

**ASSESSMENT REPORT**

**GEOLOGICAL SURVEY**

**on the**

**TULAMEEN PLATINUM PROJECT**

**Similkameen Mining Division**

**Latitude: 49° 31' 56'' N; Longitude: 120° 53' 31'' W**

**NTS 092H056**

**For**

**NORTH BAY RESOURCES INC.  
PO Box 162, Skippack, PA 19474  
USA**

**By**

**Dan V. Oancea PGeo**

**August 25, 2018**

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## 1. Summary

The Tulameen Platinum Project is located 28 km west of the town of Princeton in the Similkameen Mining Division of southern British Columbia, Canada.

The Project is 100% owned by North Bay Resources Inc. of Skippack Pennsylvania, USA. It is represented on NTS map 092H056.

The 796.79 hectares mineral property straddles the Tulameen River in between Hines Creek and Britton Creek. It is located in a transition zone in between the Cascade Mountains to the west and the Interior Plateau to the east. The property is generally in steep terrain characterized by the presence of bluffs and is partially covered by coniferous type forests.

The Project lies along the western margin of the Intermontane Belt of the Quesnellia tectonostratigraphic terrane. The Quesnell Terrane is a volcano-sedimentary arc terrane that stretches along most of the length of the Canadian Cordillera. Rocks underlying the mineral property are represented by the Triassic rocks of the Tulameen Ultramafic Complex, and sedimentary and volcanic rocks of the Upper Triassic Nicola Group.

The Tulameen Ultramafic Complex represents an Alaskan-type magmatic intrusion that hosts platiniferous chromites in its dunite rock core. The dunite rocks represent the hardrock source for the 20,000 ounces of placer platinum that have been mined since the 1885 discovery of gold rich placer deposits on the Tulameen River and its tributaries. In late 1800s the Tulameen region was recognized as North America's premier platinum producer. Subsequent mineral exploration activities failed to delineate economic hardrock Platinum Group Metals (PGM) mineralization.

The hardrock source of the 37,707 ounces of gold known to have been mined in the Tulameen area proved to be even more elusive, but it is generally accepted that gold was derived from the Nicola Group rocks.

Industrial uses for the mineral olivine that represents over 90 per cent of the Tulameen dunite rocks had also been investigated as early as 1986. It was concluded that an important part of the olivine contained in the dunite rocks favorably compares with commercially produced olivine from around the world.

The potential of the olivine rich dunite rocks for mineral sequestration of carbon dioxide (CO<sub>2</sub>) has been studied since early 2000s. Test results indicated that one tonne of Tulameen dunite could potentially sequester up to 0.4 tonnes of CO<sub>2</sub>.

By studying new worldwide developments as well as processing options for magnesium-rich silicate minerals the writer concluded that the olivine rich dunite rocks of the Tulameen Complex represent a suitable feedstock for the production of magnesium oxide and/or of different other types of magnesium products.

In 2013, the writer undertook a prospecting survey on the Tulameen Platinum Project. It was designed as a reconnaissance study of the main rock types, mineralization and of the mineral potential of the Tulameen ultramafic rocks. Assays returned values in line with the ones obtained by previous explorationists. Top values were 0.54 g/t platinum, 0.18 g/t gold, 0.2% copper, 0.14% nickel, 15.40% iron and 20.3% chromium (AR34218).

The writer's June 2016 assessment work had as main objective the collection of dunite samples from the core of the ultramafic intrusion. Samples were assayed for loss-on-ignition (LOI) and were used to evaluate the industrial mineral potential of the Tulameen olivine from an area centered on Britton Creek. The phytomining potential of the nickel-enriched body of dunite rock was also tested by assaying some of the local types of vegetation present on the ultramafic intrusion (AR36194).

The present report documents the June 2018 assessment work which had as main objectives the validation of historic LOI results for the Britton Mountain area and an evaluation of the precious and base metals potential of the contact zone between the volcanic-sedimentary Nicola Group rocks and the Tulameen intrusive ultramafic rocks.

Britton Mountain loss-on-ignition results validated the historic Diamet results and were reported as ranging from 1.93% in the fresh dunite rock to 18% in altered zones. Other significant assay results were platinum up to 0.509 g/t, nickel over 0.12%, 0.01% cobalt, and chromium assays reported as over the analytical method's detection limit (>1%). Magnesium assay results for the dunite rock were in the 24% to 25.9% range, which are equivalent to 39.79% to 42.94% magnesium oxide.

The results of the writer's assessment work combined with an extensive literature search were used to draw conclusions and make recommendations for further exploration and development programs that would provide for economic mining and processing of the different types of commodities present in the Tulameen dunite rocks.

## **2. Conclusions**

The central part of the Tulameen Ultramafic Complex, which is part of the Company's Tulameen Platinum Project, represents an attractive industrial mineral exploration and development target because of the favorable characteristics of the Tulameen olivine, which would require minimum preparation in order to be used for industrial applications.

Mining of the dunite rocks for olivine could be economically viable and might have a greater potential than mining for precious and base metals.

