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CROOKED PINE PROPERTY

WORK REPORT OF THE NOVEMBER 2020 EXPLORATION PROGRAM ON THE CROOKED PINE PROJECT, ATIKOKAN AREA, ONTARIO FOR FRONTLINE GOLD CORPORATION

NTS Map sheets 52B/14 & 52B/15

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1.0 -SUMMARY-

In November of 2020, a small exploration program was carried out on Frontline Gold Corporation's Crooked Pine claim group, see Figure 3.

The Crooked Pine property is located approximately 38km east-northeast of the town of Atikokan, Ontario, see Figure 2.

Forty-four (44) grab samples were collected on the Crooked Pine cell-claims during the November 2020 field program. These returned up to **7.03gpt Au** from a quartz vein with 5-10% arsenopyrite from an east-west shear zone and quartz vein system in intermediate volcanics, corresponding to historical Trench 1. Historical Trench 2 returned values up to **445ppb Au** from sheared intermediate volcanic with quartz stringers and 0.5% disseminated pyrite. A shear zone north of Trench 2 adjacent to a logging road returned values up to **1.49gpt Au** from silicified intermediate schist with 0.5% disseminated pyrite. The latter shear zone has seen minimal work. While only the three samples mentioned returned **>100ppb Au**, the shear zones they correspond to are strong and wide with locally strong alteration, quartz veining and mineralization. There is an excellent potential for further discoveries on the property.

2.0 -INTRODUCTION-

Frontline Gold Corp. acquired the Crooked Pine Property on July 9th, 2020. The main target mineral is gold based on previous discoveries on the property. Details of the 2020 work program are presented below.

2.1 PROPERTY DESCRIPTION, PERMIT, LOCATION AND ACCESS

Frontline Gold Corporation's Crooked Pine Project is located ~38km east-northeast of the town of Atikokan in northwestern Ontario.

Access to the property is best achieved by truck via the Crooked Pine Logging Road, which can be reached by travelling north along secondary highway 633 off of Highway ON-11 (Trans-Canada), and crossing the train tracks at Kawene.

The Crooked Pine Property is comprised of 28 claims, including 20 Single-Cell Mining Claims and 8 Multi-cell Mining Claims, See Figure 3.

2.2 CLIMATE, RESOURCES, LOCAL INFRASTRUCTURE AND PHYSIOGRAPHY

The Crooked Pine Project is located within the Canadian Shield, which is a major physiographic division of Canada. The property is situated in an area of swamps, small to moderate-sized lakes, and moderate to steep hills, with scattered to locally moderate outcrop. Elevation across the project area ranges from 440 to 480 m where explored.

The Property is covered with a thick growth of birch, balsam fir, black spruce, red cedar, jack pine, and poplar.

The Crooked Pine Property is situated approximately 38 km east-northeast of the town of Atikokan, Ontario (population ~2750). Access for the 2020 exploration program was achieved by truck. A campsite was selected on the property and a Jutland tent was set up north of Crooked Pine Lake, next to the main logging road, see Figure 2.


Climate in the area is typical of Northern Ontario, with cold winters and warm summers. Average January minimum temperatures range from -18°C to -32°C, and average July temperatures are between 24°C and 32°C. Exploration work can be carried out (subject to snow and freezing) for most of the year. Certain mapping, mechanized stripping, and soil sampling activities are best performed in snow-free conditions, whereas drilling can occur any time of the year.

2.3 PERSONNEL

The 2020 field program was carried out by Bruce MacLachlan and Coleman Robertson of Emerald Geological Services (EGS).

Tom Savage of Superior Geospatial provided drafting and GIS support.

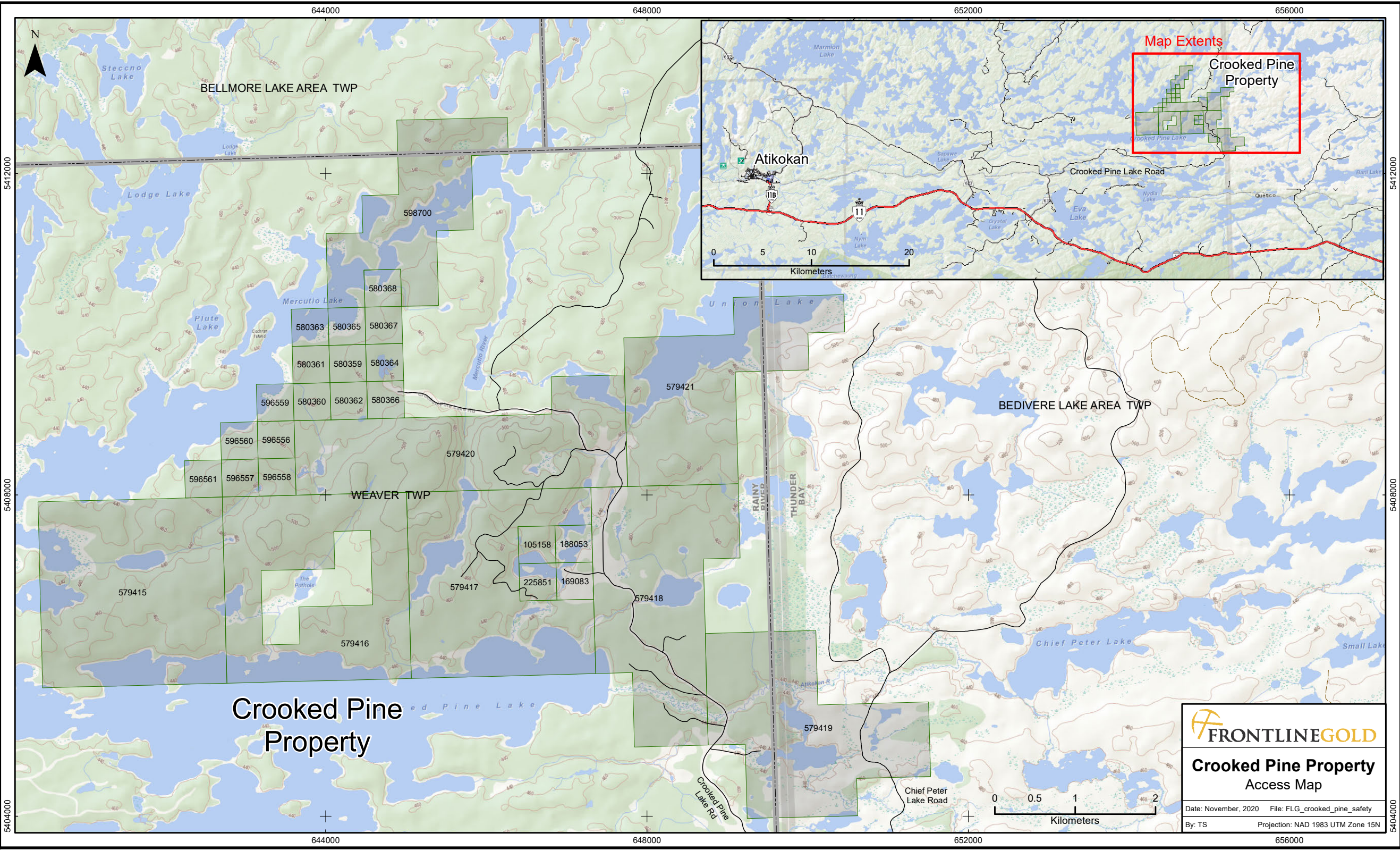


 **FRONTLINEGOLD**

Crooked Pine Project
General Location Map

Date: December, 2020

Name: TS File: ontloc_FLG_crooked_pine

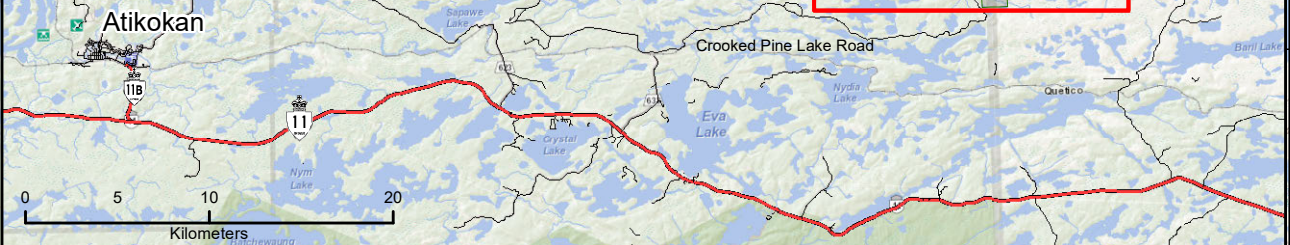
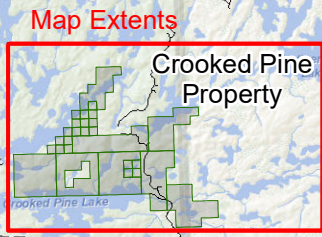


BELLMORE LAKE AREA TWP

WEAVER TWP

BEDIVERE LAKE AREA TWP

Crooked Pine Property



 **FRONTLINEGOLD**

**Crooked Pine Property
Access Map**

Date: November, 2020 File: FLG_crooked_pine_safety
By: TS Projection: NAD 1983 UTM Zone 15N

5412000

5408000

5404000

5412000

5408000

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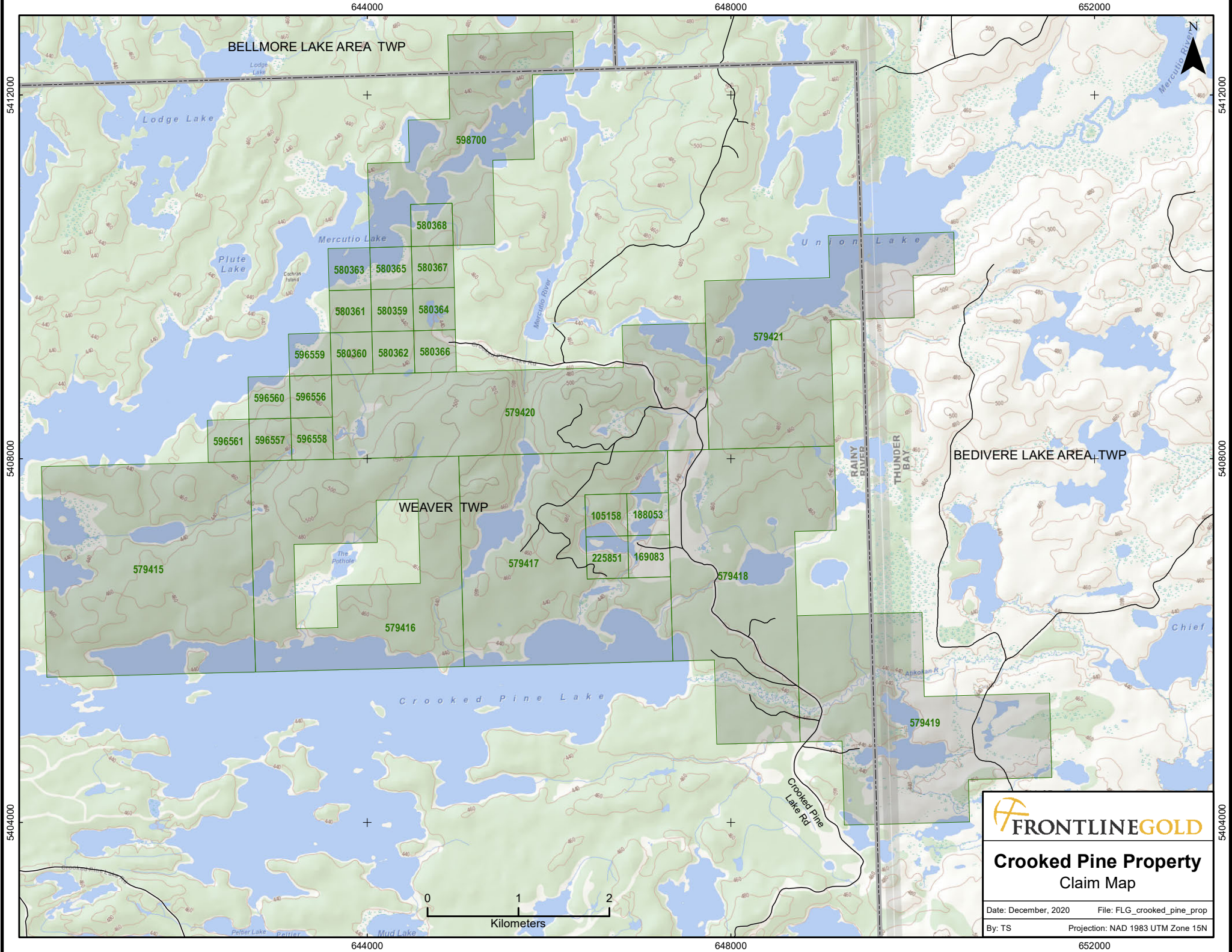
656000

644000

648000

652000

656000



Crooked Pine Property Claim Map

Date: December, 2020 File: FLG_crooked_pine_prop
By: TS Projection: NAD 1983 UTM Zone 15N

3.0 -GEOLOGY-

The following is per Holmstead et al., 1989, file 52B15SW0002.

3.1 REGIONAL GEOLOGY

The Crooked Pine Lake Area straddles part of the Wabigoon and Quetico Subprovinces separated by the Quetico Fault in this area.

North of the Quetico Fault are Early Precambrian rocks of the Wabigoon Subprovince which include narrow east trending interfingering mafic to intermediate metavolcanic to felsic metavolcanics intruded by melanogabbros, quartz diorites, trondhjemites, and quartz monzonites as sheets and small stocks. All of the rocks are deformed, folded and recrystallized to lower greenschist facies except near the contact with the Marmion Lake Batholith to the north the metamorphic grade increases to the amphibolite facies. The batholith is a layered trondhjemite, hornblende gneiss and amphibolite gneiss intruded by younger phases of quartz diorite and diorite.

The Quetico Fault forms a narrow, highly deformed and mylonitized zone along the northern shore of Crooked Pine Lake. South of the fault is a thick sequence of Early Precambrian turbidite, wacke and mudstone sequence. These are metamorphosed from biotite phyllites and schists to biotite gneisses and gneiss migmatites with garnets, staurolite, sillimanite and muscovite. There are several mafic to ultramafics cutting the sediments near Kawene and Elbow Lakes. Some of these bodies have minor associated copper-nickel mineralization.

3.2 PROPERTY GEOLOGY

The property is underlain by a series of mafic to felsic volcanics and tuffs. These rocks have been intruded by concordant to subcordant gabbros, diabase, and leucocratic quartz monzonite sills and dykes. There are also small plugs of amphibole quartz diorite and chlorite trondhjemites. The property is just 1 km north of the Quetico Fault and just south of the layered Marmion Lake Batholith.

Mafic to intermediate volcanics are fine-grained, homogeneous, foliated and from light medium green to dark green in more altered rocks. The lighter volcanics have actinolite and are carbonatized, and the darker volcanics are more chloritized. Accessory minerals are some quartz grains, some iron oxides and pyrite. The less mafic metavolcanics have up to 10% quartz present. Thin beds of tuff and lapilli-tuff occur within the predominantly felsic pyroclastic units. The tuffs are medium to dark green and have very thin alternating chlorite-rich and felsic layers. The lapilli-tuff is similar in color to the tuff and has fine grained, rounded, lithic fragments of intermediate composition set in the more mafic chlorite-rich matrix.

The intermediate to felsic metavolcanics are almost entirely pyroclastic and weather to a very pale greenish-grey or a pale creamy buff color. These pyroclastic rocks are a mixture of lapillistone, lapilli-tuff, and tuff. The lapilli-stone, the more common rock type, has light coloured, thin, very fine-grained, subangular, lens-shaped, lithic, felsic fragments as much as 2 cm long and minor rounded quartz phenocrysts set in a darker-coloured fine-grained, and more

chloritic matrix. The lapilli tuff is comprised of a granular aggregate of fine-grained quartz and albite with sparse, pale green, chlorite knots, and a few albitic plagioclase phenocrysts which are dusted with fine-grained epidote and chlorite. There are some examples of bomb-sized fragments of fine-grained intermediate metavolcanic material set in a fine-grained shear tuff matrix.

These mafic to felsic metavolcanics are frequently intruded or penetrated by medium-to-coarse-grained mafic rocks. These are fine-grained diabase, porphyritic diabase and quartz diabase that are massive and magnetic. There are also coarse-grained, black, massive, strongly magnetic gabbros. The metavolcanics are intruded by small, rounded plutons or plugs of intermediate composition. These plugs are medium-to-coarse-grained quartz diorites with 15 to 25% quartz, and green actinolite amphiboles; and trondhjemites with >25% quartz, <15% mafics, and biotites which are altered to chlorite in places. There are also some minor leucocratic quartz monzonite plugs.

