Side of the road; Same as 2033 |
| 2038 | 378048 | 5141351 | | | Volcanic breccia | | | | Ski trail, 1m², really flat; Volcanic breccia: no pillow here, purple and green (chlorite) alteration, ±epidote, some fragments are really magnetic |
| 2039 | 377978 | 5141369 | | 451002 | Volcanic breccia | | | | Ski trail, 5m²; Breccia: no purple alteration here, only epidote veinlets, mafic volcanics, brecciated, <1% disseminated pyrite locally, <1% quartz veins (1mm-1cm); |
| 2040 | 377959 | 5141341 | | 451003 | Volcanic breccia | | | | Ski trail, 5m²; Same as 2039, rusted and up to 10% pyrite locally |
| 2041 | 377925 | 5141384 | | | Mafic pillows | | | | Ski trail, 5m²; Mafic pillows: between the pillows= dark hyaloclastite ? (snake skin with garnet), 1% disseminated sulphides near the quartz veins and in between the pillows, <1% quartz±carbonate veins |
| 2042 | 377675 | 5141298 | | | Mafic pillows | | | | Ski trail, 5m²; Same as 2039, up to 10% epidote veins ± hematite |
| 2043 | 377588 | 5141286 | | | Volcanic breccia | | | | Ski trail, 10m²; Volcanic breccia: dark green volcanics, really magnetic, fragments are smaller here (2cm-4.5cm), pillow relics ? |
| 2044 | 377489 | 5141280 | | 451004 | Mafic volcanics | | | 195/70 | Ski trail, 15m²; Mafic volcanics (33%): brecciated ?, epidote veins, up to 10% quartz veins ±chlorite ±chalcopyrite (N195/70); Volcanic breccia (66%): red-purple matrix (±soft, 40%) and volcanic clasts (angular, 60%), up to 15-20% epidote veins |
| 2045 | 377379 | 5141196 | | | Volcanic breccia | | | | Ski trail, 60m²; Volcanic breccia: looks similar to 2044B but the matrix here is green (mafic/chlorite), some purple alteration in "veins", up to 15% epidote veins, 2% quartz veins |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 2046 | 377353 | 5141179 | | 451005 | Volcanic breccia | | | | Ski trail, 60m², same cliff as 2045; Volcanic breccia: 62% mafic clasts (strongly magnetic), 35% matrix (mafic?, epidotized, in the matrix there is up to 37% black glossy clasts (look UM or extremely altered mafic, it is what i have called hyaloclastite earlier), sometimes the matrix is brick-red), 5% epidote veins, <1% carbonate veins |
| 2047 | 377339 | 5141120 | | 451006 | Volcanic breccia | 050/80 | | | Ski trail, 20m²; Volcanic breccia: less matrix here, the matrix looks different (more chloritized/dark, only a few "ultramafic" clasts), rusted locally (veins/zones rich in pyrite associated with a quartz veins ?), locally the rock is porphyroblastic |
| 2048 | 377420 | 5141100 | | | Volcanic breccia | | | | Ski trail, near the top, 20m²; Same as 2046, here the purple alteration is within the clasts not in the matrix, the matrix is similar to 2046 with the glossy black clasts (look less like ultramafic clasts here), 2-3% carbonate veins |
| 2049 | 377518 | 5141119 | | | Volcanic breccia | 050/70 | | | Ski trail; Volcanic breccia: pillows, purple alteration/veins, between the pillows the matrix looks like the matrix of 2048, 10% epidote veins |
| 2050 | 377613 | 5141124 | | | Volcanic breccia | | | | Ski trail; same as 2048 |
| 2051 | 378050 | 5141119 | | | Volcanic breccia | | | | Ski trail, 20m², covered with lichens; Volcanic breccia: looks similar to 2050, green and purple, pillowed |
| 2052 | 378264 | 5140984 | | | Volcanic breccia | | | | Same as 2051, more purple alteration here |
| 2053 | 377504 | 5140980 | | | Volcanic breccia | 020/78 | | | Top of the Mont-Orignal; Volcanic breccia: similar to the breccias seen today, maybe no black glossy clasts in the matrix here, purple and green, carbonate-filled amydules, carbonate veins (1-2%), epidote veins (5-10%), ± pillows |
| 2054 | 377511 | 5140765 | | | Pillow breccia | | | | Ski-trail; Pillow breccia: huge pillows (up to 1m), purple and green, really chloritized in between the pillows (± apple-green with purple streaks (clasts or veinlets), epidote veins |
| 2055 | 377485 | 5140764 | | 451007 | Pillow breccia | | | | Ski trail, 40m²; Same as 2054, strong chlorite/epidote alteration between the pillows, there are also the black glossy clasts in between the pillows, some rust locally, no visible sulphides |
| 2056 | 377444 | 5140762 | | | Volcanic breccia | | | | Ski trail, 20m²; Volcanic breccia: purple and green, purple alteration around the clasts, epidote veins/stockwork cross-cutting the breccification (15-20%), chlorite veinlets, clasts are either mafic volcanic or are completely chloritized or altered in purple, matrix seems to be siliceous/cherty |
| 2057 | 377379 | 5140810 | | | Volcanic breccia | | | | Ski trail, 40m²; Volcanic breccia: mafic volcanics, no purple alteration, epidote-quartz veins (10%), chlorite veinlets; 6-7m to the NW, the rock is vesicular/amygdular (carbonate), the purple alteration shows up again |

| Station | East | North | Sample | ActLabs # | Main Rock type | Schistosity | Lineation | Veins/Fractures | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 2058 | 377358 | 5140849 | | | Pillow breccia | | | | Pillow breccia: same as everywhere else |
| 2059 | 377362 | 5140921 | | | Volcanic breccia | 020/40 | | | Volcanic breccia: same as 2057, no purple alteration, ± well-defined schistosity |
| 2060 | 377374 | 5140931 | | | Volcanic breccia | | | | Ski trail, 20m²; Volcanic breccia: strongly breccified, purple and green, angular clasts in a ±cherty matrix, similar to what we have seen elsewhere |
| 2061 | 377389 | 5140987 | | 451008 | Volcanic breccia | 050/52 | | 050/52 | Ski trail, 15m²; Volcanic breccia: dark to medium green (± chloritized), no purple alteration, epidote veins, chlorite veinlets, up to 10-15% quartz-carbonate veins (in a deformation zone/fault), disseminated sulphides |
| 2062 | 377306 | 5141149 | | | Pillow breccia | | | | Ski trail, 12m²; Pillow breccia: purple and green, as usual |

# Appendix II

Trace element geochemistry results for grab samples

| Analyte Symbol | Au | Ag | Cu | Cd | Mo | Pb | Ni | Zn | S | Al | As | Ba | Be | Bi | Br | Ca | Co | Cr | Cs | Fe | Hf |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppb | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | % | ppm |
| Detection Limit | 2 | 0.3 | 1 | 0.3 | 1 | 3 | 1 | 1 | 0.01 | 0.01 | 0.5 | 50 | 1 | 0.1 | 0.5 | 0.01 | 1 | 2 | 1 | 0.01 | 1 |
| Analysis Method | INAA | MULT INAA / TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | MULT INAA / TD-ICP | MULT INAA / TD-ICP | TD-ICP | TD-ICP | INAA | INAA | TD-ICP | TD-MS | INAA | TD-ICP | INAA | INAA | INAA | INAA | INAA |
| 407519 | 33 | 0.4 | 128 | < 0.3 | < 1 | 29 | 70 | 96 | 0.26 | 6.7 | 9.2 | 310 | < 1 | < 0.1 | < 0.5 | 3.98 | 49 | 123 | < 1 | 8.91 | 1 |
| 407520 | 21 | < 0.3 | 141 | < 0.3 | < 1 | 19 | 83 | 94 | 0.34 | 6.79 | 7.8 | 290 | < 1 | < 0.1 | < 0.5 | 5.35 | 53 | 126 | < 1 | 8.87 | < 1 |
| 407521 | 22 | < 0.3 | 212 | < 0.3 | < 1 | 7 | 73 | 196 | 0.38 | 6.45 | 7.3 | 260 | < 1 | < 0.1 | < 0.5 | 4.78 | 53 | 138 | < 1 | 10 | 1 |
| 407522 | 27 | < 0.3 | 53 | 0.7 | 2 | 8 | 33 | 162 | 0.47 | 3.36 | 8.8 | < 50 | < 1 | 0.2 | < 0.5 | 0.93 | 21 | 49 | < 1 | 5.91 | < 1 |
| 407523 | 23 | 0.4 | 324 | 2 | 3 | < 3 | 68 | 486 | 1.43 | 6.24 | 8.2 | < 50 | < 1 | 0.2 | < 0.5 | 5.19 | 55 | 88 | < 1 | 10.3 | 1 |
| 407524 | < 2 | < 0.3 | 144 | 0.6 | < 1 | < 3 | 61 | 177 | 0.1 | 6.17 | 9.9 | < 50 | < 1 | < 0.1 | < 0.5 | 7.98 | 49 | 72 | < 1 | 8.74 | 2 |
| 407525 | < 2 | < 0.3 | 283 | 0.4 | < 1 | < 3 | 70 | 106 | 0.49 | 6.56 | 7.4 | 270 | < 1 | < 0.1 | < 0.5 | 5.6 | 53 | 69 | < 1 | 8.76 | 2 |
| 407527 | 51 | < 0.3 | 36 | 0.9 | < 1 | < 3 | 61 | 357 | 0.01 | 8.06 | 29.9 | < 50 | < 1 | < 0.1 | < 0.5 | 10.4 | 55 | 53 | < 1 | 11 | 1 |
| 407528 | < 2 | < 0.3 | 8 | < 0.3 | < 1 | < 3 | 12 | 77 | < 0.01 | 8.68 | 9.9 | < 50 | < 1 | < 0.1 | < 0.5 | 1.95 | 9 | 10 | 1 | 2.04 | 1 |
| 407529 | 28 | 1 | 1520 | 0.8 | < 1 | < 3 | 120 | 129 | 0.34 | 6.08 | 11.4 | < 50 | < 1 | 0.5 | < 0.5 | 7.5 | 85 | 120 | < 1 | 9.64 | 1 |
| 407530 | < 2 | < 0.3 | 600 | < 0.3 | 1 | < 3 | 73 | 158 | 0.04 | 6.97 | 3.5 | < 50 | < 1 | < 0.1 | < 0.5 | 5.23 | 64 | 85 | < 1 | 8.84 | 1 |
| 407531 | 16 | 0.3 | 304 | 4.4 | < 1 | < 3 | 60 | 1180 | 2.3 | 6.04 | 5.8 | < 50 | < 1 | 0.3 | < 0.5 | 4.78 | 50 | 89 | 2 | 10.6 | 2 |
| 407532 | < 2 | < 0.3 | 38 | < 0.3 | < 1 | < 3 | 66 | 60 | 0.02 | 7.56 | 7.1 | 500 | 2 | < 0.1 | < 0.5 | 2.59 | 24 | 200 | 3 | 4.88 | 6 |
| 407533 | < 2 | < 0.3 | 7 | < 0.3 | < 1 | < 3 | 1320 | 32 | < 0.01 | 0.36 | 8.6 | < 50 | < 1 | < 0.1 | < 0.5 | 6.81 | 70 | 1960 | < 1 | 2.72 | < 1 |
| 407534 | 6 | < 0.3 | 25 | < 0.3 | < 1 | 38 | 39 | 80 | 0.69 | 7.97 | 14.6 | 940 | 2 | 0.1 | < 0.5 | 0.31 | 20 | 76 | 2 | 4.94 | 8 |
| 407535 | < 2 | < 0.3 | 147 | < 0.3 | < 1 | < 3 | 75 | 80 | 0.01 | 7.13 | 5.3 | 320 | < 1 | < 0.1 | < 0.5 | 6.07 | 52 | 165 | < 1 | 7.78 | 1 |
| 407536 | < 2 | < 0.3 | 132 | 0.4 | < 1 | < 3 | 75 | 129 | 0.24 | 6.54 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 4.39 | 54 | 98 | < 1 | 9.03 | < 1 |
| 407537 | < 2 | < 0.3 | 316 | < 0.3 | < 1 | < 3 | 62 | 122 | 0.32 | 5.76 | 3.8 | < 50 | < 1 | < 0.1 | < 0.5 | 5.02 | 48 | 88 | < 1 | 8.95 | 1 |
| 451002 | < 2 | < 0.3 | 104 | < 0.3 | < 1 | < 3 | 64 | 86 | 0.07 | 5.52 | 1.2 | < 50 | < 1 | < 0.1 | < 0.5 | 4.79 | 50 | 71 | < 1 | 8.49 | < 1 |
| 451003 | 22 | 0.5 | 566 | 3.1 | < 1 | < 3 | 66 | 279 | 1.81 | 6.67 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 6.12 | 70 | 76 | < 1 | 12.1 | < 1 |
| 451004 | < 2 | < 0.3 | 164 | 0.9 | < 1 | < 3 | 73 | 114 | 0.01 | 6.41 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 5.76 | 61 | 74 | < 1 | 9.04 | 1 |
| 451005 | < 2 | < 0.3 | 186 | < 0.3 | < 1 | < 3 | 61 | 88 | 0.01 | 5.52 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 9.28 | 50 | 73 | < 1 | 8.73 | 1 |
| 451006 | 46 | 1.6 | 5200 | 5 | < 1 | < 3 | 53 | 536 | 2.39 | 5.94 | 8.8 | 120 | < 1 | 0.3 | < 0.5 | 7.05 | 81 | 81 | < 1 | 11.7 | < 1 |
| 451007 | < 2 | < 0.3 | 263 | 0.9 | < 1 | < 3 | 76 | 104 | < 0.01 | 6.42 | 3.5 | < 50 | < 1 | < 0.1 | < 0.5 | 4.31 | 62 | 105 | 2 | 11.4 | < 1 |
| 451008 | < 2 | < 0.3 | 122 | 1.3 | < 1 | < 3 | 65 | 84 | 0.11 | 6.5 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 5.71 | 51 | 79 | < 1 | 9.38 | 1 |

| Analyte Symbol | Ge | Hg | In | Re | Ir | K | Li | Mg | Mn | Na | P | Rb | Sb | Sc | Se | Sn | Sr | Ta | Te | Ti | Th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppm | ppm | ppm | ppb | % | ppm | % | ppm | % | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | ppm |
| Detection Limit | 0.1 | 1 | 0.2 | 0.001 | 5 | 0.01 | 0.5 | 0.01 | 1 | 0.01 | 0.001 | 15 | 0.1 | 0.1 | 0.1 | 1 | 1 | 0.5 | 0.1 | 0.01 | 0.2 |
| Analysis Method | TD-MS | INAA | TD-MS | TD-MS | INAA | TD-ICP | TD-MS | TD-ICP | TD-ICP | INAA | TD-ICP | INAA | INAA | INAA | INAA/TD-ICP-MS | TD-MS | TD-ICP | INAA | TD-MS | TD-ICP | INAA |
| 407519 | 0.5 | < 1 | < 0.2 | < 0.001 | < 5 | 0.07 | 28.4 | 4.84 | 1250 | 2.83 | 0.035 | < 15 | < 0.1 | 49.3 | < 0.1 | < 1 | 73 | < 0.5 | 0.2 | 0.65 | < 0.2 |
| 407520 | 0.6 | < 1 | < 0.2 | < 0.001 | < 5 | 0.34 | 27.9 | 5.09 | 1320 | 1.96 | 0.032 | < 15 | 0.3 | 45.6 | < 0.1 | < 1 | 118 | < 0.5 | 0.2 | 0.57 | 0.7 |
| 407521 | 0.5 | < 1 | < 0.2 | 0.01 | < 5 | 0.04 | 32.3 | 6.04 | 1470 | 1.27 | 0.033 | 34 | 0.4 | 44.4 | < 0.1 | < 1 | 43 | < 0.5 | 0.2 | 0.61 | < 0.2 |
| 407522 | 0.3 | < 1 | < 0.2 | < 0.001 | < 5 | 0.05 | 13.3 | 2.63 | 820 | 1.1 | 0.023 | < 15 | 0.3 | 24 | < 0.1 | < 1 | 7 | < 0.5 | 0.2 | 0.38 | < 0.2 |
| 407523 | 0.3 | < 1 | < 0.2 | 0.01 | < 5 | 0.24 | 35.8 | 4.38 | 1290 | 0.25 | 0.027 | 23 | < 0.1 | 40 | < 0.1 | < 1 | 12 | < 0.5 | 0.1 | 0.53 | < 0.2 |
| 407524 | 0.6 | < 1 | < 0.2 | < 0.001 | < 5 | 0.03 | 13.2 | 3.35 | 1380 | 0.86 | 0.027 | < 15 | < 0.1 | 44.4 | < 0.1 | < 1 | 142 | < 0.5 | < 0.1 | 0.27 | 0.8 |
| 407525 | 0.7 | < 1 | < 0.2 | < 0.001 | < 5 | 0.03 | 37.6 | 4.74 | 1850 | 1.71 | 0.035 | < 15 | < 0.1 | 44.2 | < 0.1 | < 1 | 64 | < 0.5 | < 0.1 | 0.66 | 0.6 |
| 407527 | 0.9 | < 1 | < 0.2 | < 0.001 | < 5 | 0.25 | 15 | 2.24 | 1410 | 0.09 | 0.027 | < 15 | < 0.1 | 44.3 | < 0.1 | < 1 | 8 | < 0.5 | < 0.1 | 0.47 | < 0.2 |
| 407528 | 0.8 | < 1 | < 0.2 | < 0.001 | < 5 | 3.79 | 21.9 | 0.29 | 332 | 7 | 0.004 | < 15 | < 0.1 | 6.7 | < 0.1 | < 1 | 19 | < 0.5 | < 0.1 | 0.1 | < 0.2 |
| 407529 | 0.8 | < 1 | < 0.2 | 0.01 | < 5 | 0.02 | 19.9 | 3.78 | 1270 | 0.07 | 0.035 | < 15 | < 0.1 | 57.1 | < 0.1 | < 1 | 793 | 0.6 | 0.5 | 0.29 | < 0.2 |
| 407530 | 0.6 | < 1 | < 0.2 | < 0.001 | < 5 | 0.08 | 29.7 | 5.18 | 1730 | 1.53 | 0.025 | < 15 | 0.3 | 50 | < 0.1 | < 1 | 70 | < 0.5 | < 0.1 | 0.46 | < 0.2 |
| 407531 | 0.4 | < 1 | < 0.2 | 0.01 | < 5 | 0.08 | 39.8 | 5.7 | 1320 | 0.8 | 0.03 | < 15 | < 0.1 | 46.1 | < 0.1 | < 1 | 16 | < 0.5 | 0.1 | 0.48 | < 0.2 |
| 407532 | 0.5 | < 1 | < 0.2 | < 0.001 | < 5 | 1.53 | 22.4 | 2.44 | 844 | 3.63 | 0.111 | < 15 | < 0.1 | 18.6 | < 0.1 | < 1 | 167 | < 0.5 | < 0.1 | 0.17 | 8.6 |
| 407533 | 0.3 | < 1 | < 0.2 | < 0.001 | < 5 | 0.04 | 10.9 | 13.4 | 839 | 0.08 | 0.002 | < 15 | < 0.1 | 4.2 | < 0.1 | < 1 | 21 | < 0.5 | < 0.1 | 0.01 | < 0.2 |
| 407534 | 0.6 | < 1 | < 0.2 | < 0.001 | < 5 | 2.9 | 37.2 | 0.86 | 519 | 0.35 | 0.054 | 127 | 0.9 | 12.2 | < 0.1 | 2 | 45 | 1.2 | 0.1 | 0.54 | 10.8 |
| 407535 | 0.4 | < 1 | < 0.2 | < 0.001 | < 5 | 0.07 | 78.9 | 3.68 | 1520 | 3.06 | 0.019 | < 15 | < 0.1 | 44.1 | < 0.1 | < 1 | 402 | < 0.5 | 0.1 | 0.24 | < 0.2 |
| 407536 | 0.5 | < 1 | < 0.2 | < 0.001 | < 5 | 0.05 | 25.2 | 5.31 | 1520 | 3.15 | 0.032 | < 15 | < 0.1 | 46.1 | < 0.1 | < 1 | 25 | < 0.5 | < 0.1 | 0.66 | < 0.2 |
| 407537 | 0.5 | < 1 | < 0.2 | < 0.001 | < 5 | 0.05 | 20.4 | 4.73 | 1850 | 2.01 | 0.037 | < 15 | < 0.1 | 46.1 | < 0.1 | < 1 | 19 | < 0.5 | < 0.1 | 0.68 | < 0.2 |
| 451002 | 0.6 | < 1 | < 0.2 | 0.005 | < 5 | 0.04 | 19.8 | 5.02 | 1510 | 2.17 | 0.035 | < 15 | < 0.1 | 47.2 | < 0.1 | < 1 | 53 | < 0.5 | 0.1 | 0.52 | 0.9 |
| 451003 | 0.6 | < 1 | < 0.2 | 0.065 | < 5 | 0.02 | 19.3 | 4.61 | 1370 | 0.8 | 0.031 | < 15 | < 0.1 | 44.4 | < 0.1 | < 1 | 124 | < 0.5 | 0.5 | 0.59 | < 0.2 |
| 451004 | 0.4 | < 1 | < 0.2 | < 0.001 | < 5 | 0.04 | 30.8 | 4.89 | 1490 | 1.26 | 0.029 | < 15 | < 0.1 | 50.9 | < 0.1 | < 1 | 52 | < 0.5 | 0.1 | 0.19 | < 0.2 |
| 451005 | 0.6 | < 1 | < 0.2 | 0.001 | < 5 | 0.14 | 19.6 | 4.52 | 1630 | 1.05 | 0.02 | < 15 | < 0.1 | 38.3 | < 0.1 | < 1 | 133 | < 0.5 | < 0.1 | 0.18 | 0.4 |
| 451006 | 0.7 | < 1 | 0.2 | 0.013 | < 5 | 0.05 | 10 | 2.78 | 1020 | 0.52 | 0.026 | < 15 | 0.2 | 41.6 | 19.1 | < 1 | 282 | < 0.5 | 0.1 | 0.29 | < 0.2 |
| 451007 | 0.7 | < 1 | < 0.2 | < 0.001 | < 5 | 1.6 | 19.5 | 4.06 | 1650 | 2.05 | 0.032 | < 15 | 0.4 | 48.1 | < 0.1 | < 1 | 41 | < 0.5 | < 0.1 | 0.42 | < 0.2 |
| 451008 | 1 | < 1 | < 0.2 | 0.002 | < 5 | 0.03 | 22.2 | 5.51 | 1320 | 1.48 | 0.032 | < 15 | 0.2 | 48.1 | < 0.1 | < 1 | 31 | < 0.5 | < 0.1 | 0.57 | < 0.2 |

| Analyte Symbol | Tl | U | V | W | Y | La | Ce | Nd | Sm | Eu | Tb | Yb | Lu | Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | g |
| Detection Limit | 0.1 | 0.5 | 2 | 1 | 1 | 0.5 | 3 | 5 | 0.1 | 0.2 | 0.5 | 0.2 | 0.05 | |
| Analysis Method | TD-MS | INAA | TD-ICP | INAA | TD-ICP | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA |
| 407519 | < 0.1 | < 0.5 | 350 | 20 | 22 | 2.2 | 8 | 10 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.61 | 29.3 |
| 407520 | < 0.1 | < 0.5 | 339 | < 1 | 22 | 1.9 | 9 | < 5 | 1.6 | 0.7 | 1.2 | 3.1 | 0.59 | 32.2 |
| 407521 | < 0.1 | < 0.5 | 368 | < 1 | 22 | 2.3 | 9 | 7 | 1.6 | 0.7 | < 0.5 | 3.2 | 0.36 | 37.9 |
| 407522 | < 0.1 | < 0.5 | 211 | < 1 | 10 | 1.1 | < 3 | < 5 | 0.7 | 0.3 | < 0.5 | 1.5 | 0.23 | 32.5 |
| 407523 | < 0.1 | < 0.5 | 321 | < 1 | 19 | 1.5 | 7 | 6 | 1.4 | 0.5 | 0.6 | 2.6 | 0.53 | 33.5 |
| 407524 | < 0.1 | < 0.5 | 244 | < 1 | 23 | 2 | 7 | < 5 | 1.8 | 0.7 | 0.8 | 3.4 | 0.63 | 32.8 |
| 407525 | < 0.1 | < 0.5 | 376 | < 1 | 26 | 2.1 | 9 | < 5 | 1.7 | 0.7 | < 0.5 | 3.3 | 0.65 | 40.7 |
| 407527 | < 0.1 | < 0.5 | 358 | < 1 | 25 | 2.3 | 6 | < 5 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.63 | 38.9 |
| 407528 | 0.7 | < 0.5 | 69 | < 1 | 5 | 2.2 | 6 | < 5 | 0.6 | 0.3 | < 0.5 | 1.1 | 0.25 | 29.8 |
| 407529 | < 0.1 | < 0.5 | 172 | < 1 | 24 | 2.4 | 11 | < 5 | 2 | 0.9 | 0.6 | 3.7 | 0.68 | 28.9 |
| 407530 | < 0.1 | < 0.5 | 325 | < 1 | 26 | 2.2 | 10 | 10 | 1.9 | 1 | < 0.5 | 4.1 | 0.71 | 31.6 |
| 407531 | < 0.1 | < 0.5 | 344 | < 1 | 22 | 2.6 | 7 | 6 | 1.6 | 0.6 | < 0.5 | 3.2 | 0.58 | 34.1 |
| 407532 | 0.3 | < 0.5 | 49 | < 1 | 23 | 45 | 86 | 27 | 5.8 | 1 | < 0.5 | 2.5 | 0.45 | 25.9 |
| 407533 | < 0.1 | < 0.5 | 16 | < 1 | 2 | 5.4 | 7 | < 5 | 0.5 | < 0.2 | < 0.5 | 0.3 | < 0.05 | 25.8 |
| 407534 | 0.7 | < 0.5 | 77 | < 1 | 20 | 33.2 | 74 | 27 | 4.7 | 1.3 | < 0.5 | 2.5 | 0.44 | 19.5 |
| 407535 | < 0.1 | < 0.5 | 178 | < 1 | 18 | 1.9 | 5 | < 5 | 1.4 | 0.7 | < 0.5 | 2.7 | 0.51 | 27.6 |
| 407536 | < 0.1 | < 0.5 | 344 | < 1 | 25 | 2.4 | 9 | < 5 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.63 | 32.8 |
| 407537 | < 0.1 | < 0.5 | 360 | < 1 | 26 | 2.5 | 7 | < 5 | 1.9 | 0.8 | 0.8 | 3.6 | 0.64 | 33.1 |
| 451002 | < 0.1 | < 0.5 | 316 | < 1 | 22 | 2.6 | 10 | < 5 | 2 | 0.7 | < 0.5 | 3.4 | 0.33 | 31.5 |
| 451003 | < 0.1 | < 0.5 | 384 | < 1 | 27 | 3.3 | 12 | < 5 | 2.2 | 1 | 0.7 | 4 | 0.37 | 30.1 |
| 451004 | < 0.1 | < 0.5 | 269 | < 1 | 26 | 2.5 | 10 | 7 | 2.2 | 0.9 | < 0.5 | 4 | 0.38 | 30.1 |
| 451005 | < 0.1 | < 0.5 | 202 | < 1 | 23 | 2.2 | 10 | 6 | 1.8 | 0.8 | 0.7 | 3.4 | 0.26 | 30.4 |
| 451006 | < 0.1 | < 0.5 | 283 | < 1 | 22 | 2.2 | 10 | < 5 | 1.8 | 0.9 | < 0.5 | 3.3 | 0.25 | 34.1 |
| 451007 | < 0.1 | < 0.5 | 283 | < 1 | 25 | 2.2 | 10 | 8 | 2 | 0.8 | < 0.5 | 3.6 | 0.34 | 29.8 |
| 451008 | < 0.1 | < 0.5 | 349 | < 1 | 26 | 2.9 | 10 | < 5 | 2.1 | 0.9 | < 0.5 | 3.8 | 0.38 | 27.7 |

# Appendix III

Assay certificates for grab samples

(Some samples listed in Appendix III are not from the property so these results are not found in Appendix II but they were left in Appendix III so as not to alter the assay certificates)

| | |
|---|---|
| **Date Submitted:** | 20-Sep-10 |
| **Invoice No.:** | A10-6113 (i) |
| **Invoice Date:** | 15-Dec-10 |
| **Your Reference:** | |

**Golden Hope Mines**
**233 rue Principale**
**Ste Justine QC G0R 1Y0**
**Canada**

**ATTN: Sylvain Ouellette**

# CERTIFICATE OF ANALYSIS

19 Rock samples were submitted for analysis.

The following analytical package was requested: Code 1H2 INAA(INAAGEO)/Total Digestion ICP(TOTAL)/Total Digestion ICP/MS

REPORT **A10-6113 (i)**



Notes:
Elements which exceed the upper limits should be analyzed by assay techniques. Some elements are reported by multiple techniques. These are indicated by MULT.