The potential for carbon dioxide mineral sequestration of the Tulameen dunite rocks is considered excellent and if pursued could further improve the economics of a possible olivine mining project.

Parts of the mineral property (Grasshopper Mtn. and Britton Creek areas) that had been explored and drilled by industry majors and junior miners are suitable exploration targets for PGM, chromites, nickel, cobalt and magnetite mineralization.

The Hines Creek area is prospective for PGM, copper and gold but had not been the focus of the 2018 survey.

In conclusion the mining of the olivine rich core of the Tulameen Ultramafic Complex can be envisioned as a possible open pit mining operation that would include on-site processing of the rock (crushing, grinding, flotation and/or gravity concentration) which is considered to represent a viable solution for moving the project forward.

The main product could be represented by olivine industrial mineral, while by-products could be represented by metals (PGM, nickel, cobalt, chromites, magnetite). The tailings could be marketed for their CO<sub>2</sub> sequestration potential or could be acid leached which would result in the production of magnesium carbonate accompanied by the production of some of the aforementioned metals.

The other important option for developing the olivine mineral deposit is represented by mining the Tulameen olivine for its magnesium content. Viable processing methods (crushing, grinding, acid leaching, and calcination) are available for an economic processing of magnesium rich silicate minerals, including olivine and serpentine.

In order to be able to provide an informed opinion on minerals of interest as well as to be able to propose development options for the Tulameen olivine the author has researched the existent magnesium processing methods, mineral deposits and operations from around the world. The opinions provided in this report are also based on the author's recent experience with a similar European olivine-serpentine mineral deposit, which is also envisioned to follow similar development paths.

By taking into account recent geological maps of the area created by the British Columbia Geological Survey and considering the final depth of a possible mining operation to about or below 900 m in elevation the writer estimates that a potential exploration target for the mineral olivine contained in the dunite rocks located within the Project Area could be in the 225 million tonnes to 240 million tonnes range.

### **3. Recommendations**

North Bay Resource's Tulameen Project should be further explored for its olivine industrial mineral and magnesium potential as these two commodities could represent the most economic alternatives for developing the Project.

Systematic mapping and sampling (LOI, PGM, base metals, magnesium) of the parts of the Grasshopper Mountain, Britton Mountain and Olivine Mountain covered by the Company's mineral claims should be performed during a first pass survey. Continuous channel sampling has to be done over areas of the property that have lower loss-on-ignition values and/or present anomalous PGM and base metals values.

Dunite rocks that have a low loss-on-ignition and contain important quantities of platinum-poor chromite mineralization have to be identified and thoroughly sampled as chromite, which could represent an important by-product.

Areas known to hold anomalous to economic values of PGM and chromite mineralization have to be identified/re-located, systematically sampled and assayed.

The conclusions of these surveys should guide a drilling program that would identify at depth characteristics of the dunite rocks. If successful olivine and magnesium oxide as well as precious and base metals mineral resources could be estimated and used in a Preliminary Economic Assessment (PEA) of the Tulameen olivine-PGM deposit.

Metallurgical studies have to be undertaken in parallel with the exploration program to provide the necessary information for making development decisions.

### **4. Introduction**

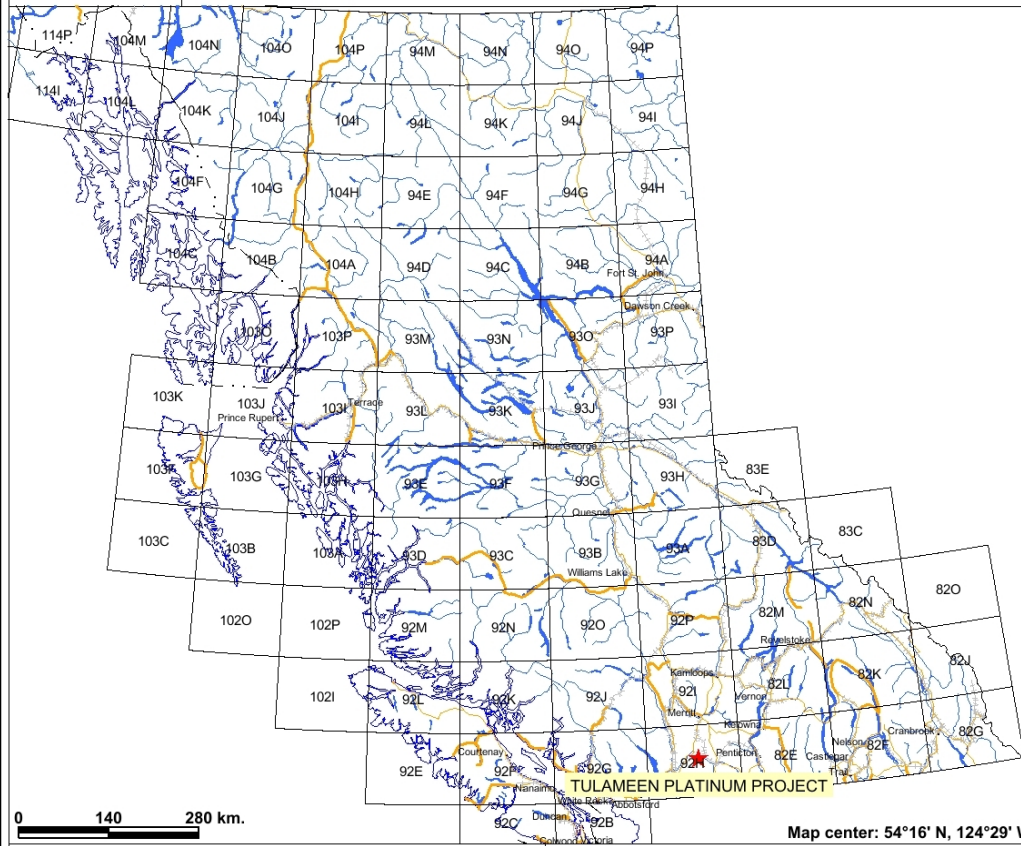
#### **4.1 Location, Access and Physiography**