Quartz veins, which are of economic interest, occur along shear zones trending east-west in mafic metavolcanics invading fissile chlorite-sericite-carbonate schists. There are two generations of quartz-veining. The earlier quartz vein is deformed into lenses (1m wide and 10m long) parallel to the foliation and later cut by narrow quartz veins of 2-10 cm and mineralized with arsenopyrite, chalcopyrite and pyrite.

Structurally the area has been deformed by the Quetico Fault giving rise to strong foliations trending N70degE to N90degE and dipping 70deg to 90deg north. Shearing, parallel to the Quetico Fault, as well as shears splaying off from the Quetico Fault tend to be invaded by quartz veins. Metamorphism is of the greenschist facies and increases to the amphibolite facies as one approaches the Marmion Lake Batholith.

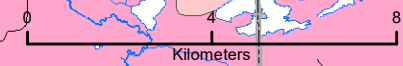
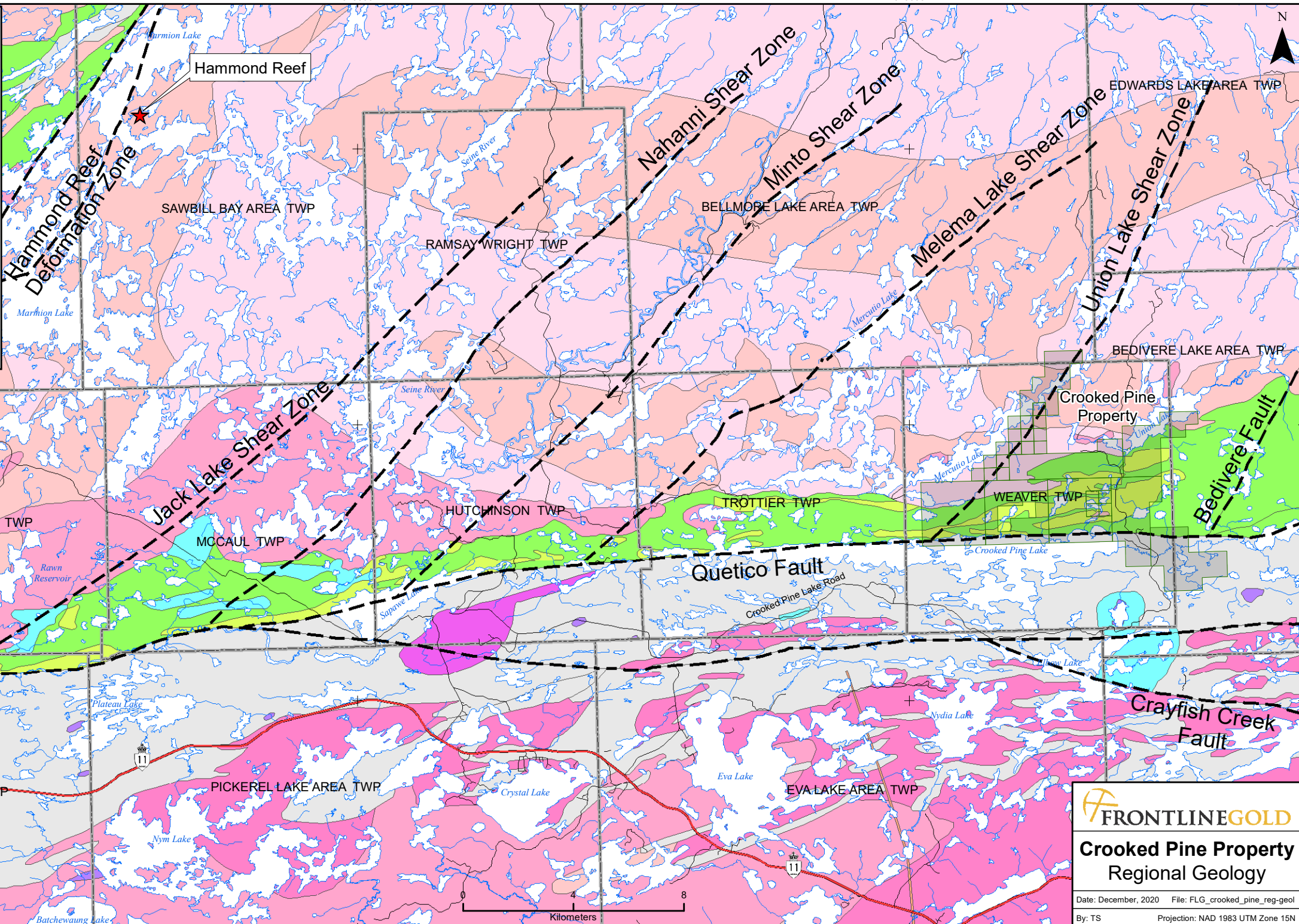
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OGS map m2663

- Mafic Intrusives
- Granite-Granodiorite
- Diorite-Monzonite-Granodiorite
- Granite-Granodiorite
- Foliated Tonalite Suite
- Gneissic Tonalite Suite
- Gabbro
- Ultramafic Plutonic Rocks
- Iron Formation
- Coarse Clastic Sedimentary Rocks
- Mixed Clastic Sedimentary Rocks
- Felsic Volcanic Rocks
- Felsic and Intermediate Volcanic Rocks
- Mafic Volcanic Rocks
- Ultramafic to Mafic Volcanic Rocks



FRONTLINEGOLD

**Crooked Pine Property
Regional Geology**

Date: December, 2020 File: FLG_crooked_pine_reg-geol
By: TS Projection: NAD 1983 UTM Zone 15N

4.0 -EXPLORATION HISTORY-

4.1 CROOKED PINE CELLS-CLAIMS

The Crooked Pine claim group as a whole has seen sparse to moderate exploration, with work focused in several areas north of Crooked Pine Lake. These include the historical Trench 1, 2 and 3 areas north of the northeast corner of Crooked Pine Lake; the South Showing west of these trenches and southeast of a northeast-trending lake; the north shore of Crooked Pine Lake, and the Pothole shear zone / vein system which is mostly off and surrounded by the current property but which strikes onto the current property. Some as yet unfiled work by Traxxin Resources in 2020 was focused on a historical shaft in the northwestern part of the property in the X.656 shear zone area. A detailed description of activities is provided below.

4.2 DETAILED DESCRIPTION OF HISTORICAL WORK

1963-1984 (Noranda, Lynx-Canada, Lazan Exploration):

In 1981, Lynx-Canada Explorations Ltd. conducted an exploration program at the Pothole shear zone within a hole in the current Crooked Pine property. According to the author of the assessment report, trenching by Noranda in 1963 (personal communication – no assessment files were located) had been carried out and one channel sample returned **0.3 oz/ton (10.3gpt) Au** / 9ft (2.7m). Sampling was also carried out by W. Morehouse in 1972, mapping and sampling by James Pirie with the Ministry of Natural Resources of Ontario in 1975, and work by Lazan Exploration in 1978, before being optioned back to Lynx-Canada in 1980 (Holmstead et al., 1989, file 52B15SW0002). Lynx-Canada conducted a ground magnetic and VLF-EM survey, and five trenches on the southeast side of Pothole Lake were examined along a vein system at least 250 feet (76m) long associated with an east-west shear in a tuffaceous, felsic metavolcanic horizon. 1900 feet (580m) west of the showing on the south side of the lake, visible gold was found in a quartz block, unknown to be float or frost heave. It did not appear to have come far, however. At the most easterly trench Lynx-Canada obtained an assay of **0.27 oz/ton (9.3gpt) Au** from a grab sample of a quartz vein with massive arsenopyrite bands. (Crowley, R., 1981, file 52B14SE0013).

In 1984, Lazan Exploration and Developments Ltd. carried out a 6-hole (POT-01 to POT-06) diamond drill program at the Pothole Lake property, part of which is on the current Crooked Pine property and part of which lies within a hole in the west-central portion of the current property. It appears that only POT-6 was located on the current property. Hole POT-01 on the main previously described shear zone returned up to **0.044 oz/ton (1.5gpt) Au** / 4.5ft within a quartz vein with pyrite and arsenopyrite; hole POT-02 returned up to **4.21% Cu** with **0.012 oz/ton (0.41gpt) Au** and **1.18 oz/ton (40.5gpt) Ag** / 1.4ft within a chalcopyrite-rich quartz vein; and hole POT-03 returned up to **0.23% Cu** / 1.5ft (Lazan Exploration and Developments Ltd., 1984, files 52B14SE0012, 52B14SE0010 (assays)).

1979: Rio Tinto carried out an airborne magnetic survey in the Quetico-Lac Des Mille Lacs areas over a narrow band of felsic to mafic volcanics. The survey area (181.24km²) covered an elongated generally east-west swath of ground including Crooked Pine Lake and ground to the

north, covering a large portion of the current Crooked Pine Property (Beckmann, H., 1979, file 52B15SE0014).

1983-1989 (Phil Sawdo, Grand Oakes Resources):

In 1989, Grand Oakes Resources Corporation carried out an exploration program on their Sawdo-Davidson Prospect property on the current Crooked Pine property, centered on three small, unnamed lakes. The Sawdo-Davidson Prospect (later the Andrews Showing or Trench 1 Area) was discovered in 1983 by Phil Sawdo. Grab samples were collected containing arsenopyrite, chalcopyrite and pyrite, returning up to **0.15 oz/ton (5.1gpt) Au** (Andrews South Showing) on a small island in an unnamed lake south of the main shear zone (Andrews North Showing) (Holmstead et al., 1989, file 52B15SW0002, Patterson et al., 1988, p91). To keep the claims in good standing a HEM max-min II (Apex) survey was carried out on two claims, which outlined 3 conductors. From 1985 to 1988 the property was visited and sampled by several companies including BP resources (1985), Noranda (1987-1988), Inco (1988) and Newmont (1988). Sampling was mainly focused at 6 showings on four historical claims (975485, 1001195, 1010545 and 1011748). Grand Oakes carried out an I.P. survey in March of 1989 (Holmstead et al., 1989; Spence, I., 1983, file 2000005163 (max-min survey)).

The I.P. survey was followed by detailed mapping, stripping, sampling and a 10-hole diamond drill program (GO-89-01 to GO-89-10). Three areas (Trench 1, 2 and 3) were stripped. Grab samples returned up to **11gpt Au** at Trench 1, **7.4gpt Au** at Trench 2, and **6ppb Au** at Trench 3, where a quartz-chlorite vein at a diorite/quartz monzonite contact was observed, although Inco had obtained up to **0.04 oz/ton (1.4gpt) Au** at Trench 3. Drill holes at Trench 1 also returned the best results, with up to **781ppb Au / 5ft (1.5m)** in an interval of schistose tuff containing folded quartz tourmaline veins, up to 7% pyrite and up to 8% arsenopyrite (within a broader 13.7m interval of schistose tuff which averaged **187ppb Au**). Two holes (GO-89-04 and GO-89-05) at Trench 2 returned up to **51ppb Au / 3.5ft (1.1m)** within a sheared, carbonatized mafic tuff with 2% disseminated pyrite and blebs of chalcopyrite. Hole GO-89-06 was drilled to test a VLF-EM anomaly coincident with a northeast lineament immediately southwest of the largest of the cluster of 3 unnamed lakes. It returned a lithology similar to Trench 1, with a sheared tuffaceous horizon with quartz veins, arsenopyrite and pyrite. This hole returned **161ppb Au / 4ft (1.2m)**. Holes GO-89-01 to GO-89-03 were drilled further to the east-southeast to test a shear zone and a chargeability & VLF-EM anomaly, returning less significant results of up to **89ppb Au / 3ft (0.9m)** in an interval containing quartz-tourmaline veining with pyrite and chalcopyrite in hole GO-89-01, corresponding to the chargeability anomaly (Larouche, C., 1990, file 52B15SW0001; Ovalbay Geological Services Inc., 1989, file 52B14SE0004 (drill logs)).

1989: MCS Capital Ltd. flew an airborne magnetometer and VLF-EM survey over an area which covered much of the current Crooked Pine property north of Crooked Pine Lake (Henriksen, G.N., 1989, file 52B15SW0003).

1990-1992 (Clifford Hicks and Michael Andrews):

In 1990, Clifford Hicks and Michael Andrews carried out a prospecting and sampling program with an additional follow-up program north of Crooked Pine Lake, at Trench 1 and the South,

North, Nose of Hill, Hill, West and MK86 Showings. The South Showing and Main Trench (Trench 1?) returned anomalous gold (up to **2.2gpt Au** at the South Showing, up to **3.3gpt Au** at Trench 1), and the Nose of Hill Showing returned anomalous silver and zinc values. The South Showing and Nose of Hill Showings (as well as the North, Hill and West Showings) are located close to a northeast-trending lake west of Trenches 1-3 (with the South showing being located on the southeast side of the lake), and the MK86 showing is located further to the east. Government sampling in 1990 had previously returned up to **0.388 oz/ton (13.3gpt) Au** at Trench 1 and up to **0.196 oz/ton (6.71gpt) Au** at the South Showing. Additional sampling on the north shore of Crooked Pine Lake returned up to **3.7gpt Au** (Hicks, C.R., 1990, files 52B15SE0005, 52B14SE0001).

In 1991, Hicks and Andrews completed a marked grid over the ice on a small lake in the vicinity of historical trenches #1, 2 and 3, intending to carry out a geophysical survey over an airborne conductor. However, unseasonably warm weather prevented this. Several grab samples were collected at two locations on the north shore of Crooked Pine Lake. Location 1 consisted of pyritic schist with quartz knots which returned up to **0.046 oz/ton (1.6gpt) Au**. Location 2 consisted of quartz and arsenopyrite veins 6 inches in width, returning up to **0.012 oz/ton (0.41gpt) Au**. Both locations are in the southwest portion of the current Crooked Pine property (Hicks, C.R., 1991, file 52B14SE0005; Andrews, M., 1991, file 52B11NE8103).

In 1992, magnetometer and VLF surveys were conducted over the ice of the same lake where the attempt was made the previous year. Drilling was attempted in the fall but the water level was too high for the target to be reached from land by an X-ray drill (Hicks, C., 1992, file 52B14SE0019; Andrews, M., 1992, file 52B14SE0028).

2003: Band Ore Resources Ltd. conducted a prospecting and sampling program on the Pothole property and its access roads during the summer. Additional mapping, prospecting, rock sampling and soil sampling were carried out in the fall. Known trenches were sampled and returned up to **11.52gpt Au** (Leahey, M.W., 2003, file 52B14SE2012).

2004-2006: Southampton Ventures Inc. completed an airborne magnetometer survey in 2004 over a large area including the current Crooked Pine Property, in search of diamond-bearing kimberlites or lamprophic intrusions. This was followed up by a field investigation and a winkie drill program in 2006 which occurred on claims off the current property (Boyd, T., 2006, file 20000001766).

2006-2014 (Robert Asselin & William Morehouse):

From 2006-2007, a mapping and sampling program was carried out by Robert Asselin & William Morehouse in the vicinity of historical Trenches 2 and 3 and nearby logging roads (Morehouse, W., 2007, file 20000002438).

In 2009, Robert Asselin commissioned a petrographic and electron microprobe study of selected samples from the Crooked Pine Lake area. The study identified hydrothermal alteration, pyrite with local enrichment in arsenic, chalcopyrite, and electrum in certain samples (Renaud, J., 2009, file 20000004206).

In 2009 and 2010, Robert Asselin conducted prospecting north of Crooked Pine Lake on two historical claims which were located on the current Crooked Pine property. On claim TB301625, assays are provided for 2 samples which returned up to **27ppb Au**, between the north shore of Crooked Pine Lake and a northeast-trending lake (Asselin, R., 2010, file 20000004569). On claim TB 4207324, assays are provided for 5 grab samples which returned up to **13ppb Au**, west of the largest lake in the trio of small lakes in the Trench 1, 2 and 3 area (Asselin, R., 2010, file 20000006155).

In 2010, Robert Asselin and William Morehouse drilled 2 test holes with a backpack drill at a quartz vein on historical claim 3014697 in the Trench 2 and 3 area. Core samples returned up to **13ppb Au** (Asselin, R. & Morehouse, W.D., 2011, file 20000006804).

In 2012, William Morehouse drilled a 2.5m test hole with a backpack drill north of historical Trench 2, at the same location EGS recently sampled adjacent to a logging road which returned **1.49gpt Au**, where a partial core box was also observed (Morehouse et al., 2012, file 20000009187).

In 2014, Dan Whaley carried out prospecting and sampling at Pothole Lake for Robert Asselin. Sampling returned up to **3.41gpt Au** (Whaley, D., 2014, file 20000009170).