CERTIFIED BY :

Emmanuel Eseme , Ph.D.
Quality Control

ISO/IEC 17025 SCC Accredited LAB 266 — LAB 266 Accrédité CCN

**ACTIVATION LABORATORIES LTD.**

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E-MAIL Ancaster@actlabs.com ACTLABS GROUP WEBSITE www.actlabs.com

| Analyte Symbol | Au | Ag | Cu | Cd | Mo | Pb | Ni | Zn | S | Al | As | Ba | Be | Bi | Br | Ca | Co | Cr | Cs | Fe | Hf | Ge | Hg | In |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppb | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm |
| Detection Limit | 2 | 0.3 | 1 | 0.3 | 1 | 3 | 1 | 1 | 0.01 | 0.01 | 0.5 | 50 | 1 | 0.1 | 0.5 | 0.01 | 1 | 2 | 1 | 0.01 | 1 | 0.1 | 1 | 0.2 |
| Analysis Method | INAA | MULT INAA / TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | MULT INAA / TD-ICP | MULT INAA / TD-ICP | TD-ICP | TD-ICP | INAA | INAA | TD-ICP | TD-MS | INAA | TD-ICP | INAA | INAA | INAA | INAA | INAA | TD-MS | INAA | TD-MS |
| A 407519 | 33 | 0.4 | 128 | < 0.3 | < 1 | 29 | 70 | 96 | 0.26 | 6.70 | 9.2 | 310 | < 1 | < 0.1 | < 0.5 | 3.98 | 49 | 123 | < 1 | 8.91 | 1 | 0.5 | < 1 | < 0.2 |
| A 407520 | 21 | < 0.3 | 141 | < 0.3 | < 1 | 19 | 83 | 94 | 0.34 | 6.79 | 7.8 | 290 | < 1 | < 0.1 | < 0.5 | 5.35 | 53 | 126 | < 1 | 8.87 | < 1 | 0.6 | < 1 | < 0.2 |
| A 407521 | 22 | < 0.3 | 212 | < 0.3 | < 1 | 7 | 73 | 196 | 0.38 | 6.45 | 7.3 | 260 | < 1 | < 0.1 | < 0.5 | 4.78 | 53 | 138 | < 1 | 10.0 | 1 | 0.5 | < 1 | < 0.2 |
| A 407522 | 27 | < 0.3 | 53 | 0.7 | 2 | 8 | 33 | 162 | 0.47 | 3.36 | 8.8 | < 50 | < 1 | 0.2 | < 0.5 | 0.93 | 21 | 49 | < 1 | 5.91 | < 1 | 0.3 | < 1 | < 0.2 |
| A 407523 | 23 | 0.4 | 324 | 2.0 | 3 | < 3 | 68 | 486 | 1.43 | 6.24 | 8.2 | < 50 | < 1 | 0.2 | < 0.5 | 5.19 | 55 | 88 | < 1 | 10.3 | 1 | 0.3 | < 1 | < 0.2 |
| A 407524 | < 2 | < 0.3 | 144 | 0.6 | < 1 | < 3 | 61 | 177 | 0.10 | 6.17 | 9.9 | < 50 | < 1 | < 0.1 | < 0.5 | 7.98 | 49 | 72 | < 1 | 8.74 | 2 | 0.6 | < 1 | < 0.2 |
| A 407525 | < 2 | < 0.3 | 283 | 0.4 | < 1 | < 3 | 70 | 106 | 0.49 | 6.56 | 7.4 | 270 | < 1 | < 0.1 | < 0.5 | 5.60 | 53 | 69 | < 1 | 8.76 | 2 | 0.7 | < 1 | < 0.2 |
| A 407526 | < 2 | < 0.3 | 11 | < 0.3 | < 1 | 34 | 16 | 44 | 0.02 | 3.51 | 10.1 | 350 | 1 | < 0.1 | < 0.5 | 0.09 | 5 | 43 | 2 | 1.78 | 2 | 0.8 | < 1 | < 0.2 |
| A 407527 | 51 | < 0.3 | 36 | 0.9 | < 1 | < 3 | 61 | 357 | 0.01 | 8.06 | 29.9 | < 50 | < 1 | < 0.1 | < 0.5 | 10.4 | 55 | 53 | < 1 | 11.0 | 1 | 0.9 | < 1 | < 0.2 |
| A 407528 | 25 | 1.1 | 1120 | 1.0 | < 1 | 10 | 125 | 125 | 0.30 | 6.05 | 5.7 | < 50 | < 1 | 0.4 | < 0.5 | 7.84 | 73 | 131 | < 1 | 10.5 | 2 | 0.8 | < 1 | < 0.2 |
| A 407529 | 14 | 0.4 | 545 | 0.6 | < 1 | 8 | 96 | 160 | 0.05 | 6.65 | 3.1 | < 50 | < 1 | < 0.1 | < 0.5 | 5.17 | 57 | 90 | < 1 | 10.0 | 2 | 0.5 | < 1 | < 0.2 |
| A 407530 | < 2 | 0.5 | 240 | 4.7 | < 1 | 4 | 69 | 1080 | 1.97 | 5.47 | 3.5 | < 50 | < 1 | 0.3 | < 0.5 | 4.37 | 45 | 98 | < 1 | 11.8 | 2 | 0.6 | < 1 | < 0.2 |
| A 407531 | < 2 | 0.4 | 36 | 0.3 | < 1 | 8 | 68 | 58 | 0.02 | 7.10 | 2.3 | 300 | 1 | < 0.1 | < 0.5 | 2.55 | 20 | 221 | 2 | 5.45 | 7 | 0.2 | < 1 | < 0.2 |
| A 407532 | < 2 | < 0.3 | 6 | < 0.3 | < 1 | 5 | 1350 | 31 | < 0.01 | 0.31 | 6.2 | 110 | < 1 | < 0.1 | < 0.5 | 7.21 | 62 | 1890 | < 1 | 2.99 | < 1 | 0.1 | < 1 | < 0.2 |
| A 407533 | 7 | 0.4 | 23 | < 0.3 | 2 | 14 | 31 | 66 | 0.23 | 7.49 | 5.8 | 510 | 1 | < 0.1 | < 0.5 | 0.87 | 9 | 62 | 2 | 3.71 | 9 | 0.3 | < 1 | < 0.2 |
| A 407534 | 6 | < 0.3 | 25 | < 0.3 | < 1 | 38 | 39 | 80 | 0.69 | 7.97 | 14.6 | 940 | 2 | 0.1 | < 0.5 | 0.31 | 20 | 76 | 2 | 4.94 | 8 | 0.6 | < 1 | < 0.2 |
| A 407535 | < 2 | < 0.3 | 147 | < 0.3 | < 1 | < 3 | 75 | 80 | 0.01 | 7.13 | 5.3 | 320 | < 1 | < 0.1 | < 0.5 | 6.07 | 52 | 165 | < 1 | 7.78 | 1 | 0.4 | < 1 | < 0.2 |
| A 407536 | < 2 | < 0.3 | 132 | 0.4 | < 1 | < 3 | 75 | 129 | 0.24 | 6.54 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 4.39 | 54 | 98 | < 1 | 9.03 | < 1 | 0.5 | < 1 | < 0.2 |
| A 407537 | < 2 | < 0.3 | 316 | < 0.3 | < 1 | < 3 | 62 | 122 | 0.32 | 5.76 | 3.8 | < 50 | < 1 | < 0.1 | < 0.5 | 5.02 | 48 | 88 | < 1 | 8.95 | 1 | 0.5 | < 1 | < 0.2 |

| Analyte Symbol | Re | Ir | K | Li | Mg | Mn | Na | P | Rb | Sb | Sc | Se | Sn | Sr | Ta | Te | Ti | Th | Tl | U | V | W | Y | La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppb | % | ppm | % | ppm | % | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| Detection Limit | 0.001 | 5 | 0.01 | 0.5 | 0.01 | 1 | 0.01 | 0.001 | 15 | 0.1 | 0.1 | 0.1 | 1 | 1 | 0.5 | 0.1 | 0.01 | 0.2 | 0.1 | 0.5 | 2 | 1 | 1 | 0.5 |
| Analysis Method | TD-MS | INAA | TD-ICP | TD-MS | TD-ICP | TD-ICP | INAA | TD-ICP | INAA | INAA | INAA | MULT INAA/TD-ICP-MS | TD-MS | TD-ICP | INAA | TD-MS | TD-ICP | INAA | TD-MS | INAA | TD-ICP | INAA | TD-ICP | INAA |
| A 407519 | < 0.001 | < 5 | 0.07 | 28.4 | 4.84 | 1250 | 2.83 | 0.035 | < 15 | < 0.1 | 49.3 | < 0.1 | < 1 | 73 | < 0.5 | 0.2 | 0.65 | < 0.2 | < 0.1 | < 0.5 | 350 | 20 | 22 | 2.2 |
| A 407520 | < 0.001 | < 5 | 0.34 | 27.9 | 5.09 | 1320 | 1.96 | 0.032 | < 15 | 0.3 | 45.6 | < 0.1 | < 1 | 118 | < 0.5 | 0.2 | 0.57 | 0.7 | < 0.1 | < 0.5 | 339 | < 1 | 22 | 1.9 |
| A 407521 | 0.010 | < 5 | 0.04 | 32.3 | 6.04 | 1470 | 1.27 | 0.033 | 34 | 0.4 | 44.4 | < 0.1 | < 1 | 43 | < 0.5 | 0.2 | 0.61 | < 0.2 | < 0.1 | < 0.5 | 368 | < 1 | 22 | 2.3 |
| A 407522 | < 0.001 | < 5 | 0.05 | 13.3 | 2.63 | 820 | 1.10 | 0.023 | < 15 | 0.3 | 24.0 | < 0.1 | < 1 | 7 | < 0.5 | 0.2 | 0.38 | < 0.2 | < 0.1 | < 0.5 | 211 | < 1 | 10 | 1.1 |
| A 407523 | 0.010 | < 5 | 0.24 | 35.8 | 4.38 | 1290 | 0.25 | 0.027 | 23 | < 0.1 | 40.0 | < 0.1 | < 1 | 12 | < 0.5 | 0.1 | 0.53 | < 0.2 | < 0.1 | < 0.5 | 321 | < 1 | 19 | 1.5 |
| A 407524 | < 0.001 | < 5 | 0.03 | 13.2 | 3.35 | 1380 | 0.86 | 0.027 | < 15 | < 0.1 | 44.4 | < 0.1 | < 1 | 142 | < 0.5 | < 0.1 | 0.27 | 0.8 | < 0.1 | < 0.5 | 244 | < 1 | 23 | 2.0 |
| A 407525 | < 0.001 | < 5 | 0.03 | 37.6 | 4.74 | 1850 | 1.71 | 0.035 | < 15 | < 0.1 | 44.2 | < 0.1 | < 1 | 64 | < 0.5 | < 0.1 | 0.66 | 0.6 | < 0.1 | < 0.5 | 376 | < 1 | 26 | 2.1 |
| A 407526 | < 0.001 | < 5 | 1.47 | 22.6 | 0.76 | 330 | 0.46 | 0.032 | 52 | 0.4 | 4.9 | < 0.1 | < 1 | 25 | < 0.5 | < 0.1 | 0.18 | 3.4 | 0.2 | < 0.5 | 44 | < 1 | 5 | 15.8 |
| A 407527 | < 0.001 | < 5 | 0.25 | 15.0 | 2.24 | 1410 | 0.09 | 0.027 | < 15 | < 0.1 | 44.3 | < 0.1 | < 1 | 8 | < 0.5 | < 0.1 | 0.47 | < 0.2 | < 0.1 | < 0.5 | 358 | < 1 | 25 | 2.3 |
| A 407528 | 0.010 | < 5 | 0.01 | 16.8 | 3.61 | 1300 | 0.06 | 0.037 | < 15 | < 0.1 | 60.8 | < 0.1 | < 1 | 841 | < 0.5 | 0.5 | 0.63 | 0.8 | < 0.1 | < 0.5 | 323 | < 1 | 23 | 3.7 |
| A 407529 | 0.010 | < 5 | 0.07 | 27.9 | 5.09 | 1760 | 1.63 | 0.029 | < 15 | < 0.1 | 53.2 | < 0.1 | < 1 | 71 | < 0.5 | 0.1 | 0.55 | < 0.2 | < 0.1 | < 0.5 | 360 | < 1 | 24 | 2.9 |
| A 407530 | 0.010 | < 5 | 0.06 | 29.3 | 5.25 | 1310 | 0.80 | 0.031 | < 15 | < 0.1 | 50.3 | < 0.1 | < 1 | 14 | < 0.5 | 1.8 | 0.58 | 0.8 | < 0.1 | < 0.5 | 377 | < 1 | 18 | 3.2 |
| A 407531 | < 0.001 | < 5 | 1.16 | 16.7 | 2.31 | 853 | 3.86 | 0.111 | 67 | < 0.1 | 19.0 | < 0.1 | < 1 | 156 | 2.5 | < 0.1 | 0.23 | 9.0 | 0.3 | 1.8 | 58 | < 1 | 19 | 45.3 |
| A 407532 | < 0.001 | 19 | 0.03 | 12.2 | 14.0 | 825 | 0.08 | 0.002 | < 15 | < 0.1 | 4.2 | < 0.1 | < 1 | 22 | < 0.5 | < 0.1 | 0.01 | 0.6 | < 0.1 | 0.8 | 13 | < 1 | 2 | 6.0 |
| A 407533 | 0.010 | < 5 | 1.45 | 19.1 | 0.98 | 532 | 3.89 | 0.050 | < 15 | < 0.1 | 10.7 | < 0.1 | 1 | 125 | < 0.5 | 0.1 | 0.29 | 8.2 | 0.3 | 1.6 | 52 | < 1 | 22 | 37.5 |
| A 407534 | < 0.001 | < 5 | 2.90 | 37.2 | 0.86 | 519 | 0.35 | 0.054 | 127 | 0.9 | 12.2 | < 0.1 | 2 | 45 | 1.2 | 0.1 | 0.54 | 10.8 | 0.7 | < 0.5 | 77 | < 1 | 20 | 33.2 |
| A 407535 | < 0.001 | < 5 | 0.07 | 78.9 | 3.68 | 1520 | 3.06 | 0.019 | < 15 | < 0.1 | 44.1 | < 0.1 | < 1 | 402 | < 0.5 | 0.1 | 0.24 | < 0.2 | < 0.1 | < 0.5 | 178 | < 1 | 18 | 1.9 |
| A 407536 | < 0.001 | < 5 | 0.05 | 25.2 | 5.31 | 1520 | 3.15 | 0.032 | < 15 | < 0.1 | 46.1 | < 0.1 | < 1 | 25 | < 0.5 | < 0.1 | 0.66 | < 0.2 | < 0.1 | < 0.5 | 344 | < 1 | 25 | 2.4 |
| A 407537 | < 0.001 | < 5 | 0.05 | 20.4 | 4.73 | 1850 | 2.01 | 0.037 | < 15 | < 0.1 | 46.1 | < 0.1 | < 1 | 19 | < 0.5 | < 0.1 | 0.68 | < 0.2 | < 0.1 | < 0.5 | 360 | < 1 | 26 | 2.5 |

| Analyte Symbol | Ce | Nd | Sm | Eu | Tb | Yb | Lu | Mass |
|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppm | ppm | ppm | ppm | ppm | ppm | g |
| Detection Limit | 3 | 5 | 0.1 | 0.2 | 0.5 | 0.2 | 0.05 | |
| Analysis Method | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA |
| A 407519 | 8 | 10 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.61 | 29.3 |
| A 407520 | 9 | < 5 | 1.6 | 0.7 | 1.2 | 3.1 | 0.59 | 32.2 |
| A 407521 | 9 | 7 | 1.6 | 0.7 | < 0.5 | 3.2 | 0.36 | 37.9 |
| A 407522 | < 3 | < 5 | 0.7 | 0.3 | < 0.5 | 1.5 | 0.23 | 32.5 |
| A 407523 | 7 | 6 | 1.4 | 0.5 | 0.6 | 2.6 | 0.53 | 33.5 |
| A 407524 | 7 | < 5 | 1.8 | 0.7 | 0.8 | 3.4 | 0.63 | 32.8 |
| A 407525 | 9 | < 5 | 1.7 | 0.7 | < 0.5 | 3.3 | 0.65 | 40.7 |
| A 407526 | 33 | 11 | 2.3 | 0.6 | < 0.5 | 1.0 | 0.18 | 27.7 |
| A 407527 | 6 | < 5 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.63 | 38.9 |
| A 407528 | 7 | 11 | 3.1 | 1.3 | 0.6 | 3.9 | 0.68 | 34.7 |
| A 407529 | 10 | 7 | 2.9 | 1.2 | 0.9 | 3.9 | 0.66 | 32.9 |
| A 407530 | < 3 | 11 | 2.6 | 0.7 | < 0.5 | 3.5 | 0.61 | 31.9 |
| A 407531 | 98 | 39 | 8.5 | 1.5 | < 0.5 | 2.6 | 0.39 | 28.3 |
| A 407532 | 12 | < 5 | 0.8 | < 0.2 | < 0.5 | 0.3 | 0.07 | 31.4 |
| A 407533 | 76 | 37 | 7.8 | 2.2 | < 0.5 | 2.8 | 0.43 | 27.8 |
| A 407534 | 74 | 27 | 4.7 | 1.3 | < 0.5 | 2.5 | 0.44 | 19.5 |
| A 407535 | 5 | < 5 | 1.4 | 0.7 | < 0.5 | 2.7 | 0.51 | 27.6 |
| A 407536 | 9 | < 5 | 1.8 | 0.7 | < 0.5 | 3.4 | 0.63 | 32.8 |
| A 407537 | 7 | < 5 | 1.9 | 0.8 | 0.8 | 3.6 | 0.64 | 33.1 |

## Quality Control

| Analyte Symbol | Au | Ag | Cu | Cd | Mo | Pb | Ni | Zn | S | Al | As | Ba | Be | Bi | Ca | Co | Cr | Fe | Ge | In | Re | K | Li | Mg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppb | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | % | ppm | ppm | ppm | ppm | % | ppm | ppm | % | ppm | ppm | ppm | % | ppm | % |
| Detection Limit | 2 | 0.3 | 1 | 0.3 | 1 | 3 | 1 | 1 | 0.01 | 0.01 | 0.5 | 50 | 1 | 0.1 | 0.01 | 1 | 2 | 0.01 | 0.1 | 0.2 | 0.001 | 0.01 | 0.5 | 0.01 |
| Analysis Method | INAA | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | INAA | INAA | TD-ICP | TD-MS | TD-ICP | INAA | INAA | INAA | TD-MS | TD-MS | TD-MS | TD-ICP | TD-MS | TD-ICP |
| GXR-1 Meas | | 31.6 | 1210 | 3.3 | 18 | 708 | 42 | 723 | 0.25 | 3.04 | | | 1 | 1440 | 0.94 | | | | | 0.8 | | 0.05 | 9.8 | 0.26 |
| GXR-1 Cert | | 31.0 | 1110 | 3.30 | 18.0 | 730 | 41.0 | 760 | 0.257 | 3.52 | | | 1.22 | 1380 | 0.960 | | | | | 0.770 | | 0.0500 | 8.20 | 0.217 |
| DNC-1 Meas | | | | | | | | | | | | | | | | | | | | | | | 5.0 | |
| DNC-1 Cert | | | | | | | | | | | | | | | | | | | | | | | 5.20 | |
| GXR-4 Meas | | 3.7 | 6420 | 0.4 | 310 | 60 | 59 | 84 | 1.77 | 6.06 | | | 2 | 19.6 | 1.10 | | | | | < 0.2 | | 3.87 | 11.2 | 1.69 |
| GXR-4 Cert | | 4.00 | 6520 | 0.860 | 310 | 52.0 | 42.0 | 73.0 | 1.77 | 7.20 | | | 1.90 | 19.0 | 1.01 | | | | | 0.270 | | 4.01 | 11.1 | 1.66 |
| SDC-1 Meas | | < 0.3 | 29 | 0.4 | 3 | 28 | 38 | 97 | 0.06 | 7.48 | | | 3 | 0.3 | 1.15 | | | | | | | 2.66 | 36.9 | 1.02 |
| SDC-1 Cert | | 0.0410 | 30.0 | 0.0800 | 0.250 | 25.0 | 38.0 | 103 | 0.0650 | 8.34 | | | 3.00 | 2.60 | 1.00 | | | | | | | 2.72 | 34.0 | 1.02 |
| SCO-1 Meas | | 0.6 | 28 | < 0.3 | < 1 | 29 | 28 | 93 | | 6.62 | | | 2 | 0.4 | 2.08 | | | | | | | 2.20 | 44.6 | 1.61 |
| SCO-1 Cert | | 0.134 | 28.7 | 0.140 | 1.37 | 31.0 | 27.0 | 103 | | 7.24 | | | 1.84 | 0.370 | 1.87 | | | | | | | 2.30 | 45.0 | 1.64 |
| GXR-6 Meas | | 0.7 | 70 | 0.4 | 2 | 95 | 26 | 129 | 0.01 | 12.4 | | | 1 | 0.2 | 0.21 | | | | | < 0.2 | | 1.81 | 32.7 | 0.63 |
| GXR-6 Cert | | 1.30 | 66.0 | 1.00 | 2.40 | 101 | 27.0 | 118 | 0.0160 | 17.7 | | | 1.40 | 0.290 | 0.180 | | | | | 0.260 | | 1.87 | 32.0 | 0.609 |
| DNC-1a Meas | | | 97 | | | | 252 | 53 | | | | | | | | | | | | | | | 4.9 | |
| DNC-1a Cert | | | 100 | | | | 247 | 70.0 | | | | | | | | | | | | | | | 5.20 | |
| OREAS 13b (4-Acid) Meas | | 1.4 | 2370 | | 9 | | 2220 | 133 | 1.18 | | | | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Cert | | 0.86 | 2327 | | 9.0 | | 2247 | 133 | 1.20 | | | | | | | | | | | | | | | |
| DMMAS 111 Meas | 1680 | | | | | | | | | | 1500 | 1300 | | | | 32 | 60 | 3.09 | | | | | | |
| DMMAS 111 Cert | 1670 | | | | | | | | | | 1450 | 1140 | | | | 34 | 52 | 2.79 | | | | | | |
| DMMAS 111 Meas | 1770 | | | | | | | | | | 1480 | 1220 | | | | 36 | 58 | 2.73 | | | | | | |
| DMMAS 111 Cert | 1670 | | | | | | | | | | 1450 | 1140 | | | | 34 | 52 | 2.79 | | | | | | |
| A 407529 Orig | | < 0.3 | 480 | 0.7 | < 1 | < 3 | 80 | 167 | 0.04 | 6.99 | | | < 1 | < 0.1 | 5.37 | | | | 0.3 | < 0.2 | < 0.001 | 0.08 | 27.9 | 5.05 |
| A 407529 Dup | | < 0.3 | 486 | 0.8 | < 1 | < 3 | 78 | 164 | 0.04 | 6.91 | | | < 1 | < 0.1 | 5.29 | | | | 0.4 | < 0.2 | < 0.001 | 0.08 | 29.7 | 5.04 |
| A 407536 Orig | | < 0.3 | 112 | < 0.3 | < 1 | 8 | 76 | 128 | 0.21 | 7.05 | | | < 1 | < 0.1 | 4.31 | | | | 0.5 | < 0.2 | 0.001 | 0.04 | 24.3 | 5.21 |
| A 407536 Dup | | < 0.3 | 116 | < 0.3 | < 1 | 4 | 71 | 126 | 0.21 | 6.21 | | | < 1 | < 0.1 | 4.21 | | | | 1.1 | < 0.2 | 0.001 | 0.03 | 24.5 | 4.93 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | < 0.1 | < 0.01 | | | | < 0.1 | < 0.2 | < 0.001 | < 0.01 | < 0.5 | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | 2 | < 0.01 | < 0.01 | | | < 1 | < 0.1 | < 0.01 | | | | < 0.1 | < 0.2 | < 0.001 | < 0.01 | < 0.5 | < 0.01 |
| Method Blank Method Blank | | | | | | | | | | | | | | < 0.1 | | | | | < 0.1 | < 0.2 | < 0.001 | | < 0.5 | |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | 2 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | < 2 | | | | | | | | | | < 0.5 | < 50 | | | | < 1 | < 2 | < 0.01 | | | | | | |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | 3 | < 0.01 | < 0.01 | | | < 1 | < 0.1 | < 0.01 | | | | < 0.1 | < 0.2 | < 0.001 | < 0.01 | < 0.5 | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | < 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |
| Method Blank Method Blank | | | | | | | | | | | | | | < 0.1 | | | | | < 0.1 | < 0.2 | < 0.001 | | < 0.5 | |

## Quality Control

| Analyte Symbol | Mn | Na | P | Sc | Se | Sn | Sr | Te | Ti | Tl | U | V | Y | La | Ce | Sm | Ag | Ni | Zn | Br | Cs | Hf | Hg | Ir |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | % | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppb |
| Detection Limit | 1 | 0.01 | 0.001 | 0.1 | 3 | 1 | 1 | 0.1 | 0.01 | 0.1 | 0.5 | 2 | 1 | 0.5 | 3 | 0.1 | 5 | 20 | 50 | 0.5 | 1 | 1 | 1 | 5 |
| Analysis Method | TD-ICP | INAA | TD-ICP | INAA | TD-MS | TD-MS | TD-ICP | TD-MS | TD-ICP | TD-MS | INAA | TD-ICP | TD-ICP | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA |
| GXR-1 Meas | 878 | | 0.060 | | 17 | 27 | 294 | 9.4 | | 0.4 | | 91 | 27 | | | | | | | | | | | |
| GXR-1 Cert | 852 | | 0.0650 | | 16.6 | 54.0 | 275 | 13.0 | | 0.390 | | 80.0 | 32.0 | | | | | | | | | | | |
| DNC-1 Meas | | | | | | | | | | | | | | | | | | | | | | | | |
| DNC-1 Cert | | | | | | | | | | | | | | | | | | | | | | | | |
| GXR-4 Meas | 142 | | 0.131 | | 6 | 6 | 205 | 1.0 | | 2.8 | | 91 | 13 | | | | | | | | | | | |
| GXR-4 Cert | 155 | | 0.120 | | 5.60 | 5.60 | 221 | 0.970 | | 3.20 | | 87.0 | 14.0 | | | | | | | | | | | |
| SDC-1 Meas | 835 | | 0.055 | | | < 1 | 169 | | 0.13 | | | 44 | 32 | | | | | | | | | | | |
| SDC-1 Cert | 883 | | 0.0690 | | | 3.00 | 183 | | 0.606 | | | 102 | 40.0 | | | | | | | | | | | |
| SCO-1 Meas | 387 | | 0.086 | | | 2 | 158 | | 0.34 | | | 134 | 19 | | | | | | | | | | | |
| SCO-1 Cert | 410 | | 0.0900 | | | 3.70 | 174 | | 0.380 | | | 131 | 26.0 | | | | | | | | | | | |
| GXR-6 Meas | 1080 | | 0.034 | | < 3 | < 1 | 41 | < 0.1 | | 2.3 | | 107 | 12 | | | | | | | | | | | |
| GXR-6 Cert | 1010 | | 0.0350 | | 0.940 | 1.70 | 35.0 | 0.0180 | | 2.20 | | 186 | 14.0 | | | | | | | | | | | |
| DNC-1a Meas | | | | | | | 129 | | | | | 141 | 14 | | | | | | | | | | | |
| DNC-1a Cert | | | | | | | 144 | | | | | 148 | 18.0 | | | | | | | | | | | |
| OREAS 13b (4-Acid) Meas | | | | | | | | | | | | | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Cert | | | | | | | | | | | | | | | | | | | | | | | | |
| DMMAS 111 Meas | | 1.95 | | 6.2 | | | | | | | 13.0 | | | 15.3 | 28 | 2.0 | | | | | | | | |
| DMMAS 111 Cert | | 1.87 | | 5.80 | | | | | | | 14.00 | | | 14.00 | 19.30 | 1.90 | | | | | | | | |
| DMMAS 111 Meas | | 1.94 | | 5.8 | | | | | | | 14.8 | | | 14.2 | 24 | 1.7 | | | | | | | | |
| DMMAS 111 Cert | | 1.87 | | 5.80 | | | | | | | 14.00 | | | 14.00 | 19.30 | 1.90 | | | | | | | | |
| A 407529 Orig | 1760 | | 0.026 | | < 3 | < 1 | 74 | < 0.1 | 0.44 | < 0.1 | | 300 | 24 | | | | | | | | | | | |
| A 407529 Dup | 1740 | | 0.026 | | < 3 | < 1 | 69 | < 0.1 | 0.47 | < 0.1 | | 328 | 24 | | | | | | | | | | | |
| A 407536 Orig | 1520 | | 0.030 | | < 3 | < 1 | 25 | < 0.1 | 0.47 | < 0.1 | | 276 | 23 | | | | | | | | | | | |
| A 407536 Dup | 1540 | | 0.032 | | < 3 | < 1 | 25 | < 0.1 | 0.64 | < 0.1 | | 361 | 20 | | | | | | | | | | | |
| Method Blank Method Blank | < 1 | | < 0.001 | | < 3 | < 1 | < 1 | < 0.1 | < 0.01 | < 0.1 | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 3 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 14 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 14 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 3 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 4 | | < 0.001 | | < 3 | < 1 | < 1 | < 0.1 | < 0.01 | < 0.1 | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | | | | | < 3 | < 1 | | < 0.1 | | < 0.1 | | | | | | | | | | | | | | |
| Method Blank Method Blank | 2 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | | < 0.01 | | < 0.1 | | | | | | | < 0.5 | | | < 0.5 | < 3 | < 0.1 | < 5 | < 20 | < 50 | < 0.5 | < 1 | < 1 | < 1 | < 5 |
| Method Blank Method Blank | 2 | | < 0.001 | | < 3 | < 1 | < 1 | < 0.1 | < 0.01 | < 0.1 | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 18 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 9 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 9 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | 10 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | | | | | | | | | |
| Method Blank Method Blank | | | | | < 3 | < 1 | | < 0.1 | | < 0.1 | | | | | | | | | | | | | | |

## Quality Control

| Analyte Symbol | Rb | Sb | Se | Ta | Th | W | Nd | Eu | Tb | Yb | Lu | Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | g |
| Detection Limit | 15 | 0.1 | 3 | 0.5 | 0.2 | 1 | 5 | 0.2 | 0.5 | 0.2 | 0.05 | |
| Analysis Method | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA |
| GXR-1 Meas | | | | | | | | | | | | |
| GXR-1 Cert | | | | | | | | | | | | |
| DNC-1 Meas | | | | | | | | | | | | |
| DNC-1 Cert | | | | | | | | | | | | |
| GXR-4 Meas | | | | | | | | | | | | |
| GXR-4 Cert | | | | | | | | | | | | |
| SDC-1 Meas | | | | | | | | | | | | |
| SDC-1 Cert | | | | | | | | | | | | |
| SCO-1 Meas | | | | | | | | | | | | |
| SCO-1 Cert | | | | | | | | | | | | |
| GXR-6 Meas | | | | | | | | | | | | |
| GXR-6 Cert | | | | | | | | | | | | |
| DNC-1a Meas | | | | | | | | | | | | |
| DNC-1a Cert | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Meas | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Cert | | | | | | | | | | | | |
| DMMAS 111 Meas | | | | | | | | | | | | |
| DMMAS 111 Cert | | | | | | | | | | | | |
| DMMAS 111 Meas | | | | | | | | | | | | |
| DMMAS 111 Cert | | | | | | | | | | | | |
| A 407529 Orig | | | | | | | | | | | | |
| A 407529 Dup | | | | | | | | | | | | |
| A 407536 Orig | | | | | | | | | | | | |
| A 407536 Dup | | | | | | | | | | | | |
| Method Blank Method Blank | | | | | | | | | | | | |
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| Method Blank Method Blank | | | | | | | | | | | | |
| Method Blank Method Blank | < 15 | < 0.1 | < 3 | < 0.5 | < 0.2 | < 1 | < 5 | < 0.2 | < 0.5 | < 0.2 | < 0.05 | 30.0 |
| Method Blank Method Blank | | | | | | | | | | | | |
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**Quality Analysis ...** **Innovative Technologies**

| | |
|---|---|
| **Date Submitted:** | 18-Oct-10 |
| **Invoice No.:** | A10-7233 |
| **Invoice Date:** | 16-Nov-10 |
| **Your Reference:** | |

**Golden Hope Mines**
**233 rue Principale**
**Ste Justine QC G0R 1Y0**
**Canada**

**ATTN: Sylvain Ouellette**

# CERTIFICATE OF ANALYSIS

11 Rock samples were submitted for analysis.

The following analytical package was requested: Code 1H2 INAA(INAAGEO)/Total Digestion ICP(TOTAL)/Total Digestion ICP/MS

REPORT **A10-7233**



Notes:
Elements which exceed the upper limits should be analyzed by assay techniques. Some elements are reported by multiple techniques. These are indicated by MULT.