The Tulameen Platinum Project is located approximately 28 km west of the town of Princeton in the Similkameen Mining Division of southern British Columbia.

Princeton, a town of 2,700 people, can be reached by following Highway 1 West over a 288 km road distance from the City of Vancouver.

From Princeton the Project can be accessed by driving on the paved Coalmont Road to Tulameen, and then continuing west on the well maintained Tulameen Forestry Service Road (FSR) for another 10 km.

**Fig. 1 - Tulameen Platinum Project Index Map**



**Legend**

- Provincial Boundary (1:6M)
- Boundary (International)
- Boundary (Interprovincial)
- NTS Grid
- Transportation - Lines (1:6M)
  - Road - Trunk
  - Road - Main
  - Rail Line
- Water - Lines (1:6M)
  - River/Stream - Definite
  - Lake - Definite
  - Island - Definite
  - Coastline - Definite
- Water - Polygons (1:6M)
  - River/Stream - Definite
  - Lake - Definite
- Major Cities

0 140 280 km.

Map center: 54°16' N, 124°29' W

Scale: 1:8,000,000

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Dan V. Oancea, September 2016 for North Bay Resources Inc.



The Company's mineral tenements straddle the Tulameen River. The Hines Creek area which represent the southeastern part of the property that lies south of the river could be accessed by crossing a bridge located 8 km west of the village of Tulameen. The northern side of the Olivine Mountain located opposite to the confluence of Britton Creek with the Tulameen River can be accessed by following a forestry road that crosses the river on the southern side of the property in a location 3.5 km west of the aforementioned confluence.

The Tulameen Platinum Project is located in a transition zone between the Cascade Mountains to the west and the Interior Plateau to the east. The elevations on the mineral property range from 900 m down in the Tulameen River valley to a maximum of 1,250 m on the northern slopes of the Grasshopper Mountain. The tops of the mountains are rounded by weathering and the eroding action of the glaciers. Glacial till covers many mountainous slopes.

From the Cascade Mountains the Tulameen River follows a northward course for 30 kilometres but it changes course at the Grasshopper Mountain and continues eastward for 10 kilometres to the town of Tulameen. The river then flows southeast for 25 kilometres before joining the Similkameen River at Princeton (Minfile 092HNE199).