2015: Michael Frymire, Adam Schneider and James Brown carried out a two-day sampling and prospecting program on a single claim covering the Andrews Showing-Trench 1 area (Frymire et al., 2015, file 20000014117).

2020: Sampling by the current optionor identified a new gold zone where surface grab samples returned the presence of highly anomalous gold from **40ppb to 2.06gpt Au**. The company also announced the acquisition of 13 additional mining claims (July 14th 2020 news release by Frontline Gold Corporation).

Frontline announced high-grade gold samples and extension of the X.656 shear zone on the Crooked Pine property. Highlights included grab samples of **19.2gpt Au** and **6.26gpt Au** from a silicified and pyrite-bearing shear zone. The most recent results extend the X.656 zone an additional 100m to the southwest from the July sampling program.

Anomalous gold samples were also recorded in similar rocks 2.2km to the northeast (August 17th 2020 news release by Frontline Gold Corporation).

5.0 -2019 EXPLORATION PROGRAM -

5.1 INTRODUCTION

From November 7th to 10th, 2020, a prospecting and sampling program was carried out by Emerald Geological Services on the Crooked Pine property, located approximately 38 kilometers east-northeast of the town of Atikokan in northwestern Ontario, see Figure 2.

Field work for the Fall program was carried out by truck from a campsite on the property, see Figure 2.

Work was mainly focused in the area of historical Trenches 1, 2 and 3, with one day spent investigating mapped quartz veins in the northeast part of the property. The program resulted in a total of 12 man-days of field work. EGS was originally also going to investigate the X.656 structure and historical shaft in the northwestern portion of the claims, but a snowfall prompted an early take-down of the camp before the logging road became un-driveable.

All the work and sample locations were defined using a handheld Garmin GPS. The measurements were plotted using UTM: NAD 83 in Zone 15 metric coordinates. All GPS tracks were downloaded and saved by type (foot traverse, truck), date and labelled as such, then saved to a "Master" file in MapInfo for plotting on the various Figures and future planning. All samples were entered in an Excel database then imported into MapInfo for reviewing current work and planning future programs.

A total of 44 rock grab samples were collected for gold and multi-element ICP analyses. Samples were individually bagged and labeled; bagged samples were then put into rice bags and driven to Activation Labs (Actlabs) in Thunder Bay.

The Rock Sample Description Table is presented in Table 1, Appendix I, and Rock Assay Certificates are presented in Appendix II. Descriptions of the Act Labs analytical procedures and packages are presented in Appendix III; the Point of Interest (POI – geological and non-geological observations) Table is presented in Table 2, Appendix IV. A list of the Crooked Pine Cell-Claims is presented in Table 3, Appendix V; the Statement of Expenditures is presented in Appendix VI; and daily logs are presented in Appendix VII. Some photos are presented in Appendix VIII. Map Sheets presented in Appendix IX display the locations of the grab samples and POIs in relation to the claim boundaries.

Results are presented below.

5.2 NOVEMBER 2020 RESULTS

A total of 44 grab samples were collected during the November program. See Map Sheets.

Four (4) grab samples (B22201-B22204) were collected in the northeast portion of the property in the vicinity of historical mapped quartz veins, consisting of a 7-8cm rusty quartz block with pyrite, mafic volcanics, and quartz diorite. These samples returned up to **6ppb Au** (B22204).

Seventeen (17) grab samples (B22205-B22221) were collected at historical Trench 1 (Andrews Showing). These consisted of sheared (085 degrees / subvertical dip) intermediate volcanics with quartz +/- minor kspar veining, iron carbonate alteration and up to 1-2% disseminated pyrite. All samples returned **<50ppb Au** except for sample B22220 which consisted of a 6cm+ white quartz vein with 5-10% massive arsenopyrite bands and returned **7.03gpt Au, 1.29gpt Ag, >10,000ppm As, 42.9ppm Sb, 1.56ppm Mo & 3.7ppm Bi**. Other samples of sheared intermediate volcanics returned up to **6720ppm As** with **45ppb Au** from sample B22212.

Three (3) grab samples (B22222-B22224) were collected at historical Trench 3 and consisted of silicified, weakly sheared (~110 degrees) intermediate volcanics with quartz veining, trace pyrite and trace malachite. These returned up to **21ppb Au** (B22222).

Four (4) grab samples (B22225-B22228) were collected at historical Trench 2 and consisted of a 5-10cm sugary quartz vein, sheared intermediate volcanics and an intermediate porphyritic dyke. These returned up to **445ppb Au, 1.74gpt Ag & 2.83ppm Bi** from sheared intermediate volcanic with minor quartz stringers and 0.5% disseminated pyrite (B22228). One measurement of 065 degrees / subvertical dip was obtained on the shear. Previous workers had described the trenched area as a contact zone between monzonite and intermediate to felsic volcanics. A few boulders of sericite schist were observed by the present workers but mostly intermediate volcanics.

Sixteen (16) grab samples (B22229-B22244) were collected at an exposed shear zone adjacent to a logging road ~190m northeast of Trench 2. These consisted of intermediate schist and quartz veins with minor pyrite and chalcopyrite, returning up to **1.49gpt Au with 4430ppm As, 1.64ppm Sb & 0.23ppm Te** from silicified intermediate schist with 0.5% pyrite blebs (B22239), up to **4.05gpt Ag with 58ppb Au, 3850ppm Cu, 40.5ppm Bi & 4.95ppm Sb** from quartz stockwork with trace pyrite and 0.5% chalcopyrite blebs (B22233), and up to **2.84ppm Mo** from a quartz vein in intermediate schist with iron carbonate alteration and trace pyrite and chalcopyrite (B22237). The shear in this area varies from 260 to 285 degrees (predominantly ~280 degrees) with a 65-to-90-degree dip north.

6.0 -DISCUSSION OF RESULTS AND RECOMMENDATIONS-

6.1 DISCUSSION OF RESULTS

While only 3 of the 44 samples collected in November returned **>100ppb Au**, the strength, width and strike length of shearing are impressive in the Trench 1, 2 and 3 areas, with several sub-parallel zones being present. Two styles of mineralization were found to be gold-bearing:

- 1) Quartz veins with massive arsenopyrite bands, up to **7.03gpt Au** (Trench 1).
- 2) Silicified intermediate schist with disseminated pyrite (Trench 2 and Trench 2 North), up to **1.49gpt Au**.

Some similarities and variations in geochemistry were noted at the various zones.

- At Trench 1, the highest gold value was associated, in addition to highly elevated As, with elevated Ag, Sb, Bi & Mo relative to background values.

-At Trench 2, the highest gold value was associated with elevated Ag and Bi.

-North of Trench 2, the highest gold value was associated with elevated As, Sb, and Te while other samples containing quartz veins were associated with elevated Ag, Cu, Bi, Sb, Mo and slightly anomalous Au.

Historical work at the **1.49gpt Au** sample appears to be very limited, with no diamond drilling besides a 2.5m test hole. Very little drilling in general has been carried out on the property. Further work is recommended given historical and recently obtained gold values, minimal previous drilling, and proximity to the Quetico fault and its northeast-trending splays.

It is important to note that sampling at Trench 1 was difficult due to most of the historical trenches being slumped in.

6.2 RECOMMENDATIONS

- Complete compilation of historical drilling, stripping/trenching and sampling.
- Carry out a high-resolution airborne magnetic survey over the property and possibly a radiometric survey in conjunction with the magnetic survey.
- Further prospecting follow-up on historical showings and on the X.656 structure.
- Soil surveying between the Pothole Lake claims and the Trench 1 area.
- Mechanical stripping at Trench 1 and other areas of interest.
- Brush out the main access road as well as trails to Trenches 1 – 3.

7.0 -STATEMENT OF QUALIFICATIONS-

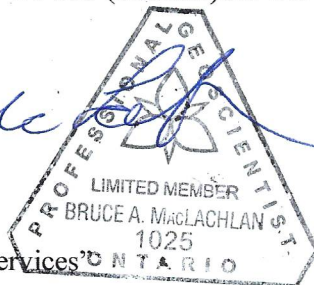
I, Bruce A. MacLachlan P. Geo (Limited), residing at 222 Emerald St., Timmins, Ontario, do hereby certify that:

- 1) Frontline Gold Corporation currently contracts me as a consulting Geological Technician and Prospector.
- 2) I am a P. Geo (Limited), registered in the province of Ontario (APGO No. 1025).
- 3) I have continuously practiced my profession as a Geological Technician and Prospector for over 37 years. I have prepared reports, conducted, supervised and managed exploration programs for several major and junior mining companies including Noranda Exploration Company Limited, CanAlaska Uranium Ltd., Noront Resources Ltd., Bold Ventures Inc., GoldON Resources Inc., Portofino Resources Inc. and others.
- 4) I am responsible for the preparation of this report titled 'Work Report of the November 2020 Exploration Program on the Crooked Pine Claim Group, Atikokan Area, Ontario.'
- 5) I have worked extensively across the Property.

Dated at Timmins, Ontario, this 6th day of February 2021.

"Bruce A. MacLachlan" P. Geo (Limited) APGO No. 1025
(Signed and Sealed)

Bruce A. MacLachlan
2099840 Ontario Inc.
"Emerald Geological Services"



8.0 - REFERENCES-

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APPENDIX I

Rock-Grab Sample Descriptions (Table 1)

Table 1													
Crooked Pine Rock Sample Descriptions													
Sample	Easting	Northing	Elevation	Date	Area	Project	Claim	Sample Type	Rock Type	Rock Code	Description	Assay Certificate No.	Au_ppb_final
B22201	648049	5408942	477	07-Nov-20	Northeast of Camp	Crooked Pine	579421	Grab	QV	Quartz Vein	7-8 cm rusty quartz vein with trace pyrite along rusty fractures, some mafic slips within. Frost heave block.	A20-14537	2.5
B22202	648052	5408943	477	07-Nov-20	Northeast of Camp	Crooked Pine	579421	Grab	MV	Mafic Volcanic	Rusty mafic volcanic with minor rusty quartz stringers. Frost heave block 3m ENE of sample B22201.	A20-14537	2.5
B22203	648104	5408960	476	07-Nov-20	Northeast of Camp	Crooked Pine	579421	Grab	QDIO	Quartz Diorite	Somewhat rusty quartz diorite with minor pyrite. In contact with mafic outcrop with fractures/weak foliation trending 100 degrees.	A20-14537	2.5
B22204	648113	5408963	478	07-Nov-20	Northeast of Camp	Crooked Pine	579421	Grab	MV	Mafic Volcanic	Rusty mafic volcanic with trace visible pyrite. Fractured outcrop.	A20-14537	6
B22205	646676	5407358	451	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate volcanic with minor-moderate quartz-kspar stringers, minor Fe-carb. Outcrop in possible old trench (possibly in Trench 1 area). Shear trends 086 degrees/85-90 deg. dip to N.	A20-14537	10
B22206	646676.5	5407358	451	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	1-2cm quartz stringer in moderately-strongly sheared intermediate volcanic, minor Fe-carb. Outcrop in same shear as sample B22205, 0.5m to the E.	A20-14537	21
B22207	646695	5407364	448	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	9cm glassy white quartz vein with rusty fractures, minor Fe-carb. Fractured outcrop at west end of ~E-W trench.	A20-14537	5
B22208	646703	5407365	449	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	10cm+ glassy white quartz vein with minor-moderate Fe-carb, trace <1mm pyrite cubes. Outcrop on south side of same trench as sample B22207. Difficult to determine orientation.	A20-14537	5
B22209	646704.5	5407364.7	449	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	10cm+ quartz vein in sheared mafic to intermediate volcanics, minor-moderate Fe-carb, minor <1mm pyrite cubes in wall rock and quartz. Outcrop 1.5m ESE of sample B22208 on south side of trench.	A20-14537	11
B22210	646705.5	5407364.5	449	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	Glassy white quartz vein with minor Fe-carb, trace pyrite. Outcrop on south side of same trench as sample B22209, 1m to ESE.	A20-14537	7
B22211	646706.5	5407364.3	449	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	Glassy white to locally grey quartz vein in sheared intermediate volcanics, minor Fe-carb, minor white mica, minor pyrite. Outcrop on south side of same trench as sample B22210, 1m to ESE.	A20-14537	24
B22212	646706.5	5407363.3	449	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Sheared intermediate volcanic with moderate 1-3mm white, sub-parallel quartz-kspar stringers, minor Fe-carb, 1-2% disseminated <1mm pyrite cubes. Outcrop on south side of same trench as sample B22211, 1m to S.	A20-14537	45
B22213	646709	5407366	455	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Sheared intermediate volcanic with moderate irregular quartz veining, minor Fe-carb, minor pyrite. Outcrop in continuation of trench containing sample B22212. Shear strikes 085 degrees/subvertical dip.	A20-14537	14
B22214	646721	5407356	450	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Sheared intermediate volcanic with moderate quartz +/- kspars veining, minor Fe-carb, trace pyrite. Outcrop.	A20-14537	6
B22215	646728	5407365	452	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	5cm+ glassy, white quartz vein in strongly sheared intermediate volcanic, minor Fe-carb. Outcrop in stripped area, shear is 085 degrees/subvertical dip.	A20-14537	8
B22216	646730.5	5407365	452	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate volcanic with minor-moderate 1cm or less glassy, white quartz stringers, minor Fe-carb. Same stripped area as sample B22215, 2.5m to E.	A20-14537	2.5

B22217	646730	5407368	453	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	Glassy white quartz vein with minor kspar in moderately-strongly sheared intermediate volcanics, trace pyrite. Outcrop 4m NNE of sample B22216.	A20-14537	6
B22218	646736	5407366	454	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	1-2cm quartz vein with minor kspar in sheared intermediate volcanics, minor Fe-carb, minor pyrite. Shear strikes 263/77 degrees N. Outcrop 4m ESE of sample B22217.	A20-14537	2.5
B22219	646745	5407369	455	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	2-3cm glassy, white quartz vein in sheared intermediate volcanics, moderate-strong Fe-carb, minor pyrite. Outcrop in trench east of trench hosting sample B22218. Shear strikes 288 degrees/subvertical dip.	A20-14537	6
B22220	646744.5	5407369	455	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	QV	Quartz Vein	6cm+ white, somewhat rusty quartz vein with 5-10% arsenopyrite stringers/blebs. Fractured outcrop 0.5m W of sample B22219.	A20-14537	7030
B22221	646752	5407373	456	08-Nov-20	Trench 1	Crooked Pine	105158	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate volcanic with moderate quartz +/- minor kspar veining, moderate Fe-carb, trace pyrite specks. Outcrop in trench east of trench hosting sample B22220.	A20-14537	22
B22222	646306.5	5406837.5	442	10-Nov-20	Trench 3	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Somewhat rusty, weakly sheared, silicified intermediate volcanic with moderate quartz veining, trace pyrite. Outcrop in stripped area (Possibly Trench 3). Shear trends ~110 degrees.	A20-14537	21
B22223	646304.5	5406838	442	10-Nov-20	Trench 3	Crooked Pine	579417	Grab	QV	Quartz Vein	Quartz vein in weakly sheared intermediate volcanic with trace pyrite, malachite. Same shear as previous sample B22222, quartz roughly follows shear.	A20-14537	18
B22224	646297	5406839	441	10-Nov-20	Trench 3	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Glassy, white-grey quartz vein in weakly sheared intermediate volcanic, some greenish streaks, trace pyrite. Outcrop in same stripped area as previous sample B22223.	A20-14537	5
B22225	646139	5406748	442	10-Nov-20	Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	5-10cm sugary grey-white quartz vein in moderately-strongly sheared intermediate volcanic, minor pyrite. Sample mostly quartz. Outcrop in possibly Trench 2.	A20-14537	41
B22226	646116	5406740	443	10-Nov-20	Trench 2	Crooked Pine	579417	Grab	ID	Intermediate Dyke	Intermediate porphyritic dyke, locally rusty, locally red-tinged (hematite). Outcrop in same trench as previous sample B22225.	A20-14537	10
B22227	646124	5406743	445	10-Nov-20	Trench 2	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Moderately sheared intermediate volcanic with minor quartz stringers, minor Fe-carb. Some blueish quartz eyes within, possible tuff? Or maybe contains some porphyry material. Outcrop in same trench as previous sample B22226.	A20-14537	2.5
B22228	646139.3	5406748	442	10-Nov-20	Trench 2	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate volcanic with minor 1-2mm quartz stringers (possibly some felsic dykelet material associated), minor Fe-carb, 0.5% disseminated pyrite. Outcrop 0.3m ENE of sample B22225, shear strikes 065 degrees/subvertical dip.	A20-14537	445
B22229	646267	5406903	443	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	6cm+ glassy, white quartz vein in sheared intermediate to mafic volcanic, minor Fe-carb, some rusty patches, trace pyrite cubes. Fractured outcrop on exposed hillside beside logging road, possibly old stripped area due to old core box.	A20-14537	72
B22230	646268	5406906	443	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	Quartz vein in strongly sheared intermediate to mafic volcanic, moderate Fe-carb. Fractured outcrop 3m NNE of previous sample B22229.	A20-14537	20
B22231	646266.5	5406906	443	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	Glassy, white qtz-carb vein in strongly sheared intermediate to mafic volcanic. Shr trends 278/64 degrees N and 262 degrees/steep dip N (a bit further north) in same outcrop. Some 'vugs' with Fe-carb within vein. Outcrop 1m w of previous sample B22230.	A20-14537	7