CERTIFIED BY :

Emmanuel Eseme , Ph.D.
Quality Control

ISO/IEC 17025
SCC Accredited
LAB 266
LAB 266
Accrédité CCN

**ACTIVATION LABORATORIES LTD.**

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E-MAIL Ancaster@actlabs.com ACTLABS GROUP WEBSITE www.actlabs.com

| Analyte Symbol | Au | Ag | Cu | Cd | Mo | Pb | Ni | Zn | S | Al | As | Ba | Be | Bi | Br | Ca | Co | Cr | Cs | Fe | Hf | Ge | Hg | In |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppb | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm |
| Detection Limit | 2 | 0.3 | 1 | 0.3 | 1 | 3 | 1 | 1 | 0.01 | 0.01 | 0.5 | 50 | 1 | 0.1 | 0.5 | 0.01 | 1 | 2 | 1 | 0.01 | 1 | 0.1 | 1 | 0.2 |
| Analysis Method | INAA | MULT INAA / TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | MULT INAA / TD-ICP | MULT INAA / TD-ICP | TD-ICP | TD-ICP | INAA | INAA | TD-ICP | TD-MS | INAA | TD-ICP | INAA | INAA | INAA | INAA | INAA | TD-MS | INAA | TD-MS |
| A407548 | < 2 | < 0.3 | 64 | < 0.3 | 2 | 5 | 70 | 64 | < 0.01 | 8.58 | 2.7 | 500 | < 1 | < 0.1 | < 0.5 | 0.54 | 40 | 223 | 4 | 8.18 | < 1 | 1.8 | < 1 | < 0.2 |
| A407549 | < 2 | < 0.3 | 12 | < 0.3 | < 1 | 4 | 53 | 48 | < 0.01 | 8.37 | 3.3 | 310 | < 1 | < 0.1 | < 0.5 | 3.25 | 31 | 186 | 4 | 7.30 | < 1 | 1.6 | < 1 | < 0.2 |
| A407550 | 12 | < 0.3 | 45 | < 0.3 | < 1 | 32 | 27 | 28 | 1.55 | 2.42 | 12.8 | 170 | < 1 | 0.2 | < 0.5 | 0.07 | 27 | 47 | 1 | 3.20 | < 1 | 0.1 | < 1 | < 0.2 |
| A451001 | 19 | 0.4 | 92 | < 0.3 | 4 | 53 | 29 | 42 | 0.29 | 7.86 | 36.6 | 470 | 2 | 0.3 | < 0.5 | 0.04 | 9 | 191 | 4 | 5.71 | 6 | 1.3 | < 1 | < 0.2 |
| A451002 | < 2 | < 0.3 | 104 | < 0.3 | < 1 | < 3 | 64 | 86 | 0.07 | 5.52 | 1.2 | < 50 | < 1 | < 0.1 | < 0.5 | 4.79 | 50 | 71 | < 1 | 8.49 | < 1 | 0.6 | < 1 | < 0.2 |
| A451003 | 22 | 0.5 | 566 | 3.1 | < 1 | < 3 | 66 | 279 | 1.81 | 6.67 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 6.12 | 70 | 76 | < 1 | 12.1 | < 1 | 0.6 | < 1 | < 0.2 |
| A451004 | < 2 | < 0.3 | 164 | 0.9 | < 1 | < 3 | 73 | 114 | 0.01 | 6.41 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 5.76 | 61 | 74 | < 1 | 9.04 | 1 | 0.4 | < 1 | < 0.2 |
| A451005 | < 2 | < 0.3 | 186 | < 0.3 | < 1 | < 3 | 61 | 88 | 0.01 | 5.52 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 9.28 | 50 | 73 | < 1 | 8.73 | 1 | 0.6 | < 1 | < 0.2 |
| A451006 | 46 | 1.6 | 5200 | 5.0 | < 1 | < 3 | 53 | 536 | 2.39 | 5.94 | 8.8 | 120 | < 1 | 0.3 | < 0.5 | 7.05 | 81 | 81 | < 1 | 11.7 | < 1 | 0.7 | < 1 | 0.2 |
| A451007 | < 2 | < 0.3 | 263 | 0.9 | < 1 | < 3 | 76 | 104 | < 0.01 | 6.42 | 3.5 | < 50 | < 1 | < 0.1 | < 0.5 | 4.31 | 62 | 105 | 2 | 11.4 | < 1 | 0.7 | < 1 | < 0.2 |
| A451008 | < 2 | < 0.3 | 122 | 1.3 | < 1 | < 3 | 65 | 84 | 0.11 | 6.50 | < 0.5 | < 50 | < 1 | < 0.1 | < 0.5 | 5.71 | 51 | 79 | < 1 | 9.38 | 1 | 1.0 | < 1 | < 0.2 |

| Analyte Symbol | Re | Ir | K | Li | Mg | Mn | Na | P | Rb | Sb | Sc | Se | Sn | Sr | Ta | Te | Ti | Th | Tl | U | V | W | Y | La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppb | % | ppm | % | ppm | % | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| Detection Limit | 0.001 | 5 | 0.01 | 0.5 | 0.01 | 1 | 0.01 | 0.001 | 15 | 0.1 | 0.1 | 0.1 | 1 | 1 | 0.5 | 0.1 | 0.01 | 0.2 | 0.1 | 0.5 | 2 | 1 | 1 | 0.5 |
| Analysis Method | TD-MS | INAA | TD-ICP | TD-MS | TD-ICP | TD-ICP | INAA | TD-ICP | INAA | INAA | INAA | MULT INAA/TD-ICP-MS | TD-MS | TD-ICP | INAA | TD-MS | TD-ICP | INAA | TD-MS | INAA | TD-ICP | INAA | TD-ICP | INAA |
| A407548 | 0.001 | < 5 | 5.33 | 18.2 | 1.69 | 1230 | 1.69 | 0.008 | 142 | 2.0 | 45.6 | < 0.1 | < 1 | 38 | < 0.5 | < 0.1 | 0.28 | 1.0 | 0.6 | < 0.5 | 68 | < 1 | 7 | 5.4 |
| A407549 | < 0.001 | < 5 | 4.22 | 13.0 | 1.31 | 1900 | 2.43 | 0.008 | 96 | 1.2 | 40.4 | < 0.1 | < 1 | 101 | < 0.5 | < 0.1 | 0.26 | 0.7 | 0.5 | < 0.5 | 72 | < 1 | 8 | 4.4 |
| A407550 | 0.002 | < 5 | 1.60 | 11.5 | 0.52 | 795 | < 0.01 | 0.019 | 55 | 2.1 | 6.8 | < 0.1 | < 1 | 7 | < 0.5 | 0.5 | 0.13 | 3.4 | 0.7 | 1.2 | 40 | < 1 | 7 | 13.8 |
| A451001 | 0.001 | < 5 | 5.22 | 35.9 | 1.40 | 856 | 0.07 | 0.056 | 184 | 3.7 | 20.8 | < 0.1 | 2 | 11 | < 0.5 | 0.4 | 0.34 | 8.0 | 1.4 | 3.0 | 109 | < 1 | 18 | 29.5 |
| A451002 | 0.005 | < 5 | 0.04 | 19.8 | 5.02 | 1510 | 2.17 | 0.035 | < 15 | < 0.1 | 47.2 | < 0.1 | < 1 | 53 | < 0.5 | 0.1 | 0.52 | 0.9 | < 0.1 | < 0.5 | 316 | < 1 | 22 | 2.6 |
| A451003 | 0.065 | < 5 | 0.02 | 19.3 | 4.61 | 1370 | 0.80 | 0.031 | < 15 | < 0.1 | 44.4 | < 0.1 | < 1 | 124 | < 0.5 | 0.5 | 0.59 | < 0.2 | < 0.1 | < 0.5 | 384 | < 1 | 27 | 3.3 |
| A451004 | < 0.001 | < 5 | 0.04 | 30.8 | 4.89 | 1490 | 1.26 | 0.029 | < 15 | < 0.1 | 50.9 | < 0.1 | < 1 | 52 | < 0.5 | 0.1 | 0.19 | < 0.2 | < 0.1 | < 0.5 | 269 | < 1 | 26 | 2.5 |
| A451005 | 0.001 | < 5 | 0.14 | 19.6 | 4.52 | 1630 | 1.05 | 0.020 | < 15 | < 0.1 | 38.3 | < 0.1 | < 1 | 133 | < 0.5 | < 0.1 | 0.18 | 0.4 | < 0.1 | < 0.5 | 202 | < 1 | 23 | 2.2 |
| A451006 | 0.013 | < 5 | 0.05 | 10.0 | 2.78 | 1020 | 0.52 | 0.026 | < 15 | 0.2 | 41.6 | 19.1 | < 1 | 282 | < 0.5 | 0.1 | 0.29 | < 0.2 | < 0.1 | < 0.5 | 283 | < 1 | 22 | 2.2 |
| A451007 | < 0.001 | < 5 | 1.60 | 19.5 | 4.06 | 1650 | 2.05 | 0.032 | < 15 | 0.4 | 48.1 | < 0.1 | < 1 | 41 | < 0.5 | < 0.1 | 0.42 | < 0.2 | < 0.1 | < 0.5 | 283 | < 1 | 25 | 2.2 |
| A451008 | 0.002 | < 5 | 0.03 | 22.2 | 5.51 | 1320 | 1.48 | 0.032 | < 15 | 0.2 | 48.1 | < 0.1 | < 1 | 31 | < 0.5 | < 0.1 | 0.57 | < 0.2 | < 0.1 | < 0.5 | 349 | < 1 | 26 | 2.9 |

| Analyte Symbol | Ce | Nd | Sm | Eu | Tb | Yb | Lu | Mass |
|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | ppm | ppm | ppm | ppm | ppm | ppm | g |
| Detection Limit | 3 | 5 | 0.1 | 0.2 | 0.5 | 0.2 | 0.05 | |
| Analysis Method | INAA | INAA | INAA | INAA | INAA | INAA | INAA | INAA |
| A407548 | 13 | 7 | 1.2 | 0.4 | < 0.5 | 1.3 | 0.17 | 27.4 |
| A407549 | 11 | < 5 | 1.2 | 0.3 | < 0.5 | 1.2 | 0.12 | 29.4 |
| A407550 | 46 | 9 | 1.9 | 0.4 | < 0.5 | 1.0 | 0.13 | 29.6 |
| A451001 | 77 | 22 | 4.3 | 1.0 | < 0.5 | 3.0 | 0.42 | 23.3 |
| A451002 | 10 | < 5 | 2.0 | 0.7 | < 0.5 | 3.4 | 0.33 | 31.5 |
| A451003 | 12 | < 5 | 2.2 | 1.0 | 0.7 | 4.0 | 0.37 | 30.1 |
| A451004 | 10 | 7 | 2.2 | 0.9 | < 0.5 | 4.0 | 0.38 | 30.1 |
| A451005 | 10 | 6 | 1.8 | 0.8 | 0.7 | 3.4 | 0.26 | 30.4 |
| A451006 | 10 | < 5 | 1.8 | 0.9 | < 0.5 | 3.3 | 0.25 | 34.1 |
| A451007 | 10 | 8 | 2.0 | 0.8 | < 0.5 | 3.6 | 0.34 | 29.8 |
| A451008 | 10 | < 5 | 2.1 | 0.9 | < 0.5 | 3.8 | 0.38 | 27.7 |

## Quality Control

| Analyte Symbol | Au | Ag | Cu | Cd | Mo | Pb | Ni | Zn | S | Al | As | Ba | Be | Bi | Ca | Co | Cr | Fe | Ge | In | Re | K | Li | Mg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppb | ppm | ppm | ppm | ppm | ppm | ppm | ppm | % | % | ppm | ppm | ppm | ppm | % | ppm | ppm | % | ppm | ppm | ppm | % | ppm | % |
| Detection Limit | 2 | 0.3 | 1 | 0.3 | 1 | 3 | 1 | 1 | 0.01 | 0.01 | 0.5 | 50 | 1 | 0.1 | 0.01 | 1 | 2 | 0.01 | 0.1 | 0.2 | 0.001 | 0.01 | 0.5 | 0.01 |
| Analysis Method | INAA | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | TD-ICP | INAA | INAA | TD-ICP | TD-MS | TD-ICP | INAA | INAA | INAA | TD-MS | TD-MS | TD-MS | TD-ICP | TD-MS | TD-ICP |
| GXR-1 Meas | | 31.8 | 1170 | 3.3 | 15 | 708 | 42 | 725 | 0.23 | 2.77 | | | 1 | 1360 | 0.93 | | | | | 0.8 | | 0.06 | 7.5 | 0.25 |
| GXR-1 Cert | | 31.0 | 1110 | 3.30 | 18.0 | 730 | 41.0 | 760 | 0.257 | 3.52 | | | 1.22 | 1380 | 0.960 | | | | | 0.770 | | 0.0500 | 8.20 | 0.217 |
| GXR-4 Meas | | 3.3 | 6460 | 0.5 | 313 | 43 | 42 | 72 | 1.79 | 6.99 | | | 2 | 19.3 | 1.13 | | | | | 0.2 | | 3.77 | 10.3 | 1.84 |
| GXR-4 Cert | | 4.00 | 6520 | 0.860 | 310 | 52.0 | 42.0 | 73.0 | 1.77 | 7.20 | | | 1.90 | 19.0 | 1.01 | | | | | 0.270 | | 4.01 | 11.1 | 1.66 |
| SDC-1 Meas | | < 0.3 | 29 | < 0.3 | < 1 | 21 | 37 | 103 | 0.06 | 7.82 | | | 3 | 0.3 | 1.15 | | | | | | | 3.45 | 34.9 | 1.07 |
| SDC-1 Cert | | 0.0410 | 30.0 | 0.0800 | 0.250 | 25.0 | 38.0 | 103 | 0.0650 | 8.34 | | | 3.00 | 2.60 | 1.00 | | | | | | | 2.72 | 34.0 | 1.02 |
| SCO-1 Meas | | < 0.3 | 27 | 0.3 | < 1 | 25 | 29 | 100 | | 4.54 | | | 2 | 0.4 | 1.75 | | | | | | | 1.53 | 44.9 | 1.46 |
| SCO-1 Cert | | 0.134 | 28.7 | 0.140 | 1.37 | 31.0 | 27.0 | 103 | | 7.24 | | | 1.84 | 0.370 | 1.87 | | | | | | | 2.30 | 45.0 | 1.64 |
| GXR-6 Meas | | < 0.3 | 61 | 0.4 | < 1 | 81 | 25 | 116 | < 0.01 | 13.4 | | | 1 | 0.2 | 0.25 | | | | | < 0.2 | | 1.90 | 40.1 | 0.69 |
| GXR-6 Cert | | 1.30 | 66.0 | 1.00 | 2.40 | 101 | 27.0 | 118 | 0.0160 | 17.7 | | | 1.40 | 0.290 | 0.180 | | | | | 0.260 | | 1.87 | 32.0 | 0.609 |
| DNC-1a Meas | | | 98 | | | | 246 | 57 | | | | | | | | | | | | | | | 4.7 | |
| DNC-1a Cert | | | 100 | | | | 247 | 70.0 | | | | | | | | | | | | | | | 5.20 | |
| OREAS 13b (4-Acid) Meas | | 0.8 | 2190 | | 8 | | 2140 | 109 | 1.10 | | | | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Cert | | 0.86 | 2327 | | 9.0 | | 2247 | 133 | 1.20 | | | | | | | | | | | | | | | |
| DMMAS 111 Meas | 1670 | | | | | | | | | | 1500 | 1250 | | | | 36 | 58 | 2.91 | | | | | | |
| DMMAS 111 Cert | 1670 | | | | | | | | | | 1450 | 1140 | | | | 34 | 52 | 2.79 | | | | | | |
| A451002 Orig | | < 0.3 | 108 | 1.0 | < 1 | < 3 | 65 | 90 | 0.07 | 6.05 | | | < 1 | < 0.1 | 4.93 | | | | 0.7 | < 0.2 | 0.004 | 0.05 | 21.5 | 5.24 |
| A451002 Dup | | < 0.3 | 101 | < 0.3 | 1 | < 3 | 62 | 83 | 0.07 | 4.99 | | | < 1 | < 0.1 | 4.66 | | | | 0.5 | < 0.2 | 0.006 | 0.03 | 18.1 | 4.80 |
| Method Blank Method Blank | | | | | | | | | | | | | | < 0.1 | | | | | < 0.1 | < 0.2 | < 0.001 | | < 0.5 | |
| Method Blank Method Blank | | < 0.3 | < 1 | < 0.3 | < 1 | < 3 | < 1 | 1 | < 0.01 | < 0.01 | | | < 1 | | < 0.01 | | | | | | | < 0.01 | | < 0.01 |

## Quality Control

| Analyte Symbol | Mn | Na | P | Sc | Se | Sn | Sr | Te | Ti | Tl | U | V | Y | La | Ce | Sm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Symbol | ppm | % | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| Detection Limit | 1 | 0.01 | 0.001 | 0.1 | 3 | 1 | 1 | 0.1 | 0.01 | 0.1 | 0.5 | 2 | 1 | 0.5 | 3 | 0.1 |
| Analysis Method | TD-ICP | INAA | TD-ICP | INAA | TD-MS | TD-MS | TD-ICP | TD-MS | TD-ICP | TD-MS | INAA | TD-ICP | TD-ICP | INAA | INAA | INAA |
| GXR-1 Meas | 889 | | 0.060 | | 17 | 37 | 287 | 13.1 | | 0.4 | | 88 | 28 | | | |
| GXR-1 Cert | 852 | | 0.0650 | | 16.6 | 54.0 | 275 | 13.0 | | 0.390 | | 80.0 | 32.0 | | | |
| GXR-4 Meas | 152 | | 0.135 | | 7 | 9 | 203 | 1.2 | | 3.2 | | 89 | 13 | | | |
| GXR-4 Cert | 155 | | 0.120 | | 5.60 | 5.60 | 221 | 0.970 | | 3.20 | | 87.0 | 14.0 | | | |
| SDC-1 Meas | 883 | | 0.058 | | | < 1 | 173 | | 0.14 | | | 39 | 32 | | | |
| SDC-1 Cert | 883 | | 0.0690 | | | 3.00 | 183 | | 0.606 | | | 102 | 40.0 | | | |
| SCO-1 Meas | 390 | | 0.081 | | | 4 | 138 | | 0.35 | | | 136 | 12 | | | |
| SCO-1 Cert | 410 | | 0.0900 | | | 3.70 | 174 | | 0.380 | | | 131 | 26.0 | | | |
| GXR-6 Meas | 952 | | 0.030 | | < 3 | 1 | 46 | 0.1 | | 2.2 | | 122 | 11 | | | |
| GXR-6 Cert | 1010 | | 0.0350 | | 0.940 | 1.70 | 35.0 | 0.0180 | | 2.20 | | 186 | 14.0 | | | |
| DNC-1a Meas | | | | | | | 128 | | | | | 142 | 15 | | | |
| DNC-1a Cert | | | | | | | 144 | | | | | 148 | 18.0 | | | |
| OREAS 13b (4-Acid) Meas | | | | | | | | | | | | | | | | |
| OREAS 13b (4-Acid) Cert | | | | | | | | | | | | | | | | |
| DMMAS 111 Meas | | 1.85 | | 5.9 | | | | | | | 15.1 | | | 13.8 | 23 | 1.7 |
| DMMAS 111 Cert | | 1.87 | | 5.80 | | | | | | | 14.00 | | | 14.00 | 19.30 | 1.90 |
| A451002 Orig | 1530 | | 0.032 | | < 3 | < 1 | 55 | 0.2 | 0.38 | < 0.1 | | 289 | 25 | | | |
| A451002 Dup | 1480 | | 0.038 | | < 3 | < 1 | 52 | 0.1 | 0.65 | < 0.1 | | 344 | 20 | | | |
| Method Blank Method Blank | | | | | < 3 | < 1 | | < 0.1 | | < 0.1 | | | | | | |
| Method Blank Method Blank | 7 | | < 0.001 | | | | < 1 | | < 0.01 | | | < 2 | < 1 | | | |

# Appendix IV

SGH – Soil gas hydrocarbon geochemistry report

# SGH – SOIL GAS HYDROCARBON
# Predictive Geochemistry

***for***

## *GOLDEN HOPE MINES*
## *"MOOSE CLIFF SURVEY"*

*October 15, 2010*

** Dale Sutherland, Eric Hoffman*

*Activation Laboratories Ltd*

(* - author)

**EVALUATION OF SGH "SOIL SAMPLE" DATA**

**EXPLORATION FOR: "*GOLD and/or VMS* " TARGETS**

***Workorder: A10-4997***




1336 Sandhill Drive • Ancaster, ON • L9G 4V5 • Tel: (905) 648-9611 • Fax: (905) 648-9613 • Toll Free: 1-888-ACTLABS
E-mail: dalesutherland@actlabsint.com • Web Site: www.actlabs.com

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E-mail: dalesutherland@actlabsint.com ● Web Site: www.actlabs.com

## SOIL GAS HYDROCARBON (SGH) GEOCHEMISTRY – OVERVIEW

SGH is a deep penetrating geochemistry that involves the analysis of surficial samples from over potential mineral or petroleum targets. The analysis involves the testing for 162 hydrocarbon compounds in the C5-C17 carbon series range applicable to a wide variety of sample types. SGH has been successful for delineating targets found at over 500 metres in depth. Samples of various media have been successfully analyzed such as soil (any horizon), drill core, rock, peat, lake-bottom sediments and even snow. The SGH analysis incorporates a very weak leach, essentially aqueous, that only extracts the surficial bound hydrocarbon compounds and those compounds in interstitial spaces around the sample particles. These are the hydrocarbons that have been mobilized from the target depth. SGH is unique and should not be confused with other hydrocarbon tests or traditional analyses that measure C1 (Methane) to C5 (Pentane) or other gases. SGH is also different from soil hydrocarbon tests that thermally extract or desorb all of the hydrocarbons from the whole soil sample. This test is less specific as it does not separate the hydrocarbons and thus does not identify or measure the responses as precisely. These tests also do not use a forensic approach to identification. The hydrocarbons in the SGH extract are separated by high resolution capillary column gas chromatography to isolate, confirm, and measure the presence of only the individual hydrocarbons that have been found to be of interest from initial research and development and from performance testing in two Canadian Mining Industry Research Organization (CAMIRO) projects (97E04 and 01E02).

Over the past 14 years of research, Activation Laboratories Ltd. has developed an in-depth understanding of the unique SGH signatures associated with different commodity targets. Using a forensic approach we have developed target signatures or templates for identification, and the understanding of the expected geochromatography that is exhibited by each class of SGH compounds. In 2004 we began to include an SGH interpretation report delivered with the data to enable our clients to realize the complete value and understanding of the SGH results in the shortest time frame and provide the benefit from past research sponsored by Actlabs, CAMIRO, OMET and other projects.

SGH has attracted the attention of a large number of Exploration companies. In the above mentioned research projects the sponsors have included (in no order): Western Mining Corporation, BHP-Billiton, Inco, Noranda, Outokumpu, Xstrata, Cameco, Cominco, Rio Algom, Alberta Geological Survey, Ontario Geological Survey, Manitoba Geological Survey and OMET. Further, beyond this research, Activation Laboratories Ltd. has interpreted the SGH data for over 400 targets from clients since January of 2004. In both CAMIRO research projects over known mineralization and in exploration projects over unknown targets, SGH has performed exceptionally well. As an example, in the first CAMIRO research project that commenced in 1997 (Project 97E04), there were 10 study areas that were submitted blindly to Actlabs. These study sites were selected since other inorganic geochemistries were unsuccessful at illustrating anomalies related to the target.


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## SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW

Although Actlabs was only provided with the samples and their coordinates, SGH was able to locate the blind mineralization with exceptional accuracy in 9 of the 10 surveys. SGH has recently been very successful in exploration and discovery of unknown targets e.g. Golden Band Resources drilled an SGH anomaly and discovered a significant vein containing "visible" gold. (www.goldenbandresources.com)

**Sample Type and Survey Design:** It is highly recommended that a ***minimum*** of 50 sample "locations" is preferred to obtain enough samples into background areas on both sides of small suspected targets (wet gas plays, Kimberlite pipes, Uranium Breccia pipes, veins, etc.). SGH is not interpreted in the same way as inorganic based geochemistries. SGH must have enough samples over both the target and background areas in order to fully study the dispersion patterns or geochromatography of the SGH classes of compounds. Based on our minimum recommendation of at least 50 sample locations we further suggest that all samples be evenly spaced with about one-third of the samples over the target and one-third on each side of the target in order for SGH to be used for exploration. Targets other than gas plays, pipes, dykes or veins usually require additional samples to represent both the target and background areas.

SGH has been shown to be very robust to the use of different sample types even "within" the same survey or transect. Research has illustrated that it is far more important to the ultimate interpretation of the results to take a complete sample transect or grid than to skip samples due to different sample media. The most ideal natural sample is still believed to be soil from the "Upper B-Horizon", however excellent results can also be obtained from other soil horizons, humus, peat, lake-bottom sediments, and even snow. The sampling design is suggested to use evenly spaced samples from 15 metres to 200 metres and line spacing from 50 metres to 500 metres depending on the size and type of target. A 4:1 ratio is suggested, however, larger orientation surveys have also been successful. Ideally even large grids should have one-third of the samples over the target and two-thirds of the samples into anticipated background areas. This will allow the proper assessment of the SGH geochromatographic vectoring and background site signature levels with minimal bias. Individual samples taken at significant distances from the main survey area to represent background are not of value in the SGH interpretation as SGH results are not background subtracted. Samples can be drip dried in the field and do not need special preservation for shipping and has been specifically designed to avoid common contaminants from sample handling and shipping. SGH has also been shown to be robust to cultural activities even to the point that successful results and interpretation has been obtained from roadside right-of-ways.


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## SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW

**Sample Preparation and Analysis:** Upon receipt at Activation Laboratories the samples are air-dried in isolated and dedicated environmentally controlled rooms set to 40°C. The dried samples are then sieved. In the sieving process, it is important that compressed air is not used to clean the sieves between samples as trace amounts of compressor oils "may" poison the samples and significantly affect some target signatures. At Activation Laboratories a vacuum is used to clean the sieve between each sample. The -60 mesh sieve fraction (<250 microns, although different mesh sizes can be used at the preference of the exploration geologist) is collected and packaged in a Kraft paper envelope and transported from our sample preparation building to our analytical building on the same street in Ancaster Ontario. Each sample is then extracted, separated by gas chromatography and analyzed by mass spectrometry using customized parameters enabling the highly specific detection of the 162 targeted hydrocarbons at a reporting limit of one part-per-trillion (ppt). This trace level limit of reporting is critical to the detection of these hydrocarbons that, through research, have been found to be related at least in part to the breakdown and release of hydrocarbons from the death phase of microbes directly interacting with a deposit at depth. The hydrocarbon signatures are directly linked to the deposit type which is used as a food source. The hydrocarbons that are mobilized and metabolized by the microbes are released in the death phase of each successive generation. Very few of the hydrocarbons measured are actually due to microbe cell structure, or hydrocarbons present or formed in the genesis of the deposit or from anthropogenic contamination. The results of the SGH analysis is reported in raw data form in an Excel spreadsheet as "semi-quantitative" concentrations without any additional statistical modification.

**Mobilized Inorganic Geochemical Anomalies:** It is important to note that SGH is essentially "blind" to any inorganic content in samples as only organic compounds as hydrocarbons are measured. Thus inorganic geochemical surface anomalies that have migrated away from the mineral source, and thus may be interpreted and found to be a false target location, is not detected and does not affect SGH results. This fact is of great advantage when comparing the SGH results to inorganic geochemical results. If there is agreement in the location of the anomalies between the organic and inorganic technique, such as Actlabs' Enzyme Leach, a significant increase in confidence in the target location can be realized. If there is no agreement or a shift in the location of the anomalies between the techniques, the inorganic anomaly may have been mobilized in the surficial environment.

**The Nugget Effect:** As SGH is "blind" to the inorganic content in the survey samples, any concern of a "nugget effect" will not be encountered with SGH data. A "nugget effect" may be of a concern for inorganic geochemistries from surveys over copper, gold, lead, nickel, etc. type targets.


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## SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW

**SGH Interpretation Report:** All SGH submissions must be accompanied by relative or UTM coordinates so that we may ensure that the sample survey design is appropriate for use with SGH, and to provide an SGH interpretation with the results. In our interpretation procedure, we separate the results into 19 SGH sub-classes. These classes include specific alkanes, alkenes, thiophenes, aromatic, and polyaromatic compounds. Note that none of the SGH hydrocarbons are "gaseous" at room temperature and pressure. The classes are then evaluated in terms of their geochromatography and for coincident compound class anomalies that are unique to different types of mineralization. Actlabs uses a six point scale in assigning a subjective rating of similarity of the SGH signatures found in the submitted survey to signatures previously reviewed and researched from known case studies over the same commodity type. Also factored into this rating is the appropriateness of the survey and amount of data/sample locations that is available for interpretation. This rating scale is described in detail in the following section.

## SGH RATING SYSTEM - DESCRIPTION

To date SGH has been found to be successful in the depiction of buried mineralization for Gold, Nickel, VMS, SEDEX, Uranium, Polymetallic, and Copper, as well as for Kimberlites. SGH data has developed into a dual exploration tool. From the interpretation, a vertical projection of the predicted location of the target can be made as well as a statement on the rating of the comparability of the identification of the anticipated target type to that from known case studies, as an example: if the client anticipates the target to be a Gold deposit, what is the rating or comparability that the target is similar to the SGH results over a Gold deposit in Nunavut, shear hosted and sediment hosted deposits in Nevada, or Paleochannel Gold mineralization in Western Australia.

- A rating of "6" is the highest or best rating, and means that the SGH classes most important to describing a Gold related hydrocarbon signature are all present and consistently vector to the same location with well defined anomalies. To obtain this rating there also needs to be other SGH classes that when mapped lend support to the predicted location.
- A rating of "5" means that the SGH classes most important to describing a Gold signature are all present and consistently describe the same location with well defined anomalies. The SGH signatures may not be strong enough to also develop additional supporting classes.
- A rating of "4" means that the SGH classes most important to describing a Gold signature are mostly present describing the location with <u>well</u> defined anomalies. Supporting classes may also be present.


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## SGH RATING SYSTEM - DESCRIPTION (continued)

- A rating of "3" means that the SGH classes most important to describing a Gold signature are mostly present and describe the same location with fairly well defined anomalies. Some supporting classes may or may not be present.
- A rating of "2" means that some of the SGH classes most important to describing a Gold signature are present but a predicted location is difficult to determine. Some supporting classes may be present
- A rating of "1" is the lowest rating, and means that one of the SGH classes most important to describing a Gold signature is present but a predicted location is difficult to determine. Supporting classes are also not helpful.
- The SGH rating is directly and significantly affected by the survey design. Small data sets, especially if significantly <50 sample locations, or transects/surveys that are geographically too short will automatically receive a lower rating no matter how impressive an SGH anomaly might be. When there is not enough sample locations to adequately review the SGH class geochromatography, or when the sample spacing is inadequate, or if the spacing is highly variable such that it biases the interpretation of the results, then the confidence in the interpretation of any geochemistry is adversely affected. The SGH rating is not just a rating of the agreement between the SGH pathfinder classes for a particular target type; it is a rating of the overall confidence in the SGH results from this particular survey. The interpretation is only based on the SGH results without any information from other geochemical, geological or geophysical information unless otherwise specified.