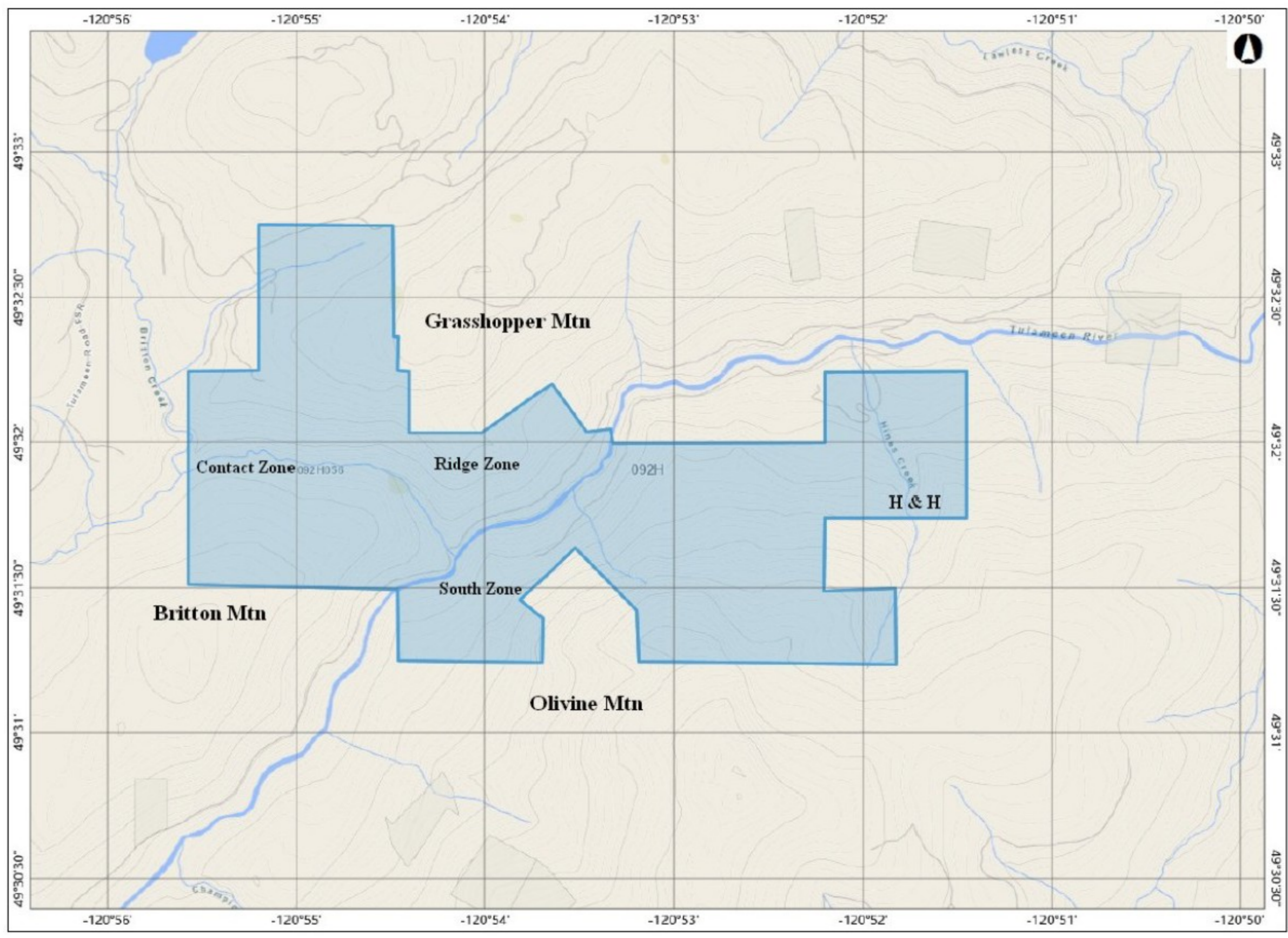
The upper part of the river runs through a wide valley extending from its headwaters in Paradise Valley southward to Champion Creek. The river continues through a narrow rock-walled canyon between Grasshopper and Olivine Mountains to the mouth of Olivine (Slate) Creek. The gravels in this canyon are generally no more than a metre thick and occur in the creek bed and in benches on the sides of the valley, either in or above the level of the canyon.

Below Olivine Creek, a broad valley floor filled with deep gravel deposits opens up and continues past the towns of Tulameen and Coalmont to a point 2 kilometres below Granite Creek.

The Tulameen River then cuts through a canyon to a point 5 kilometres west of Princeton. Here, the river enters a broad valley that eventually merges with that of the Similkameen River at Princeton (Minfile 092HNE199).

The Company's mineral property lies mostly in between the Britton Creek to the west and the Hines Creek to the east. Britton Creek is a northern Tulameen River tributary, while Hines Creek is a southern Tulameen River tributary.

The Project is generally in steep terrain characterized by the presence of bluffs on both the north face of the Olivine Mountain and the south face of the Grasshopper



**Fig. 2 - Tulameen Platinum Project Access & Topo**

**Legend**

- National Parks - Outlined
- National Parks - Colour Fille
- Ecological Reserves - Tanta
- Protected Areas - Tantal
- Recreation Areas - Tantal
- Conservancy Areas - Tantal
- Mapsheet Grid (1:20,000)
- Mapsheet Grid (1:250,000)
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**Dan V. Oancea**  
 for  
**North Bay Resources Inc. -**  
**August 2018**

Datum: NAD83  
 Projection: Web Mercator



Mountain. The Tulameen River section that flows east-west through the mineral property is narrow and represented by a canyon.

The Project is centered on the Britton Creek which also flows through a narrow canyon for 4 km from its confluence with the Tulameen River.

The mineral property is partially covered by coniferous type forests usually developed on glacial till. Lower elevations are sometimes covered by dense second growth. A few types of plants that can grow on 'serpentine soils' have developed on the ultramafic rocks of the Grasshopper and Olivine Mountain. The plants that grow on the Grasshopper Mountain are neither protected nor considered endangered in British Columbia.



**Plate 1 - Britton Mountain Dunite Outcrop**

## **4.2 Mineral Claims**

The Tulameen Platinum Project consists of four mineral claims that cover 796.79 hectares (1,968.91 acres). The claims are 100% owned by North Bay Resources Inc. and are centred at 49° 31' 56" N and 120° 53' 31" W (652534 Easting, 5488758 Northing – Zone 10). The mineral property is part of the NTS 092H056 map.