B22232	646266.5	5406908	443	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	3-4cm glassy, white quartz vein with minor kspar, moderate Fe-carb, trace pyrite. Rubble in same area as previous sample B22231.	A20-14537	2.5
B22233	646257	5406905	444	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QSTOCK	Quartz Stockwork	Glassy, white quartz stockwork in mottled dark-grey to light orange (ksp?) rock which is locally foliated/banded (altered volcanic?). Minor Fe-carb patches in veins, trace pyrite, 0.5% cpy blebs.	A20-14537	58
B22234	646255.5	5406907.5	444	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QSTOCK	Quartz Stockwork	Glassy, white quartz stockwork in mottled dark-grey to light orange (ksp?) rock. Minor Fe-carb patches in veins, trace pyrite blebs, minor cpy blebs. Same rubble block as sample B22235.	A20-14537	18
B22235	646256	5406908	444	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QSTOCK	Quartz Stockwork	Glassy, white quartz stockwork in mottled dark-grey to light orange (ksp?) rock. Minor Fe-carb patches in veins, trace pyrite. Rubble block 3m NNW of sample B22233.	A20-14537	6
B22236	646234	5406918	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QCV	Quartz-Carb Vein	Quartz-carb vein in intermediate to mafic schist (likely volcanics), minor Fe-carb. Outcrop on hillside exposed next to logging road, in same general area as previous samples B22229-B22235.	A20-14537	59
B22237	646231	5406918	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	Quartz vein in intermediate to mafic schist (likely volcanics), minor-moderate Fe-carb, trace pyrite, possible trace chalcopyrite. Outcrop 3m W of previous sample B22236.	A20-14537	15
B22238	646226	5406915	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate schist (likely volcanic) with min-mod qtz veining, min-mod Fe-carb, trace pyrite. Appears to be some quartz eyes, possible tuff? Shear strikes 286/86 degrees N. Same hillside as previous sample B22237.	A20-14537	46
B22239	646225	5406915.5	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Rusty, silicified intermediate schist (likely volcanic) with 0.5% pyrite blebs. Outcrop 1m WNW of previous sample B22238.	A20-14537	1490
B22240	646222.5	5406916.5	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	3-4cm glassy, white-grey quartz vein with minor Fe-carb. Fractured outcrop 2.5m WNW of previous sample B22239.	A20-14537	28
B22241	646221.5	5406916.8	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	Quartz vein in intermediate schist (likely volcanic) with minor Fe-carb, minor pyrite blebs, trace chalcopyrite blebs. Fractured outcrop 1m WNW of previous sample B22240.	A20-14537	40
B22242	646221	5406915	448	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	5cm+ glassy, white quartz vein with minor-moderate Fe-carb, minor pyrite blebs. Some intermediate schist wall rock. Talus/fractured outcrop 2m SSW of previous sample B22241.	A20-14537	26
B22243	646207	5406921	449	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	IV	Intermediate Volcanic	Moderately-strongly sheared intermediate volcanic with moderate glassy, white quartz veining, minor-moderate Fe-carb. Fractured outcrop in vicinity of previous sample B22242.	A20-14537	8
B22244	646266.5	5406908.3	443	10-Nov-20	Logging road north of Trench 2	Crooked Pine	579417	Grab	QV	Quartz Vein	5cm+ glassy, white quartz vein, several fractures with Fe-carb. Fractured outcrop 0.3m N of sample B22232.	A20-14537	8

APPENDIX II

Rock Assay Certificates (Act Labs)



Report No.: A20-14537-TD
Report Date: 21-Jan-21
Date Submitted: 13-Nov-20
Your Reference: Pine

Frontline Gold
1 Toronto Street, Suite 201, Box 10
Toronto ON M5C 2V6
Canada

ATTN: Walter Henry

CERTIFICATE OF ANALYSIS

44 Rock samples were submitted for analysis.

Table with 2 columns: The following analytical package(s) were requested: and Testing Date:
Row 1: UT-6M, QOP Total/QOP Ultratrace- 4acid Digest (Total Digestion ICPOES/ICPMS), 2020-12-18 12:44:47

REPORT A20-14537-TD

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 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 material submitted for analysis.

Notes:

Values which exceed the upper limit should be assayed for accurate numbers.

CERTIFIED BY:

[Handwritten signature]

Emmanuel Esemé, Ph.D.
Quality Control Coordinator

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Analyte Symbol	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
Lower Limit	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2	0.01	0.05	0.05	0.1	0.005	0.01	0.5	0.2	0.01	5
Method Code	TD-MS	TD-ICP	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-ICP
B22201	0.02	0.20	1.5	10	0.06	0.03	0.23	0.35	7.93	2.2	9	0.07	21.7	1.58	1.09	< 0.05	< 0.1	0.007	0.06	4.0	0.9	0.13	197
B22202	0.06	5.57	0.7	70	0.64	0.32	5.10	0.46	19.7	41.5	25	0.24	129	10.5	20.4	0.06	1.3	0.115	0.48	7.7	14.3	2.24	1490
B22203	0.02	7.40	0.7	170	0.86	0.10	2.86	0.50	41.9	10.6	14	0.76	19.2	4.81	18.2	0.06	0.2	0.049	0.43	17.2	22.3	0.84	707
B22204	0.24	6.54	0.5	50	0.56	0.37	5.87	0.46	14.4	46.7	52	0.25	440	11.3	20.0	0.27	0.7	0.101	0.31	5.0	16.8	3.34	1640
B22205	< 0.01	7.09	220	170	0.38	0.06	2.41	0.43	18.8	46.5	276	0.27	73.0	8.80	18.0	0.20	2.2	0.059	0.74	8.5	35.8	3.61	1300
B22206	0.02	2.83	44.2	120	0.26	0.03	0.16	0.54	8.31	14.3	74	0.14	64.5	4.08	6.55	0.43	0.4	0.050	0.38	3.1	14.0	1.28	1390
B22207	0.01	0.64	162	30	0.08	0.01	0.57	0.50	2.17	2.0	23	0.09	7.6	1.36	1.97	0.06	0.3	0.011	0.15	1.6	1.0	0.37	301
B22208	< 0.01	0.36	451	20	0.05	0.01	0.34	0.51	1.62	1.9	15	0.09	4.6	1.09	1.30	< 0.05	0.1	0.011	0.13	1.0	0.5	0.16	220
B22209	0.03	2.05	1070	70	0.18	0.05	3.62	0.45	3.63	12.6	52	0.19	8.0	3.06	6.10	< 0.05	0.4	0.031	0.45	1.6	6.6	2.23	591
B22210	0.01	0.63	791	30	0.07	0.01	1.51	0.39	1.59	3.2	30	0.09	4.9	1.37	1.94	< 0.05	0.1	0.016	0.18	0.6	1.2	0.76	319
B22211	0.01	6.04	2750	110	0.28	0.04	2.82	0.45	5.48	18.6	140	0.35	4.9	7.03	16.5	0.07	0.6	0.036	0.71	2.2	31.2	3.41	706
B22212	0.04	7.31	6720	150	0.48	0.30	4.99	0.43	14.6	44.5	164	0.45	23.6	8.74	18.4	0.09	1.3	0.038	1.06	5.7	28.5	3.60	1240
B22213	0.03	3.72	560	90	0.25	0.23	7.36	0.43	23.0	51.8	420	0.21	5.2	6.59	10.5	0.09	1.0	0.055	0.54	9.8	17.1	4.99	1050
B22214	0.02	4.26	135	180	0.29	0.03	6.74	0.45	3.85	26.1	112	0.18	4.7	5.36	11.1	0.09	0.5	0.041	0.57	1.5	24.6	2.31	1030
B22215	0.05	3.92	102	100	0.24	0.08	4.10	0.53	6.30	28.3	58	0.20	9.8	6.22	11.0	0.07	0.7	0.035	0.35	2.5	20.0	2.29	1120
B22216	0.04	5.10	40.3	180	0.30	< 0.01	2.91	0.42	18.3	13.7	21	0.30	2.0	5.81	12.7	0.06	< 0.1	0.027	0.58	8.1	24.8	2.57	898
B22217	0.02	2.05	1110	50	0.17	0.06	4.40	0.50	2.90	9.4	21	0.09	1.8	2.86	4.66	< 0.05	0.4	0.018	0.16	1.1	7.2	0.87	845
B22218	0.02	2.66	71.8	110	0.21	0.02	7.11	0.54	2.96	11.1	70	0.19	33.9	3.86	5.88	0.05	0.5	0.043	0.52	1.1	6.9	1.86	1260
B22219	0.02	4.58	98.4	180	0.40	0.04	3.86	0.54	20.5	20.9	36	0.42	12.5	3.73	10.0	0.05	< 0.1	0.063	0.92	8.6	3.5	0.81	1340
B22220	1.29	0.83	> 10000	30	0.12	3.70	0.06	0.42	1.56	21.4	32	0.11	97.0	13.4	2.51	0.07	0.2	0.057	0.15	0.7	0.6	0.10	102
B22221	0.07	3.28	914	60	0.22	0.20	7.96	0.70	17.6	64.4	440	0.18	5.8	9.14	10.2	< 0.05	1.4	0.076	0.22	7.2	21.0	3.47	2150
B22222	0.11	4.62	153	450	0.70	0.09	0.20	0.36	13.0	6.6	10	0.51	55.2	1.54	10.5	< 0.05	< 0.1	0.026	1.61	5.6	5.4	0.65	228
B22223	0.68	0.53	54.3	50	0.12	0.03	0.34	0.47	1.74	3.4	7	0.10	363	1.32	1.57	< 0.05	0.4	0.039	0.17	0.8	1.1	0.17	214
B22224	0.16	0.32	28.0	< 10	0.08	0.05	0.52	0.48	1.24	2.9	11	< 0.05	65.7	0.98	1.13	< 0.05	< 0.1	0.010	0.03	0.6	1.1	0.21	170
B22225	0.28	0.95	29.9	40	0.26	0.13	2.02	0.45	5.88	6.9	44	0.16	114	1.75	2.57	< 0.05	0.2	0.010	0.41	2.1	1.0	0.60	772
B22226	0.02	6.77	58.1	270	0.87	0.03	0.33	0.42	44.4	3.7	13	0.67	8.2	2.81	15.9	0.09	0.6	0.042	0.87	19.7	4.2	0.34	244
B22227	0.02	6.54	11.3	490	1.01	0.03	0.28	0.46	42.1	5.2	4	0.91	21.4	2.96	16.9	0.11	1.7	0.036	1.57	18.0	4.8	0.39	380
B22228	1.74	8.25	130	130	1.79	2.83	4.18	0.59	12.2	76.7	127	1.21	34.3	8.19	20.0	0.33	1.9	0.041	3.22	5.0	17.1	2.11	1830
B22229	0.13	2.79	75.3	160	0.48	0.28	2.05	0.41	4.71	6.1	7	0.23	49.8	1.97	7.05	< 0.05	2.0	0.028	0.68	2.4	2.1	0.22	331
B22230	0.02	3.64	73.4	170	0.35	0.04	7.59	0.58	6.42	19.7	109	0.23	19.3	5.52	8.25	0.10	0.6	0.051	0.78	2.7	9.3	2.55	1540
B22231	0.05	3.63	16.5	90	0.34	0.11	0.17	0.36	31.0	8.5	6	0.16	47.6	1.67	7.35	< 0.05	0.2	0.024	0.41	13.9	3.7	0.34	132
B22232	0.02	3.37	78.0	130	0.29	0.04	3.03	0.63	11.5	19.7	80	0.23	21.0	6.50	7.34	0.23	0.6	0.079	0.66	11.8	9.0	1.28	2150
B22233	4.05	3.25	401	40	0.34	40.5	4.75	0.76	4.95	6.4	34	0.07	3850	4.07	9.21	< 0.05	0.5	0.477	0.19	2.2	2.2	2.06	1120
B22234	0.18	7.93	1180	120	0.72	0.45	7.60	0.75	21.5	19.7	62	0.22	166	5.89	22.3	0.09	2.7	0.094	0.61	9.1	5.9	3.62	1610
B22235	0.16	4.32	209	100	0.42	13.8	5.03	0.60	5.63	5.6	43	0.18	13.3	3.75	10.7	0.30	0.5	0.041	0.56	2.7	4.1	2.04	1080
B22236	0.06	4.19	58.5	100	0.29	0.07	3.17	0.55	28.2	6.7	17	0.17	44.9	3.96	10.8	0.15	2.3	0.046	0.47	13.9	14.8	0.85	856
B22237	0.11	5.82	41.2	160	0.90	0.32	0.44	0.48	42.0	8.1	6	0.25	186	2.35	13.6	< 0.05	3.3	0.041	0.63	21.0	14.6	0.15	488
B22238	0.19	8.96	254	270	1.09	0.13	0.24	0.52	70.8	7.7	5	0.46	45.4	2.41	19.4	< 0.05	6.8	0.038	1.40	34.4	14.9	0.38	378
B22239	0.51	6.18	4430	200	0.73	0.82	0.08	0.43	39.9	3.9	8	0.37	107	3.63	16.9	< 0.05	4.7	0.077	0.88	16.1	11.0	0.17	152
B22240	0.04	1.37	279	30	0.16	0.13	1.57	0.48	4.08	4.5	19	0.06	115	2.20	3.73	< 0.05	0.4	0.021	0.17	1.8	3.1	0.43	547
B22241	0.11	5.02	769	70	0.90	0.88	1.59	0.50	26.2	18.0	64	0.13	25.5	3.86	12.4	< 0.05	3.2	0.039	0.38	12.0	5.3	0.79	599
B22242	0.08	2.27	674	70	0.37	0.49	3.30	0.49	11.0	6.8	12	0.09	126	3.24	5.48	< 0.05	1.6	0.045	0.36	4.9	4.0	0.58	819
B22243	0.09	3.39	161	100	0.26	0.05	3.91	0.52	11.3	8.1	12	0.12	47.3	5.77	8.56	< 0.05	1.3	0.062	0.36	5.0	16.2	2.24	1950
B22244	0.03	0.99	107	20	0.14	0.03	1.77	0.57	2.98	4.2	26	< 0.05	16.0	2.02	2.61	< 0.05	0.2	0.022	0.09	1.7	1.0	0.47	664