## SGH RATING SYSTEM – HISTORY & UNDERSTANDING

The subjective SGH rating system has been used since 2004 when Activation Laboratories started providing an SGH Interpretation Report with ever submission for SGH analysis to aid our clients in understanding this organic geochemistry and ensuring that they obtain the best results for their surveys. As explained in the previous section, the SGH rating is not just a rating of how definitive an SGH anomaly is, and is not based just on the map(s) provided in this report. It is a rating of "confidence in the interpreted anomaly" from the combination of (i) are the expected SGH Pathfinder Classes of compounds present from the template for this target type (one Pathfinder Class map is shown in the report, at least three must be present to adequately describe the correct signature for a particular target), (ii) how well do these SGH Pathfinder Classes agree in describing an particular area, (iii) how well does this agreement compare to SGH case studies over known targets of that type, (iv) how well is the interpreted anomaly defined by the survey (i.e. a single


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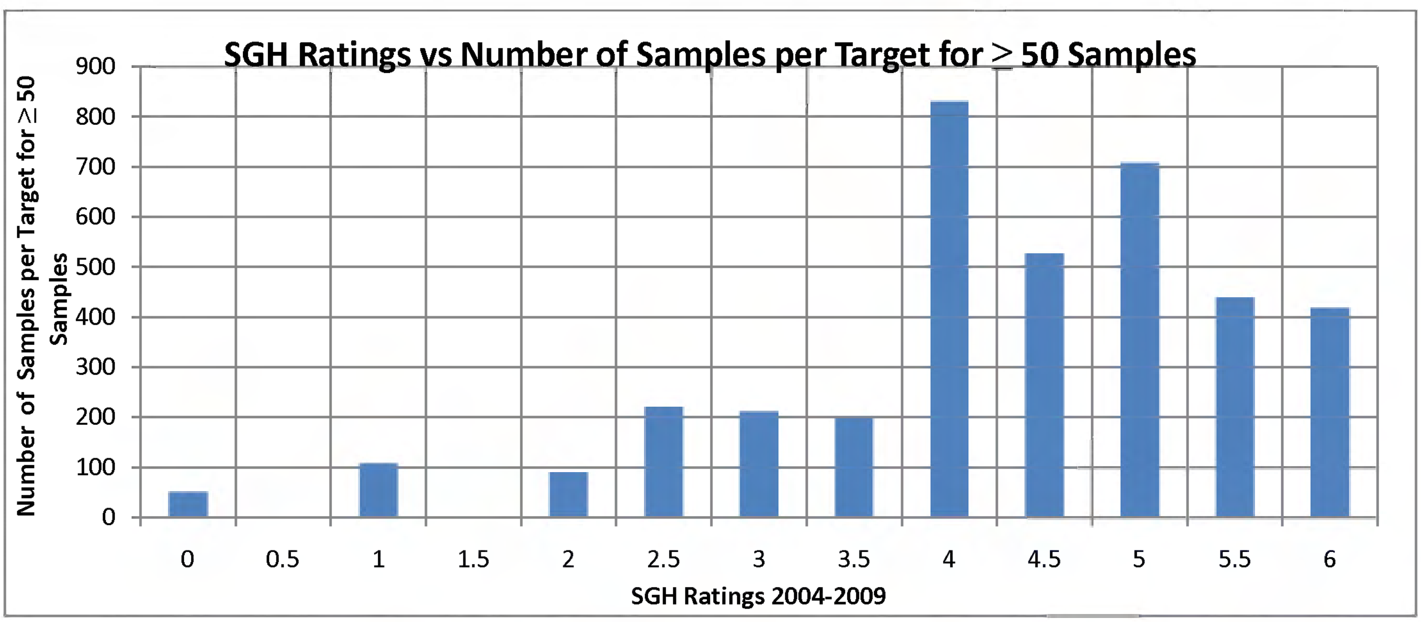
## SGH RATING SYSTEM – HISTORY & UNDERSTANDING (cont.)

transect does not provide the same confidence as a complete grid of samples), and (v) is there at least a minimum of 50 sample locations in the survey so that there may be an adequate amount of data to observe the geochromatography of the different SGH Pathfinder Class of compounds.

The question often arises by clients as to the frequency of a rating, e.g. "how often is a rating of 5.0 given in an interpretation". To better understand this we present this review of the history of the SGH rating program since 2004 and some of the underlying situations that can affect the historical rating charts.

Originally it was recommended that a minimum of 35 sample location be used for small target exploration, however it was quite quickly realized that this is often insufficient and at least 50 sample locations were required. In 2007, the rating scale was refined to include increments of 0.5 units rather than just integer values from 0 to 6.

A rating frequency may be biased high as most clients conduct an orientation study over a known target, thus several of these projects result in high ratings. Note that, at this time, the rating is not said to be linked to grade of a deposit or depth to the target. Even in exploration surveys clients tend to submit samples over more promising targets due to knowledge of the geology and prior geochemical or geophysical results. As shown in the following chart, projects with SGH data from 200 or more sample locations have a higher level of confidence in the interpretation as the geochromatography of the SGH Pathfinder Classes of compounds can be more completely observed and reviewed.





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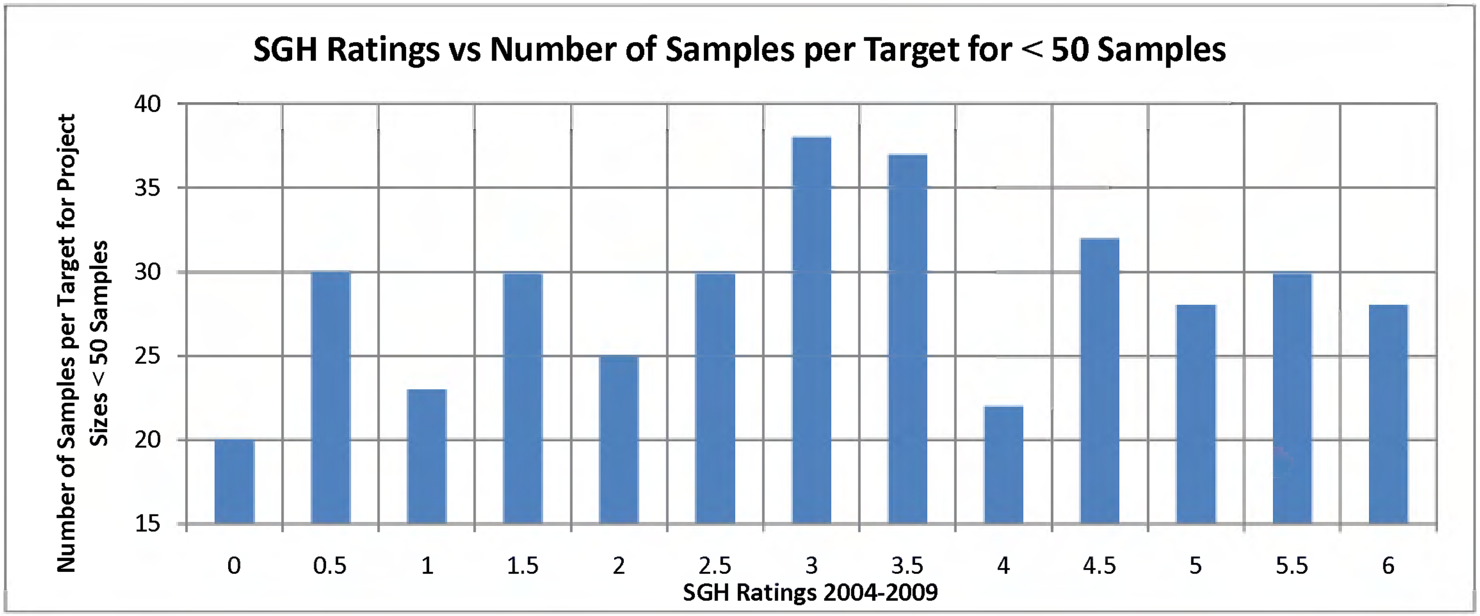
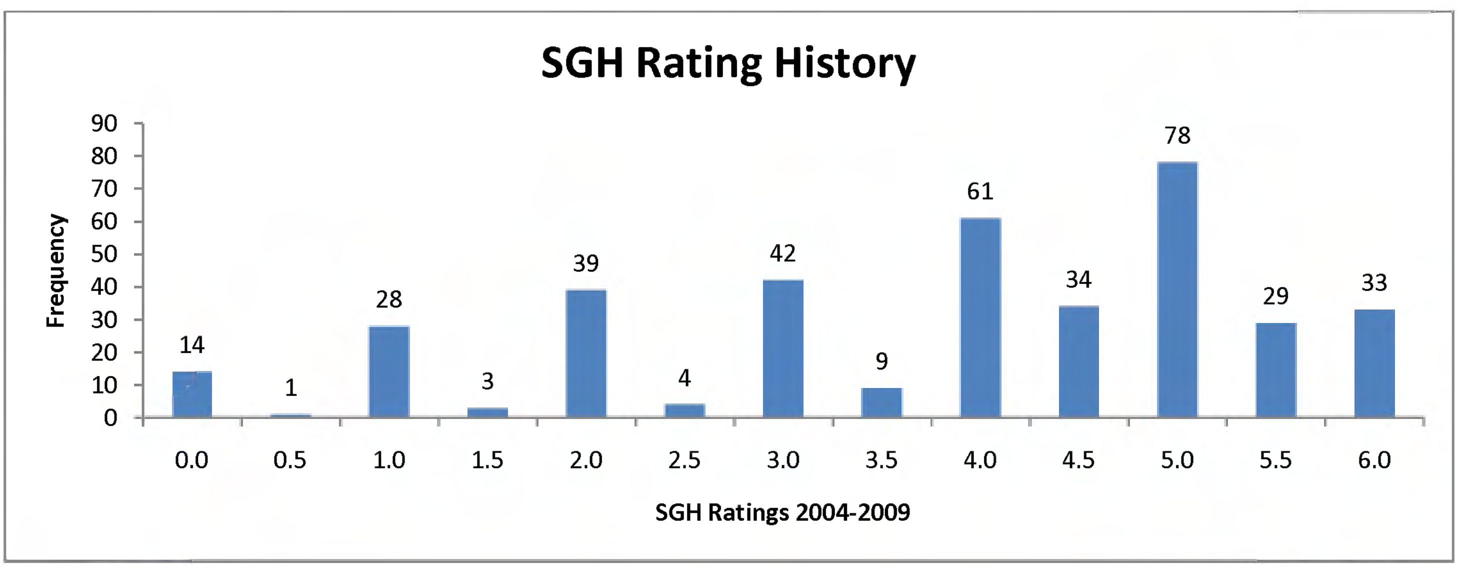
## SGH RATING SYSTEM – HISTORY & UNDERSTANDING (cont.)

The rating frequency may be biased low as research projects often include a bare minimum of samples to reduce costs. Research projects may also be over targets known to be difficult to depict with geochemistry. Multiple targets in close vicinity in a survey may result in a low bias as the Pathfinder Class geochromatography is more difficult to deconvelute. Ratings may also be biased low if less than the recommended 50 sample locations is submitted as indicated by the following chart. This chart also illustrates that there is no interpretation bias to a particular rating value.




The overall rating frequency for over 400 targets from January 2004 to December 2009 is shown in the chart below illustrating that surveys over more promising targets are most often submitted for best use of research or exploration dollars. It also indicates that the 0.5 increments were less frequent as they started in 2007.





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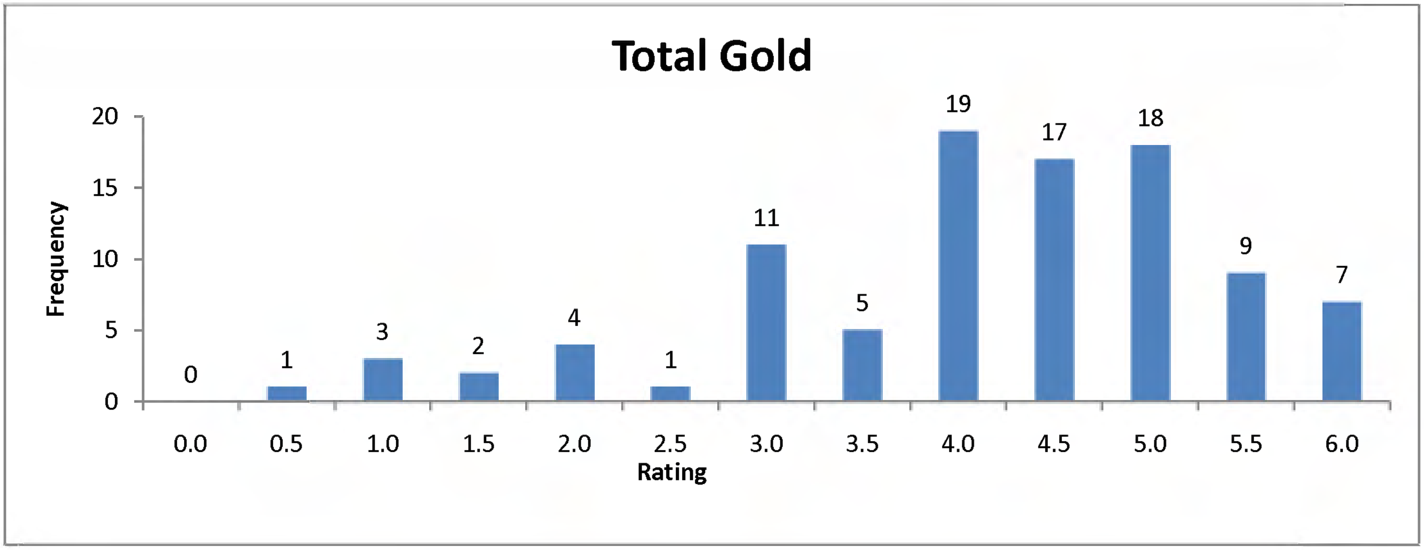
## SGH RATING SYSTEM – HISTORY & UNDERSTANDING (cont.)

More specific for SGH interpretation for Gold targets, the overall rating frequency for 97 targets from January 2004 to December 2009 is shown in the chart below that also illustrates that surveys over more promising Gold targets are most often submitted for best use of research or exploration dollars.




## SGH DATA QUALITY

- **Reporting Limit:** The SGH Excel spreadsheet of results contains the raw unaltered concentrations of the individual SGH compounds in units of "part-per-trillion" (ppt). The reporting of these ultra low levels is vital to the measurement of the small amounts of hydrocarbons now known to be leached/metabolized and subsequently released by dead bacteria that have been interacting with the ore at depth. To ensure that the data has a high level of confidence, a "reporting limit" is used. The reporting limit of 1 ppt actually represents a level of confidence of approximately 5 standard deviations where SGH data is assured to be "real" and non-zero. Thus in SGH the use of a reporting limit automatically removes site variability and there is no need to further background subtract any data as the reporting limit has already filtered out any site background effects. Thus we recommend that all data that is equal to or greater than 2 ppt should be used in any data review. It is important to review all SGH data as low values that may be the centre of halo anomalies and higher values as apical anomalies or as halo ridges are all important.

- **Laboratory Replicate Analysis:** A laboratory replicate is a sample taken randomly from the submitted survey being analyzed and are not unrelated samples taken from some large stockpile of bulk material. In the Organics laboratory an equal portion of this sieved sample, or pulp, is taken and analyzed in the same manner using the Gas Chromatography/Mass Spectrometer. The comparison of laboratory replicate and field duplicate results for chemical tests in the parts-per-million or even parts-per-billion range has typically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## SGH DATA QUALITY (continued)

been done using an absolute "relative percent difference (RPD)" statistic which is an easy proxy for error estimation rather than a more complete analysis of precision as specified by Thompson and Howarth. An RPD statistic is not appropriate for SGH results as the reporting limit for SGH is 1 part-per-trillion. Further, SGH is a semi-quantitative technique and was not designed to have the same level of precision as other less sensitive geochemistry's as it is only used as an exploration tool and not for any assay work. SGH is also designed to cover a wide range of organic compounds with an unprecedented 162 compounds being measured for each sample. In order to analyze such a wide molecular weight range of compounds, sacrifices were made to the variability especially in the low molecular weight range of the SGH analysis. The result is that the first fifteen SGH compounds in the Excel spreadsheet is expected to exhibit more imprecision than the other 147 compounds. An SGH laboratory replicate is a large set of data for comparison even for just a few pairs of analyses. Precision calculations using a Thompson and Howarth approach should only be used for estimating error in individual measurements, and not for describing the average error in a larger data set. In geochemical exploration geochemists seek concentration patterns to interpret and thus rigorous precision in individual samples is not required because the concentrations of many samples are interpreted collectively. For these reasons recent and independent research at Acadia University in Canada promote that a percent Coefficient of Variation (%CV) should be used as a universal measurement of relative error in all geochemical applications. As SGH results are a relatively large data set for nearly all submissions, %CV is a better statistic for use with SGH. By using %CV, the concentration of duplicate pairs is irrelevant because the units of concentration cancel out in the formation of the coefficient of variation ratio. For SGH, the %CV is calculated on all values ≥ 2 ppt. These values are averaged and represent a value for each pair of replicate analysis of the sample. All of the %CV values for the replicates are then averaged to report one %CV value to represent the overall estimate of the relative error in the laboratory sub-sampling from the prepared samples, and any instrumental variability, in the SGH data set for the survey. Actlabs' has successfully addressed the analytical challenge to minimize analytical variability for such a large list of compounds. Thus as SGH is also interpreted as a signature and is solely used for exploration and not assay measurement, the data from SGH is **"fit for purpose"** as a geochemical exploration tool.

- **Historical SGH Precision:** In the general history of geochemistry, studies indicate that a large component of total measurement error is introduced during the collection of the initial sample and in sub-sampling, and that only a subordinate amount of error in the result is introduced during preparation and analysis. A historical record encompassing many projects for SGH, including a wide variety of sample


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## SGH DATA QUALITY (continued)

types, geology and geography, shows that the consistency and precision for the analysis of SGH is excellent with an overall precision of 6.8% Coefficient of Variation (%CV). When last calculated, this number has a range having a maximum of 12.4% CV, a minimum of 3.0% CV, with a standard deviation of 1.6%, in a population made up of over 400 targets (over 45,000 samples) interpreted since June of 2004. Again the precision of 6.8% CV included all of the sample types as soil from different horizons, peat, till, humus, lake-bottom sediments, ocean-bottom sediments, and even snow. When field duplicates have been revealed to us, we have found that the precision of the field duplicates are in the range of about 9 to 12 %CV. As SGH is interpreted using a combination of compounds as a chemical "class" or signature, the affect of a few concentrations that may be imprecise in a direct comparison of duplicates is not significant. Further, projects that have been re-sampled at different times or seasons are expected to have different SGH concentrations. The SGH anomalies may not be in exactly the same position or of the same intensity due to variable conditions that may have affected the dispersion of different pathfinder classes. However, the SGH "signature" as to the presence of the specific mix of SGH pathfinder classes will definitely still exist, and will retain the ability to identify the deposit type and vector to the same target location.

- **LABORATORY MATERIALS BLANK – QUALITY ASSURANCE (LMB-QA):**

The Laboratory Materials Blank Quality Assurance measurements (LMB-QA) shown in the SGH spreadsheet of results are matrix free blanks analyzed for SGH. These blanks are not standard laboratory blanks as they do not accurately reflect an amount expected to be from laboratory handling or laboratory conditions that may be present and affect the sample analysis result. The LMB-QA measurements are a pre-warning system to only detect any contamination originating from laboratory glassware, vials or caps. As there is no substrate to emulate the sample matrix, the full solvating power of the SGH leaching solution, effectively a water leach, is fully directed at the small surface area of the glassware, vials or caps. In a sample analysis the solvating power of the SGH leaching solution is distributed between the large sample surface area (from soil, humus, sediments, peat, till, etc.) and the relatively small contribution from the laboratory materials surfaces. The sample matrix also buffers the solvating or leaching effect in the sample versus the more vigourous leaching of the laboratory materials which do not experience this buffering effect. Thus the level of the LMB-QA reported is biased high relative to the sample concentration and the actual contribution of the laboratory reagents, equipment, handling, etc. to the values in samples is significantly lower. This situation in organic laboratory analysis only occurs at such extremely low part-per-trillion (ppt) measurement levels. This is one of the reasons that SGH uses a reporting limit and not a detection limit. The 1 ppt reporting limit used in the SGH spreadsheet of raw concentration data is 3 to 5


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## <u>SGH DATA QUALITY</u> (continued)

times greater than a detection limit. The reporting limit automatically filters out analytical noise, the actual LMB-QA, and most of the sample survey site background. This has been proven as SGH values of 1 to 3 parts-per-trillion (ppt) have very often illustrated the outline of anomalies directly related to mineral targets. <u>Thus all SGH values greater than or equal to 1 or 2 ppt should be used as reliable values for interpretations.</u>

The LMB-QA values thus should not be used to background subtract any SGH data. The LMB-QA values are only an early warning as a quality assurance procedure to indicate the relative cleanliness of laboratory glassware, vials, caps, and the laboratory water supply at the ppt concentration level. <u>Do not subtract the LMB-QA values from SGH sample data.</u>

## <u>SGH DATA LEVELING</u>

The combination of SGH data from different field sampling events has rarely required leveling in order to combine survey grids. The only circumstances that have occasionally required leveling has been the combination of samples that are very fine in texture, thus having a combined large surface area to samples of peat that may be in nearby areas. Even after maceration of the peat and in using the maximum size of sample amenable to this test method, peat samples have a significantly lower surface area. Peat samples have only required leveling in one survey in the last 500 SGH interpretations.

In only the last year (2009-2010) it has been observed that SGH data may require leveling when different field sampling events have significantly different soil temperature. It has been documented that when “soil” samples are taken from “frozen” ground that SGH data leveling may be required as frozen samples act as a frozen cap to the hydrocarbon flux and may collect a higher concentration of hydrocarbon compounds. Only two surveys have required leveling due to very different sampling site temperatures in the last 500 SGH interpretations.

The author has taken introductory training in the leveling of geochemical data. In the process of leveling, both data sets are reviewed in terms of maximum, minimum and average values for each SGH Pathfinder Class intended for use in the interpretation. Data in sectioned into quartiles and each section is assigned specific leveling factors that are applied to one data set. It should be noted that any type of data leveling is an approximation.

<u>**No data leveling was required for this project.**</u>


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# SGH DATA INTERPRETATION

- **GEOCHEMICAL ANOMALY THRESHOLD VALUE:**

  In the interpretation of "inorganic" geochemical data one of the determinations to be made is to calculate a "Threshold" value above which data is considered anomalous. This is done on an element by element basis. In the interpretation of this "organic" geochemical data this determination is done differently. The determination of a threshold value is not calculated for each hydrocarbon compound. The determination of a threshold value is also a concentration below which geochemical data is considered as "noise" for the purposes of geochemical interpretation. As discussed on page 10, SGH uses a "Reporting Limit" instead of some type of Detection Limit. The amount of noise that is already eliminated in the data, as below the Reporting Limit of 1 part-per-trillion (shown in the data spreadsheet as "-1" as "not-detected at a Reporting Limit of 1 ppt") is equivalent to approximately 5 standard deviations of variability. To thus calculate an additional Threshold Value is a loss of real and valuable data. Further, in the interpretation of SGH data, individual compounds are not considered (unless explicitly mentioned in the report). The interpretation of SGH data is exclusively conducted by "compound chemical class" which is the sum of four to fourteen individual hydrocarbons in the same organic chemical class as these compounds naturally have the same chemical properties that ultimately define their spatial dispersion characteristics in their rise from a mineral target through the overburden. This combined class is more reliable than the measurement of any one compound. SGH also eliminates the need for a Threshold value determination above the Reporting Limit due to the "high specificity" of the specific hydrocarbons and the classes they form. Each of the hydrocarbons has been hand selected due to their lower probability of being found in general surface soils. Further, only those classes where the majority of the compounds are detected above the Reporting Limit are considered in the interpretation. This defines the SGH geochemistry as having less geochemical noise due to the use of a reporting limit and as having higher confidence in the use of groups (classes) of data instead of individual compounds. However the most important aspect of interpretation is the use of a forensic signature. At least three specific "Pathfinder" classes, based on the combinations or template of classes we have developed, must be present to define the hydrocarbon signature to confidently predict the presence of a specific type of mineral target. Do not calculate another Threshold value. FACT: It has been proven many times that important chemical anomalies can exist even at 5 ppt.

- **SGH PATHFINDER CLASS MAGNITUDE**:

  The magnitude of any individual concentration or that of a hydrocarbon class does not imply that the data is of more importance or that mineralization is of higher quantity or grade. SGH interpretations must use the review of the combination of specific hydrocarbon classes to make any interpretation.


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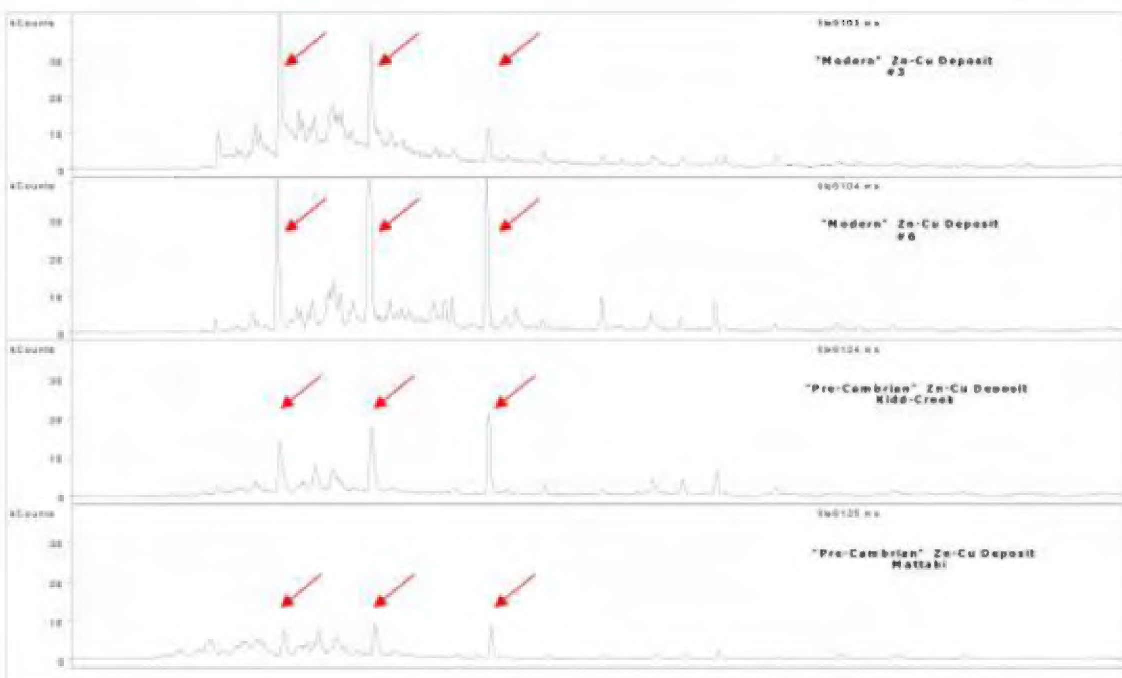
## SGH – FORENSIC GEOCHEMICAL SIGNATURES

- One of the first experiments in 1996 in the development of the SGH analysis was to observe if an SGH response could be obtained directly from an ore sample. From office shelf specimens, small rock chips were obtained which were then crushed and milled. The fine pulp obtained was then subjected to the SGH analysis. These shelf specimen samples were from well known Volcanic Massive Sulphide deposits of the Mattabi deposit from the Archean Sturgeon Lake Camp in Northwestern Ontario and from the Kidd Creek Archean volcanic-hosted copper-zinc deposit. Even these specimen samples contain a geochemical record of the hydrocarbons produced by the bacteria that had been feeding on these deposits at depth. As a comparison, SGH analysis were similarly conducted on modern-day VMS ore samples taken from a "black smoker" hydrothermal volcanic vent from the deep sea bed of the Juan de Fuca Ridge where high concentrations of microbial growth was also known to exist. The raw data profiles as GC/MS Total Ion Chromatograms are shown below to illustrate the "visible" portion of the VMS signature obtained from the SGH analysis.




The top two profiles were obtained from two samples of the modern day "black smokers". The third and fourth chromatograms in the above image were obtained from the Pre-Cambrian Zn-Cu Kidd Creek and Mattabi deposits. The red arrows point to three compounds that are a portion of the SGH signature for VMS type deposits. This visible portion of the VMS signature of hydrocarbons can easily be seen in the analysis of each of these four samples.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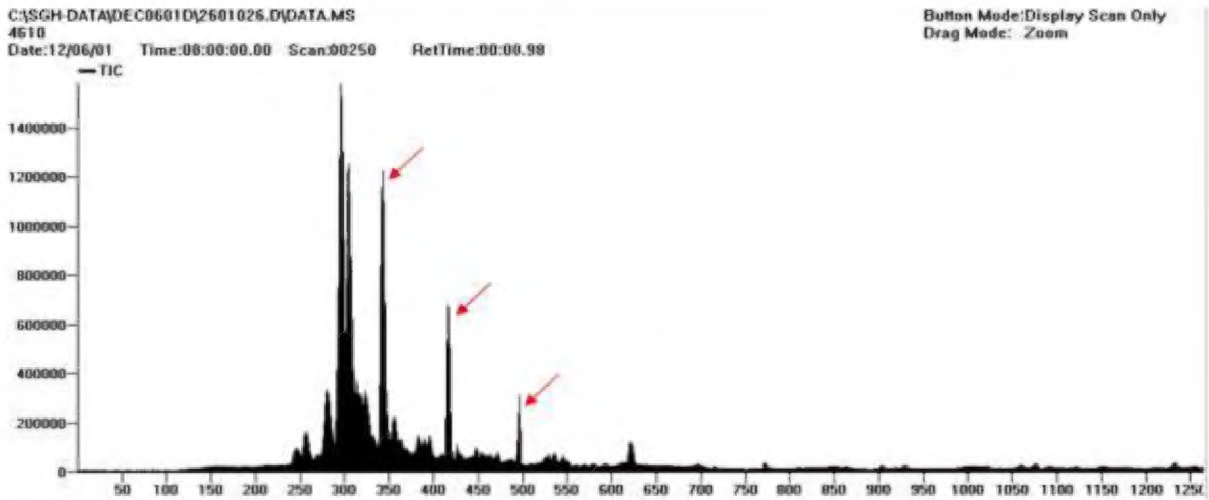
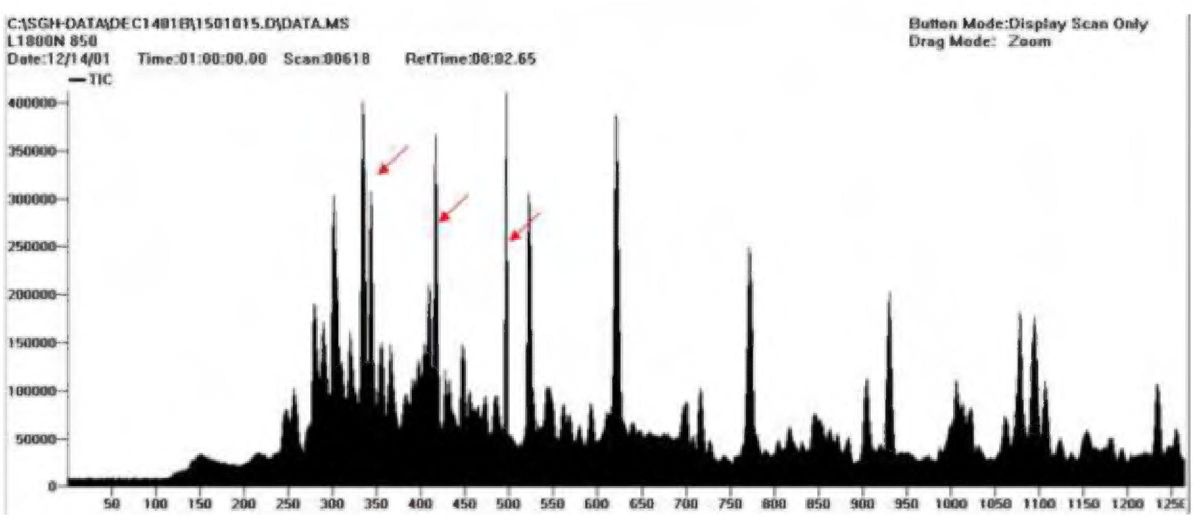
## SGH – FORENSIC GEOCHEMICAL SIGNATURES (cont.)

The next question in our early objectives was to see if this SGH signature could also be observed in surficial soil samples that had been taken over VMS deposits. Through our research projects, soil samples were obtained from over the Ruttan Cu-Zn VMS deposit near Leaf Rapids, Manitoba and located in the Paleoproterozoic Rusty Lake greenstone belt. The profile obtained, as observed in the raw GC/MS chromatogram, is shown in this next image below:




The three compounds indicated by the red arrows represent the same visible portion of the VMS signature observed from the modern day black smoker samples and the ore samples taken from the Mattabi and Kidd Creek, even though this soil was taken from over a different VMS deposit in a geographically different area. Is this coincidence? Another soil sample was obtained from Noranda's Gilmour South base-metal occurrence in the Bathurst Mining camp in northern New Brunswick. As shown below, this sample contained a very complex SGH signature, however the visible portion of the VMS signature as indicated by the red arrows is still observed as in the black smoker, Mattabi and Kidd Creek ore samples.