The Tulameen Platinum project's mineral claims partially overlap a few small legacy claims on its southern and northern borders. The writer did not research the title to the legacy claims, as these are not considered material to the viability of the project.

**TABLE 1: MINERAL TITLES AT TULAMEEN PLATINUM MINERAL PROPERTY**

<b>Tenure Number</b>	<b>Claim Name</b>	<b>Owner</b>	<b>NTS Map Number</b>	<b>Good to Date*</b>	<b>Status</b>	<b>Area (ha)</b>
1054964	TP NW	204090	092H056	2021/MAR/12	GOOD*	83.85
1061110	TP SW	204090	092H056	2021/MAR/12	GOOD*	62.91
1061113	TP E	204090	092H056	2021/MAR/12	GOOD*	293.57
1061115	TULAMEEN PLATINUM	204090	092H056	2021/MAR/12	GOOD*	356.46
<b>TOTAL</b>						<b>796.79</b>

\*Subject to acceptance of the present Assessment Report.

### **4.3 Climate, Local Resources, Infrastructure**

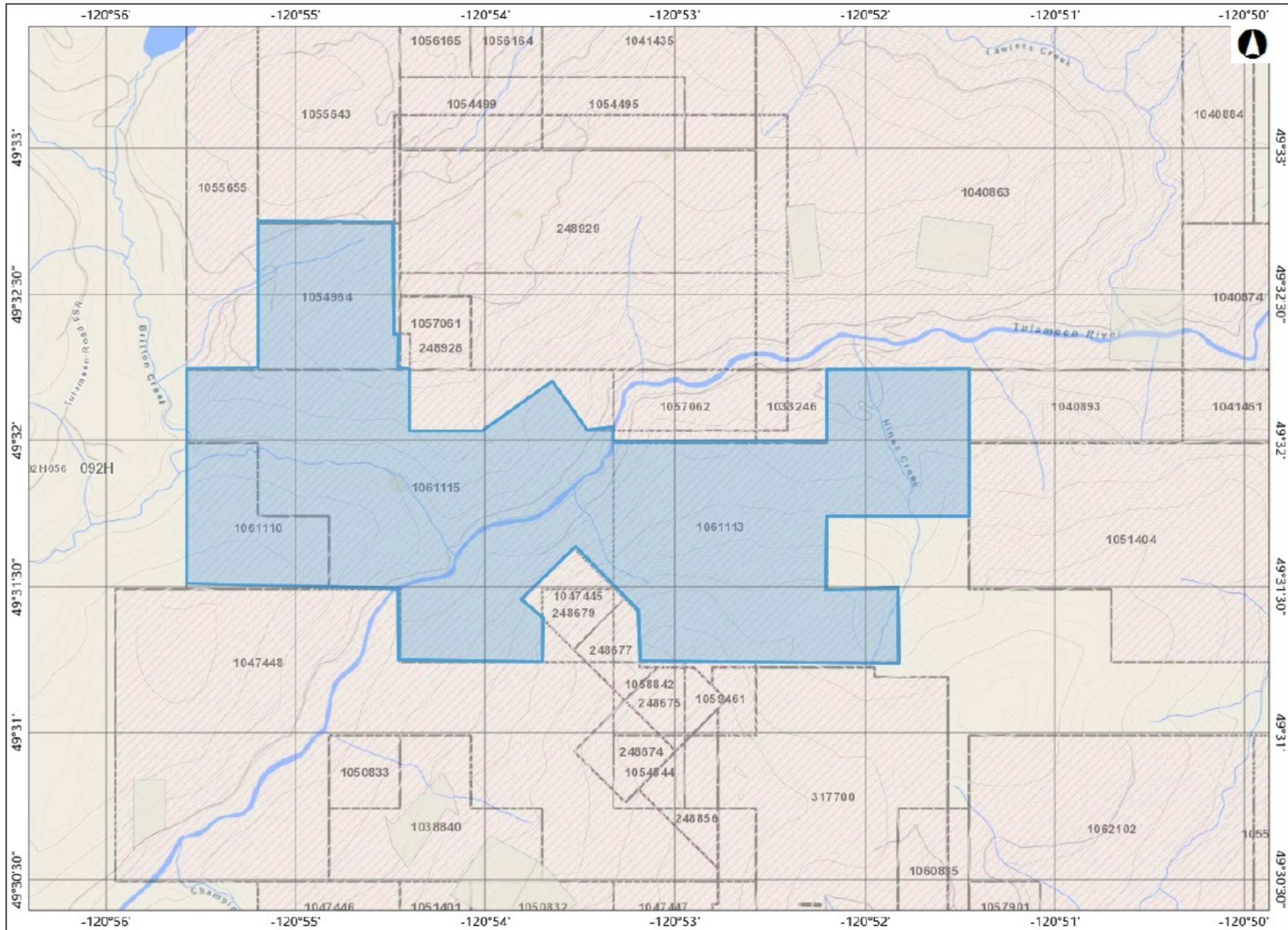
Climate is typical of southern B.C. interior mountainous areas: moderate winters with warm and semi-arid summers. The region experiences moderate precipitation (356 mm per year) due to being located on the lee side of the Cascade Mountains. Snow covers higher elevations starting in November and lasts until late May. There is usually only a light snow cover that averages 22 cm but heavier snowfalls could also occur.