Analyte Symbol	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	
Lower Limit	0.05	0.01	0.1	0.2	10	0.5	0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.01	0.005	0.02	0.1	1	0.1	0.1	
Method Code	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS
B22201	0.44	0.05	0.2	1.9	30	< 0.5	1.9	< 0.002	0.06	0.06	0.9	< 1	< 0.2	4.8	< 0.05	< 0.05	0.28	0.016	< 0.02	< 0.1	10	5.2	0.9	
B22202	< 0.05	1.03	< 0.1	31.3	580	1.5	7.9	< 0.002	0.33	< 0.05	36.7	< 1	< 0.2	109	< 0.05	< 0.05	1.74	0.314	0.04	0.5	250	< 0.1	44.1	
B22203	0.18	2.48	0.1	6.0	710	2.2	20.3	< 0.002	0.02	< 0.05	15.3	< 1	0.3	163	< 0.05	< 0.05	2.71	0.360	0.08	0.6	48	< 0.1	28.9	
B22204	0.09	1.40	< 0.1	40.0	380	1.2	7.0	< 0.002	0.29	< 0.05	45.3	< 1	0.2	86.8	< 0.05	< 0.05	0.72	0.190	0.03	0.2	154	< 0.1	27.2	
B22205	0.09	1.00	0.2	185	300	1.1	18.4	< 0.002	0.02	< 0.05	31.1	< 1	< 0.2	33.7	< 0.05	< 0.05	1.11	0.229	0.08	0.3	163	< 0.1	8.6	
B22206	0.88	0.12	0.5	25.9	140	1.2	9.7	< 0.002	0.02	0.19	14.5	< 1	0.3	13.7	< 0.05	< 0.05	0.66	0.158	0.06	0.1	109	1.2	3.6	
B22207	0.35	0.05	0.5	3.4	70	0.7	3.9	< 0.002	0.01	0.22	3.1	< 1	< 0.2	6.5	< 0.05	< 0.05	0.19	0.088	< 0.02	< 0.1	31	1.0	2.0	
B22208	0.51	0.04	0.2	4.1	70	0.9	3.5	< 0.002	0.03	0.25	2.5	< 1	< 0.2	7.5	< 0.05	< 0.05	0.10	0.037	< 0.02	< 0.1	14	2.6	1.6	
B22209	0.37	0.16	1.1	41.0	200	1.1	12.0	< 0.002	0.26	0.46	12.3	< 1	0.3	20.3	0.07	< 0.05	0.21	0.148	0.05	< 0.1	84	1.3	3.7	
B22210	0.47	0.07	0.3	8.8	110	0.8	4.5	< 0.002	0.06	0.36	4.0	< 1	< 0.2	11.9	< 0.05	< 0.05	0.08	0.043	< 0.02	< 0.1	24	1.2	2.2	
B22211	0.17	0.78	0.3	94.3	200	2.1	18.6	< 0.002	0.20	0.20	25.7	< 1	0.5	46.8	< 0.05	< 0.05	0.26	0.304	0.08	< 0.1	200	0.5	5.1	
B22212	0.55	1.21	1.8	149	310	3.6	24.6	< 0.002	2.06	0.99	35.0	< 1	0.6	90.2	< 0.05	< 0.05	0.50	0.510	0.11	0.2	237	3.7	6.6	
B22213	0.09	0.19	0.9	206	410	1.1	12.9	< 0.002	0.85	0.15	27.0	< 1	0.8	27.2	< 0.05	< 0.05	0.84	0.348	0.05	0.2	107	0.3	6.5	
B22214	0.23	0.13	0.5	75.2	130	2.1	13.9	< 0.002	0.06	0.10	26.4	< 1	0.3	80.5	< 0.05	< 0.05	0.16	0.225	0.06	< 0.1	131	0.7	4.6	
B22215	0.26	0.42	0.8	62.9	240	1.6	9.0	< 0.002	0.13	0.21	17.9	< 1	0.3	47.3	< 0.05	< 0.05	0.32	0.301	0.04	< 0.1	147	0.5	3.9	
B22216	0.23	0.77	2.0	37.2	290	1.1	15.3	< 0.002	0.01	0.13	12.4	< 1	0.3	40.6	< 0.05	< 0.05	1.40	0.195	0.06	0.3	95	0.5	6.1	
B22217	0.27	0.59	0.9	23.7	310	1.3	4.4	< 0.002	0.22	0.45	11.8	< 1	0.2	43.6	0.06	< 0.05	0.22	0.159	< 0.02	< 0.1	59	1.2	3.9	
B22218	0.26	0.36	0.6	34.7	130	1.4	12.6	< 0.002	0.05	0.23	16.3	< 1	0.3	63.8	< 0.05	< 0.05	0.19	0.187	0.05	< 0.1	89	0.5	3.7	
B22219	0.53	1.26	1.2	24.6	350	2.1	22.7	< 0.002	0.04	0.23	16.3	< 1	0.4	68.4	< 0.05	< 0.05	1.63	0.297	0.09	0.2	113	0.7	7.5	
B22220	1.56	0.08	< 0.1	25.9	30	6.4	5.3	< 0.002	7.64	42.9	2.8	2	< 0.2	10.7	< 0.05	0.15	0.12	0.054	< 0.02	< 0.1	34	9.5	0.8	
B22221	0.44	0.26	4.5	178	210	1.9	5.7	< 0.002	0.27	0.35	25.5	< 1	0.8	67.4	0.11	< 0.05	0.72	0.408	0.02	0.2	133	1.5	5.8	
B22222	0.47	1.05	2.5	6.5	170	1.4	48.5	< 0.002	0.07	0.19	6.1	< 1	1.0	9.6	< 0.05	< 0.05	3.07	0.171	0.16	0.6	28	1.1	7.0	
B22223	0.44	0.03	0.9	3.6	30	2.6	5.7	< 0.002	0.04	0.12	1.0	< 1	< 0.2	4.8	0.07	< 0.05	0.42	0.025	< 0.02	0.1	6	0.4	1.1	
B22224	0.87	0.02	0.2	3.0	10	1.9	0.8	< 0.002	0.02	0.09	0.6	< 1	< 0.2	3.9	< 0.05	< 0.05	0.12	0.007	< 0.02	< 0.1	5	0.4	0.8	
B22225	0.79	0.03	0.3	18.2	270	1.4	15.6	< 0.002	0.19	0.15	4.4	< 1	< 0.2	21.4	< 0.05	< 0.05	0.21	0.039	0.06	< 0.1	21	2.2	1.9	
B22226	0.11	3.23	< 0.1	2.9	280	2.8	37.6	< 0.002	< 0.01	< 0.05	7.5	< 1	0.5	89.8	< 0.05	< 0.05	4.01	0.097	0.10	0.6	7	< 0.1	17.0	
B22227	< 0.05	2.13	< 0.1	3.5	260	4.1	59.9	< 0.002	0.01	< 0.05	7.5	< 1	0.7	72.4	< 0.05	< 0.05	4.28	0.071	0.21	0.9	7	0.2	11.4	
B22228	0.69	0.12	3.7	167	250	17.7	125	< 0.002	2.90	0.42	31.6	< 1	1.3	37.2	0.20	0.10	0.73	0.493	0.55	0.9	230	15.6	7.5	
B22229	0.66	0.42	2.8	5.2	200	1.5	20.1	< 0.002	0.39	0.35	4.6	< 1	0.7	38.3	0.13	< 0.05	0.96	0.100	0.08	0.4	36	1.0	4.9	
B22230	0.18	0.29	0.2	42.3	150	1.7	24.0	< 0.002	0.02	0.16	22.6	< 1	< 0.2	70.7	< 0.05	< 0.05	0.15	0.202	0.09	< 0.1	120	0.1	6.1	
B22231	0.26	1.27	2.5	5.4	70	1.7	12.6	< 0.002	< 0.01	0.20	4.9	< 1	0.5	37.9	< 0.05	< 0.05	2.61	0.081	0.04	0.3	25	0.3	6.8	
B22232	0.24	0.30	< 0.1	40.0	250	1.9	20.1	< 0.002	0.02	0.21	22.2	< 1	0.3	47.6	< 0.05	< 0.05	0.75	0.173	0.10	0.2	113	0.3	10.4	
B22233	0.33	0.33	1.1	17.3	130	3.9	5.6	< 0.002	0.42	4.95	17.9	< 1	0.5	54.9	0.06	< 0.05	0.29	0.147	< 0.02	0.1	112	1.5	5.0	
B22234	0.37	0.87	4.6	56.9	490	4.4	18.2	< 0.002	0.32	1.12	31.0	< 1	1.1	123	0.35	< 0.05	1.43	0.430	0.07	0.5	267	4.7	10.2	
B22235	0.15	0.62	0.1	11.7	80	3.0	16.1	< 0.002	0.04	0.21	17.0	< 1	0.4	83.0	< 0.05	< 0.05	0.31	0.152	0.06	0.1	93	< 0.1	5.4	
B22236	0.43	1.02	3.6	21.3	140	2.6	13.6	< 0.002	0.03	0.39	10.3	< 1	0.5	69.0	0.26	< 0.05	2.38	0.127	0.05	0.3	84	0.9	7.5	
B22237	2.84	1.44	5.6	6.8	160	3.7	16.8	< 0.002	0.09	0.45	7.2	< 1	1.2	107	0.22	< 0.05	3.82	0.141	0.06	0.8	24	0.5	11.8	
B22238	1.39	1.94	10.7	5.5	220	4.5	31.0	< 0.002	0.09	0.37	9.0	< 1	2.5	116	0.46	< 0.05	5.34	0.201	0.13	1.0	44	0.8	17.3	
B22239	0.84	1.37	4.4	3.5	170	4.4	23.8	< 0.002	0.46	1.64	9.3	2	4.8	107	0.16	0.23	3.41	0.170	0.09	1.6	28	1.0	28.0	
B22240	0.38	0.18	0.8	11.2	90	0.9	4.5	< 0.002	0.08	0.42	7.3	< 1	0.3	23.8	< 0.05	< 0.05	0.28	0.101	< 0.02	< 0.1	49	0.8	3.3	
B22241	0.66	0.59	4.8	40.0	220	2.8	9.9	< 0.002	1.05	0.77	20.3	< 1	1.2	58.7	0.14	< 0.05	2.39	0.346	0.04	0.5	166	3.8	8.0	
B22242	0.63	0.39	3.0	10.8	130	1.9	9.5	< 0.002	0.29	0.73	9.0	< 1	0.8	46.8	0.22	< 0.05	1.19	0.119	0.03	0.2	54	1.2	5.2	
B22243	0.65	0.16	1.8	22.5	220	1.3	9.9	< 0.002	0.06	0.38	9.7	< 1	0.4	44.9	0.13	< 0.05	0.74	0.098	0.04	0.2	49	0.4	8.3	
B22244	0.40	0.12	0.3	9.9	30	0.9	2.7	< 0.002	0.02	0.25	5.0	< 1	< 0.2	22.3	< 0.05	< 0.05	0.20	0.044	< 0.02	< 0.1	32	0.5	2.4	

Analyte Symbol	Zn	Zr
Unit Symbol	ppm	ppm
Lower Limit	2	0.5
Method Code	TD-ICP	TD-MS
B22201	7	2.7
B22202	95	46.7
B22203	44	20.2
B22204	96	22.0
B22205	106	84.9
B22206	49	15.0
B22207	9	8.9
B22208	4	4.0
B22209	19	15.3
B22210	6	4.3
B22211	82	19.2
B22212	66	48.3
B22213	45	33.7
B22214	65	18.2
B22215	81	25.6
B22216	82	14.0
B22217	26	15.6
B22218	30	16.0
B22219	18	6.0
B22220	9	16.9
B22221	79	51.1
B22222	19	5.4
B22223	14	15.3
B22224	14	3.7
B22225	17	9.2
B22226	42	30.4
B22227	50	57.5
B22228	139	65.2
B22229	12	75.4
B22230	33	21.9
B22231	14	12.7
B22232	36	20.5
B22233	44	21.0
B22234	68	106
B22235	27	18.9
B22236	52	76.0
B22237	14	133
B22238	24	220
B22239	11	151
B22240	14	15.3
B22241	36	117
B22242	17	55.9
B22243	87	55.4
B22244	12	7.0

Analyte Symbol	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
Lower Limit	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2	0.01	0.05	0.05	0.1	0.005	0.01	0.5	0.2	0.01	5
Method Code	TD-MS	TD-ICP	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-ICP
Oreas 72a (4 Acid Digest) Meas			23.4							152	216		330	9.58									
Oreas 72a (4 Acid Digest) Cert			14.7							157	228		316	9.63									
Oreas 72a (4 Acid Digest) Meas			6.3							138			281										
Oreas 72a (4 Acid Digest) Cert			14.7							157			316										
Oreas 72a (4 Acid Digest) Meas			15.6							159			328										
Oreas 72a (4 Acid Digest) Cert			14.7							157			316										
OREAS 101b (4 Acid) Meas									> 500	48.8			457	10.7					2.50	677		1.27	974
OREAS 101b (4 Acid) Cert									1325	45			412	10.7					2.36	754		1.23	927
OREAS 101b (4 Acid) Meas									> 500	42.4			377								699		
OREAS 101b (4 Acid) Cert									1325	45			412								754		
OREAS 101b (4 Acid) Meas									> 500	46.2			408								786		
OREAS 101b (4 Acid) Cert									1325	45			412								754		
OREAS 98 (4 Acid) Meas	44.0					86.6				116			> 10000										
OREAS 98 (4 Acid) Cert	45.1					97.2				121			14800 0.0										
OREAS 98 (4 Acid) Meas	45.7					88.5				119			> 10000										
OREAS 98 (4 Acid) Cert	45.1					97.2				121			14800 0.0										
OREAS 98 (4 Acid) Meas	48.5					89.0				119			> 10000										
OREAS 98 (4 Acid) Cert	45.1					97.2				121			14800 0.0										
DNC-1a Meas				100			7.31			57.9	108		96.5	7.05	14.3						3.5	4.8	
DNC-1a Cert				118			8.21			57	270		100	6.97	15						3.6	5.2	
OREAS 904 (4 ACID) Meas	0.68	6.61	116	220	8.16	4.43	0.05		87.0	87.7	53	4.10	6450	6.80	17.7	0.18	4.8	0.239	4.21	43.7	16.5	0.59	442
OREAS 904 (4 ACID) Cert	0.551	6.30	98.0	194	7.86	4.05	0.0460		86.0	83.0	54.0	3.79	6120	6.68	16.7	0.180	5.00	0.220	3.31	43.2	16.7	0.556	410
SBC-1 Meas				770							91												
SBC-1 Cert				788.0							109												
OREAS 45d (4-Acid) Meas		8.09	7.7	190	0.67	0.33	0.20		32.8	26.1	506	3.54	333	14.1	18.9		1.5	0.077	0.42	14.6	20.5	0.25	505
OREAS 45d (4-Acid) Cert		8.150	13.8	183.0	0.79	0.31	0.185		37.20	29.50	549	3.910	371	14.5	21.20		3.830	0.096	0.412	16.9	21.5	0.245	490.000
OREAS 45d (4-Acid) Meas			10.8		0.73	0.31			36.1	29.6		3.93	363		22.2		2.5	0.097		16.4	22.5		
OREAS 45d (4-Acid) Cert			13.8		0.79	0.31			37.20	29.50		3.910	371		21.20		3.830	0.096		16.9	21.5		
OREAS 96 (4 Acid) Meas	11.7					28.6				46.7			> 10000										
OREAS 96 (4 Acid) Cert	11.5					26.3				49.9			39300										
OREAS 96 (4 Acid) Meas	12.5					28.4				50.3			> 10000										