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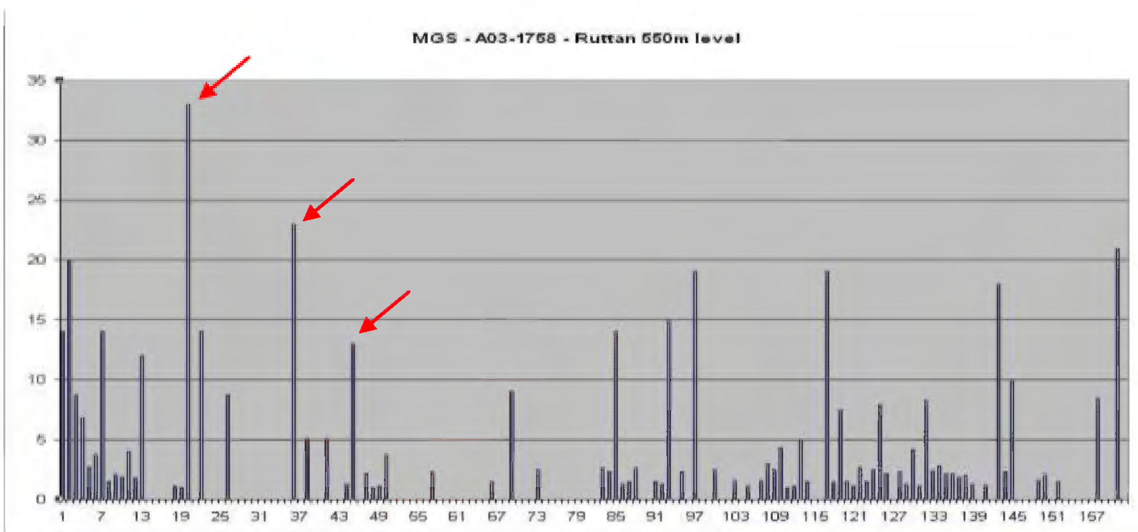
## SGH – FORENSIC GEOCHEMICAL SIGNATURES (cont.)

In research conducted by the Ontario Geological Survey, this same portion of the SGH signature was also observed over the VMS deposit at Cross Lake in Ontario. Note that the visible signature shown as the three compounds indicated by the red arrows is only a small portion of the complete SGH VMS signature. The full VMS signature is made up of at least three groups, as three organic chemical classes, that together contain at least 35 of the individual SGH hydrocarbons.

The chromatograms shown on the preceding page from the GC/MS analysis are not used directly in the interpretation of SGH data. As we are only interested in a specific list of 162 hydrocarbons, the mass spectrometer and associated software programs specifically identifies the hydrocarbons of interest, runs calculations using relative responses to a short list of hydrocarbons used as standards, and develops an Excel spreadsheet of semi-quantitative concentration data to represent the sample. Thus the SGH results for a sample, like that observed in ore from the Ruttan, are filtered to obtain the concentrations for the specific 162 hydrocarbons. A simple bar graph drawn from the Excel spreadsheet of the hydrocarbons and their concentrations results in a DNA like **forensic SGH signature** as shown below. The portion discussed hear as the "visible" SGH VMS signature in the GC/MS chromatograms, is again shown by the red arrows.




Through the work done in the SGH CAMIRO research projects, it was observed that the hydrocarbon signature produced by the SGH technique appeared to also be able to be used to differentiate barren from ore-bearing conductors. This was explored further through the submission and analysis of specific specimen samples that represented a barren pyritic conductor and a barren graphitic conductor.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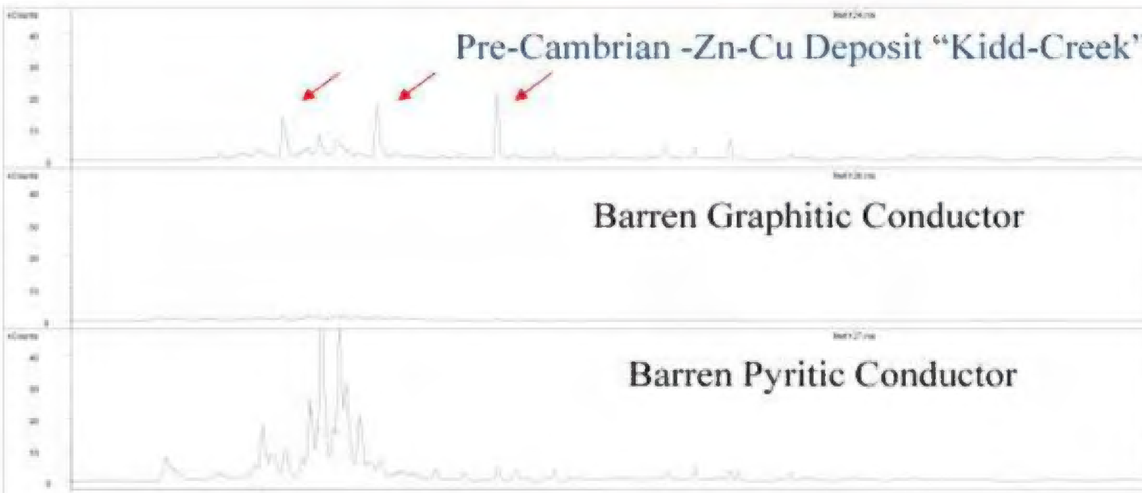
## SGH – FORENSIC GEOCHEMICAL SIGNATURES (cont.)

The GC/MS chromatograms from these two specimens are compared to that obtained from the Kidd-Creek ore as shown below. This diagram conclusively shows that the SGH signatures obtained from the two types of barren conductors are completely different than that obtained by SGH over VMS type ore. SGH is thus able to differentiate between ore-bearing conductors and barren conductors as the Forensic SGH Geochemical signature is different.




- SGH has been described by the Ontario Geological Survey of Canada (OGS) as a "REDOX cell locator". Many SGH surveys for Gold and other mineral targets can result in multiple types of anomalies, depending on the class of SGH compounds, even over the same target and in the same set of samples. Thus "Apical", "Nested-Halo", and "Rabbit-Ear" or "Halo" type SGH anomalies are all typically observed from the effect of REDOX cells that have developed over deposits. REDOX cells are also related to the presence of bacteriological activity.
- The VMS template of SGH Pathfinder Classes uses low and medium weight classes of hydrocarbon compounds. Again, at least three Pathfinder Class group maps, associated with the SGH signature for VMS, must be present to begin to be considered for assignment of a good rating. The Pathfinder Class anomalies in these maps must logically concur and support a consistent interpretation in relation to the expected geochromatographic characteristics of the Pathfinder Class, for a specific area. The SGH Pathfinder Class map(s) shown in this report is usually the most diagnostic for the presence of Volcanic Massive Sulphide based mineralization. This interpretation development history for VMS is similar to the development history for other target types. The reader should not draw a conclusion that SGH is used only for sulphide based mineralization as some of the most intense SGH anomalies have been associated with Kimberlites where sulphides are essentially not present.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**_INTERPRETION OF SGH RESULTS – A10-4997_**
**_GOLDEN HOPE MINES – MOOSE CLIFF PROJECT_**

## SGH SURVEY INTERPRETATION

- This report is based on the SGH results from the analysis of a total of 65 soil samples from the MOOSE CLIFF Project. The survey is made up of 4 parallel North-South trending transects that are 50 metres apart with samples spaced at approximately 20 metres along each transect. UTM coordinates were provided to map the SGH results for these surveys.
- The number of samples submitted for this project is adequate to use SGH as an exploration tool. Note that the SGH data is only reviewed for the particular target deposit type requested, in this case for the presence of a Gold and/or VMS based deposit. It is also assumed that there is only one potential target in the survey. To obtain the best interpretation the client should indicate if there are possible multiple targets, say from geophysical data. The possibility of multiple targets "in close proximity" (~200 metres for Gold) should be known due to potential overlap and increased complexity of resulting geochromatographic anomalies which could alter the interpretation.
- Note that the associated SGH results are presented in a separate Excel spreadsheet for A10-4997. This raw data is semi-quantitative and is presented in units of pg/g or parts-per-trillion (ppt).
- **The overall precision of the SGH analysis for the samples in this MOOSE CLIFF project was excellent** as demonstrated by 4 samples taken from the survey which were used for laboratory replicate analysis. The average Coefficient of Variation (%CV) of the replicate results for the MOOSE CLIFF survey was 9.0% for these replicate samples which represents excellent levels of analytical performance especially at the low parts-per-trillion (ppt) measurements in the Soil Gas Hydrocarbon geochemistry.
- SGH has been described by the Ontario Geological Survey of Canada (OGS) as a "REDOX cell locator". Many SGH surveys for Gold and other mineral targets can result in multiple types of anomalies, depending on the class of SGH compounds, even over the same target and in the same set of samples. Thus "Apical", "Nested-Halo", and "Rabbit-Ear" or "Halo" type anomalies are all typically observed from the effect of REDOX cells that have developed over deposits. REDOX cells are also related to the presence of bacteriological activity.
- At this time we cannot comment on either the depth to mineralization or grade, except that SGH has been able to detect mineralization at up to 520 metres in depth to date (McArthur River P2 pod-uranium, CAMIRO 97E04).


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***INTERPRETION OF SGH RESULTS – A10-4997***
***GOLDEN HOPE MINES – MOOSE CLIFF PROJECT***

## SGH SURVEY INTERPRETATION – GOLD PATHFINDER CLASS MAP

- The map shown on page 21 for the MOOSE CLIFF project in plan view is also shown as a 3D view on page 22. This map is an SGH "Pathfinder Class map" for targeting Gold mineralization. The map represents the simple summation of several individual hydrocarbon compound concentrations that are grouped from within the same organic chemical class. SGH Pathfinder Class maps have been shown to be robust as they are each described using from 4 to 14 (unless otherwise stated) chemically related SGH compounds which are simply summed to create each class map. Thus each map has a higher level of confidence as it is not illustrating just one compound response. A legend of the compound classes appears at the bottom of the SGH data spreadsheet. The overall SGH interpretation Rating has even a higher level of confidence as it further relies on the consensus between at least two additional pathfinder classes that together make the signature of the target at depth.

- The Gold template of SGH Pathfinder Classes use low and medium weight classes of hydrocarbon compounds. At least three Pathfinder Class maps associated with the SGH signature for Gold must be present to begin to be considered for assignment of a good rating. The Pathfinder Class anomalies must also concur and support a consistent interpretation, in relation to the expected geochromatographic characteristics of the Pathfinder Class, for a specific area. These SGH templates have been shown to be applicable to a wide variety of lithology such as epithermal, porphyry, sedimentary hosted, orogenic, vein and other types of gold deposits.

- The dotted black lines applied to the SGH Pathfinder Class maps on page 21 are the interpretations that have been applied to illustrate, as a vertical projection, possible gold based mineralization at some depth. Other SGH Pathfinder Class maps (not shown in this report) also agree on the assignment of this boundary.


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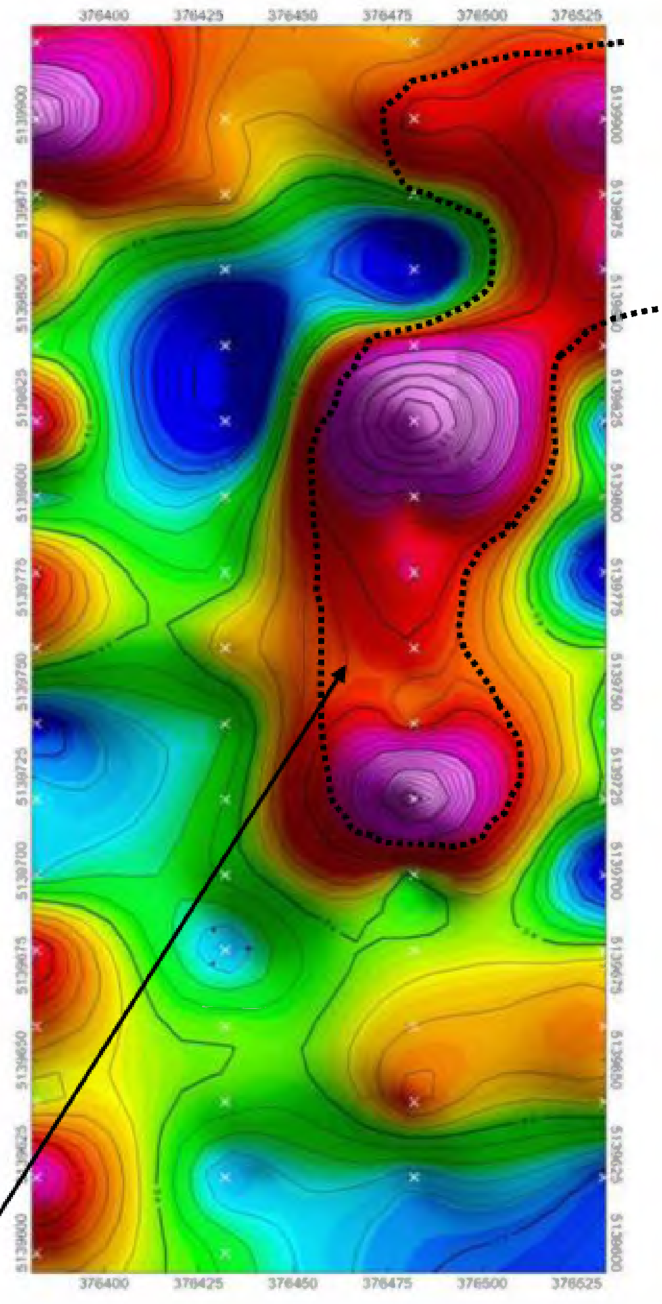
# INTERPRETION OF SGH RESULTS – A10-4997
# GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

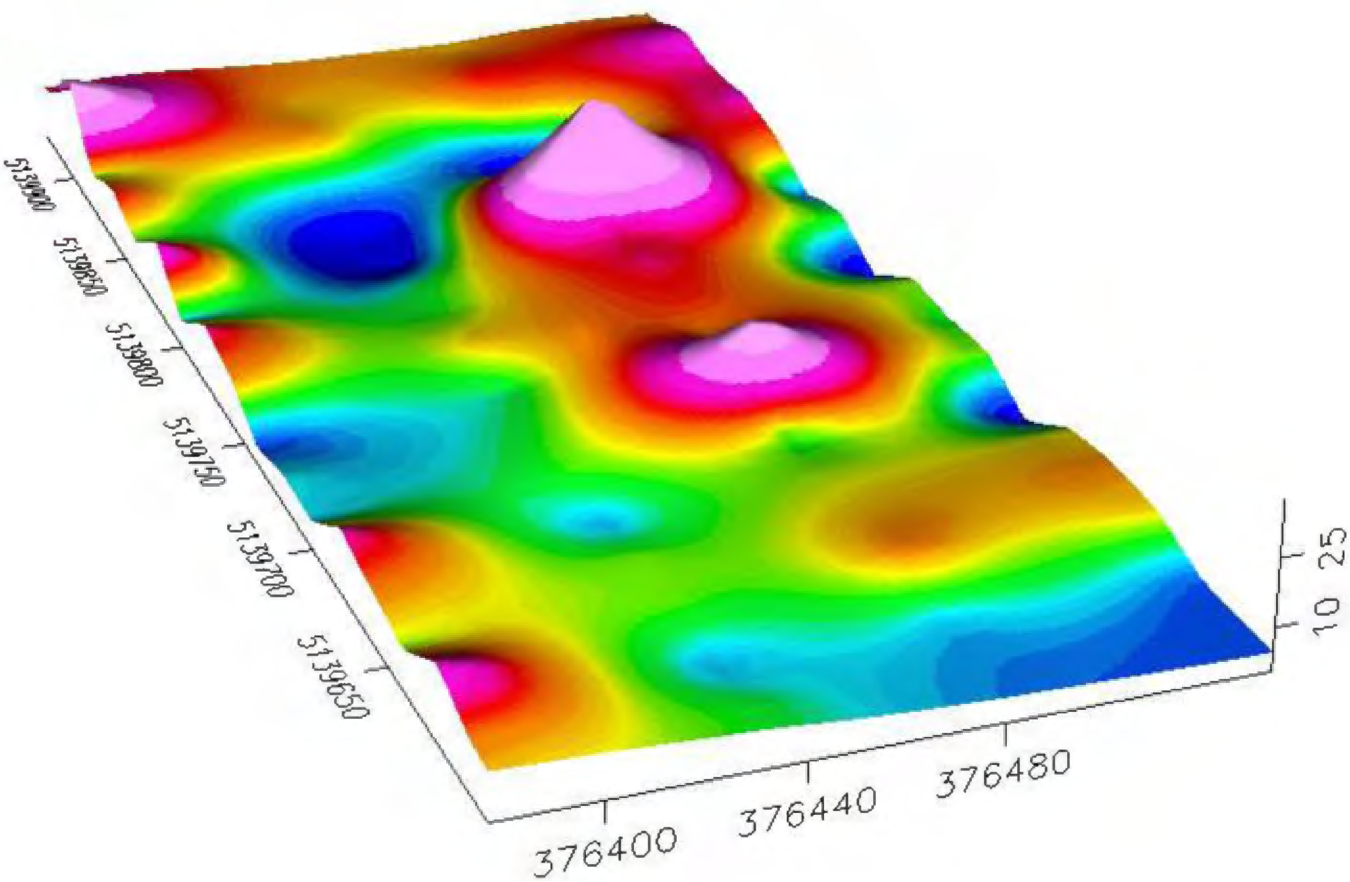
## SGH "GOLD" PATHFINDER CLASS MAP




ANOMALOUS ZONE

## INTERPRETION OF SGH RESULTS – A10-4997
## GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

**SGH "GOLD" PATHFINDER CLASS MAP -3D VIEW**





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# INTERPRETION OF SGH RESULTS – A10-4997
# GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

## SGH SURVEY INTERPRETATION RATING

- After review of all of the SGH Pathfinder Class maps, the SGH results from these soil samples suggest a **"rating of 3.0"** for the anomalous zone within the black dotted outline applied to the map of the MOOSE CLIFF grid on page 21 as to the presence of Gold mineralization. This rating is based on a scale of 6.0, in 0.5 increments, with a value of 6.0 being the best. The rating represents the similarity of these SGH results, and the developed Pathfinder Class maps, primarily to case studies for Gold in Nunavut, shear hosted as well as sediment hosted deposits in Nevada, and Paleochannel Gold deposits in Australia. The degree of confidence in the rating only starts to be "good" at a level of 4.0.
- In the anomalous zone outlined on page 21, the two central more intense apical anomalies may be the best location where SGH predicts the best drill target as a vertical superposition for Gold mineralization. However, this interpretation is complexed as the VMS signature discussed in the next section intersects this zone, thus there is a mixture of signatures which is automatically more difficult to interpret. The lower rating for the anomalous zone identified on page 21 reflects the lower confidence due to the mixture of signatures. Note that Activation Laboratories Ltd. has no experience in drilling and vertical drilling may not be the best approach for exploration of these anomalies.
- This interpretation is based only on this survey and on these SGH results.
- The client should use a combination of these SGH results and its report with additional geochemical, geophysical, and geological information to possibly obtain a more confident and precise target location.


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## SGH SURVEY INTERPRETATION – VMS PATHFINDER CLASS MAP

- The map shown on page 25 for the MOOSE CLIFF project in plan view is also shown as a 3D view on page 26. This map is an SGH "Pathfinder Class map" for targeting VMS mineralization. The map represents the simple summation of several individual hydrocarbon compound concentrations that are grouped from within the same organic chemical class. SGH Pathfinder Class maps have been shown to be robust as they are each described using from 4 to 14 (unless otherwise stated) chemically related SGH compounds which are simply summed to create each class map. Thus each map has a higher level of confidence as it is not illustrating just one compound response. A legend of the compound classes appears at the bottom of the SGH data spreadsheet. The overall SGH interpretation Rating has even a higher level of confidence as it further relies on the consensus between at least two additional pathfinder classes that together make the signature of the target at depth.

- The VMS template of SGH Pathfinder Classes also uses low and medium weight classes of hydrocarbon compounds. At least three Pathfinder Class maps associated with the SGH signature for VMS must be present to begin to be considered for assignment of a good rating. The Pathfinder Class anomalies must also concur and support a consistent interpretation, in relation to the expected geochromatographic characteristics of the Pathfinder Class, for a specific area.

- The dashed black outline applied to the SGH Pathfinder Class map on page 25 is the interpretation that has been applied to illustrate, as a vertical projection, possible VMS based mineralization at some depth. The anomaly for VMS based mineralization for this SGH Pathfinder Class map is expected to be low in response as the centre of a "Rabbit-Ear" or halo anomaly. Again, the interpretation of this area is affected by the possible SGH Gold signatures overlapping this area. Other SGH Pathfinder Class maps for VMS mineralization (not shown in this report) also agree on the assignment of the outline shown on page 25.


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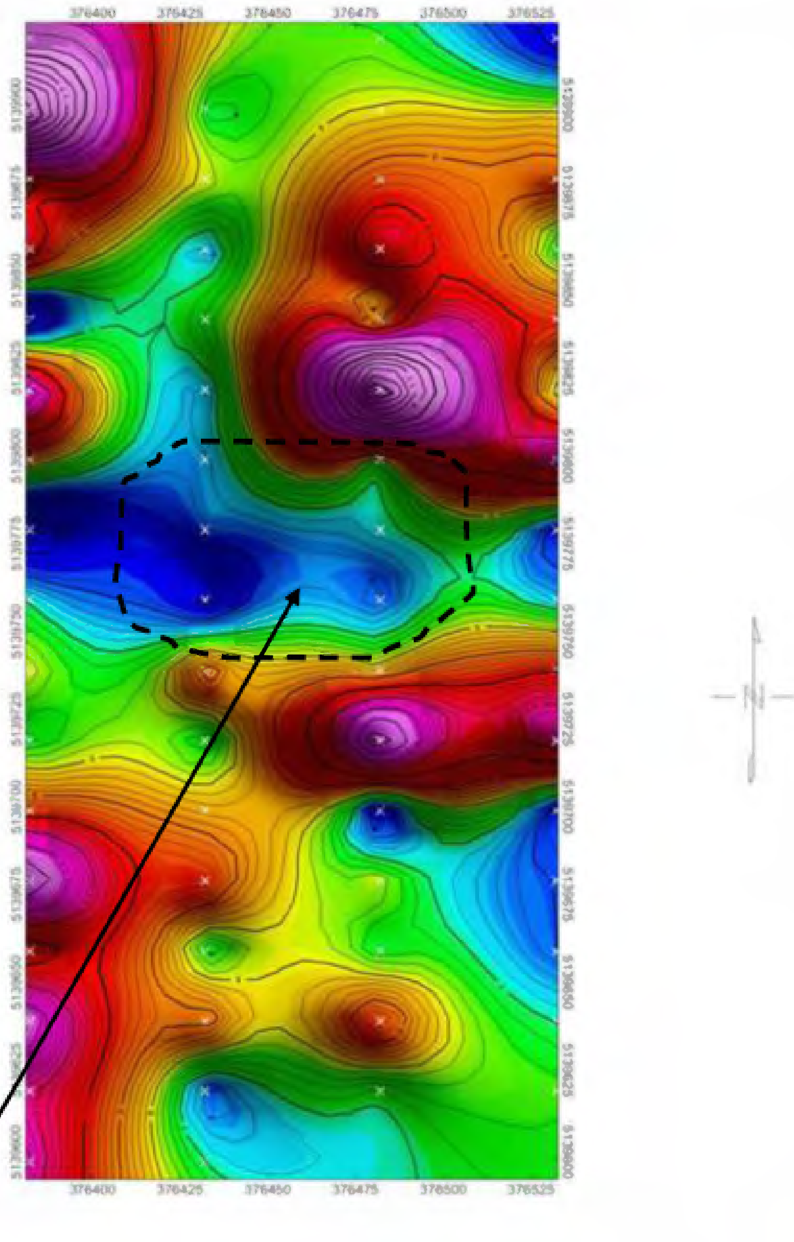
# INTERPRETION OF SGH RESULTS – A10-4997
# GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

## SGH "VMS" PATHFINDER CLASS MAP




ANOMALOUS ZONE





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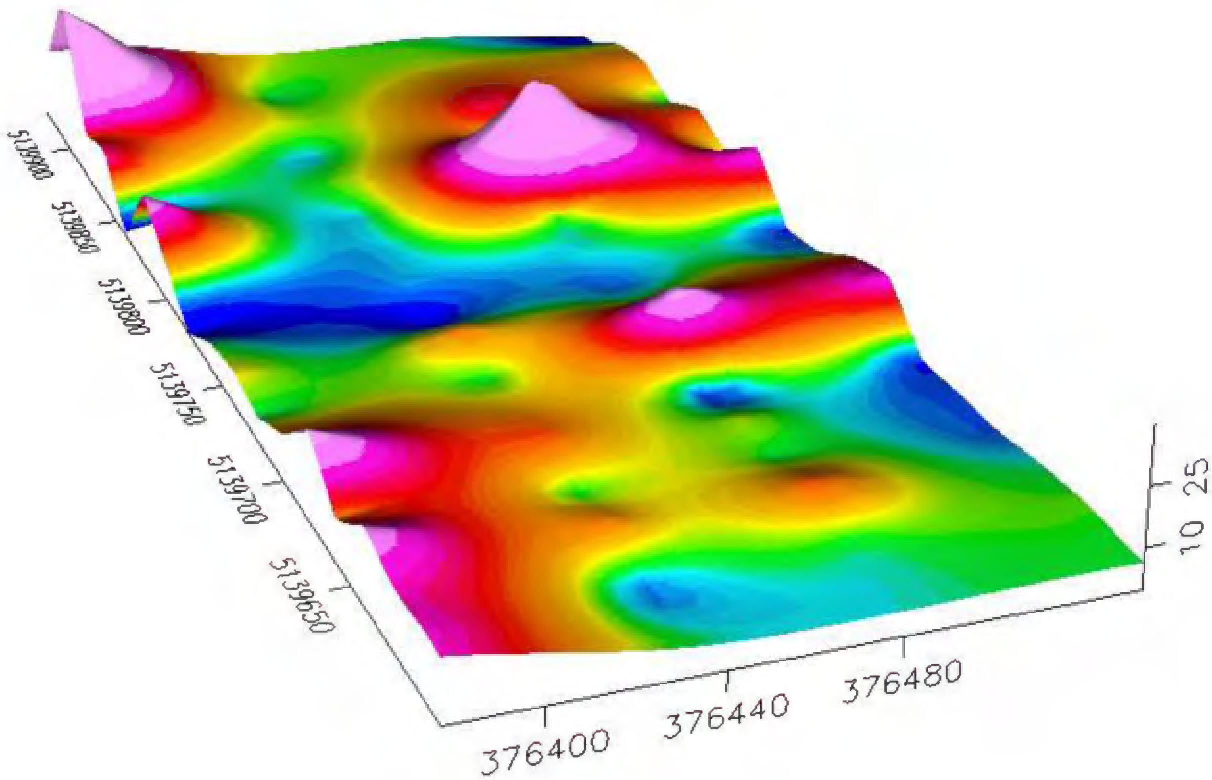
## INTERPRETION OF SGH RESULTS – A10-4997
## GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

### SGH "VMS" PATHFINDER CLASS MAP -3D VIEW



## INTERPRETION OF SGH RESULTS – A10-4997
## GOLDEN HOPE MINES – MOOSE CLIFF PROJECT

### SGH SURVEY INTERPRETATION RATING

- After review of all of the SGH Pathfinder Class maps, the SGH results from these soil samples suggest a **"rating of 4.5"** for the anomalous zone within the black dashed outline applied to the map of the MOOSE CLIFF grid on page 25 as to the presence of VMS mineralization. This rating is based on a scale of 6.0, in 0.5 increments, with a value of 6.0 being the best. This rating represents the similarity of these SGH results with case studies over a Volcanic Massive Sulphide (VMS) type target, to the SGH case studies conducted at the Hanson Lake VMS deposit in Saskatchewan, the South Gilmour VMS deposit in New Brunswick and the Cross Lake VMS deposit in Ontario. The degree of confidence in the rating only starts to be "good" at a level of 4.0.
- SGH predicts that the best drill target for VMS type mineralization would be in the centre of the black dashed outlined zone on page 25 as a vertical superposition. Note that Activation Laboratories Ltd. has no experience in drilling and vertical drilling may not be the best approach for exploration of these anomalies.
- This interpretation is based only on this survey and on these SGH results. The client should use a combination of these SGH results and its report with additional geochemical, geophysical, and geological information to possibly obtain a more confident and precise target location.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## IN-FILL SAMPLING RECOMMENDATIONS FOR SGH ANALYSIS

- Based on the results of this report and/or other information, the client may decide that infill sampling may be warranted. To obtain the best results from additional sampling for SGH it is recommended that sample locations within, or bordering, the area of interest be re-sampled rather than combining new results with the sample data from the initial survey. Although several SGH surveys have previously been easily and directly, combined without data leveling, it cannot be guaranteed that data leveling will not be required. It has been found that data leveling is more apt to be required should the new samples be collected under significantly different environmental conditions than during the initial sample survey, i.e. summer collection versus winter collection. The process of data leveling adds a minimum of 3 to 5 days of work to conduct the additional data evaluation, develop additional plots of the results, conduct new interpretations, and in additional report descriptions. Results from data leveling is also always considered "an approximation" thus having a lower level of confidence that newly re-sampled locations would have. As of September 2010, an additional cost will be invoiced should data leveling operations be required if the client requests that two SGH data sets be interpreted and reported together. Thus re-sampling locations will provide a faster turnaround time for results and provide more accurate and confident surveys for evaluation and aid in deciding specific drill targets.


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## DISCLAIMER

This "SGH Interpretation Report" has been prepared to assist the user in understanding the development and capabilities of this Organic based Geochemistry. The interpretation of the Soil Gas Hydrocarbon (SGH) data is in reference to a template or group of SGH classes of compounds specific to a type of mineralization or target that is chosen by the client (i.e. the template for gold, copper, VMS, uranium, etc.). Although the template of SGH Pathfinder Classes that has been developed through research and review of case studies has proven to be able to address many lithologies, Activation Laboratories Ltd. cannot guarantee that the template is applicable to every type of target in every type of environment. The interpretation in this report attempts to identify an anomaly that has the best SGH signature in the survey for the type of mineralization or target chosen by the client. However, this interpretation is not exhaustive and there may be additional SGH anomalies that may warrant interest and interpretation. It should not be viewed due to the generation of this SGH report, that Activation Laboratories Ltd. has the expertise or is in the business of interpreting geochemical data as a general service. As the author is the originator of the SGH geochemistry, has researched and developed this exploration tool since 1996, and has produced similar interpretations using SGH data for over 500 surveys, he is perhaps the best qualified to prepare this interpretation as assistance to clients who wish to use SGH. Also, any mention of a "drill target" is to help the reader focus on the specific anomaly or specific area of the survey where the SGH geochemical data vectors to and implies the spatial location as a vertical projection over the centre of the mineralization if present. The author and/or Activation Laboratories has no professional expertise in drilling techniques to explore and drill any of the targets or anomalies mentioned. Activation Laboratories Ltd. can offer assistance in general suggestions for sampling protocols and in sample grid location design; however we accept no responsibility to the appropriateness of the samples taken. Activation Laboratories Ltd. has made every attempt to ensure the accuracy and reliability of the information provided in this report. Activation Laboratories Ltd. or its employees, does not accept any responsibility or liability for the accuracy, content, completeness, legality, or reliability of the information or description of processes contained in this report. The information is provided "as is" without a guarantee of any kind in the interpretation or use of the results of the SGH geochemistry. The client or user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly form using any information or material contained in this report.