The seasonal snow melt reaches its climax in June and July when it causes heavy water flows on the local creeks and rivers. Starting with the month of August the water level on most of the creeks recedes and they all could be easily forded.

Mining and the forestry industry are mainstays of the local Princeton economy. There are three mining operations surrounding the Tulameen Platinum Project: the important Copper Mountain Mine located 14 km south of Princeton; the Basin Coal Mine located south of Coalmont about 9 km up on the Blakeburn Forestry Road; and, the Treasure Mountain silver-base metals mine located about 17 km southwest in direct line of the Tulameen Platinum Project. Both the Basin Coal Mine and the Treasure Mountain Mine are in care and maintenance.

Infrastructure is good with good logging roads connecting the project area with the community of Tulameen.

Accommodation, food and gas could be provided and sourced from Tulameen and Princeton.



**Fig. 3: Tulameen Platinum Project Mineral Tenements**

**LEGEND**

- National Parks - Outlined
  - National Parks - Colour Fille
  - Ecological Reserves - Tanta
  - Protected Areas - Tantal
  - Recreation Areas - Tantal
  - Conservancy Areas - Tantal
  - Mapsheet Grid (1:20,000)
  - Mapsheet Grid (1:250,000)
  - Land Act Primary Parcels - 1 Filled
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**Dan V. Oancea  
for  
North Bay  
Resources Inc. -  
August 2018**

Datum: NAD83  
Projection: Web Mercator

Key Map of British Columbia



#### 4.4 History and Development

Gold was first discovered in the Similkameen region in 1853 by George B. McClellan but mining commenced only in 1860 when placer mining activities started on the Similkameen River at the Blackfoot Camp located 11 km south of Princeton.

The 1861 discovery of gold in the Cariboo region of British Columbia caused most of the local placer miners to leave the poorer Similkameen diggings for the prospect of new riches. A few Chinese miners stayed behind and continued mining the river for the next 25 years. They had not engaged in any prospecting activity so the 1885 Tulameen Gold Rush took them by surprise.

In 1885, cowboy Johnny Chance noticed gold nuggets in the Tulameen River next to the confluence with Granite Creek, which is one of Tulameen River's southern tributaries. Large quantities of gold were subsequently found on Granite Creek and on the Tulameen River and many of its southern tributaries. Early placer miners noticed the association of gold with a heavy whitish metal but not recognizing it as platinum they have initially discarded it. By 1891, the Tulameen mining district was considered to be the most important producer of platinum in North America.

A city was founded at the confluence of Granite Creek with the Tulameen River. Granite City boasted a population of over 700 people and was a typical city for the gold rush era. The community of Tulameen has developed during the same years, while the community of Coalmont was founded in 1912 when the gold rush subsided and the development of local coal deposits has already started. No hardrock platinum mine has ever been developed in the Tulameen area.

There are no pre-1885 placer mining activity records as many of the miners (Americans and Chinese alike) used to ship the gold out of the country without paying taxes. There is even less information on the quantity of platinum produced in the region as it was usually shipped and sold out of the province. The records after 1885 are 'reasonably complete'. (Bulletin 28, Placer Gold Production in BC)

In the period 1885 to 1950, some 42,719 ounces of gold were reported as being produced in the Similkameen Mining Division. It is considered that a total of 20,000 ounces of platinum have been placer mined in the region in the period leading to 1905.

Production of placer gold on the Tulameen River was first reported in 1877, but it may have commenced as early as 1860. By 1887, most of the shallower gravel deposits mined along the Tulameen River were reported to be exhausted (ARMM 1887). That might be the reason why in 1890 only Indians (over 100) and a few Chinese were reportedly mining the Tulameen River by employing rudimentary methods (rockers). During that year a Chinese miner reportedly recovered 40 ounces of platinum from the river (ARMM 1890).

A few operators persisted in mining the upper section of the river through the early 1900s. One operation on the Schubert lease, 10 kilometres above Tulameen, recovered 620 grams of gold and also some platinum from 1500 cubic metres of gravel (ARMM 1916).

High platinum prices during the WWI and 1920s prompted a revival of placer mining along both the upper and lower sections of the river. Several deposits saw significant production during this time on the upper part of the river. The Sootheran lease, 1 kilometre below Britton (Eagle) Creek, was operated intermittently between 1925 and 1947, producing 3,920 grams of platinum and 530 grams gold between 1926 and 1928. The claim is located on the Company's Tulameen mineral tenements.