Analyte Symbol	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
Lower Limit	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2	0.01	0.05	0.05	0.1	0.005	0.01	0.5	0.2	0.01	5
Method Code	TD-MS	TD-ICP	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-ICP
OREAS 96 (4 Acid) Cert	11.5					26.3				49.9			39300										
OREAS 923 (4 Acid) Meas	1.85	7.51	8.3	450	2.32	21.2	0.51	0.74	79.0	22.8	77	6.61	4180	6.67	17.0		3.9	0.496	2.34	38.7	32.5	1.78	987
OREAS 923 (4 Acid) Cert	1.60	7.29	7.61	434	2.42	21.4	0.473	0.420	83.0	23.1	71.0	6.70	4230	6.43	20.3		3.42	0.520	2.51	42.2	31.4	1.69	950
OREAS 621 (4 Acid) Meas	62.5	6.62	79.6		1.75	4.31	2.12	284	44.9	30.2	50	3.31	3680	3.77	26.1		4.5	1.75	2.12	16.1	15.2	0.53	557
OREAS 621 (4 Acid) Cert	69.0	6.40	77.0		1.69	3.93	1.97	284	46.6	29.3	37.1	3.28	3630	3.70	24.6		4.41	1.83	2.20	21.6	14.2	0.507	532
OREAS 621 (4 Acid) Meas	67.8		77.7		1.83	4.19		243	43.3	27.5		3.44	3480		23.9		4.7	1.79		15.3	15.8		
OREAS 621 (4 Acid) Cert	69.0		77.0		1.69	3.93		284	46.6	29.3		3.28	3630		24.6		4.41	1.83		21.6	14.2		
OREAS 522 (4 Acid) Meas	1.57		491		0.77	9.83			81.0	565		0.68	9450		16.9		3.3	0.256		48.8	16.7		
OREAS 522 (4 Acid) Cert	1.31		490		0.700	8.72			148	550		0.640	9160		16.0		2.96	0.230		171	16.2		
B22207 Orig	0.01	0.64	163	30	0.09	0.01	0.58	0.50	2.15	1.9	23	0.08	8.5	1.35	1.97	0.06	0.3	0.014	0.15	1.6	1.0	0.38	300
B22207 Dup	0.01	0.63	161	30	0.08	0.01	0.57	0.49	2.19	2.0	23	0.09	6.7	1.38	1.97	0.05	0.2	0.009	0.14	1.6	0.9	0.37	303
B22217 Orig	0.02	2.08	1110	50	0.15	0.07	4.48	0.50	2.76	9.4	24	0.09	1.8	2.88	4.64	< 0.05	0.5	0.015	0.17	1.1	7.4	0.88	863
B22217 Dup	0.03	2.03	1110	50	0.19	0.06	4.33	0.50	3.04	9.3	18	0.09	1.8	2.84	4.68	< 0.05	0.4	0.021	0.16	1.2	7.1	0.86	828
B22228 Orig	1.77	8.34	126	100	1.66	2.76	4.10	0.59	11.7	74.6	126	1.20	34.7	8.07	19.4	0.31	1.8	0.050	3.17	4.6	16.9	2.09	1790
B22228 Dup	1.72	8.15	134	160	1.93	2.91	4.26	0.58	12.7	78.8	128	1.23	34.0	8.32	20.7	0.35	1.9	0.033	3.27	5.3	17.4	2.14	1880
B22241 Orig	0.10	5.03	745	70	0.86	0.86	1.60	0.51	25.9	17.8	65	0.14	25.0	3.87	11.8	< 0.05	3.1	0.033	0.38	11.8	5.2	0.80	597
B22241 Dup	0.12	5.02	792	70	0.95	0.90	1.59	0.48	26.5	18.1	64	0.13	26.0	3.86	13.1	< 0.05	3.3	0.045	0.38	12.3	5.4	0.78	600
Method Blank	< 0.01	< 0.01	< 0.2	< 10	< 0.05	< 0.01	< 0.01	< 0.02	< 0.01	< 0.1	3	< 0.05	1.1	< 0.01	0.12	< 0.05	< 0.1	< 0.005	< 0.01	< 0.5	< 0.2	< 0.01	< 5
Method Blank	< 0.01		0.5		< 0.05	< 0.01		0.37	< 0.01	< 0.1		< 0.05	1.2		0.29	< 0.05	< 0.1	< 0.005		< 0.5	< 0.2		
Method Blank	< 0.01	< 0.01	1.1	< 10	< 0.05	< 0.01	< 0.01	< 0.02	< 0.01	< 0.1	9	< 0.05	< 0.2	< 0.01	0.09	< 0.05	< 0.1	< 0.005	< 0.01	< 0.5	< 0.2	< 0.01	< 5
Method Blank	< 0.01		0.8		0.08	< 0.01		0.41	< 0.01	< 0.1		< 0.05	< 0.2		0.26	< 0.05	< 0.1	< 0.005		< 0.5	< 0.2		
Method Blank	< 0.01	< 0.01	0.5	< 10	< 0.05	< 0.01	< 0.01	0.41	< 0.01	< 0.1	4	< 0.05	1.6	< 0.01	0.29	< 0.05	< 0.1	< 0.005	< 0.01	< 0.5	< 0.2	< 0.01	9
Method Blank	< 0.01		0.5		0.08	< 0.01		0.43	< 0.01	< 0.1		< 0.05	0.2		0.29	0.07	< 0.1	< 0.005		< 0.5	< 0.2		
Method Blank	< 0.01		0.7		< 0.05	< 0.01		0.37	< 0.01	< 0.1		< 0.05	0.3		0.22	< 0.05	< 0.1	< 0.005		< 0.5	< 0.2		
Method Blank	< 0.01		0.2		< 0.05	< 0.01		0.39	< 0.01	< 0.1		< 0.05	0.3		0.21	< 0.05	< 0.1	< 0.005		< 0.5	< 0.2		
Method Blank	< 0.01		0.3		< 0.05	< 0.01		0.45	0.01	< 0.1		< 0.05	< 0.2		0.20	0.07	< 0.1	< 0.005		< 0.5	< 0.2		

Analyte Symbol	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.05	0.01	0.1	0.2	10	0.5	0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.01	0.005	0.02	0.1	1	0.1	0.1
Method Code	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS
Oreas 72a (4 Acid Digest) Meas				6130					1.65														
Oreas 72a (4 Acid Digest) Cert				6930.000					1.74														
Oreas 72a (4 Acid Digest) Meas				5900																			
Oreas 72a (4 Acid Digest) Cert				6930.000																			
Oreas 72a (4 Acid Digest) Meas				6860																			
Oreas 72a (4 Acid Digest) Cert				6930.000																			
OREAS 101b (4 Acid) Meas	19.3			9.3	1150	23.9											36.4	0.360		347	79		122
OREAS 101b (4 Acid) Cert	20.1			8.2	1118	23											36.4	0.35		387	77		133
OREAS 101b (4 Acid) Meas	14.8			7.8		21.3											32.1			353			113
OREAS 101b (4 Acid) Cert	20.1			8.2		23											36.4			387			133
OREAS 101b (4 Acid) Meas	19.7			9.2		23.5											35.3			395			129
OREAS 101b (4 Acid) Cert	20.1			8.2		23											36.4			387			133
OREAS 98 (4 Acid) Meas						274			> 10.0	4.78		160	191										
OREAS 98 (4 Acid) Cert						345			15.5	20.1		158	206										
OREAS 98 (4 Acid) Meas						291				5.37		155	161										
OREAS 98 (4 Acid) Cert						345				20.1		158	206										
OREAS 98 (4 Acid) Meas						319				4.55		167	172										
OREAS 98 (4 Acid) Cert						345				20.1		158	206										
DNC-1a Meas		1.35	1.6	260		6.7	2.9			0.94	30.5			143				0.260			132		15.9
DNC-1a Cert		1.40	3	247		6.3	4.50			0.96	31			144				0.29			148		18.0
OREAS 904 (4 ACID) Meas	2.23	0.04		45.0	1010	11.6	130		0.06	1.21	11.5	2	2.7	26.4	0.13		15.4		0.55	9.2	82	1.7	34.2
OREAS 904 (4 ACID) Cert	2.12	0.0340		40.1	980	10.6	130		0.0630	1.48	11.2	3.30	2.83	27.2	0.540		14.3		0.520	8.43	76.0	2.12	31.5
SBC-1 Meas																		0.486			214		
SBC-1 Cert																		0.51			220.0		
OREAS 45d (4-Acid) Meas	0.19	0.09	< 0.1	202	360	19.5	39.0		0.05	< 0.05	42.3		0.5	27.1	< 0.05		12.9	0.285	0.22	2.5	134	< 0.1	10.1
OREAS 45d (4-Acid) Cert	2.500	0.101	14.50	231.0	420.000	21.8	42.1		0.049	0.82	49.30		2.78	31.30	1.02		14.5	0.773	0.27	2.63	235.0	1.62	9.53
OREAS 45d (4-Acid) Meas	0.41		1.0	221		22.2	44.7			< 0.05	50.1		0.5	30.0	< 0.05		14.2		0.26	2.8		< 0.1	10.9
OREAS 45d (4-Acid) Cert	2.500		14.50	231.0		21.8	42.1			0.82	49.30		2.78	31.30	1.02		14.5		0.27	2.63		1.62	9.53
OREAS 96 (4 Acid) Meas						94.0				2.66		38	55.6										
OREAS 96 (4 Acid) Cert						101				5.09		40.7	65.6										
OREAS 96 (4 Acid) Meas						95.9				2.81		40	58.3										

Analyte Symbol	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y
Unit Symbol	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.05	0.01	0.1	0.2	10	0.5	0.1	0.002	0.01	0.05	0.1	1	0.2	0.2	0.05	0.05	0.01	0.005	0.02	0.1	1	0.1	0.1
Method Code	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS	TD-ICP	TD-MS	TD-MS
OREAS 96 (4 Acid) Cert						101				5.09		40.7	65.6										
OREAS 923 (4 Acid) Meas	0.90	0.32	13.1	34.6	630	85.9	163		0.69	1.11	12.4	5	12.2	42.2	0.74		15.9	0.400	0.87	3.1	93	4.3	25.1
OREAS 923 (4 Acid) Cert	0.930	0.324	14.1	35.8	630	83.0	166		0.691	1.29	13.1	6.54	13.3	43.0	1.11		16.5	0.405	0.860	3.06	91.0	4.85	26.4
OREAS 621 (4 Acid) Meas	12.8	1.31	7.5	29.7	350	> 10000	81.2		4.62	14.7	5.8	4	5.4	59.2			3.56	0.180	2.11	3.0	34	1.9	12.4
OREAS 621 (4 Acid) Cert	13.6	1.31	8.61	26.2	359	13600	84.0		4.48	139	6.24	5.64	5.25	91.0			7.48	0.149	1.96	2.83	31.8	2.35	11.1
OREAS 621 (4 Acid) Meas	12.8		7.9	27.3		> 10000	81.4			14.0	5.8	4	4.7	54.6			3.40		2.08	3.0		1.9	11.9
OREAS 621 (4 Acid) Cert	13.6		8.61	26.2		13600	84.0			139	6.24	5.64	5.25	91.0			7.48		1.96	2.83		2.35	11.1
OREAS 522 (4 Acid) Meas	207		4.2	70.2		8.5	91.8	0.084		2.78	10.8	2	8.0	75.8	0.16	0.35	1.77		0.31	42.8		76.6	18.8
OREAS 522 (4 Acid) Cert	206		5.66	70.0		12.5	82.0	0.0980		7.93	10.9	2.74	9.32	199	0.440	1.14	7.53		0.290	42.2		135	18.5
B22207 Orig	0.35	0.06	0.5	3.4	70	0.8	3.9	< 0.002	0.01	0.23	3.1	< 1	< 0.2	6.4	< 0.05	< 0.05	0.19	0.088	< 0.02	< 0.1	31	0.9	2.1
B22207 Dup	0.35	0.05	0.5	3.4	70	0.7	3.9	< 0.002	0.01	0.22	3.2	< 1	< 0.2	6.5	< 0.05	< 0.05	0.18	0.088	< 0.02	< 0.1	31	1.0	2.0
B22217 Orig	0.28	0.60	1.0	24.2	310	1.3	4.4	< 0.002	0.23	0.44	11.9	< 1	0.2	44.6	0.06	< 0.05	0.22	0.159	< 0.02	< 0.1	59	1.3	3.9
B22217 Dup	0.26	0.58	0.9	23.3	300	1.3	4.4	< 0.002	0.22	0.46	11.7	< 1	0.2	42.5	0.06	< 0.05	0.22	0.159	< 0.02	< 0.1	58	1.2	4.0
B22228 Orig	0.71	0.11	3.7	167	250	17.8	121	< 0.002	2.83	0.45	31.5	1	1.3	36.0	0.21	0.10	0.70	0.491	0.54	0.6	227	15.7	7.2
B22228 Dup	0.68	0.12	3.6	168	250	17.6	129	< 0.002	2.97	0.39	31.7	< 1	1.3	38.4	0.20	0.10	0.76	0.496	0.56	1.2	232	15.5	7.8
B22241 Orig	0.64	0.59	4.6	39.0	220	2.8	9.7	< 0.002	1.05	0.77	19.2	< 1	1.1	57.5	0.13	< 0.05	2.30	0.346	0.04	0.5	163	3.6	8.0
B22241 Dup	0.68	0.58	5.0	41.1	220	2.9	10.2	< 0.002	1.05	0.77	21.5	< 1	1.2	59.9	0.16	0.06	2.47	0.346	0.03	0.5	169	3.9	8.1
Method Blank	0.08	< 0.01	< 0.1	< 0.2	< 10	< 0.5	< 0.1	< 0.002	< 0.01	0.14	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01	< 0.005	< 0.02	< 0.1	< 1	< 0.1	< 0.1
Method Blank	0.08		< 0.1	< 0.2		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	< 0.05	< 0.01	< 0.1	< 0.2	< 10	< 0.5	< 0.1	< 0.002	< 0.01	0.11	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01	< 0.005	< 0.02	< 0.1	< 1	< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	< 0.2		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	0.09	< 0.01	< 0.1	< 0.2	< 10	< 0.5	< 0.1	< 0.002	< 0.01	< 0.05	0.2	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01	< 0.005	< 0.02	< 0.1	< 1	< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	2.5		< 0.5	< 0.1	< 0.002		< 0.05	0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	< 0.2		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	< 0.2		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	< 0.2		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1
Method Blank	< 0.05		< 0.1	2.5		< 0.5	< 0.1	< 0.002		< 0.05	< 0.1	< 1	< 0.2	< 0.2	< 0.05	< 0.05	< 0.01		< 0.02	< 0.1		< 0.1	< 0.1

Analyte Symbol	Zn	Zr
Unit Symbol	ppm	ppm
Lower Limit	2	0.5
Method Code	TD-ICP	TD-MS
Oreas 72a (4 Acid Digest) Meas		
Oreas 72a (4 Acid Digest) Cert		
Oreas 72a (4 Acid Digest) Meas		
Oreas 72a (4 Acid Digest) Cert		
Oreas 72a (4 Acid Digest) Meas		
Oreas 72a (4 Acid Digest) Cert		
OREAS 101b (4 Acid) Meas		
OREAS 101b (4 Acid) Cert		
OREAS 101b (4 Acid) Meas		
OREAS 101b (4 Acid) Cert		
OREAS 101b (4 Acid) Meas		
OREAS 101b (4 Acid) Cert		
OREAS 98 (4 Acid) Meas	1300	
OREAS 98 (4 Acid) Cert	1360	
OREAS 98 (4 Acid) Meas		
OREAS 98 (4 Acid) Cert		
OREAS 98 (4 Acid) Meas		
OREAS 98 (4 Acid) Cert		
DNC-1a Meas	58	37.0
DNC-1a Cert	70	38.0
OREAS 904 (4 ACID) Meas	28	183
OREAS 904 (4 ACID) Cert	26.3	171
SBC-1 Meas	189	
SBC-1 Cert	186	
OREAS 45d (4-Acid) Meas	45	57.9
OREAS 45d (4-Acid) Cert	45.7	141
OREAS 45d (4-Acid) Meas		92.9
OREAS 45d (4-Acid) Cert		141
OREAS 96 (4 Acid) Meas		
OREAS 96 (4 Acid) Cert		
OREAS 96 (4 Acid) Meas		

Analyte Symbol	Zn	Zr
Unit Symbol	ppm	ppm
Lower Limit	2	0.5
Method Code	TD-ICP	TD-MS
OREAS 96 (4 Acid) Cert		
OREAS 923 (4 Acid) Meas	356	127
OREAS 923 (4 Acid) Cert	345	116
OREAS 621 (4 Acid) Meas	> 10000	165
OREAS 621 (4 Acid) Cert	52200	168
OREAS 621 (4 Acid) Meas		171
OREAS 621 (4 Acid) Cert		168
OREAS 522 (4 Acid) Meas		126
OREAS 522 (4 Acid) Cert		112
B22207 Orig	9	9.3
B22207 Dup	8	8.5
B22217 Orig	27	15.7
B22217 Dup	25	15.5
B22228 Orig	136	64.5
B22228 Dup	141	66.0
B22241 Orig	36	116
B22241 Dup	36	118
Method Blank	< 2	< 0.5
Method Blank		< 0.5
Method Blank	< 2	< 0.5
Method Blank		< 0.5
Method Blank	< 2	< 0.5
Method Blank		< 0.5
Method Blank		< 0.5
Method Blank		< 0.5
Method Blank		< 0.5

APPENDIX III

Act Labs Analytical Descriptions

Sample Preparation Packages

To obtain meaningful analytical results, it is imperative that sample collection and preparation be done properly. Actlabs can advise on sampling protocol for your field program if requested. Once the samples arrive in the laboratory, Actlabs will ensure that they are prepared properly. As a routine practice with rock and core, the entire sample is crushed to a nominal -2 mm, mechanically split to obtain a representative sample and then pulverized to at least 95% -105 microns (μm). All of our steel mills are now mild steel and do not introduce Cr or Ni contamination. Quality of crushing and pulverization is routinely checked as part of our quality assurance program. Samples submitted in an unorganized fashion will be subject to a sorting surcharge and may substantially slow turnaround time. Providing an accurate detailed sample list by e-mail will also aid in improving turnaround time and for Quality Control purposes.

Rock, Core and Drill Cuttings

Code RX1	Crush (< 7 kg) up to 80% passing 2 mm, riffle split (250 g) and pulverize (mild steel) to 95% passing 105 μm included cleaner sand	\$11.75
Code RX1-ORE	Crush up to 90% passing 2 mm	add \$2.10
Code RX1+500	500 grams pulverized	add \$1.25
Code RX1+800	800 grams pulverized	add \$2.25
Code RX1+1000	1000 grams pulverized	add \$2.75
Code RX1-SD	Crush (< 7 kg) up to 80% passing 2 mm, rotary split (250 g) and pulverized (mild steel) to 95% passing 105 μm	\$10.75
Code RX1-SD-ORE	Crush up to 90% passing 2 mm	add \$2.10
Code RX3	Oversize charge per kilogram for crushing	\$1.25
Code RX4	Pulverization only (mild steel) (coarse pulp or crushed rock) (< 800 g)	\$7.50
Code RX5	Pulverize ceramic (100 g)	\$18.75
Code RX6	Hand pulverize small samples (agate mortar & pestle) (<5g)	\$18.75
Code RX7	Crush and split (< 5 kg)	\$5.50
Code RX8	Sample prep only surcharge, no analyses	\$4.75
Code RX9	Compositing (per composite) dry weight	\$2.75
Code RX10	Weight (kg) as received	\$2.25
Code RX11	Checking quality of pulps or rejects prepared by other labs and issuing report	\$10.00
Code RX12	Ball Mill preparation	on request
Code RX13	Rod Mill preparation	on request
Code RX14	Core cutting	on request
Code RX15	Special Preparation/Hour	\$68.25
Code RX16	Specific Gravity on Core	\$14.00
Code RX16-W	Specific Gravity (WAX) on friable samples	\$18.00
Code RX17	Specific Gravity on the pulp	\$17.00
Code RX17-GP	Specific Gravity on the pulp by gas pycnometer	\$18.00

Note: Larger sample sizes than listed above can be pulverized at additional cost.