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## Cautionary Note Regarding Assumptions and Forward Looking Statements

The statements and target rating made in the Soil Gas Hydrocarbon (SGH) interpretive report or in other communications may contain certain forward-looking information related to a target or SGH anomaly.

Statements related to the rating of a target are based on comparison of the SGH signatures derived by Activation Laboratories Ltd. through previous research on known case studies. The rating is not derived from any statistics or other formula. The rating is a subjective value on a scale of 0 to 6 relative to the similarity of the SGH signature reviewed compared to the results of previous scientific research and case studies based on the analysis of surficial samples over known ore bodies. No information on other geochemistries, geophysics, or geology is usually available as additional information for the interpretation and assignment of a rating value unless otherwise stated. The rating does not imply ore grade and is not to be used in mineral resource estimate calculations. References to the rating should be viewed as forward-looking statements to the extent that it involves a subjective comparison to known SGH case studies. As with other geochemistries, the implied rating and anticipated target characteristics may be different than that actually encountered if the target is drilled or the property developed.

Activation Laboratories Ltd. may also make a scientifically based reference in this interpretive report to an area that might be used as a drill target. Usually the nearest sample is identified as an approximation to a "possible drill target" location. This is based only on SGH results and is to be regarded as a guide based on the current state of this science.

Unless stated, Activation Laboratories Ltd. has not physically observed the exploration site and has no prior knowledge of any site description or details. Actlabs makes general recommendations for sampling and shipping of samples. Unless stated, the laboratory does not witness sampling, does not take into consideration the specific sampling procedures used, season, handling, packaging, or shipping methods. The majority of the time, Activation Laboratories Ltd. has had no input into sampling survey design. Where specified Activation Laboratories Ltd. may not have conducted sample preparation procedures as it may have been conducted at the client's assigned laboratory. Although the Company has attempted to identify important factors that could cause actual actions, events or results to differ scientifically which may impact the associated interpretation and target rating from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended.

In general, any statements that express or involve discussions with respect to predictions, expectations, beliefs, plans, projections, objectives, assumptions, future events or performance are not statements of historical fact. These "scientifically based educated theories" should be viewed as "forward-looking statements".

Readers of this interpretive report are cautioned not to place undue reliance on forward-looking information. Forward looking statements are made based on scientific beliefs, estimates and opinions on the date the statements are made and the interpretive report issued. The Company undertakes no obligation to update forward-looking statements or otherwise revise previous reports if these beliefs, estimates and opinions, future scientific developments, other new information, or other circumstances should change that may affect the analytical results, rating, or interpretation.




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Date Submitted: August 17, 2010

Date Analyzed: September 13-14, 2010

Interpretation Report: October 15, 2010

## Golden Hope Mines

**233 rue Principale**
**Ste. Justine, QC**
**G0R 1Y0**

**Attention: Sylvain Ouellette**

**RE: Your Reference: MOOSE CLIFF**

# CERTIFICATE OF ANALYSIS

65 Soil samples were submitted for analysis. Code S4 – Sample Preparation

The following analytical package was requested: Code SGH – Soil Gas Hydrocarbon Geochemistry

**REPORT/WORKORDER: A10-4997**

This report may be reproduced without our consent. If only selected portions of the report are reproduced, permission must be obtained. If no instructions were given at the time of sample submittal regarding excess material, it will be discarded within 90 days of this report. Our liability is limited solely to the analytical cost of these analyses. Test results are representative only of the material submitted for analysis.

**Notes:**
The SGH – Soil Gas Hydrocarbon Geochemistry is a semi-quantitative analytical procedure to detect and measure 162 hydrocarbon compounds as the organic signature in the sample material collected from a survey area. It is not an assay of mineralization but is a predictive geochemical tool used for exploration. This certificate pertains only to the SGH data presented in the associated Microsoft Excel spreadsheet of results.

The author of this SGH Interpretation Report, Mr. Dale Sutherland, is the creator of the SGH organic geochemistry. He is a Chartered Chemist (C.Chem.) and Forensic Scientist specializing in organic chemistry. He is not a professional geologist or geochemist.

CERTIFIED BY:

Dale Sutherland, B.Sc.,B.Sc.,B.Ed.,C.Chem.
Forensic Scientist, Organics Manager,
Director of Research
Activation Laboratories Ltd.


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SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE



| | 001 - LA | 002 - LA | 003 - LB | 004 - LA | 005 - LB | 006 - LB | 007 - LA | 008 - LB | 009 - LB | 010 - LB | 011 - LA | 012 - LB | 013 - LBA | 014 - LB | 015 - LAR | 016 - LB | 017 - LB | 018 - LB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 40 | 112 | 30 | 10 | 5 | 10 | 8 | 4 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | 1 | -1 |
| L0+00-S0+40N | 47 | 117 | 36 | 18 | 5 | 19 | 8 | 13 | 3 | 3 | 2 | -1 | 2 | -1 | -1 | 2 | 3 | 3 |
| L0+00-S0+60N | 41 | 109 | 27 | 10 | 4 | 9 | 11 | 10 | -1 | 2 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | 2 |
| L0+00-S0+80N | 56 | 133 | 29 | 16 | 4 | 13 | 1 | 10 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L0+00-S1+00N | 63 | 147 | 33 | 3 | 5 | 15 | 8 | 10 | 2 | 2 | 2 | 1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L0+00-S1+00N-R | 65 | 152 | 35 | 7 | 5 | 15 | 7 | 10 | 2 | 2 | 3 | -1 | 3 | -1 | -1 | -1 | -1 | 1 |
| L0+00-S1+20N | 50 | 123 | 20 | 7 | 3 | 10 | -1 | 6 | 1 | -1 | 1 | -1 | 2 | -1 | -1 | -1 | 1 | 1 |
| L0+00-S1+40N | 48 | 136 | 23 | 17 | 3 | 8 | -1 | 7 | 1 | -1 | 2 | -1 | 2 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S1+60N | 54 | 113 | 3 | 5 | 5 | 19 | 8 | 14 | 3 | 2 | 2 | -1 | 1 | -1 | -1 | 1 | 2 | 3 |
| L0+00-S1+80N | 39 | 93 | 26 | -1 | 4 | 15 | 10 | 14 | 3 | 2 | 2 | -1 | 1 | -1 | -1 | 1 | 3 | 3 |
| L0+00-S2+00N | 36 | 40 | 18 | 5 | 6 | 28 | 3 | 17 | 4 | 3 | 1 | 1 | -1 | -1 | -1 | 1 | 2 | 3 |
| L0+00-S2+20N | 38 | 104 | 14 | 7 | 4 | 14 | 7 | 7 | -1 | 2 | 2 | -1 | 1 | -1 | -1 | -1 | 1 | 2 |
| L0+00-S2+40N | 67 | 157 | 28 | 7 | 6 | 24 | 8 | 18 | 4 | 3 | 2 | -1 | 2 | -1 | -1 | 1 | 3 | 3 |
| L0+00-S2+60N | 29 | 8 | 20 | 5 | 4 | 13 | 6 | 9 | 2 | 1 | 1 | -1 | 1 | -1 | -1 | -1 | 2 | 2 |
| L0+00-S2+80N | 52 | 89 | 29 | 24 | 5 | 16 | 13 | 11 | 2 | 2 | 2 | -1 | -1 | -1 | -1 | 1 | 2 | 3 |
| L0+00-S3+00N | 45 | 91 | 24 | 6 | 4 | 11 | 5 | 9 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L0+00-S3+20N | 137 | 652 | 44 | 113 | 13 | 26 | 31 | 20 | 4 | 4 | 6 | 1 | 9 | -1 | -1 | 2 | 3 | 3 |
| L0+00-S3+40N | 59 | 141 | 31 | 5 | 4 | 16 | 9 | 13 | 3 | 2 | 2 | -1 | 4 | -1 | -1 | 1 | 2 | 3 |
| L0+50E-S0+20N | 29 | 13 | 22 | 8 | 4 | 12 | 2 | 7 | 2 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L0+50E-S0+40N | 36 | 91 | 18 | -1 | 3 | 10 | 3 | 5 | 1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | 1 |
| L0+50E-S0+60N | 63 | 135 | 13 | 20 | 6 | 16 | 12 | 15 | 3 | 3 | 2 | -1 | 2 | -1 | -1 | 2 | 3 | 3 |
| L0+50E-S0+60N-R | 61 | 121 | 26 | 12 | 4 | 14 | 8 | 15 | 3 | 2 | 2 | -1 | 2 | -1 | -1 | 1 | 3 | 3 |
| L0+50E-S0+80N | 46 | 122 | 25 | 7 | 5 | 10 | 7 | 8 | 2 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L0+50E-S1+00N | 49 | 103 | 21 | -1 | 2 | 8 | 6 | 8 | 2 | 1 | 2 | -1 | 3 | -1 | -1 | -1 | 2 | 2 |
| L0+50E-S1+20N | 50 | 102 | 25 | 7 | 3 | 11 | 5 | 5 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | -1 |
| L0+50E-S1+40N | 43 | 105 | 24 | 3 | 3 | 11 | 6 | 11 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | 1 | 1 | 1 |
| L0+50E-S1+60N | 50 | 126 | 20 | 3 | 3 | 12 | 15 | 9 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 2 | 2 |
| L0+50E-S1+80N | 43 | 113 | 30 | 23 | 4 | 10 | 6 | 8 | 2 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 2 | 2 |
| L0+50E-S2+00N | 41 | 105 | 21 | 5 | 4 | 13 | 4 | 9 | 2 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 2 | 2 |
| L0+50E-S2+20N | 30 | 80 | 22 | 4 | 3 | 11 | 7 | 8 | 2 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | 1 | 1 |
| L0+50E-S2+40N | 52 | 106 | 11 | 2 | 2 | 5 | 4 | 7 | 1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | 1 | 1 |
| L0+50E-S2+60N | 42 | 100 | 10 | 2 | 1 | 6 | 4 | 7 | 1 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | 2 |
| L0+50E-S2+80N | 57 | 116 | 22 | 14 | 2 | 9 | 3 | 7 | 1 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S3+00N | 55 | 122 | 30 | 17 | 5 | 11 | 6 | -1 | -1 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S3+20N | 46 | 121 | 24 | 6 | 6 | 14 | 12 | 9 | 2 | 2 | 2 | -1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L1+00E-S0+40N | 41 | 91 | 18 | 3 | 3 | 11 | 2 | 10 | 2 | 1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L1+00E-S0+60N | 38 | 105 | 30 | 11 | 3 | 11 | 4 | 6 | 1 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+60N-R | 36 | 113 | 31 | 7 | 4 | 16 | 15 | 5 | -1 | -1 | 2 | -1 | 3 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+80N | 50 | 122 | 27 | 22 | 4 | 13 | 7 | 9 | 2 | 1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S1+00N | 44 | 116 | 24 | 4 | 3 | 14 | 2 | 10 | 2 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 2 | 2 |
| L1+00E-S1+20N | 49 | 110 | 21 | 12 | 4 | 12 | 6 | 9 | 2 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L1+00E-S1+40N | 73 | 145 | 45 | 7 | 10 | 33 | 15 | 16 | 3 | 2 | 2 | 1 | 5 | -1 | -1 | -1 | 1 | 1 |
| L1+00E-S1+60N | 59 | 113 | 29 | 3 | 4 | 13 | 12 | 11 | 2 | 2 | 2 | 1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L1+00E-S1+80N | 48 | 127 | 24 | 3 | 8 | 18 | 9 | 6 | 1 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L1+00E-S2+00N | 41 | 98 | 26 | 8 | 7 | 20 | 12 | 8 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | -1 |
| L1+00E-S2+20N | 53 | 108 | 30 | 16 | 5 | 17 | 4 | 8 | -1 | 2 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | 2 |
| L1+00E-S2+40N | 128 | 270 | 64 | 89 | 16 | 42 | 25 | 32 | 7 | 5 | 5 | 3 | 8 | -1 | -1 | 2 | 3 | 3 |
| L1+00E-S2+60N | 74 | 134 | 26 | 26 | 6 | 23 | 12 | 12 | 3 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 2 | 1 |
| L1+00E-S2+80N | 47 | 128 | 3 | 4 | 2 | 6 | 13 | 11 | 2 | 1 | 2 | 1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L1+00E-S3+00N | 54 | 131 | 29 | 6 | 3 | 10 | 8 | 9 | 2 | 2 | 2 | -1 | 3 | -1 | -1 | 1 | 2 | 2 |
| L1+00E-S3+20N | 44 | 119 | 33 | 6 | 4 | 15 | 6 | 8 | 2 | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 2 | 2 |
| L1+00E-S3+40N | 75 | 155 | 28 | 28 | 4 | 12 | 5 | 7 | 1 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |
| L1+50E-S0+40N | 39 | 89 | 13 | 17 | 5 | 17 | 4 | 8 | 2 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 1 | 2 |
| L1+50E-S0+40N-R | 36 | 88 | 3 | 14 | 4 | 15 | 4 | 10 | 2 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 2 |

| | 001 - LA | 002 - LA | 003 - LB | 004 - LA | 005 - LB | 006 - LB | 007 - LA | 008 - LB | 009 - LB | 010 - LB | 011 - LA | 012 - LB | 013 - LBA | 014 - LB | 015 - LAR | 016 - LB | 017 - LB | 018 - LB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 56 | 84 | 23 | 1 | 6 | 14 | 12 | 7 | 1 | -1 | 2 | -1 | 2 | -1 | -1 | -1 | 1 | 1 |
| L1+50E-S0+80N | 44 | 129 | 20 | 9 | 9 | 17 | 4 | 10 | 2 | -1 | 1 | -1 | 2 | -1 | -1 | -1 | 1 | 1 |
| L1+50E-S1+00N | 66 | 135 | 26 | 10 | 4 | 12 | 12 | 10 | 2 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | 2 | 2 |
| L1+50E-S1+20N | 26 | 68 | 14 | -1 | 1 | 6 | 2 | 5 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 1 |
| L1+50E-S1+40N | 54 | 109 | 29 | 7 | 2 | 9 | 13 | 9 | 2 | 2 | 2 | -1 | 1 | -1 | -1 | 1 | 2 | 2 |
| L1+50E-S1+60N | 36 | 88 | 24 | 2 | 3 | 11 | 7 | 8 | 1 | -1 | 2 | -1 | 2 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S1+80N | 45 | 107 | 26 | 30 | 3 | 12 | 3 | 10 | 2 | -1 | 2 | -1 | 3 | -1 | -1 | -1 | 2 | 2 |
| L1+50E-S2+00N | 97 | 230 | 3 | -1 | 4 | 12 | 8 | 7 | 1 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 2 | 2 |
| L1+50E-S2+20N | 40 | 106 | 23 | 10 | 5 | 11 | 6 | 10 | 2 | 2 | 2 | -1 | 3 | -1 | -1 | 1 | 2 | 2 |
| L1+50E-S2+40N | 45 | 116 | 3 | 8 | 7 | 19 | 7 | 10 | 2 | 1 | 2 | -1 | 1 | -1 | -1 | -1 | 1 | 2 |
| L1+50E-S2+60N | 56 | 152 | 26 | 9 | 5 | 17 | 13 | 10 | 2 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | 2 | 2 |
| L1+50E-S2+80N | 47 | 112 | 36 | 22 | 5 | 14 | 6 | 10 | 2 | 1 | 2 | -1 | -1 | -1 | -1 | -1 | 2 | 2 |
| L1+50E-S3+00N | 49 | 97 | 31 | 12 | 5 | 16 | 5 | 7 | 1 | -1 | 2 | -1 | 4 | -1 | -1 | -1 | 1 | 1 |
| L1+50E-S3+20N | 46 | 106 | 34 | 20 | 5 | 21 | 3 | 7 | 1 | -1 | 2 | -1 | 3 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S3+40N | 39 | 73 | 27 | 2 | 4 | 16 | 3 | 6 | 1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 23 | 59 | 11 | 9 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| LMB-QA | 27 | 73 | 17 | 9 | -1 | 4 | 5 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| | | | | | | | | | | | | | | | | | | |

**SOIL GAS HYDROCARBONS (SGH) by GC/MS**

A10-4997 - Date: September 13, 2010 - Activation Laboratories Ltd.


**Golden Hope Mines - Sylvain Ouellette**
Moose Cliff Project Site

R=Replicate Sample
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)
LMB-QA = Laboratory Materials Blank - Quality Assurance

**LEGEND FOR COLUMN HEADINGS - SGH COMPOUND CLASSES**

LA, HA, LBA, HBA = ALKYL-ALKANES
LB, HB, LPB, HPB = ALKYL-BENZENES
LAR, MAR, HAR = ALKYL-AROMATICS
LBI, MBI, HBI, LPH, MPH, HPH = ALKYL-POLYAROMATICS
THI = ALKYL-DIVINYLENE SULPHIDES
ALK = ALKYL-ALKENES

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

# SOIL GAS HYDROCARBONS
# (SGH) by GC/MS
# MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 019 - LB | 020 - LA | 021 - LPH | 022 - LBA | 023 - LAR | 024 - LB | 025 - LAR | 026 - LBA | 027 - LB | 028 - ALK | 029 - HB | 030 - HB | 031 - HB | 032 - HB | 033 - HB | 034 - HB | 035 - LAR | 036 - LBA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S0+40N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S0+60N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 |
| L0+00-S0+80N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S1+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S1+00N-R | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L0+00-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S1+60N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S1+80N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S2+00N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S2+40N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S2+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+00-S2+80N | 2 | 2 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S3+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S3+20N | 2 | 4 | -1 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+00-S3+40N | 2 | 1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 |
| L0+50E-S0+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+60N | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+50E-S0+60N-R | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L0+50E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+40N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+50E-S1+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+50E-S1+80N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+50E-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L0+50E-S2+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L0+50E-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L0+50E-S3+20N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+00E-S0+60N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S0+60N-R | -1 | 2 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S0+80N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S1+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+00E-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S1+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+00E-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+40N | 2 | 3 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 |
| L1+00E-S2+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+00E-S2+80N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S3+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+00E-S3+20N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+00E-S3+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S0+40N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S0+40N-R | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |

| | 019 - LB | 020 - LA | 021 - LPH | 022 - LBA | 023 - LAR | 024 - LB | 025 - LAR | 026 - LBA | 027 - LB | 028 - ALK | 029 - HB | 030 - HB | 031 - HB | 032 - HB | 033 - HB | 034 - HB | 035 - LAR | 036 - LBA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+50E-S1+00N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+50E-S1+40N | 1 | 2 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S1+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+50E-S2+20N | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+60N | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| L1+50E-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S3+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| L1+50E-S3+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 |
| LMB-QA | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 |
| | | | | | | | | | | | | | | | | | | |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 037 - HB | 038 - LBA | 039 - LAR | 040 - LPB | 041 - LBA | 042 - LPB | 043 - HB | 044 - HB | 045 - LA | 046 - LPH | 047 - LBA | 048 - HB | 049 -HB | 050 - LBA | 051 - LBI | 052 - LPB | 053 - LPB | 054 - HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | -1 | 3 | -1 | -1 | 3 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S0+40N | -1 | 3 | 1 | -1 | 3 | -1 | -1 | -1 | 3 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S0+60N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S0+80N | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S1+00N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S1+00N-R | -1 | 4 | -1 | -1 | 4 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S1+20N | -1 | 2 | -1 | -1 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S1+40N | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S1+60N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S1+80N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S2+00N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S2+20N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 3 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S2+40N | -1 | 3 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S2+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S2+80N | -1 | 3 | -1 | -1 | 3 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+00-S3+00N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+00-S3+20N | -1 | 4 | -1 | -1 | 3 | -1 | -1 | -1 | 6 | -1 | 2 | -1 | -1 | 3 | -1 | -1 | -1 | -1 |
| L0+00-S3+40N | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+50E-S0+20N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+40N | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+60N | -1 | 3 | 1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+50E-S0+60N-R | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S0+80N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+00N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+20N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+40N | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+60N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L0+50E-S1+80N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+00N | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+20N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+40N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+60N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+80N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S3+00N | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L0+50E-S3+20N | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+40N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+60N | -1 | 3 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+60N-R | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S0+80N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S1+00N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S1+40N | -1 | 3 | -1 | -1 | 3 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+00E-S1+60N | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S1+80N | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+20N | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+40N | -1 | 4 | 1 | -1 | 4 | -1 | -1 | -1 | 5 | -1 | 3 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+00E-S2+60N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S2+80N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+00E-S3+00N | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S3+20N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+00E-S3+40N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S0+40N | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S0+40N-R | -1 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 037 - HB | 038 - LBA | 039 - LAR | 040 - LPB | 041 - LBA | 042 - LPB | 043 - HB | 044 - HB | 045 - LA | 046 - LPH | 047 - LBA | 048 - HB | 049 -HB | 050 - LBA | 051 - LBI | 052 - LPB | 053 - LPB | 054 - HB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S0+80N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S1+00N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S1+20N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S1+40N | -1 | 3 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+50E-S1+60N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+50E-S1+80N | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+00N | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+20N | -1 | 2 | -1 | -1 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | -1 |
| L1+50E-S2+40N | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+60N | -1 | 3 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S2+80N | -1 | 2 | -1 | -1 | 1 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S3+00N | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |
| L1+50E-S3+20N | -1 | 1 | -1 | -1 | 2 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| L1+50E-S3+40N | -1 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| LMB-QA | -1 | 2 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | -1 | 1 | -1 | -1 | -1 | -1 |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
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Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 055 - LPB | 056 - LBI | 057 - ALK | 058 - LPB | 059 - LPB | 060 - LPH | 061 - LBI | 062 - LBA | 063 - LPH | 064 - LBA | 065 - HPB | 066 - LBA | 067 - LBI | 068 - HPB | 069 - LA | 070 - HPB | 071 - HPB | 072 - HPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | 1 | 4 | 1 | 6 | 1 | -1 | 7 | -1 | -1 | -1 |
| L0+00-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | 1 | 4 | 1 | 5 | -1 | -1 | 7 | 1 | 1 | 1 |
| L0+00-S0+60N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 5 | 1 | 5 | 1 | 8 | -1 | -1 | 4 | -1 | -1 | -1 |
| L0+00-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | 1 | 4 | 1 | 5 | -1 | -1 | 3 | 1 | -1 | -1 |
| L0+00-S1+00N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 5 | -1 | 5 | -1 | 6 | 1 | -1 | 3 | -1 | -1 | -1 |
| L0+00-S1+00N-R | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 5 | -1 | 5 | 1 | 9 | -1 | -1 | 6 | 1 | -1 | -1 |
| L0+00-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | 1 | 6 | -1 | -1 | 3 | -1 | -1 | -1 |
| L0+00-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | 1 | 5 | -1 | -1 | 3 | -1 | -1 | -1 |
| L0+00-S1+60N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | -1 | 4 | 1 | 5 | -1 | -1 | 6 | -1 | -1 | -1 |
| L0+00-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 1 | -1 | -1 | -1 |
| L0+00-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 1 | -1 | -1 | -1 |
| L0+00-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | -1 | 4 | 1 | 3 | -1 | -1 | 4 | -1 | -1 | -1 |
| L0+00-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 4 | -1 | 4 | -1 | 8 | -1 | -1 | 4 | -1 | -1 | -1 |
| L0+00-S2+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 3 | -1 | -1 | -1 |
| L0+00-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | 1 | 5 | -1 | -1 | 2 | -1 | -1 | -1 |
| L0+00-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | 1 | 5 | -1 | -1 | -1 |
| L0+00-S3+20N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 5 | -1 | 5 | 1 | 7 | 1 | -1 | 12 | -1 | -1 | -1 |
| L0+00-S3+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | 1 | 4 | -1 | 6 | -1 | 1 | 1 | 1 | 1 | -1 |
| L0+50E-S0+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 3 | 1 | -1 | -1 | -1 | 4 | -1 | -1 | -1 |
| L0+50E-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 3 | -1 | -1 | 5 | -1 | -1 | -1 |
| L0+50E-S0+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 5 | -1 | -1 | 2 | -1 | -1 | -1 |
| L0+50E-S0+60N-R | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | 1 | 6 | -1 | -1 | 7 | -1 | -1 | -1 |
| L0+50E-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 5 | -1 | -1 | -1 |
| L0+50E-S1+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L0+50E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 5 | -1 | -1 | 2 | -1 | -1 | -1 |
| L0+50E-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L0+50E-S1+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 5 | -1 | -1 | -1 |
| L0+50E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 6 | -1 | -1 | 1 | -1 | -1 | -1 |
| L0+50E-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 5 | -1 | -1 | 2 | -1 | -1 | -1 |
| L0+50E-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | -1 | -1 | -1 | -1 |
| L0+50E-S2+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | -1 | 5 | -1 | -1 | 7 | -1 | -1 | -1 |
| L0+50E-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 6 | -1 | -1 | 8 | -1 | -1 | -1 |
| L0+50E-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 5 | -1 | -1 | 2 | -1 | -1 | -1 |
| L0+50E-S3+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | -1 | -1 | 5 | -1 | -1 | 5 | -1 | -1 | -1 |
| L1+00E-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 2 | -1 | -1 | -1 |
| L1+00E-S0+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 2 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S0+60N-R | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 5 | -1 | -1 | 5 | -1 | -1 | -1 |
| L1+00E-S1+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 2 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 4 | -1 | 5 | -1 | -1 | 7 | -1 | -1 | -1 |
| L1+00E-S1+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | 1 | -1 | -1 | 1 | 4 | -1 | -1 | -1 |
| L1+00E-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | -1 | 5 | -1 | -1 | 4 | -1 | -1 | -1 |
| L1+00E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | -1 | 6 | -1 | -1 | 2 | -1 | -1 | -1 |
| L1+00E-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | 1 | 3 | -1 | -1 | 4 | -1 | -1 | -1 |
| L1+00E-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 5 | -1 | 5 | 1 | 7 | 1 | -1 | 10 | 1 | 1 | 1 |
| L1+00E-S2+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | -1 | 6 | -1 | -1 | 7 | -1 | -1 | -1 |
| L1+00E-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | 1 | 5 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+00E-S3+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 5 | -1 | -1 | -1 |
| L1+00E-S3+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 5 | -1 | -1 | 1 | -1 | -1 | -1 |
| L1+50E-S0+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 5 | -1 | -1 | -1 |
| L1+50E-S0+40N-R | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 2 | -1 | -1 | -1 |

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
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| | 055 - LPB | 056 - LBI | 057 - ALK | 058 - LPB | 059 - LPB | 060 - LPH | 061 - LBI | 062 - LBA | 063 - LPH | 064 - LBA | 065 - HPB | 066 - LBA | 067 - LBI | 068 - HPB | 069 - LA | 070 - HPB | 071 - HPB | 072 - HPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 5 | -1 | 4 | 1 | 6 | -1 | -1 | 8 | -1 | -1 | -1 |
| L1+50E-S0+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 3 | -1 | -1 | -1 |
| L1+50E-S1+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 2 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S1+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | 3 | -1 | -1 | 4 | -1 | -1 | -1 |
| L1+50E-S1+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S1+60N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 4 | -1 | 4 | -1 | 6 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S1+80N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | -1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S2+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 3 | -1 | -1 | 3 | -1 | -1 | -1 |
| L1+50E-S2+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 4 | 1 | 6 | -1 | -1 | 5 | -1 | -1 | -1 |
| L1+50E-S2+40N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S2+60N | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 3 | -1 | 3 | -1 | 5 | -1 | -1 | 7 | -1 | -1 | -1 |
| L1+50E-S2+80N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 6 | -1 | -1 | -1 |
| L1+50E-S3+00N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 3 | -1 | -1 | -1 |
| L1+50E-S3+20N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | -1 | 2 | -1 | -1 | 4 | -1 | -1 | -1 |
| L1+50E-S3+40N | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | 3 | -1 | -1 | 3 | -1 | -1 | -1 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 2 | -1 | 2 | -1 | 2 | -1 | -1 | 3 | -1 | -1 | -1 |
| LMB-QA | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 3 | -1 | 3 | 1 | 4 | -1 | -1 | 5 | -1 | -1 | -1 |