Big Bend Platinum Gold Mining Company Ltd. produced 280 grams of gold and 930 grams of platinum from the J. Marks lease, 10 kilometres upstream from Tulameen (ARMM 1928). Sporadic exploration and placer mining occurred during the 1950s, 1960s and 1970s, mostly below the canyon, in between Olivine Creek and the town of Tulameen. Crude gold production for the entire river between 1885 and 1945 is estimated at 297,000 grams (9,548 ounces). (Minfile 092HNE199)

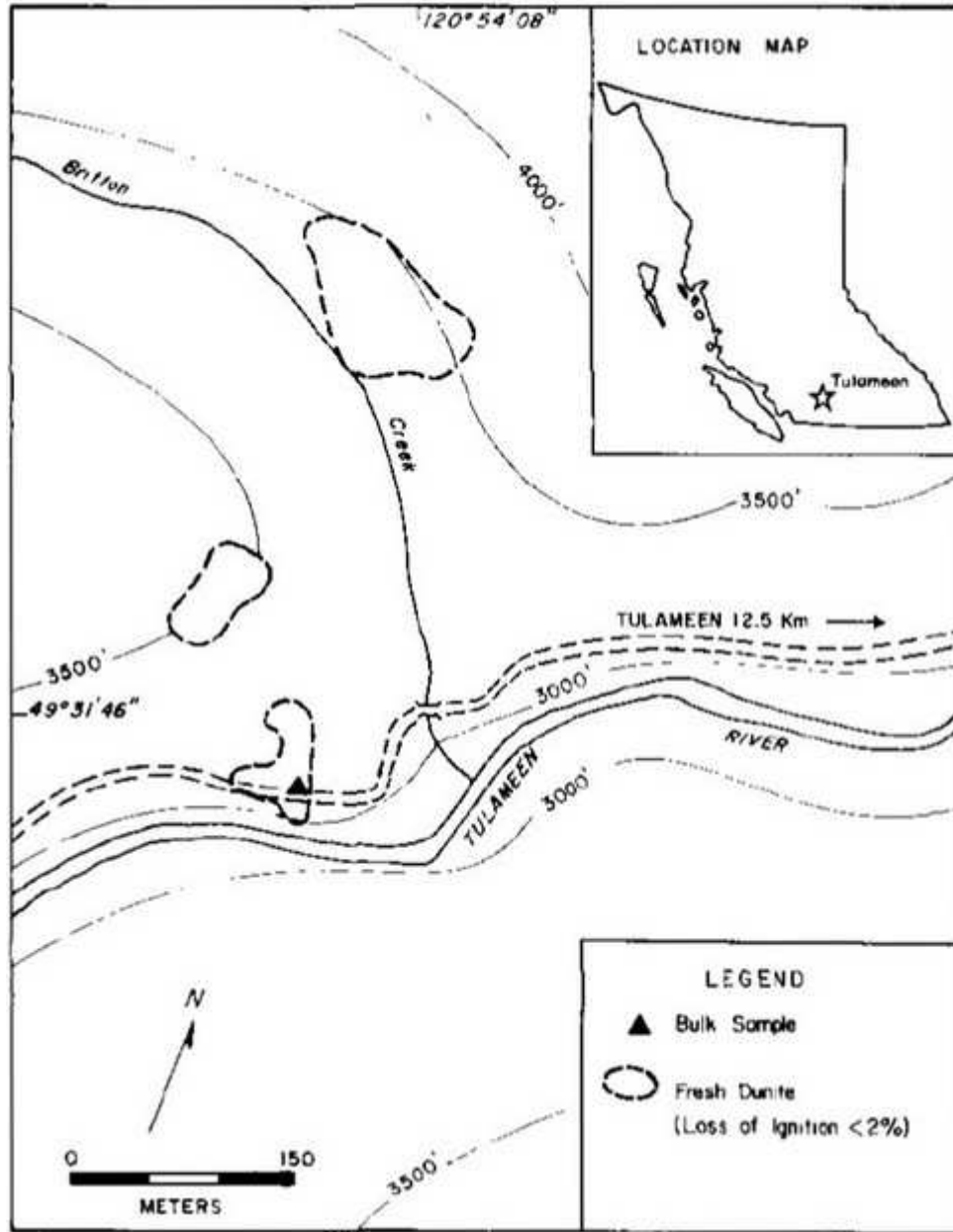
Most of the British Columbia mining production records could be found in the Annual Reports of the Minister of Mines (ARMM).

Gold and platinum placer deposits have been found within the lower 40 kilometres of the Tulameen River. Most of the recorded production and exploration has occurred along two stretches. The upper stretch begins about 2 kilometres west of the Tulameen Village and continues up the river for 12 kilometres to the mouth of Champion Creek. The lower stretch begins at Coalmont, just above the mouth of Granite Creek, and continues southeast for 19 kilometres to Princeton. (Minfile 092HNE199)

The Tulameen River section in between the Olivine (Slate) Creek and Champion Creek is mostly underlain by mineral claims belonging to the Company's Tulameen Platinum Project and it was the richest in placer platinum. On this section the gold to platinum ratio in placer deposits was 1:1 but close to the mouth of the Britton Creek more platinum had been recovered than gold.