Soils, Stream and Lake Bottom Sediments, and Heavy Minerals

Code S1	Drying (60°C) and sieving (-177 μm) save all portions	\$4.25
Code S1 DIS	Drying (60°C) and sieving (-177 μm), discard oversize	\$3.75
Code S1-230	Drying (60°C) and sieving (-63 μm), save oversize	\$5.75
Code S1-230 DIS	Drying (60°C) and sieving (-63 μm), discard oversize	\$5.25
Code S2	Lake bottom sediment preparation crush & sieve (-177 μm)	\$9.00
Code S3	Alternate size fractions and bracket sieving, add	\$2.75
Code S4	Selective Extractions or SGH drying (40°C) & sieving (-177 μm)	\$4.25
Code S5	Wet or damp samples submitted in plastic bags, add	\$2.10
Code S6	Separating -2 micron material	\$28.25
Code S7mi	Methylene iodide heavy mineral separation specific gravity can be customized (100 grams)	\$73.75
Code S7w	Sodium polytungstate heavy mineral separation specific gravity can be customized (100 grams)	\$73.75
Code S8	Sieve analysis (4 sieve sizes) coarser than 53 μm	\$40.00
Code S9	Particle size analysis (laser)	\$102.00

Our Sample Preparation pricing is all-inclusive including: sorting, drying, labeling, new reject bags, using cleaner sand between each sample and crushing samples up to 7 kg (for RX1 and RX1-SD).



Riffle Splitting



Sample Pulverizers

Gold and Silver Analyses

Gold and Silver Analyses - Geochem

Code	Method	Sample Weight (g)	Metric Range	Price
1A1	Au Fire Assay - INAA	30	1 - 20,000 ppb	\$20.50
1A2	Au Fire Assay - AA	30	5 - 5,000 ppb	\$17.00
1A2B-30	Au Fire Assay - AA	30	5 - 10,000 ppb	\$17.50
1A2-50	Au Fire Assay - AA	50	5 - 5,000 ppb	\$19.50
1A2B-50	Au Fire Assay - AA	50	5 - 10,000 ppb	\$20.00
1A2-ICP	Au Fire Assay - ICP-OES	30	2 - 30,000 ppb	\$18.00
1A2-ICP-50	Au Fire Assay - ICP-OES	50	2 - 30,000 ppb	\$20.25
1A2-ICPMS	Au Fire Assay - ICP-MS	30	0.5 - 30,000 ppb	\$26.25
1A6	Au BLEG - ICP-MS	1,000	0.1 - 10,000 ppb	\$40.00
1A6-50	Au Cyanide Extraction - ICP-MS	50	0.02 - 1,000 ppb	\$15.00
	Ag or Cu add-on, for each additional, add			\$5.00
1A8	Au Aqua Regia - ICP-MS	30	0.2 - 2,000 ppb	\$18.00
1E-Ag	Ag Aqua Regia - ICP-OES	0.5	0.2 - 100 ppm	\$6.75



Gold and Silver Analyses - Assay

Code	Method	Sample Weight (g)	Metric Range	Price
1A3-30	Au Fire Assay - Gravimetric	30	0.03 - 10,000 g/T	\$22.75
1A3-50	Au Fire Assay - Gravimetric	50	0.02 - 10,000 g/T	\$24.00
1A3-Ag (Au,Ag)	Au, Ag Fire Assay - Gravimetric	30	0.03 - 10,000 g/T (Au) 3 - 10,000 g/T (Ag)	\$26.25
1A4 *	Au Fire Assay - Metallic Screen	500	0.03 g/T	\$79.50
1A4-1000 *	Au Fire Assay - Metallic Screen	1,000	0.03 g/T	\$90.75
8-Ag	Ag Fire Assay - Gravimetric	30	3 - 10,000 g/T	\$25.50

When submitting samples for Au and Ag analysis, or Au, Pt Pd and Rh analysis, please try to ensure you send two-times the listed weight.

Gold, Platinum, Palladium and Rhodium

Code	Method	Sample Weight (g)	Range (ppb)				Price
			Au	Pt	Pd	Rh	
1C-Exploration	Fire Assay - ICP-MS	30	2 - 30,000	1 - 30,000	1 - 30,000		\$22.75
1C-EXP 2	Fire Assay - ICP-MS	30	1 - 30,000	0.5 - 30,000	0.5 - 30,000		\$25.00
1C-research	Fire Assay - ICP-MS	30	1 - 30,000	0.1 - 30,000	0.1 - 30,000		\$36.25
1C-Rhodium	Fire Assay - ICP-MS	30	-	-	-	5 - 10,000	\$34.25
1C-OES	Fire Assay - ICP-OES	30	2 - 30,000	5 - 30,000	5 - 30,000		\$20.75
8 Au Pt Pd	Fire Assay - ICP-OES	30	0.001 - 1000 g/T	0.001 - 1000 g/T	0.001 - 1000 g/T		\$51.25

Platinum Group Elements

Code	Method	Sample Weight (g)	Range (ppb)							Price
			Os	Ir	Ru	Rh	Pt	Pd	Au	
1B1	NiS Fire Assay - INAA	25	2	0.1	5	0.2	5 †	2	0.5	1-2 samples \$363.25 3+ samples \$181.75
1B2	NiS Fire Assay - ICP-MS	50	-	1	1	1	1	1	1	1-2 samples \$363.25 3+ samples \$181.75

Organic Sample Surcharge - \$1.25/sample for Fire Assay packages

Notes:

Use of 50 gram sample for fire assay may not provide optimum recovery.

For proper fire assay fusion, Actlabs may reduce the sample weights to 15 g or smaller at its discretion.

* A representative 500 gram or 1000 gram (or customized) sample split is sieved at 149µm, with assays performed on the entire +149 µm fraction and two splits of the -149 µm fraction. It is important not to overpulverize the sample too finely; as tests have shown gold will plate out on the mill and be lost. When assays have been completed on the coarse and fine portions of the bulk sample, a final assay is calculated based on the weight of each fraction.

† Detection limits for Pt are increased with high Au/Pt ratios and limits for other elements will be affected by abnormally high Au, Sb and Cu content.

Samples with high Au can be reanalyzed by Code 1C exploration or research. Zn concentrates are not amenable to the nickel sulphide fire assay. Au results by Code 1B1 or 1B2 can be low by nickel sulphide fire assay. For accurate Au values, please request Code 1C-exploration.

4-Acid "Near Total" Digestion

This acid attack is the most vigorous digestion used in geochemistry. It will employ hydrochloric, nitric, perchloric and hydrofluoric acids. Even with this digestion, certain minerals (barite, gahnite, chromite, cassiterite, etc.) may only be partially dissolved or stable in solution. Other minerals including zircon, sphene and magnetite may not be totally dissolved. Most other silicates will be dissolved, however some elements will be erratically volatilized, including As, Sb, Cr, U and Au.

Near-Total digestion **cannot** be used to obtain accurate determinations of REE, Ta, Nb, As, Sb, Sn, Hg, Cr, Au and U.

NOTE: Results from acid digestions may be lab dependent or lab operator dependent. Actlabs has automated this aspect of digestion using a microprocessor designed hotbox to accurately reproduce digestion conditions every time.

Hg add-on by cold vapour FIMS

Code 1G (5 ppb) add \$10.25

Assays

Package	Code 8 - 4 Acid ICP-OES	Code 8 - 4 Acid ICP-MS
Ag	3 ppm	1 - 10,000 ppm
Bi	-	0.0001 - 1 %
Cd	0.003 %	0.0001 - 1 %
Co	0.003 %	0.0001 - 1 %
Cu	0.001 %	0.0001 - 1 %
Li	0.001 %	-
Mo	0.003 %	0.0001 - 1 %
Ni	0.003 %	0.0001 - 1 %
Pb	0.003 %	0.0001 - 1 %
Se	-	0.0001 - 1 %
Sn	-	0.0001 - 1 %
Tl	-	0.0001 - 1 %
U	-	0.0001 - 1 %
Zn	0.001 %	0.0001 - 1 %
One Element	\$14.75	\$17.00
Each Additional Element	\$2.25	\$2.25
All Elements	\$20.50	\$22.75

Package	ICP-OES	ICP-MS		ICP-OES + ICP-MS	
	1F2	UT-4M	Ultratrace 4	Ultratrace 6	UT-6M
Ag	0.3 - 100 ppm	0.1 - 100 ppm	0.05 - 100 ppm	0.05 - 100 ppm	0.01 - 100 ppm
Al	0.01 - 50 %	0.01 - 20 %	0.01 - 10 %	0.01 - 10 %	0.01 - 50 %
As	3 - 5,000 ppm	1 - 10,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm	0.2 - 10,000 ppm
B	-	-	20 - 6,000 ppm	-	-
Ba	7 - 1,000 ppm	1 - 10,000 ppm	1 - 5,000 ppm	1 - 5,000 ppm	10 - 10,000 ppm
Be	1 - 10,000 ppm	1 - 1,000 ppm	0.1 - 1,000 ppm	0.1 - 1,000 ppm	0.05 - 1,000 ppm
Bi	2 - 10,000 ppm	0.1 - 4,000 ppm	0.02 - 2,000 ppm	0.02 - 2,000 ppm	0.01 - 10,000 ppm
Ca	0.01 - 70 %	0.01 - 40 %	0.01 - 50 %	0.01 - 50 %	0.01 - 50 %
Cd	0.3 - 2,000 ppm	0.1 - 4,000 ppm	0.1 - 1,000 ppm	0.1 - 1,000 ppm	0.02 - 1,000 ppm
Ce	-	1 - 2,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm	0.01 - 500 ppm
Co	1 - 10,000 ppm	0.2 - 4,000 ppm	0.1 - 500 ppm	0.1 - 500 ppm	0.1 - 10,000 ppm
Cr	1 - 10,000 ppm	1 - 10,000 ppm	1 - 5,000 ppm	1 - 5,000 ppm	1 - 10,000 ppm
Cs	-	0.1 - 10,000 ppm	0.05 - 100 ppm	0.05 - 100 ppm	0.05 - 500 ppm
Cu	1 - 10,000 ppm	0.1 - 10,000 ppm	0.2 - 10,000 ppm	0.2 - 10,000 ppm	0.2 - 10,000 ppm
Dy	-	-	0.1 - 5,000 ppm	0.1 - 5,000 ppm	-
Er	-	-	0.1 - 1,000 ppm	0.1 - 1,000 ppm	-
Eu	-	-	0.05 - 100 ppm	0.05 - 100 ppm	-
Fe	0.01 - 50 %	0.01 - 60 %	0.01 - 50 %	0.01 - 50 %	0.01 - 50 %
Ga	1 - 10,000 ppm	-	0.1 - 500 ppm	0.1 - 500 ppm	0.05 - 10,000 ppm
Gd	-	-	0.1 - 5,000 ppm	0.1 - 5,000 ppm	-
Ge	-	-	0.1 - 500 ppm	0.1 - 500 ppm	0.05 - 500 ppm
Hf	-	0.1 - 1,000 ppm	0.1 - 500 ppm	0.1 - 500 ppm	0.1 - 500 ppm
Hg	1	-	10 - 10,000 ppb	10 - 10,000 ppb	-
Ho	-	-	0.1 - 1,000 ppm	0.1 - 1,000 ppm	-
In	-	-	0.1 - 100 ppm	0.1 - 100 ppm	0.005 - 500 ppm
K	0.01 - 10 %	0.01 - 10 %	0.01 - 5 %	0.01 - 5 %	0.01 - 10 %
La	-	0.1 - 2,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm	0.5 - 10,000 ppm
Li	1 - 10,000 ppm	0.1 - 2,000 ppm	0.5 - 400 ppm	0.5 - 400 ppm	0.2 - 10,000 ppm
Lu	-	-	0.1 - 100 ppm	0.1 - 100 ppm	-
Mg	0.01 - 50 %	0.01 - 30 %	0.01 - 50 %	0.01 - 50 %	0.01 - 50 %
Mn	1 - 100,000 ppm	1 - 10,000 ppm	1 - 10,000 ppm	1 - 10,000 ppm	5 - 100,000 ppm
Mo	1 - 10,000 ppm	0.1 - 4,000 ppm	0.05 - 10,000 ppm	0.1 - 10,000 ppm	0.05 - 10,000 ppm
Na	0.01 - 10 %	0.001 - 10 %	0.01 - 3 %	0.01 - 3 %	0.01 - 10 %
Nb	-	0.1 - 2,000 ppm	0.1 - 500 ppm	0.1 - 500 ppm	0.1 - 500 ppm
Nd	-	-	0.1 - 10,000 ppm	0.1 - 10,000 ppm	-
Ni	1 - 10,000 ppm	0.1 - 10,000 ppm	0.5 - 5,000 ppm	0.5 - 5,000 ppm	0.2 - 10,000 ppm
P	0.001 - 10 %	0.001 - 5 %	-	0.001 - 10 %	10 - 10,000 ppm
Pb	3 - 5,000 ppm	0.1 - 5,000 ppm	0.5 - 5,000 ppm	0.5 - 5,000 ppm	0.5 - 10,000 ppm
Pr	-	-	0.1 - 5,000 ppm	0.1 - 1,000 ppm	-
Rb	-	0.1 - 2,000 ppm	0.2 - 500 ppm	0.2 - 5,000 ppm	0.1 - 10,000 ppm
Re	-	-	0.001 - 100 ppm	0.001 - 100 ppm	0.002 - 50 ppm
S +	0.01 - 20 %	1 - 10 %	-	0.01 - 20 %	0.01 - 10 %
Sb	5 - 10,000 ppm	0.1 - 4,000 ppm	0.1 - 500 ppm	0.1 - 500 ppm	0.05 - 10,000 ppm
Sc	4 - 10,000 ppm	1 - 200 ppm	-	1 - 5,000 ppm	0.1 - 10,000 ppm
Se	-	-	0.1 - 1,000 ppm	0.1 - 1,000 ppm	1 - 1,000 ppm
Sm	-	-	0.1 - 100 ppm	0.1 - 100 ppm	-
Sn	-	0.1 - 2,000 ppm	1 - 200 ppm	1 - 200 ppm	0.2 - 500 ppm
Sr	1 - 10,000 ppm	1 - 10,000 ppm	0.2 - 10,000 ppm	0.2 - 1,000 ppm	0.2 - 10,000 ppm
Ta	-	0.1 - 2,000 ppm	0.1 - 1,000 ppm	0.1 - 1,000 ppm	0.05 - 100 ppm
Tb	-	-	0.1 - 100 ppm	0.1 - 100 ppm	-
Te	2 - 10,000 ppm	-	0.1 - 500 ppm	0.1 - 500 ppm	0.05 - 500 ppm
Th	-	0.1 - 4,000 ppm	0.1 - 500 ppm	0.1 - 500 ppm	0.2 - 10,000 ppm
Ti	0.01 - 10 %	0.001 - 10 %	-	0.0005 - 10 %	0.005 - 10 %
Tl	5 - 10,000 ppm	0.05 - 10,000 ppm	0.05 - 500 ppm	0.05 - 500 ppm	0.02 - 10,000 ppm
Tm	-	-	0.1 - 1,000 ppm	0.1 - 1,000 ppm	-
U	10 - 10,000 ppm	0.1 - 4,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm
V	2 - 10,000 ppm	4 - 10,000 ppm	1 - 10,000 ppm	1 - 1,000 ppm	1 - 10,000 ppm
W	5 - 10,000 ppm	0.1 - 200 ppm	0.1 - 200 ppm	0.1 - 200 ppm	0.1 - 10,000 ppm
Y	1 - 1,000 ppm	0.1 - 2,000 ppm	0.1 - 10,000 ppm	0.1 - 10,000 ppm	0.1 - 500 ppm
Yb	-	-	0.1 - 5,000 ppm	0.1 - 5,000 ppm	-
Zn	1 - 10,000 ppm	1 - 10,000 ppm	0.2 - 10,000 ppm	0.2 - 10,000 ppm	2 - 10,000 ppm
Zr	5 - 10,000 ppm	0.1 - 2,000 ppm	1 - 5,000 ppm	1 - 5,000 ppm	0.5 - 500 ppm
Price:	\$17.00	\$21.25	\$24.00	\$35.00	\$28.50

Extraction of each element by 4-Acid Digestion is dependent on mineralogy
+ Sulphide sulphur and soluble sulphates are extracted

APPENDIX IV

Point of Interest (Table 2)

Crooked Pine Property Point of Interest Table 2

POI_#	Date	UTM Zone	Easting	Northing	Elevation	Description	Photo(s)
1	07-Nov-20	15	648024	5408923	476	Diorite outcrop, medium-grained, salt-pepper look.	
2	07-Nov-20	15	648041	5408932	479	Possible mafic volcanic outcrop.	
3	08-Nov-20	15	647066	5408493	477	Intermediate tuff (?) with 5-10cm quartz vein. Foliation and vein at 090 degrees.	
4	08-Nov-20	15	646737	5407498	461	Gabbro outcrop.	
5	08-Nov-20	15	646639	5407486	467	Gabbro or possibly diorite outcrop.	
6	08-Nov-20	15	646640	5407425	475	Gabbro or possibly diorite outcrop.	
7	08-Nov-20	15	646659	5407389	455	Possible fine-grained, mafic to intermediate volcanic.	