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE



| | 073 - HBA | 074 - HBA | 075 - HPB | 076 - LPH | 077 - MAR | 078 - ALK | 079 - LBI | 080 - LPH | 081 - MAR | 082 - LPH | 083 - HBA | 084 - HBA | 085 - LPH | 086 - LBI | 087 - MAR | 088 - HBA | 089 - THI | 090 - HPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 5 | 5 | -1 | 1 | -1 | 1 | -1 | 1 | 1 | 2 | 2 | 2 | 6 | 1 | 1 | 4 | -1 | 2 |
| L0+00-S0+40N | 6 | 6 | 1 | 1 | -1 | 2 | -1 | 1 | 1 | 2 | 1 | 2 | 9 | 1 | 2 | 6 | 1 | 2 |
| L0+00-S0+60N | 7 | 8 | 1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | 22 | 1 | 19 | 1 | 2 | 14 | -1 | 2 |
| L0+00-S0+80N | 5 | 3 | 1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 11 | 2 | 11 | -1 | 1 | 8 | -1 | 2 |
| L0+00-S1+00N | 7 | 8 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 14 | 2 | 16 | -1 | 2 | 12 | -1 | 2 |
| L0+00-S1+00N-R | 11 | 6 | 1 | -1 | -1 | 4 | -1 | 1 | 2 | 2 | 2 | 1 | 19 | -1 | 2 | 13 | -1 | 2 |
| L0+00-S1+20N | 6 | 2 | -1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | 1 | 2 | 13 | -1 | 1 | 8 | -1 | 2 |
| L0+00-S1+40N | 7 | 6 | -1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | 2 | 2 | 9 | -1 | 2 | 8 | -1 | 2 |
| L0+00-S1+60N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 3 | 2 | 10 | -1 | 1 | 8 | -1 | 2 |
| L0+00-S1+80N | 3 | 4 | -1 | -1 | -1 | -1 | -1 | 1 | 2 | 2 | 4 | 1 | 7 | -1 | 1 | 6 | -1 | 2 |
| L0+00-S2+00N | 3 | 2 | -1 | -1 | -1 | -1 | -1 | 1 | 1 | 2 | 8 | 1 | 6 | -1 | 1 | 5 | -1 | 2 |
| L0+00-S2+20N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 2 | 2 | 5 | 1 | 12 | -1 | 2 | 10 | -1 | 2 |
| L0+00-S2+40N | 6 | 4 | 1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | -1 | 2 | 9 | -1 | 1 | 8 | -1 | 2 |
| L0+00-S2+60N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 1 | 2 | 10 | -1 | 1 | 7 | -1 | 2 |
| L0+00-S2+80N | 5 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | 2 | 2 | 1 | 11 | 1 | 1 | 5 | -1 | 2 |
| L0+00-S3+00N | 4 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 5 | 2 | 9 | -1 | 1 | 5 | -1 | 2 |
| L0+00-S3+20N | 6 | 6 | -1 | -1 | -1 | 2 | -1 | 1 | 2 | 2 | 10 | 2 | 13 | 1 | 2 | 12 | -1 | 2 |
| L0+00-S3+40N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 2 | 2 | 3 | 1 | 11 | -1 | 1 | 9 | -1 | 2 |
| L0+50E-S0+20N | 3 | 3 | -1 | -1 | -1 | -1 | -1 | 1 | 1 | 2 | 6 | 1 | 6 | -1 | 1 | 5 | -1 | 2 |
| L0+50E-S0+40N | 4 | 3 | -1 | -1 | -1 | 1 | -1 | 1 | -1 | 2 | 8 | 2 | 8 | -1 | 1 | 5 | -1 | 2 |
| L0+50E-S0+60N | 4 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 6 | 2 | 10 | -1 | 1 | 6 | -1 | 2 |
| L0+50E-S0+60N-R | 8 | 5 | -1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | 1 | 2 | 8 | -1 | 1 | 8 | -1 | 2 |
| L0+50E-S0+80N | 4 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 10 | 2 | 9 | -1 | 1 | 6 | -1 | 1 |
| L0+50E-S1+00N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 8 | 1 | 10 | -1 | 1 | 7 | -1 | 2 |
| L0+50E-S1+20N | 4 | 5 | -1 | -1 | -1 | 2 | -1 | -1 | 1 | 2 | 5 | 1 | 9 | -1 | 1 | 6 | -1 | 2 |
| L0+50E-S1+40N | 5 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 7 | 1 | 8 | -1 | 1 | 5 | -1 | 1 |
| L0+50E-S1+60N | 4 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 2 | 2 | 5 | 1 | 9 | -1 | 1 | 8 | -1 | 1 |
| L0+50E-S1+80N | 8 | 5 | -1 | -1 | -1 | 4 | -1 | 1 | -1 | 1 | 1 | 1 | 8 | -1 | 1 | 7 | -1 | 2 |
| L0+50E-S2+00N | 6 | 7 | -1 | -1 | -1 | 2 | -1 | 1 | -1 | 2 | 8 | 2 | 13 | -1 | 1 | 8 | -1 | 2 |
| L0+50E-S2+20N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 2 | 1 | 9 | -1 | 1 | 7 | -1 | 2 |
| L0+50E-S2+40N | 3 | 2 | -1 | -1 | -1 | 1 | -1 | -1 | 1 | 2 | 8 | 1 | 8 | -1 | 1 | 6 | -1 | 1 |
| L0+50E-S2+60N | 8 | 3 | -1 | -1 | -1 | 3 | -1 | 1 | -1 | 2 | 1 | 2 | 9 | -1 | 1 | 8 | -1 | 2 |
| L0+50E-S2+80N | 6 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 4 | 2 | 9 | -1 | 1 | 7 | -1 | 1 |
| L0+50E-S3+00N | 6 | 3 | -1 | -1 | -1 | 2 | -1 | -1 | -1 | 2 | 2 | 1 | 8 | -1 | 1 | 7 | -1 | 2 |
| L0+50E-S3+20N | 4 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 10 | 2 | 8 | -1 | 1 | 6 | -1 | 1 |
| L1+00E-S0+40N | 4 | 4 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 1 | 7 | 1 | 8 | -1 | 1 | 6 | -1 | 1 |
| L1+00E-S0+60N | 4 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 6 | 2 | 8 | -1 | 1 | 6 | -1 | 2 |
| L1+00E-S0+60N-R | 4 | 4 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 7 | 1 | 9 | -1 | 1 | 6 | -1 | 2 |
| L1+00E-S0+80N | 3 | 3 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 2 | 1 | 6 | 1 | 1 | 5 | -1 | 2 |
| L1+00E-S1+00N | 4 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | -1 | 1 | 9 | -1 | 1 | 3 | -1 | 2 |
| L1+00E-S1+20N | 4 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 4 | 1 | 5 | -1 | 1 | 3 | -1 | 2 |
| L1+00E-S1+40N | 5 | 6 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 10 | 1 | 12 | -1 | 1 | 9 | -1 | 2 |
| L1+00E-S1+60N | 4 | 4 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 3 | 2 | 9 | -1 | 1 | 7 | -1 | 2 |
| L1+00E-S1+80N | 3 | 4 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 7 | 1 | 7 | -1 | 1 | 7 | -1 | 2 |
| L1+00E-S2+00N | 8 | 2 | 1 | -1 | -1 | 3 | -1 | 1 | 1 | 2 | 1 | 1 | 9 | -1 | 1 | 6 | -1 | 2 |
| L1+00E-S2+20N | 4 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 4 | 1 | 7 | -1 | 2 | 5 | -1 | 2 |
| L1+00E-S2+40N | 6 | 7 | 1 | -1 | -1 | 2 | -1 | 1 | 2 | 2 | 15 | 1 | 17 | 1 | 1 | 14 | -1 | 2 |
| L1+00E-S2+60N | 4 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 7 | 1 | 10 | -1 | 1 | 6 | -1 | 2 |
| L1+00E-S2+80N | 4 | 2 | 1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 6 | 2 | 9 | -1 | 1 | 6 | -1 | 2 |
| L1+00E-S3+00N | 4 | 3 | -1 | -1 | -1 | -1 | -1 | 1 | 1 | 2 | 3 | 1 | 6 | 1 | 2 | 4 | 1 | 2 |
| L1+00E-S3+20N | 4 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 2 | 2 | 8 | -1 | 1 | 5 | -1 | 2 |
| L1+00E-S3+40N | 4 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 6 | 1 | 10 | 1 | 1 | 9 | -1 | 2 |
| L1+50E-S0+40N | 4 | 4 | -1 | -1 | -1 | 1 | -1 | -1 | 1 | 2 | 7 | 2 | 8 | -1 | 1 | 6 | -1 | 2 |
| L1+50E-S0+40N-R | 4 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 9 | 1 | 8 | -1 | 1 | 5 | -1 | 1 |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 073 - HBA | 074 - HBA | 075 - HPB | 076 - LPH | 077 - MAR | 078 - ALK | 079 - LBI | 080 - LPH | 081 - MAR | 082 - LPH | 083 - HBA | 084 - HBA | 085 - LPH | 086 - LBI | 087 - MAR | 088 - HBA | 089 - THI | 090 - HPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 11 | 8 | 1 | -1 | -1 | 5 | -1 | 1 | 1 | 2 | 1 | 2 | 10 | -1 | 1 | 7 | -1 | 2 |
| L1+50E-S0+80N | 6 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | -1 | 2 | 11 | -1 | 1 | 7 | -1 | 2 |
| L1+50E-S1+00N | 4 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 5 | 2 | 7 | -1 | 1 | 6 | -1 | 1 |
| L1+50E-S1+20N | 3 | 3 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 2 | 1 | 7 | -1 | 1 | 4 | -1 | 2 |
| L1+50E-S1+40N | 4 | 2 | -1 | -1 | -1 | -1 | -1 | 1 | 1 | 2 | 2 | 2 | 5 | 1 | 1 | 3 | -1 | 2 |
| L1+50E-S1+60N | 5 | 4 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 3 | 1 | 11 | 1 | 1 | 8 | -1 | 1 |
| L1+50E-S1+80N | 4 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 3 | 2 | 6 | -1 | 1 | 4 | -1 | 2 |
| L1+50E-S2+00N | 4 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 4 | 2 | 7 | -1 | 1 | 7 | 1 | 2 |
| L1+50E-S2+20N | 4 | 5 | 1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 6 | 2 | 10 | -1 | 1 | 7 | -1 | 2 |
| L1+50E-S2+40N | 5 | 5 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 1 | 2 | 9 | -1 | 2 | 7 | -1 | 2 |
| L1+50E-S2+60N | 5 | 3 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 5 | 2 | 9 | -1 | 1 | 8 | -1 | 2 |
| L1+50E-S2+80N | 4 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 7 | 1 | 9 | 1 | 1 | 5 | -1 | 2 |
| L1+50E-S3+00N | 4 | 2 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | 5 | 2 | 8 | -1 | 1 | 6 | -1 | 2 |
| L1+50E-S3+20N | 3 | 2 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 2 | 4 | 1 | 5 | -1 | 1 | 4 | -1 | 2 |
| L1+50E-S3+40N | 2 | 2 | -1 | -1 | -1 | -1 | -1 | -1 | 1 | 1 | 3 | 1 | 4 | -1 | 1 | 3 | -1 | 1 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 2 | 2 | -1 | -1 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 1 | 3 | -1 | 1 | 2 | -1 | 1 |
| LMB-QA | 5 | -1 | -1 | -1 | -1 | 2 | -1 | 1 | 1 | 2 | -1 | 1 | 3 | -1 | 1 | 3 | -1 | 2 |
| | | | | | | | | | | | | | | | | | | |

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE



| | 091 - LBI | 092 - LPH | 093 - LA | 094 - LBI | 095 - MAR | 096 - LPH | 097 - HBA | 098 - THI |
|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 1 | 1 | 9 | 2 | 2 | 2 | 7 | 1 |
| L0+00-S0+40N | 1 | 1 | 2 | 2 | 2 | 2 | 9 | 2 |
| L0+00-S0+60N | 2 | 1 | 7 | 2 | 2 | 2 | 13 | 2 |
| L0+00-S0+80N | 2 | 1 | 10 | 2 | 2 | 2 | 8 | 2 |
| L0+00-S1+00N | 1 | 1 | 7 | 2 | 2 | 2 | 11 | 2 |
| L0+00-S1+00N-R | 1 | 1 | 6 | 2 | -1 | 2 | 11 | 2 |
| L0+00-S1+20N | 1 | 1 | 2 | 1 | 2 | 2 | 7 | 1 |
| L0+00-S1+40N | 1 | 1 | 10 | 1 | 2 | 2 | 7 | 2 |
| L0+00-S1+60N | 1 | 1 | 9 | 1 | 2 | 2 | 7 | 1 |
| L0+00-S1+80N | 1 | 1 | 7 | 1 | 1 | 2 | 6 | 2 |
| L0+00-S2+00N | 1 | 1 | 3 | 1 | 1 | 2 | 5 | 1 |
| L0+00-S2+20N | 1 | 1 | 11 | 1 | 1 | 2 | 8 | 2 |
| L0+00-S2+40N | 1 | 1 | 2 | 2 | 1 | 2 | 7 | 1 |
| L0+00-S2+60N | 1 | 1 | 4 | 1 | 2 | 1 | 8 | 1 |
| L0+00-S2+80N | 1 | 1 | 9 | 1 | 2 | 2 | 6 | -1 |
| L0+00-S3+00N | 1 | 1 | 4 | 1 | 1 | 2 | 7 | 1 |
| L0+00-S3+20N | 2 | 2 | 29 | 2 | 1 | 2 | 25 | -1 |
| L0+00-S3+40N | 1 | 1 | 5 | 2 | 2 | 2 | 9 | 1 |
| L0+50E-S0+20N | 1 | 1 | 7 | 1 | 2 | 1 | 5 | 2 |
| L0+50E-S0+40N | 1 | 1 | 7 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S0+60N | 1 | 1 | 8 | 1 | 2 | 2 | 7 | 1 |
| L0+50E-S0+60N-R | 1 | 1 | 2 | 1 | 2 | 2 | 7 | 2 |
| L0+50E-S0+80N | 1 | 1 | 8 | 2 | 2 | 2 | 3 | 1 |
| L0+50E-S1+00N | 1 | 1 | 6 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S1+20N | 1 | 1 | 6 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S1+40N | 1 | 1 | 8 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S1+60N | 1 | 1 | 5 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S1+80N | 1 | 1 | 1 | 1 | 2 | 1 | 7 | 1 |
| L0+50E-S2+00N | 1 | 1 | 7 | 1 | 1 | 2 | 7 | 1 |
| L0+50E-S2+20N | 1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 |
| L0+50E-S2+40N | 1 | 1 | 2 | 1 | 1 | 1 | 5 | 1 |
| L0+50E-S2+60N | 1 | 1 | 9 | 1 | 1 | 2 | 6 | 1 |
| L0+50E-S2+80N | 1 | 1 | 8 | 1 | 1 | 1 | 7 | 1 |
| L0+50E-S3+00N | 1 | 1 | 8 | 1 | 1 | 1 | 6 | 1 |
| L0+50E-S3+20N | 1 | 1 | 5 | 1 | 1 | 2 | 7 | 1 |
| L1+00E-S0+40N | 1 | 1 | 7 | 1 | 1 | 2 | 6 | 1 |
| L1+00E-S0+60N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | -1 |
| L1+00E-S0+60N-R | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 1 |
| L1+00E-S0+80N | 1 | 1 | 8 | 1 | 1 | 2 | 5 | 1 |
| L1+00E-S1+00N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 1 |
| L1+00E-S1+20N | 1 | 1 | 8 | 1 | 1 | 2 | 6 | 1 |
| L1+00E-S1+40N | 1 | 1 | 9 | 1 | 1 | 2 | 8 | 1 |
| L1+00E-S1+60N | 1 | 1 | 8 | 1 | 1 | 2 | 6 | 1 |
| L1+00E-S1+80N | 1 | 1 | 5 | 2 | 1 | 2 | 5 | 1 |
| L1+00E-S2+00N | 2 | 1 | 8 | 2 | 1 | 2 | 1 | 2 |
| L1+00E-S2+20N | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 |
| L1+00E-S2+40N | 2 | 1 | 26 | 2 | 1 | 2 | 21 | 2 |
| L1+00E-S2+60N | 1 | 1 | 9 | 1 | 2 | 2 | 7 | 2 |
| L1+00E-S2+80N | 1 | 1 | 9 | 1 | 1 | 2 | 6 | 1 |
| L1+00E-S3+00N | 1 | 1 | 4 | 1 | 1 | 2 | 7 | 2 |
| L1+00E-S3+20N | 1 | 1 | 9 | 1 | 1 | 2 | 6 | 1 |
| L1+00E-S3+40N | 1 | 1 | 2 | 1 | 2 | 1 | 6 | 2 |
| L1+50E-S0+40N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 2 |
| L1+50E-S0+40N-R | 1 | 1 | 1 | 1 | 1 | 2 | 6 | 1 |

| | 099 - LPH | 100 - LPH | 101 - MAR | 102 - MBI | 103 - LPH | 104 - MAR | 105 - ALK | 106 - MBI | 107 - MBI | 108 - LPH |
|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 2 | 2 | -1 | 2 | 2 | 2 | 3 | -1 | 2 | 6 |
| L0+00-S0+40N | 2 | 2 | -1 | 2 | 2 | 2 | 3 | 1 | 2 | 5 |
| L0+00-S0+60N | 2 | 2 | -1 | 2 | 2 | 2 | 3 | 1 | 2 | 6 |
| L0+00-S0+80N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L0+00-S1+00N | 2 | 2 | -1 | 2 | 2 | 2 | 3 | 1 | 2 | 6 |
| L0+00-S1+00N-R | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+00-S1+20N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+00-S1+40N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L0+00-S1+60N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 6 |
| L0+00-S1+80N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+00-S2+00N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+00-S2+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L0+00-S2+40N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | -1 | 6 |
| L0+00-S2+60N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+00-S2+80N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 6 |
| L0+00-S3+00N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+00-S3+20N | 2 | 2 | -1 | 2 | 2 | 3 | 4 | 1 | 2 | 6 |
| L0+00-S3+40N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L0+50E-S0+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+50E-S0+40N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S0+60N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+50E-S0+60N-R | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S0+80N | 1 | 2 | -1 | 2 | 2 | 1 | 2 | 1 | 2 | 5 |
| L0+50E-S1+00N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S1+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S1+40N | 1 | 2 | -1 | 1 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+50E-S1+60N | 1 | 2 | -1 | 2 | 1 | 1 | 2 | -1 | 2 | 5 |
| L0+50E-S1+80N | 1 | 2 | -1 | 2 | 1 | 1 | 2 | 1 | 2 | 5 |
| L0+50E-S2+00N | 1 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | -1 |
| L0+50E-S2+20N | 1 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L0+50E-S2+40N | 1 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S2+60N | 1 | 2 | -1 | 2 | 2 | 1 | 2 | -1 | 2 | 5 |
| L0+50E-S2+80N | 1 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| L0+50E-S3+00N | 1 | 2 | -1 | 1 | 2 | 2 | 2 | 1 | 2 | 5 |
| L0+50E-S3+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S0+40N | 1 | 2 | -1 | 1 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S0+60N | 1 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+00E-S0+60N-R | 1 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S0+80N | 2 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+00E-S1+00N | 2 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S1+20N | 2 | 2 | -1 | 2 | 1 | 1 | 2 | -1 | 2 | 5 |
| L1+00E-S1+40N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S1+60N | 2 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S1+80N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S2+00N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+00E-S2+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S2+40N | 2 | 2 | -1 | 2 | 2 | 2 | 3 | 1 | 2 | 5 |
| L1+00E-S2+60N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S2+80N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L1+00E-S3+00N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+00E-S3+20N | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+00E-S3+40N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S0+40N | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S0+40N-R | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 091 - LBI | 092 - LPH | 093 - LA | 094 - LBI | 095 - MAR | 096 - LPH | 097 - HBA | 098 - THI | 099 - LPH | 100 - LPH | 101 - MAR | 102 - MBI | 103 - LPH | 104 - MAR | 105 - ALK | 106 - MBI | 107 - MBI | 108 - LPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 1 | 1 | 10 | 1 | 1 | 2 | 7 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S0+80N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 1 | 1 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S1+00N | 1 | 1 | 2 | 1 | 1 | 2 | 6 | 2 | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S1+20N | 1 | 1 | 6 | 1 | 1 | 2 | 5 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S1+40N | 1 | 1 | 2 | 1 | 1 | 2 | 7 | 2 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S1+60N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 1 | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S1+80N | 1 | 1 | 3 | 1 | 1 | 2 | 6 | 1 | 2 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S2+00N | 1 | 1 | 8 | 2 | 2 | 2 | 7 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S2+20N | 1 | 1 | 2 | 2 | 2 | 2 | 8 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| L1+50E-S2+40N | 1 | 1 | 8 | 1 | 1 | 2 | 6 | 1 | 2 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S2+60N | 1 | 1 | 9 | 1 | 1 | 2 | 7 | 1 | 2 | 2 | -1 | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S2+80N | 1 | 1 | 8 | 1 | 1 | 2 | 6 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S3+00N | 1 | 1 | 7 | 1 | 2 | 2 | 6 | 2 | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
| L1+50E-S3+20N | 1 | 1 | 1 | 1 | 1 | 2 | 6 | 1 | 1 | 2 | -1 | 2 | 2 | 2 | 2 | -1 | 2 | 5 |
| L1+50E-S3+40N | 1 | 1 | 6 | 1 | 1 | 2 | 4 | 1 | 2 | 2 | -1 | 2 | 2 | 2 | 1 | 1 | 2 | 5 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 1 | 1 | 5 | 1 | 1 | 1 | -1 | 1 | 1 | 2 | -1 | 2 | 1 | 2 | 2 | -1 | 2 | 5 |
| LMB-QA | 1 | 1 | 8 | 2 | 1 | 2 | 6 | 2 | 1 | 2 | -1 | 2 | 2 | 2 | 2 | 1 | 2 | 6 |
| | | | | | | | | | | | | | | | | | | |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
(SGH) by GC/MS
MOOSE CLIFF PROJECT SITE

Activation Laboratories Ltd.
Date: September 14, 2010
R=Replicate Sample

| | 109 - MAR | 110 - HBA | 111 - MAR | 112 - MBI | 113 -HBA | 114 - MBI | 115 - MBI | 116 - MAR | 117 - HA | 118 - MPH | 119 - HBA | 120 - THI | 121 - MPH | 122 - MPH | 123 - MPH | 124 - MBI | 125 - HAR | 126 - MPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 8 | 13 | 4 | 8 | 15 | 6 | 6 | 4 | 33 | 5 | 21 | 4 | -1 | 12 | 5 | 6 | 6 | 5 |
| L0+00-S0+40N | 8 | 15 | 4 | 11 | 14 | 7 | 7 | 4 | 43 | 6 | 23 | -1 | 5 | 12 | 5 | 7 | 5 | 5 |
| L0+00-S0+60N | 9 | 25 | 4 | 10 | 21 | 7 | 7 | 4 | 53 | 5 | 31 | 5 | 5 | 13 | 5 | 7 | 6 | 6 |
| L0+00-S0+80N | 7 | 14 | 3 | 14 | 15 | 7 | 8 | 4 | 26 | 4 | 15 | 5 | 4 | 12 | 5 | 7 | 6 | 5 |
| L0+00-S1+00N | 8 | 17 | 3 | 7 | 16 | 5 | 5 | 4 | 34 | 5 | 21 | 4 | 5 | 11 | 5 | 6 | 6 | 5 |
| L0+00-S1+00N-R | 8 | 17 | 3 | 8 | 15 | 6 | 7 | 4 | 41 | 5 | 11 | 5 | 5 | 11 | -1 | 6 | 6 | 5 |
| L0+00-S1+20N | 7 | 12 | 3 | 13 | 14 | 8 | 7 | 3 | 38 | 5 | 20 | 5 | 4 | 11 | 5 | 7 | 6 | 5 |
| L0+00-S1+40N | 7 | 13 | 3 | 8 | 14 | 5 | 6 | 4 | 33 | 5 | 16 | 4 | 5 | 12 | 5 | 6 | 6 | 5 |
| L0+00-S1+60N | 7 | 12 | 4 | 12 | 14 | 7 | 7 | 4 | 33 | 5 | 19 | 4 | 5 | 11 | 5 | 6 | 6 | 5 |
| L0+00-S1+80N | 7 | 11 | 4 | 12 | 12 | 7 | 7 | 3 | 22 | 5 | 15 | 4 | 5 | 12 | 5 | 6 | 6 | 5 |
| L0+00-S2+00N | 6 | 10 | 3 | 11 | 12 | 7 | 6 | 4 | 20 | 5 | 7 | 5 | 5 | 11 | 5 | 6 | 5 | 5 |
| L0+00-S2+20N | 7 | 13 | 3 | 7 | 2 | 5 | 5 | 3 | 29 | 5 | 20 | 5 | 4 | 11 | 5 | -1 | 6 | 5 |
| L0+00-S2+40N | 7 | 13 | 3 | 11 | 15 | 7 | 7 | 4 | 40 | 5 | 19 | 4 | 5 | 12 | 5 | 7 | 6 | 6 |
| L0+00-S2+60N | 7 | 13 | 4 | 7 | 14 | 5 | 6 | 4 | 28 | 4 | 8 | 4 | 4 | 12 | 5 | 6 | 6 | 5 |
| L0+00-S2+80N | 7 | 13 | 3 | 12 | 13 | 7 | 6 | 3 | 47 | 5 | 21 | 4 | 5 | 12 | 5 | 6 | 6 | 5 |
| L0+00-S3+00N | 7 | 12 | 3 | 14 | 14 | 7 | 7 | 4 | 36 | 4 | 19 | 4 | 4 | 11 | 5 | 7 | 5 | 5 |
| L0+00-S3+20N | 8 | 21 | 4 | 13 | 18 | 8 | 8 | 4 | 57 | 6 | 2 | 4 | 5 | 13 | 5 | 6 | 6 | 6 |
| L0+00-S3+40N | 1 | 15 | 3 | 16 | 17 | 8 | 8 | 4 | 73 | 5 | 28 | 4 | 5 | 12 | 5 | 7 | 6 | 5 |
| L0+50E-S0+20N | 7 | 10 | 3 | 7 | 12 | 5 | 6 | 4 | 17 | 4 | 13 | 4 | 5 | 11 | 5 | 5 | 6 | 5 |
| L0+50E-S0+40N | 6 | 11 | 3 | 6 | 11 | 5 | 5 | 4 | 22 | 5 | 16 | 4 | 5 | 11 | 4 | 6 | 5 | 5 |
| L0+50E-S0+60N | 7 | 12 | 3 | 18 | 12 | 9 | 9 | 3 | 20 | 4 | 3 | 4 | 4 | 11 | 5 | 7 | 5 | 5 |
| L0+50E-S0+60N-R | 7 | 11 | 3 | 14 | 14 | 8 | 7 | 4 | 45 | 4 | 17 | 4 | 4 | 12 | 4 | 7 | 5 | 5 |
| L0+50E-S0+80N | 7 | 10 | 3 | 7 | 11 | 5 | 5 | 3 | 23 | 5 | 13 | 4 | 4 | 11 | 5 | 6 | 5 | 5 |
| L0+50E-S1+00N | 7 | 12 | 3 | 9 | 13 | 6 | 6 | 4 | 24 | 5 | 15 | 4 | 4 | 12 | 5 | -1 | 5 | 5 |
| L0+50E-S1+20N | 6 | 11 | 3 | 6 | 12 | 5 | 6 | 3 | 24 | 4 | 16 | 4 | 4 | 11 | 5 | 5 | 6 | 5 |
| L0+50E-S1+40N | 7 | 10 | 3 | 11 | 11 | 7 | 6 | 3 | 20 | 5 | 14 | 4 | 4 | 10 | 4 | 6 | 5 | 5 |
| L0+50E-S1+60N | 7 | 12 | 3 | 9 | 12 | 6 | 5 | 4 | 36 | 5 | 17 | 4 | 4 | 10 | 4 | 6 | 5 | 5 |
| L0+50E-S1+80N | 7 | 12 | 3 | 7 | 12 | 5 | 6 | 4 | 34 | 5 | 21 | 5 | 4 | 11 | 4 | 6 | -1 | 5 |
| L0+50E-S2+00N | 7 | 14 | 3 | 9 | 13 | 5 | 6 | 3 | 28 | 4 | 18 | 4 | 4 | 10 | 5 | 6 | 5 | 5 |
| L0+50E-S2+20N | 6 | 11 | 3 | 8 | 10 | 5 | 5 | 3 | 30 | 4 | 15 | 4 | 5 | 10 | 5 | 6 | -1 | 5 |
| L0+50E-S2+40N | 6 | 9 | 3 | 7 | 11 | 5 | 5 | 3 | 18 | 5 | 12 | 4 | 4 | 10 | 5 | 5 | 5 | 5 |
| L0+50E-S2+60N | 7 | 11 | 3 | 6 | 10 | 5 | 5 | 4 | 30 | 5 | 10 | 4 | 5 | 10 | 4 | 6 | 5 | 4 |
| L0+50E-S2+80N | 7 | 10 | 3 | 6 | 12 | 4 | 5 | 3 | 26 | 4 | 17 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |
| L0+50E-S3+00N | 6 | 9 | 3 | 7 | 11 | 5 | 5 | 3 | 33 | 4 | 20 | 4 | 4 | 10 | 4 | 6 | 5 | 4 |
| L0+50E-S3+20N | 7 | 11 | 3 | 6 | 13 | 5 | 5 | 3 | 24 | 4 | 11 | 4 | 4 | 12 | 4 | 5 | 5 | 5 |
| L1+00E-S0+40N | 7 | 10 | 3 | 8 | 10 | 5 | 5 | 3 | 20 | 4 | 12 | 4 | 4 | 10 | 4 | 5 | 6 | 5 |
| L1+00E-S0+60N | 7 | 12 | 3 | 8 | 12 | 6 | 6 | 3 | 32 | 4 | 8 | 4 | 4 | 11 | 5 | 6 | 5 | 5 |
| L1+00E-S0+60N-R | 7 | 11 | 3 | 8 | 12 | 5 | 5 | 3 | 26 | 4 | 16 | 4 | 4 | 11 | 4 | 6 | 5 | 5 |
| L1+00E-S0+80N | 7 | 10 | 3 | 11 | 11 | 7 | 6 | 3 | 28 | 5 | 16 | 4 | 4 | 11 | 4 | 6 | 5 | 5 |
| L1+00E-S1+00N | 6 | 13 | 3 | 18 | 14 | 9 | 8 | 4 | 46 | 5 | 20 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |
| L1+00E-S1+20N | 6 | 12 | 3 | 12 | 12 | 7 | 7 | 4 | 23 | 5 | 1 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |
| L1+00E-S1+40N | 6 | 11 | 3 | 7 | 14 | 5 | 5 | 4 | 30 | 5 | 14 | 5 | 5 | 12 | 5 | 6 | 6 | 5 |
| L1+00E-S1+60N | 7 | 11 | 3 | 8 | 11 | 6 | 5 | 3 | 19 | 5 | 13 | 5 | 5 | 11 | 5 | 6 | 6 | 5 |
| L1+00E-S1+80N | 7 | 10 | 3 | 5 | 11 | 4 | 5 | 4 | 20 | 5 | 12 | 4 | 4 | 12 | 4 | 6 | 5 | 5 |
| L1+00E-S2+00N | 7 | 10 | 3 | 7 | 14 | 5 | 6 | 4 | 28 | 5 | 17 | 4 | 5 | 12 | 5 | 6 | 6 | 5 |
| L1+00E-S2+20N | 6 | 11 | 3 | 12 | 12 | 7 | 6 | 3 | 35 | 5 | 17 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |
| L1+00E-S2+40N | 7 | 19 | 3 | 11 | 18 | 7 | 7 | 4 | 62 | 5 | 27 | 5 | 5 | 12 | 5 | 6 | 6 | 5 |
| L1+00E-S2+60N | 7 | 11 | 3 | 6 | 12 | 5 | 5 | 4 | 25 | 5 | 14 | 4 | 4 | 11 | 5 | 6 | 5 | 5 |
| L1+00E-S2+80N | 7 | 11 | 3 | 15 | 13 | 8 | 7 | 4 | 28 | 5 | 16 | 4 | 5 | 12 | 5 | 6 | 6 | 5 |
| L1+00E-S3+00N | 7 | 12 | 3 | 14 | 13 | 8 | 8 | 4 | 32 | 5 | 14 | 5 | 5 | 11 | 5 | 7 | 5 | 5 |
| L1+00E-S3+20N | 7 | 12 | 3 | 15 | 13 | 8 | 7 | 3 | 36 | 4 | 18 | 4 | 4 | 12 | 5 | 7 | 6 | 5 |
| L1+00E-S3+40N | 6 | 9 | 3 | 13 | 13 | 7 | 7 | 3 | 38 | 4 | 8 | 4 | 4 | 12 | 5 | 7 | 6 | 6 |
| L1+50E-S0+40N | 7 | 12 | 3 | 8 | 12 | 6 | 5 | 3 | 34 | 5 | 19 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |
| L1+50E-S0+40N-R | 6 | 12 | 3 | 9 | 11 | 6 | 6 | 4 | 24 | 4 | 17 | 4 | 4 | 11 | 4 | 6 | 5 | 5 |

Golden Hope Mines
Sylvain Ouellette
-1=Reporting Limit of 1pg/g (ppt=parts per trillion)