APPENDIX V

List of Claims

Crooked Pine List of Mining Cells-Claims Table 3

TENURE_NUM	TITLE_TY_1	ISSUE_DATE	ANNIVERSARY	HOLDER
105158	Single Cell Mining Claim	2018-04-10	2022-08-16	(10) JAMES RICHARD BROWN, (90) Traxxin Resources Inc.
579415	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
579419	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
579418	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
169083	Single Cell Mining Claim	2018-04-10	2022-08-16	(10) JAMES RICHARD BROWN, (90) Traxxin Resources Inc.
579416	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
188053	Single Cell Mining Claim	2018-04-10	2022-08-16	(10) JAMES RICHARD BROWN, (90) Traxxin Resources Inc.
580359	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580360	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580361	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580362	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580365	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580363	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580364	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
225851	Single Cell Mining Claim	2018-04-10	2022-08-16	(10) JAMES RICHARD BROWN, (90) Traxxin Resources Inc.
579420	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
580366	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
580367	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
579417	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
580368	Single Cell Mining Claim	2020-02-28	2022-02-28	(100) Traxxin Resources Inc.
579421	Multi-cell Mining Claim	2020-02-24	2022-02-24	(100) Traxxin Resources Inc.
596556	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
596557	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
596558	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
596559	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
596560	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
596561	Single Cell Mining Claim	2020-06-24	2022-06-24	(100) Traxxin Resources Inc.
598700	Multi-cell Mining Claim	2020-07-09	2022-07-09	(100) Traxxin Resources Inc.

APPENDIX VI

Statement of Expenditures

STATEMENT of EXPENDITURES

The following is a breakdown of expenditures related to the 2020 field program on the Crooked Pine Property.

Labour:

Preparation, field work, travel

Labour \$ 8,387.50

Prepare maps etc.

Drafting & digitizing \$ 1,656.00

Report Writing

Report Writing \$ 3,150.50

Associated Costs:

Meals & Groceries \$ 454.39

Field Supplies \$ 318.89

Ground Transportation (1640km x \$0.50/km) \$ 820.00

Camp Rental \$ 750.00

Motel \$ 135.04

Analytical Costs:

Act Labs (44 rock - grab samples) \$ 2,653.00

TOTAL EXPENDITURES \$ 18,324.82

Cell No.	Rock Samples Collected per Cell	Expenditure per Cell
105158	17	\$ 7,094.64
579417	23	\$ 9,566.50
579421	4	\$ 1,663.68
Total	44	\$ 18,324.82

APPENDIX VII

Daily Log

Table 4		Daily Log Crooked Pine Project November 2020							
Date	B. Maclachlan days	Prospecting	Other	Activities		C. Robertson days	Prospecting	Other	Activities
November-06-2020	1		Travel, set up camp	Picked up groceries, drove to Crooked Pine, set up camp		1		Travel, set up camp	Picked up groceries, drove to Crooked Pine, set up camp
November-07-2020	1	Prospecting		Brushed out road, walked towards the west, couldn't cross due to water, prospected northeast of camp		1	Prospecting		Brushed out road, walked towards the west, couldn't cross due to water, prospected northeast of camp
November-08-2020	1	Prospecting		Prospecting southwest of camp around the Andrews Showing		1	Prospecting		Prospecting southwest of camp around the Andrews Showing
November-09-2020	1	Prospecting		Rain all day, prospected a little south of camp		1	Prospecting		Rain all day, prospected a little south of camp
November-10-2020	1	Prospecting		Prospecting in and around Trench 2 & 3		1	Prospecting		Prospecting in and around Trench 2 & 3
November-11-2020	1		Pack up, travel to Thunder Bay	Lots of snow, packed up the camp, drove to Thunder Bay		1		Pack up, travel to Thunder Bay	Lots of snow, packed up the camp, drove to Thunder Bay
November-18-2020	1		Drove to Timmins	Drove to Timmins		1		Drove to Timmins	Drove to Timmins
Total Days	7	4	3			7	4	3	

APPENDIX VIII

Photos

B22207

22207
Alabaster
Alabaster Co., 10 Westmore
Cape Girardeau, MO 63703
E 213.23
Volume for: _____
Reference:



B22221



B2229

B2229





Baaaz0

B222 33



B22238



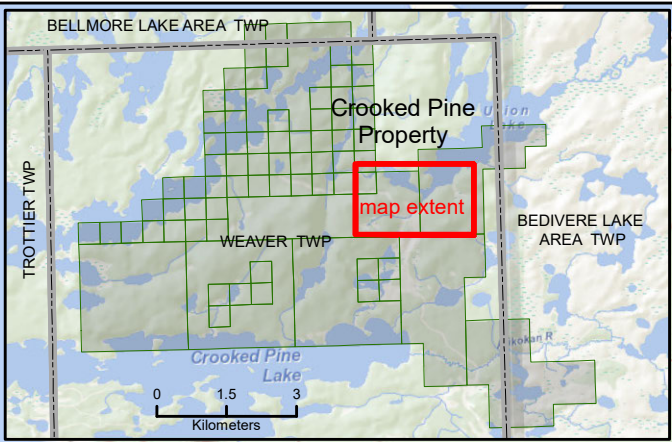
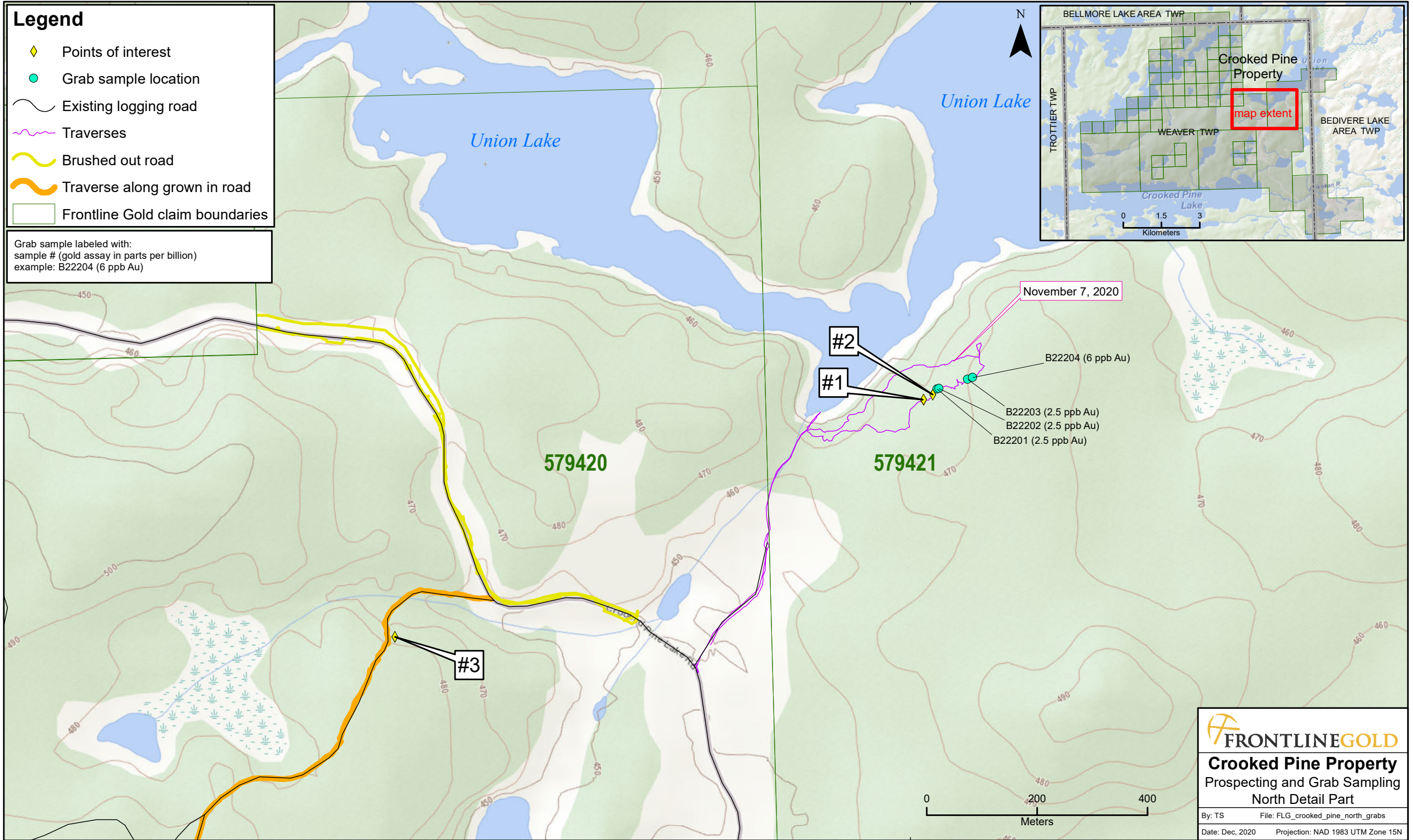
APPENDIX IX

Map Sheets

Legend

- ◆ Points of interest
- Grab sample location
- Existing logging road
- Traverses
- Brushed out road
- Traverse along grown in road
- Frontline Gold claim boundaries

Grab sample labeled with:
 sample # (gold assay in parts per billion)
 example: B22204 (6 ppb Au)



November 7, 2020

#2

#1

B22204 (6 ppb Au)

B22203 (2.5 ppb Au)

B22202 (2.5 ppb Au)

B22201 (2.5 ppb Au)

579420

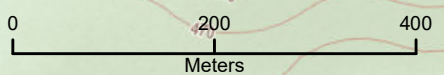
579421

#3



Crooked Pine Property
 Prospecting and Grab Sampling
 North Detail Part

By: TS File: FLG_crooked_pine_north_grabs
 Date: Dec, 2020 Projection: NAD 1983 UTM Zone 15N



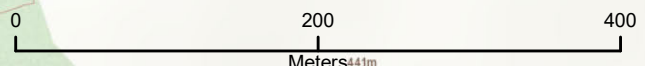
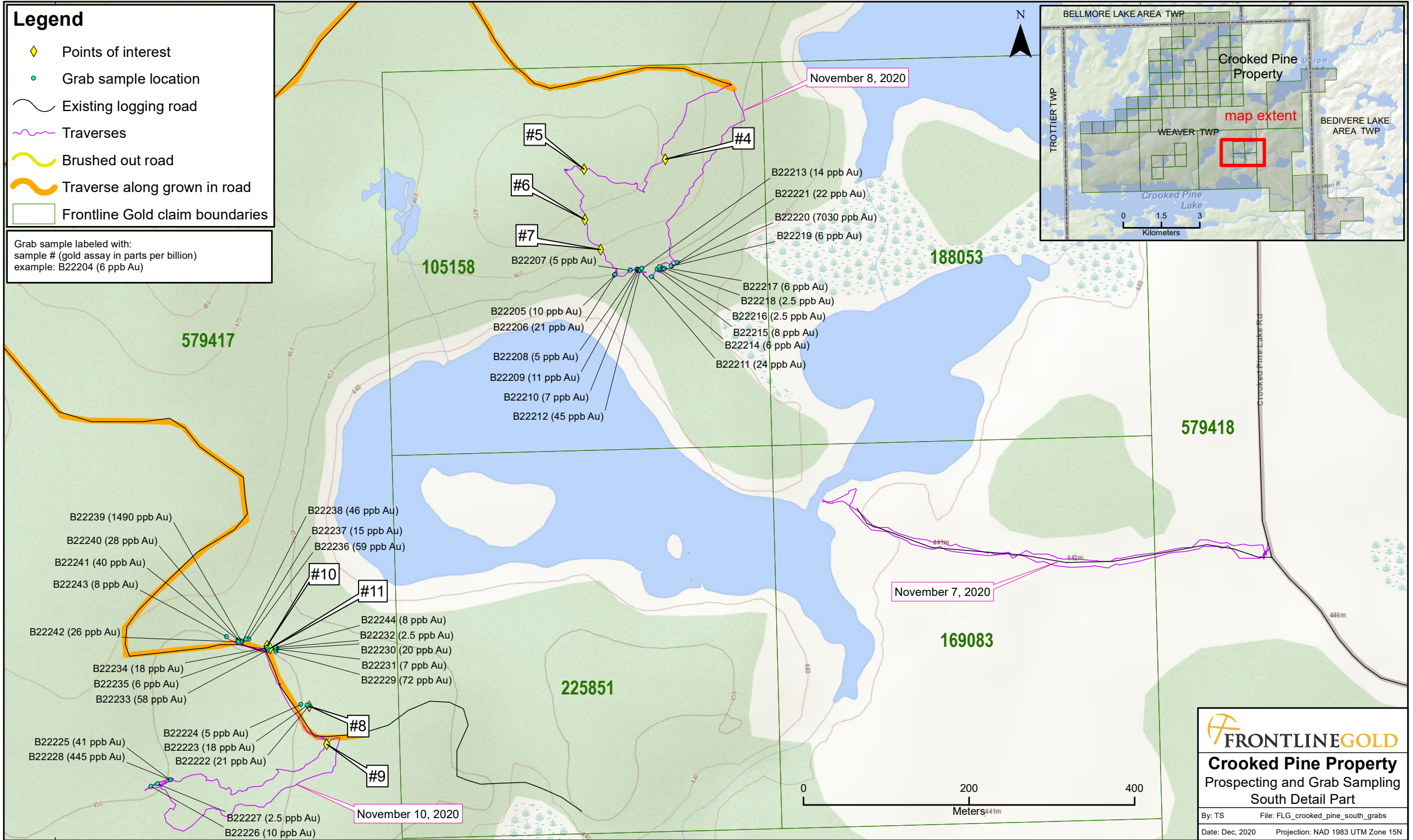
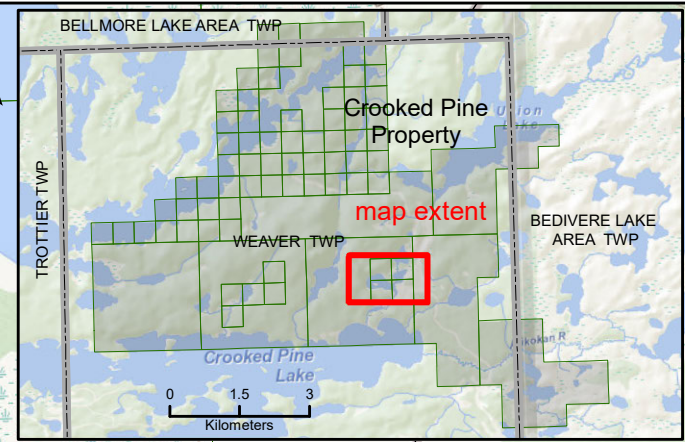
648000

648000

Legend

- ◆ Points of interest
- Grab sample location
- Existing logging road
- Traverses
- Brushed out road
- Traverse along grown in road
- Frontline Gold claim boundaries

Grab sample labeled with:
 sample # (gold assay in parts per billion)
 example: B22204 (6 ppb Au)



FRONTLINEGOLD
Crooked Pine Property
 Prospecting and Grab Sampling
 South Detail Part

By: TS File: FLG_crooked_pine_south_grabs
 Date: Dec, 2020 Projection: NAD 1983 UTM Zone 15N