SOIL GAS HYDROCARBONS
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Activation Laboratories Ltd.
Date: September 14, 2010
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| | 109 - MAR | 110 - HBA | 111 - MAR | 112 - MBI | 113 -HBA | 114 - MBI | 115 - MBI | 116 - MAR | 117 - HA | 118 - MPH | 119 - HBA | 120 - THI | 121 - MPH | 122 - MPH | 123 - MPH | 124 - MBI | 125 - HAR | 126 - MPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 6 | 13 | 3 | 14 | 13 | 8 | 7 | 4 | 67 | 5 | 11 | 4 | 5 | 12 | 5 | 7 | 6 | 6 |
| L1+50E-S0+80N | 6 | 12 | 3 | 6 | 11 | 6 | 6 | 4 | 31 | 4 | 16 | 4 | 4 | 11 | 5 | 5 | 5 | 5 |
| L1+50E-S1+00N | 7 | 10 | 3 | 7 | 13 | 5 | 6 | 4 | 26 | 5 | 17 | 4 | 5 | 12 | 5 | 6 | 6 | 6 |
| L1+50E-S1+20N | 7 | 9 | 3 | 7 | 12 | 5 | 5 | 3 | 24 | 4 | 15 | 4 | 4 | 11 | 5 | 6 | 5 | 5 |
| L1+50E-S1+40N | 7 | 13 | 3 | 24 | 13 | 11 | 10 | 3 | 41 | 5 | 21 | 4 | 5 | 12 | 5 | 8 | 5 | 5 |
| L1+50E-S1+60N | 6 | 11 | 3 | 10 | 13 | 6 | 6 | 3 | 40 | 5 | 20 | 5 | 5 | 12 | 5 | -1 | 6 | 5 |
| L1+50E-S1+80N | 7 | 12 | 3 | 16 | 11 | 8 | 7 | 3 | 50 | 5 | 26 | 5 | -1 | 11 | 5 | 7 | 5 | 5 |
| L1+50E-S2+00N | 7 | 12 | 4 | 12 | 11 | 8 | 7 | 3 | 21 | 5 | 16 | 5 | 5 | 11 | 5 | 6 | 5 | 5 |
| L1+50E-S2+20N | 7 | 11 | 3 | 10 | 13 | 6 | 7 | 4 | 40 | 5 | 19 | 4 | 5 | 12 | 5 | 6 | 5 | 5 |
| L1+50E-S2+40N | 6 | 12 | 3 | 7 | 13 | 5 | 6 | 4 | 26 | 5 | 16 | 4 | 4 | 11 | 5 | 6 | 5 | 5 |
| L1+50E-S2+60N | 7 | 11 | 3 | 8 | 14 | 5 | 6 | 4 | 27 | 4 | 14 | -1 | 4 | 11 | 5 | 6 | 6 | 5 |
| L1+50E-S2+80N | 7 | 12 | 3 | 9 | 12 | 6 | 6 | 4 | 17 | 5 | 14 | 4 | 5 | 12 | 5 | 6 | -1 | 5 |
| L1+50E-S3+00N | 6 | 11 | 3 | 8 | 13 | 6 | 6 | 4 | 27 | 5 | 16 | 4 | 5 | 12 | 5 | 6 | 5 | 5 |
| L1+50E-S3+20N | 6 | 10 | 3 | 5 | 10 | 4 | 5 | 3 | 28 | 4 | 14 | 4 | 4 | 11 | 4 | 5 | 5 | 5 |
| L1+50E-S3+40N | 6 | 8 | 3 | 6 | 11 | 4 | 5 | 3 | 19 | 5 | 13 | 4 | 4 | 11 | 4 | 6 | 5 | 5 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 6 | 9 | 3 | 4 | 11 | 4 | 5 | 3 | 16 | 4 | 13 | 4 | 4 | 10 | 5 | 5 | 5 | 5 |
| LMB-QA | 7 | 11 | 3 | 4 | 14 | 4 | 5 | 4 | 29 | 4 | 17 | 4 | 5 | 11 | 5 | 6 | 5 | 5 |

| | 127 - MPH | 128 - MPH | 129 - HAR | 130 - HAR | 131 - MPH | 132 - ALK | 133 - HAR | 134 - HAR | 135 - MPH | 136 - MPH | 137 - HBI | 138 - HBI | 139 - HPH | 140 - HPH | 141 - HBI | 142 - HPH | 143 - HA | 144 - HBI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 4 | 3 | 4 | 5 | 5 | 18 | 12 | 19 | 11 | 9 | 5 | 9 | 10 | 9 | 10 | 11 | 39 | 12 |
| L0+00-S0+40N | 4 | 3 | 4 | 5 | 6 | 20 | 13 | 18 | 11 | 10 | 7 | 9 | 10 | 9 | 9 | 11 | 43 | 12 |
| L0+00-S0+60N | 5 | 3 | 4 | 6 | 6 | 23 | 13 | 18 | 11 | 9 | 6 | 9 | 11 | 9 | 10 | 11 | 50 | 12 |
| L0+00-S0+80N | 4 | 3 | 4 | 5 | 5 | 16 | 11 | 17 | 10 | 9 | 6 | 9 | 11 | 9 | 9 | 1 | 36 | 10 |
| L0+00-S1+00N | 4 | 3 | 4 | 5 | 5 | 19 | 11 | 17 | 11 | 9 | 6 | 9 | 2 | 9 | 9 | 11 | 44 | 12 |
| L0+00-S1+00N-R | 4 | 3 | 4 | 5 | 6 | 21 | 12 | 18 | 12 | 9 | 5 | 8 | 1 | 9 | 9 | 11 | 7 | 11 |
| L0+00-S1+20N | 4 | 3 | 4 | 5 | 6 | 18 | 12 | 18 | 10 | 9 | 6 | 8 | 10 | 9 | 8 | 2 | 38 | 10 |
| L0+00-S1+40N | 4 | 3 | 4 | 5 | 5 | 19 | 12 | 16 | 10 | 9 | 5 | 8 | 2 | 9 | 9 | 11 | 44 | 11 |
| L0+00-S1+60N | 4 | 3 | 4 | 5 | 5 | 18 | 12 | 18 | 11 | 10 | 6 | 9 | 9 | 8 | 9 | 2 | 34 | 11 |
| L0+00-S1+80N | 4 | 3 | 4 | 5 | 5 | 13 | 12 | 18 | 11 | 10 | 7 | 8 | 10 | 8 | 8 | 10 | 33 | 10 |
| L0+00-S2+00N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 18 | 9 | 10 | 5 | 8 | 9 | 9 | 8 | 11 | 18 | 10 |
| L0+00-S2+20N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 17 | 11 | 11 | 6 | 9 | 10 | 9 | 9 | 1 | 35 | 11 |
| L0+00-S2+40N | 4 | 3 | 4 | 5 | 5 | 19 | 11 | 18 | 10 | 9 | 6 | 8 | 2 | 9 | 9 | 2 | 19 | 10 |
| L0+00-S2+60N | 4 | 3 | 4 | 5 | 5 | 16 | 11 | 18 | 11 | 10 | 6 | 9 | 9 | 9 | 8 | 10 | 22 | 11 |
| L0+00-S2+80N | 4 | 3 | 4 | 5 | 5 | 12 | 11 | 18 | 10 | 8 | 5 | 8 | 11 | 8 | 9 | 2 | 35 | 10 |
| L0+00-S3+00N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 17 | 11 | 8 | 5 | 9 | 2 | 8 | 9 | 10 | 19 | 11 |
| L0+00-S3+20N | 4 | 3 | 4 | 5 | 5 | 19 | 11 | 17 | 11 | 9 | 6 | 9 | 2 | 9 | 9 | 1 | 66 | 10 |
| L0+00-S3+40N | 4 | 3 | 4 | 5 | 5 | 19 | 11 | 17 | 11 | 9 | 5 | 9 | 9 | 8 | 9 | 11 | 26 | 10 |
| L0+50E-S0+20N | 4 | 3 | 4 | 5 | 5 | 11 | 11 | 17 | 10 | 10 | 6 | 9 | 11 | 8 | 8 | 11 | 26 | 10 |
| L0+50E-S0+40N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 16 | 11 | 9 | 5 | 8 | 9 | 8 | 8 | 9 | 33 | 10 |
| L0+50E-S0+60N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 11 | 9 | 6 | 8 | 9 | 9 | 9 | 10 | 31 | 11 |
| L0+50E-S0+60N-R | 4 | 3 | 4 | 5 | 5 | 20 | 11 | 16 | 10 | 9 | 6 | 9 | 9 | 8 | 8 | 10 | 38 | 10 |
| L0+50E-S0+80N | 4 | 3 | 4 | 5 | 5 | 12 | 11 | 16 | 10 | 8 | 5 | 8 | 9 | 8 | 8 | 10 | 14 | 10 |
| L0+50E-S1+00N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 10 | 9 | 6 | 8 | 10 | 7 | 8 | 9 | 32 | 10 |
| L0+50E-S1+20N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 15 | 11 | 9 | 5 | 9 | 1 | 8 | 8 | 9 | 16 | 9 |
| L0+50E-S1+40N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 15 | 10 | 9 | 6 | 8 | 10 | 8 | 9 | 10 | 32 | 9 |
| L0+50E-S1+60N | 4 | 3 | 4 | 5 | 5 | 14 | 10 | 16 | 10 | 9 | 5 | 8 | 9 | 7 | 8 | 9 | 34 | 10 |
| L0+50E-S1+80N | 4 | 3 | 4 | 5 | 6 | 24 | 11 | 14 | 10 | 9 | 5 | 8 | 9 | 9 | 8 | 10 | 43 | 9 |
| L0+50E-S2+00N | 4 | 3 | 4 | 5 | 5 | 15 | 10 | 15 | 10 | 9 | 6 | 8 | 9 | 8 | 10 | 10 | 30 | 9 |
| L0+50E-S2+20N | 4 | 3 | 4 | 5 | 5 | 16 | 10 | 15 | 10 | 9 | 6 | 8 | 2 | 7 | 8 | 8 | 31 | 9 |
| L0+50E-S2+40N | 4 | 3 | 3 | 4 | 5 | 13 | 11 | 16 | 10 | 10 | 6 | 8 | 2 | 8 | 7 | 9 | 30 | 10 |
| L0+50E-S2+60N | 4 | 3 | 3 | 5 | 5 | 17 | 10 | 16 | 10 | 9 | 5 | 8 | 9 | 9 | 8 | 10 | 31 | 9 |
| L0+50E-S2+80N | 4 | 3 | 4 | 4 | 5 | 15 | 10 | 15 | 10 | 8 | 5 | 8 | 9 | 7 | 7 | 9 | 34 | 1 |
| L0+50E-S3+00N | 4 | 3 | 4 | 5 | 5 | 15 | 10 | 15 | 10 | 8 | 5 | 8 | 9 | 8 | 8 | 10 | 14 | 9 |
| L0+50E-S3+20N | 4 | 3 | 3 | 4 | 5 | 11 | 11 | 17 | 10 | 8 | 6 | 8 | 2 | 8 | 7 | 1 | 15 | 9 |
| L1+00E-S0+40N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 16 | 10 | 10 | 5 | 7 | 9 | 8 | 8 | 10 | 32 | 9 |
| L1+00E-S0+60N | 4 | 3 | 4 | 5 | 5 | 14 | 12 | 15 | 10 | 8 | 5 | 8 | 9 | 8 | 7 | 10 | 34 | 10 |
| L1+00E-S0+60N-R | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 15 | 10 | 9 | 5 | 8 | 9 | 7 | 7 | 8 | 30 | 9 |
| L1+00E-S0+80N | 4 | 3 | 4 | 5 | 5 | 12 | 10 | 15 | 9 | 10 | 6 | 8 | 9 | 8 | 8 | 11 | 31 | 10 |
| L1+00E-S1+00N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 16 | 11 | 9 | 5 | 7 | 9 | 8 | 8 | 8 | 33 | 9 |
| L1+00E-S1+20N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 15 | 10 | 9 | 5 | 8 | 10 | 8 | 8 | 1 | 19 | 10 |
| L1+00E-S1+40N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 17 | 10 | 10 | 5 | 8 | 10 | 9 | 8 | 10 | 32 | 1 |
| L1+00E-S1+60N | 4 | 3 | 4 | 5 | 5 | 12 | 12 | 15 | 11 | 9 | 5 | 8 | 9 | 1 | 9 | 10 | 30 | 10 |
| L1+00E-S1+80N | 4 | 3 | 4 | 5 | 4 | 14 | 11 | 17 | 10 | 10 | 5 | 8 | 10 | 8 | 8 | 10 | 32 | 10 |
| L1+00E-S2+00N | 4 | 3 | 4 | 5 | 5 | 18 | 12 | 16 | 10 | 9 | 6 | 9 | 10 | 9 | 8 | 10 | 37 | 11 |
| L1+00E-S2+20N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 16 | 10 | 9 | 6 | 8 | 9 | 8 | 8 | 10 | 33 | 11 |
| L1+00E-S2+40N | 4 | 3 | 4 | 5 | 5 | 17 | 12 | 18 | 11 | 9 | 5 | 8 | 10 | 8 | 8 | 10 | 52 | 11 |
| L1+00E-S2+60N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 16 | 11 | 8 | 5 | 8 | 9 | 8 | 8 | 10 | 33 | 10 |
| L1+00E-S2+80N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 16 | 10 | 8 | 5 | 8 | 2 | 8 | 9 | 2 | 29 | 10 |
| L1+00E-S3+00N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 16 | 10 | 9 | 6 | 8 | 10 | 10 | 9 | 10 | 35 | 11 |
| L1+00E-S3+20N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 16 | 10 | 8 | 5 | 9 | 10 | 8 | 8 | 9 | 32 | 10 |
| L1+00E-S3+40N | 4 | 3 | 4 | 5 | 5 | 12 | 10 | 15 | 11 | 9 | 5 | 8 | 10 | 8 | 8 | 10 | 31 | 10 |
| L1+50E-S0+40N | 4 | 3 | 4 | 5 | 5 | 14 | 12 | 16 | 10 | 10 | 5 | 8 | 9 | 8 | 8 | 8 | 34 | 9 |
| L1+50E-S0+40N-R | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 9 | 9 | 6 | 8 | 9 | 8 | 8 | 9 | 37 | 10 |

# SOIL GAS HYDROCARBONS
# (SGH) by GC/MS
# MOOSE CLIFF PROJECT SITE



| | 127 - MPH | 128 - MPH | 129 - HAR | 130 - HAR | 131 - MPH | 132 - ALK | 133 - HAR | 134 - HAR | 135 - MPH | 136 - MPH | 137 - HBI | 138 - HBI | 139 - HPH | 140 - HPH | 141 - HBI | 142 - HPH | 143 - HA | 144 - HBI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 4 | 3 | 4 | 5 | 6 | 25 | 12 | 17 | 11 | 9 | 6 | 8 | 10 | 9 | 9 | 1 | 24 | 11 |
| L1+50E-S0+80N | 4 | 3 | 4 | 5 | 5 | 16 | 12 | 18 | 10 | 9 | 5 | 8 | 9 | 8 | 8 | 1 | 18 | 10 |
| L1+50E-S1+00N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 11 | 9 | 5 | 8 | 10 | 9 | 9 | 10 | 34 | 10 |
| L1+50E-S1+20N | 4 | 3 | 4 | 5 | 5 | 13 | 11 | 15 | 10 | 9 | 6 | 8 | 10 | 8 | 8 | 10 | 5 | 10 |
| L1+50E-S1+40N | 4 | 3 | 4 | 5 | 5 | 15 | 12 | 16 | 12 | 8 | 6 | 9 | 10 | 8 | 9 | 11 | 35 | 10 |
| L1+50E-S1+60N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 10 | 10 | 6 | 9 | 9 | 8 | 8 | 9 | 34 | 10 |
| L1+50E-S1+80N | 4 | 3 | 4 | 5 | 5 | 16 | 11 | 16 | 10 | 8 | 5 | 8 | 10 | 8 | 8 | 9 | 34 | 10 |
| L1+50E-S2+00N | 4 | 3 | 4 | 5 | 5 | 15 | 12 | 18 | 11 | 9 | 6 | 8 | 10 | 8 | 8 | 9 | 35 | 10 |
| L1+50E-S2+20N | 4 | 3 | 4 | 5 | 5 | 14 | 10 | 15 | 10 | 9 | 5 | 8 | 9 | 8 | 8 | 9 | 20 | 9 |
| L1+50E-S2+40N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 16 | 10 | 9 | 5 | 8 | 9 | 8 | 8 | 10 | 30 | 10 |
| L1+50E-S2+60N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 17 | 10 | 8 | 5 | 8 | 2 | 9 | 8 | 10 | 31 | 10 |
| L1+50E-S2+80N | 4 | 3 | 4 | 5 | 5 | 14 | 11 | 17 | 10 | 9 | 6 | 8 | 10 | 8 | 8 | 10 | 28 | 9 |
| L1+50E-S3+00N | 4 | 3 | 4 | 5 | 5 | 15 | 11 | 17 | 11 | 10 | 5 | 8 | 10 | 8 | 8 | 1 | 6 | 9 |
| L1+50E-S3+20N | 4 | 3 | 4 | 5 | 4 | 12 | 11 | 16 | 10 | 8 | 5 | 8 | 9 | 8 | 8 | 10 | 30 | 10 |
| L1+50E-S3+40N | 4 | 3 | 4 | 5 | 5 | 12 | 11 | 15 | 9 | 9 | 5 | 7 | 9 | 9 | 8 | 10 | 25 | 9 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 4 | 3 | 4 | 5 | 5 | 11 | 11 | 16 | 9 | 10 | 5 | 8 | 9 | 8 | 8 | 9 | 30 | 10 |
| LMB-QA | 4 | 3 | 4 | 5 | 5 | 17 | 11 | 15 | 10 | 9 | 5 | 8 | 10 | 8 | 8 | 1 | 37 | 9 |
| | | | | | | | | | | | | | | | | | | |

| | 145 - HBA | 146 - HPH | 147 - HBI | 148 - HPH | 149 - HBI | 150 - HPH | 151 - HBI | 152 - HPH | 153 - HPH | 154 - HPH | 155 - HPH | 156 - HBI | 157 - HAR | 158 - HBA | 159 - HBA | 160 - HBI | 161 - HA | 162 - HPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L0+00-S0+20N | 51 | 4 | 7 | 9 | 1 | 11 | 10 | 13 | 17 | 18 | 17 | 13 | 16 | 45 | 18 | 18 | 33 | 18 |
| L0+00-S0+40N | 50 | 17 | 7 | 9 | 2 | 10 | 9 | 13 | 17 | 18 | 19 | 14 | 16 | 41 | 19 | 18 | 61 | 20 |
| L0+00-S0+60N | 88 | 17 | 7 | 9 | 11 | 1 | 10 | 6 | 17 | 17 | 3 | 15 | 15 | 55 | 18 | 18 | 72 | 20 |
| L0+00-S0+80N | 52 | 2 | 7 | 9 | 11 | 10 | 9 | 13 | 16 | 3 | 16 | 13 | 15 | 43 | 3 | 18 | 49 | 19 |
| L0+00-S1+00N | 55 | 4 | 7 | 9 | 11 | 11 | 10 | 13 | 15 | 17 | 17 | 15 | 14 | 45 | 2 | 4 | 51 | 2 |
| L0+00-S1+00N-R | 60 | 4 | 7 | 8 | 11 | 10 | 9 | 3 | 16 | 16 | 17 | 14 | 14 | 45 | 2 | 16 | 60 | 17 |
| L0+00-S1+20N | 31 | 2 | 6 | 8 | 10 | 10 | 9 | 2 | 16 | 17 | 17 | 14 | 14 | 39 | 16 | 3 | 50 | 18 |
| L0+00-S1+40N | 59 | 17 | 7 | 8 | 11 | 10 | 9 | 12 | 2 | 16 | 17 | 13 | 13 | 41 | 16 | 3 | 54 | 17 |
| L0+00-S1+60N | 57 | 3 | 7 | 9 | 10 | 10 | 9 | 12 | 15 | 15 | 17 | 13 | 15 | 42 | 3 | 17 | 51 | 19 |
| L0+00-S1+80N | 39 | 3 | 7 | 8 | 11 | 1 | 9 | 13 | 15 | 15 | 15 | 14 | 13 | 39 | 16 | 18 | 52 | 18 |
| L0+00-S2+00N | 31 | 3 | 6 | 8 | 10 | 11 | 9 | 12 | 15 | 16 | 17 | 13 | 14 | 37 | 18 | 17 | 43 | 18 |
| L0+00-S2+20N | 30 | 2 | 7 | 8 | 1 | 10 | 9 | 12 | 16 | 16 | 16 | 13 | 14 | 37 | 16 | 17 | 47 | 17 |
| L0+00-S2+40N | 65 | 3 | 7 | 9 | 10 | 10 | 9 | 12 | 15 | 16 | 17 | 14 | 13 | 40 | 17 | 3 | 10 | 18 |
| L0+00-S2+60N | 65 | 16 | 6 | 8 | 10 | 2 | 9 | 12 | 15 | 15 | 16 | 14 | 14 | 40 | 17 | 18 | 26 | 18 |
| L0+00-S2+80N | 44 | 3 | 7 | 8 | 10 | 10 | 9 | 13 | 3 | 16 | 16 | 13 | 14 | 39 | 15 | 17 | 50 | 18 |
| L0+00-S3+00N | 44 | 3 | 7 | 9 | 10 | 10 | 9 | 13 | 16 | 15 | 16 | 13 | 14 | 29 | 17 | 17 | 42 | 18 |
| L0+00-S3+20N | 52 | 2 | 6 | 9 | 10 | 10 | 9 | 13 | 17 | 16 | 16 | 14 | 15 | 49 | 17 | 17 | 61 | 17 |
| L0+00-S3+40N | 37 | 3 | 7 | 8 | 10 | 10 | 9 | 12 | 15 | 17 | 16 | 14 | 14 | 45 | 17 | 17 | 61 | 17 |
| L0+50E-S0+20N | 26 | 3 | 6 | 8 | 10 | 10 | 9 | 2 | 15 | 16 | 17 | 14 | 13 | 38 | 17 | 16 | 44 | 17 |
| L0+50E-S0+40N | 37 | 15 | 7 | 8 | 10 | 10 | 9 | 2 | 15 | 3 | 18 | 13 | 14 | 37 | 16 | 16 | 46 | 17 |
| L0+50E-S0+60N | 33 | 2 | 7 | 8 | 10 | 10 | 9 | 12 | 15 | 16 | 15 | 13 | 13 | 38 | 16 | 17 | 25 | 16 |
| L0+50E-S0+60N-R | 89 | 4 | 7 | 8 | 11 | 2 | 8 | 12 | 15 | 16 | 16 | 13 | 13 | 33 | 3 | 17 | 49 | 17 |
| L0+50E-S0+80N | 37 | 2 | 6 | 8 | 10 | 11 | 8 | 12 | 15 | 2 | 16 | 12 | 13 | 37 | 16 | 16 | 27 | 16 |
| L0+50E-S1+00N | 39 | 2 | 7 | 8 | 10 | 1 | 8 | 12 | 2 | 3 | 15 | 13 | 13 | 40 | 16 | 16 | 16 | 17 |
| L0+50E-S1+20N | 37 | 3 | 7 | 8 | 10 | 9 | 9 | 12 | 15 | 16 | 16 | 13 | 14 | 36 | 16 | 2 | 25 | 18 |
| L0+50E-S1+40N | 46 | 16 | 6 | 8 | 10 | 10 | 8 | 1 | 15 | 2 | 15 | 14 | 13 | 34 | 16 | 16 | 37 | 17 |
| L0+50E-S1+60N | 39 | 15 | 7 | 7 | 10 | 10 | 9 | 12 | 2 | 16 | 16 | 13 | 14 | 37 | 16 | 16 | 46 | 2 |
| L0+50E-S1+80N | 54 | 2 | 6 | 8 | 1 | 9 | 9 | 2 | 15 | 15 | 16 | 13 | 14 | 36 | 16 | 16 | 23 | 17 |
| L0+50E-S2+00N | 38 | 2 | 6 | 8 | 10 | 10 | 8 | 12 | 15 | 2 | 15 | 13 | 12 | 33 | 15 | 15 | 29 | 16 |
| L0+50E-S2+20N | 46 | 4 | 6 | 8 | 9 | 2 | 9 | 12 | 2 | 15 | 15 | 14 | 14 | 41 | 17 | 2 | 43 | 17 |
| L0+50E-S2+40N | 28 | 3 | 6 | 8 | 2 | 10 | 8 | 12 | 14 | 3 | 16 | 13 | 13 | 37 | 16 | 17 | 9 | 2 |
| L0+50E-S2+60N | 76 | 3 | 6 | 8 | 9 | 9 | 8 | 11 | 15 | 15 | 15 | 13 | 13 | 39 | 3 | 17 | 23 | 16 |
| L0+50E-S2+80N | 30 | 3 | 6 | 8 | 10 | 1 | 1 | 12 | 14 | 2 | 15 | 12 | 13 | 17 | 17 | 16 | 42 | 17 |
| L0+50E-S3+00N | 62 | 1 | 6 | 8 | 10 | 9 | 9 | 1 | 14 | 15 | 15 | 12 | 13 | 37 | 15 | 15 | 43 | 2 |
| L0+50E-S3+20N | 31 | 2 | 6 | 8 | 9 | 2 | 8 | 2 | 14 | 2 | 15 | 13 | 13 | 36 | 16 | 3 | 21 | 17 |
| L1+00E-S0+40N | 35 | 1 | 6 | 8 | 10 | 10 | 8 | 12 | 14 | 16 | 16 | 13 | 13 | 38 | 16 | 17 | 46 | 2 |
| L1+00E-S0+60N | 30 | 16 | 7 | 8 | 10 | 9 | 9 | 12 | 3 | 4 | 15 | 13 | 14 | 35 | 16 | 16 | 18 | 17 |
| L1+00E-S0+60N-R | 35 | 3 | 6 | 8 | 9 | 10 | 8 | 12 | 14 | 16 | 15 | -1 | 13 | 36 | 16 | 16 | 26 | 2 |
| L1+00E-S0+80N | 30 | 16 | 6 | 8 | 10 | 9 | 8 | 12 | 15 | 2 | 15 | 12 | 13 | 38 | 16 | 16 | 39 | 3 |
| L1+00E-S1+00N | 31 | 2 | 6 | 8 | 10 | 9 | 8 | 2 | 14 | 15 | 16 | 13 | 14 | 38 | 15 | 16 | 47 | 17 |
| L1+00E-S1+20N | 29 | 2 | 6 | 8 | 10 | 11 | 9 | 2 | 15 | 15 | 17 | 13 | 14 | 39 | 17 | 17 | 42 | 18 |
| L1+00E-S1+40N | 25 | 3 | 7 | 8 | 1 | 11 | 9 | 12 | 14 | 16 | 16 | 13 | 14 | 36 | 17 | 18 | 48 | 17 |
| L1+00E-S1+60N | 35 | 3 | 7 | 8 | 10 | 1 | 9 | 2 | 15 | 16 | 16 | 14 | 13 | 39 | 16 | 16 | 50 | 2 |
| L1+00E-S1+80N | 36 | 4 | 7 | 8 | 10 | 11 | 9 | 3 | 14 | 17 | 3 | 14 | 13 | 35 | 16 | 2 | 40 | 17 |
| L1+00E-S2+00N | 34 | 6 | 7 | 9 | 11 | 11 | 9 | 2 | 15 | 17 | 16 | 14 | -1 | 36 | 18 | 17 | 46 | 18 |
| L1+00E-S2+20N | 26 | 1 | 7 | 8 | 10 | 10 | 9 | 2 | 15 | 2 | 16 | 12 | 13 | 38 | 3 | 3 | 31 | 16 |
| L1+00E-S2+40N | 25 | 3 | 7 | 9 | 10 | 10 | 9 | 2 | 16 | 16 | 16 | 13 | 14 | 43 | 18 | 17 | 9 | 3 |
| L1+00E-S2+60N | 24 | 1 | 6 | 8 | 10 | 2 | 9 | 12 | 14 | 15 | 16 | 13 | 14 | 35 | 2 | 18 | 6 | 4 |
| L1+00E-S2+80N | 41 | 3 | 6 | 8 | 2 | 10 | 9 | 12 | 15 | 16 | 17 | 13 | 13 | 34 | 3 | 17 | 45 | 18 |
| L1+00E-S3+00N | 37 | 2 | 7 | 9 | 10 | 2 | 9 | 2 | 15 | 3 | 15 | 13 | 14 | 40 | 17 | 17 | 46 | 17 |
| L1+00E-S3+20N | 30 | 15 | 7 | 8 | 1 | 10 | 8 | 2 | 14 | 15 | 16 | 12 | 14 | 16 | 3 | 17 | 43 | 18 |
| L1+00E-S3+40N | 45 | 4 | 7 | 8 | 10 | 9 | 8 | 2 | 15 | 17 | 16 | 14 | 14 | 37 | 16 | 18 | 43 | 18 |
| L1+50E-S0+40N | 40 | 2 | 6 | 8 | 10 | 2 | 9 | 12 | 15 | 2 | 15 | 13 | 14 | 42 | 2 | 3 | 28 | 17 |
| L1+50E-S0+40N-R | 51 | 4 | 6 | 8 | 11 | 2 | 9 | 2 | 15 | 17 | 17 | 12 | 13 | 39 | 16 | 2 | 50 | 17 |

# SOIL GAS HYDROCARBONS (SGH) by GC/MS MOOSE CLIFF PROJECT SITE



| | 145 - HBA | 146 - HPH | 147 - HBI | 148 - HPH | 149 - HBI | 150 - HPH | 151 - HBI | 152 - HPH | 153 - HPH | 154 - HPH | 155 - HPH | 156 - HBI | 157 - HAR | 158 - HBA | 159 - HBA | 160 - HBI | 161 - HA | 162 - HPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1+50E-S0+60N | 66 | 2 | 6 | 8 | 11 | 10 | 1 | 3 | 14 | 3 | 16 | 14 | 14 | 36 | 17 | 17 | 43 | 17 |
| L1+50E-S0+80N | 55 | 8 | 6 | 8 | 9 | 9 | 9 | 2 | 15 | 16 | 15 | 13 | 13 | 40 | 15 | 16 | 51 | 17 |
| L1+50E-S1+00N | 30 | 3 | 6 | 9 | 10 | 2 | 9 | 12 | 16 | 15 | 16 | 15 | 15 | 40 | 3 | 18 | 55 | 2 |
| L1+50E-S1+20N | 24 | 16 | 6 | 8 | 1 | 10 | 9 | 1 | 2 | 15 | 16 | 13 | 13 | 36 | 16 | 3 | 49 | 17 |
| L1+50E-S1+40N | 44 | 3 | 6 | 9 | 10 | 10 | 9 | 12 | 14 | 16 | 17 | 13 | 14 | 18 | 17 | 16 | 21 | 18 |
| L1+50E-S1+60N | 34 | 3 | 6 | 9 | 10 | 2 | 9 | 12 | 2 | 3 | 16 | 13 | 14 | 42 | 17 | 17 | 47 | 17 |
| L1+50E-S1+80N | 22 | 1 | 6 | 8 | 10 | 11 | 8 | 12 | 14 | 15 | 16 | 14 | 14 | 41 | 17 | 17 | 40 | 18 |
| L1+50E-S2+00N | 39 | 4 | 7 | 9 | 10 | 11 | 9 | 2 | 2 | 16 | 17 | 14 | 14 | 42 | 17 | 18 | 8 | 18 |
| L1+50E-S2+20N | 46 | 14 | 6 | 8 | 2 | 2 | 9 | 2 | 15 | 15 | 16 | 13 | 13 | 37 | 16 | 15 | 54 | 17 |
| L1+50E-S2+40N | 35 | 3 | 7 | 8 | 2 | 10 | 9 | 3 | 16 | 16 | 17 | 14 | 13 | 40 | 15 | 16 | 43 | 17 |
| L1+50E-S2+60N | 41 | 4 | 7 | 8 | 1 | 2 | 9 | 12 | 2 | 2 | 16 | 13 | 14 | 42 | 2 | 15 | 50 | 18 |
| L1+50E-S2+80N | 26 | 3 | 6 | 8 | 10 | 10 | 9 | 2 | 15 | 16 | 17 | 14 | 14 | 37 | 16 | 2 | 51 | 4 |
| L1+50E-S3+00N | 24 | 2 | 7 | 8 | 2 | 11 | 9 | 13 | 15 | 3 | 17 | 14 | 14 | 39 | 16 | 18 | 46 | 19 |
| L1+50E-S3+20N | 30 | 3 | 6 | 8 | 10 | 10 | 8 | 12 | 15 | 15 | 16 | 13 | 12 | 36 | 17 | 16 | 43 | 2 |
| L1+50E-S3+40N | 29 | 15 | 6 | 9 | 10 | 2 | 9 | 1 | 13 | 3 | 16 | 13 | 14 | 18 | 16 | 16 | 41 | 17 |
| | | | | | | | | | | | | | | | | | | |
| LMB-QA | 26 | 15 | 6 | 8 | 10 | 9 | 8 | 11 | 14 | 14 | 16 | 13 | 13 | 40 | 17 | 16 | 48 | 17 |
| LMB-QA | 73 | 2 | 7 | 8 | 10 | 10 | 9 | 1 | 15 | 3 | 15 | 14 | 14 | 34 | 17 | 17 | 39 | 17 |
| | | | | | | | | | | | | | | | | | | |