In general placer mining activities on the Tulameen River have been concentrated on areas endowed with thinner alluvium (gravels) or on higher elevation benches. This was also characteristic for the narrow rock walled canyon located on the Company's mineral claims. Areas where the Tulameen valley was larger display thicker but poorer gravels which have never been worked for gold or platinum. (Camsel, 1913)

Kemp (1902) noted that the larger platinum nuggets found in river are associated with chromite, olivine and pyroxenes. He was the first to propose that placer platinum was derived from ultramafic rocks that outcrop in an area cut by the river and which coincided with the richest platinum placer deposits.



**Fig 4: Unaltered Olivine Map (White, 1987)**

Important contributions to understanding the geology of the Tulameen Ultramafic Complex and its mineralization were brought by Camsell (1913), O'Neill and Gunning (1934), Findlay (1969), Mertie (1969), St. Louis (1981), and Nixon (1987, 1990).

The platiniferous dunite rocks of the Tulameen Ultramafic Complex continued to attract the attention of numerous explorers. Explorers with notable finds include Imperial Metals (1984-1986), Newmont Exploration (1986), Longreach Resources Ltd (1987-1988) and Diamet Minerals (1986-1989).



The industrial mineral potential for olivine was evaluated by G.V. White in 1986, K.D. Hancock in 1991, and Diamet Minerals during the period from 1986 to 1989.

The carbon dioxide sequestration potential of the Tulameen ultramafic was explored by a series of authors in early 2000s incl. Simandl, G.J. of BCGS who was also involved in studying the magnesium potential of the dunite rocks.

## **5. Geology and Mineralization**

### **5.1 Regional Setting**

The Tulameen Platinum mineral property lies along the western margin of the Intermontane Belt of the Quesnellia tectonostratigraphic terrane. The Quesnell Terrane is a volcano-sedimentary arc terrane that could be found along most of the length of the Canadian Cordillera. The region hosts some of the southernmost exposures of the late Triassic Nicola Group clastic sedimentary rocks, dominated by black argillites, which are intercalated with feldspathic tuffs and tuffaceous sediments. These pass westwards, and probably upwards, into typical Nicola pyroxene-feldspar tuffs, lapilli tuffs and breccias. A sequence of massive feldspar basalt and greenstone flows occurs in the area southeast of the Granite Creek campsite.

The volcanic rocks become more deformed to the west, with the change from massive to schistose rocks being transitional and gradual from east to west as foliation becomes progressively more penetrative and steeper. Both schistose metasedimentary and metavolcanic rocks occur in the aureole of the Eagle Plutonic Complex along the western margin of the map area (OF 2010-06).

The Tulameen Ultramafic-Gabbro Complex outcrops over a 60 square kilometers area and is structurally emplaced into, though probably coeval with, the Nicola Group. Several smaller bodies of diorite-gabbro or pyroxenite also occur in the map area. The structural fabric of the area is north-northwest with westward dipping foliation.

The Tulameen complex is elongated and concordant with the structural grain. The Tulameen ultramafic complex consists primarily of dunite, olivine clinopyroxenite, hornblende clinopyroxenite and gabbroic rocks. Dunite is restricted to the northern part of the complex. Olivine clinopyroxenite envelopes the dunite core and extends southward. Breccia bodies occur within this unit. Hornblende clinopyroxenite occurs generally at the periphery of the complex. Gabbroic rocks are most abundant along the eastern side of the complex (OF 1988-25).

Findlay considers that the ultramafic rocks represent fractional crystallization products of an ultrabasic magma. The main ultramafic zone extends from Grasshopper Mountain south through Olivine Mountain and Lodestone Mountain to Granite Creek (Findlay, 1969).

Volcanic and sedimentary rocks of the Eocene Princeton Group occur in the northern (Tulameen Coal Basin) and eastern (Princeton Basin) parts of the area. They lie unconformably on the Nicola Group and related intrusive rocks. Comagmatic minor intrusions occur throughout the area as ubiquitous intermediate-felsic porphyry dikes.

The local ice movement during the Quaternary glaciation is considered to have been northeast to southwest. Glacial till up to 25 feet (2.4 m) was deposited on the mountainous slopes.

The most recent geological maps covering the area are represented by the BC MEMPR Open Files 2010-06, and 2018-2.

## **5.2 Mineralization and Deposits**

The most important mineralization in the Tulameen area is represented by Platinum Group Metals mineralization (PGM) hosted by ultramafic rocks of the Tulameen Complex. The Complex is an Alaskan-type mafic-ultramafic zoned intrusion characterized by the presence of platiniferous cumulate chromites.

Concentrations of chrome spinel and massive chromitite appear to be distributed randomly throughout the dunite as discrete layers, nodular masses and schlieren up to 1 metre in length and 6 centimeters in width. Associated with the chromite are microscopic grains of platinum minerals, nickel-iron sulphides, chalcopyrite and pyrite (St. Louis et al. 1986)

Most of the PGM mineralization is hosted by the dunite core of the ultramafic intrusion.

As a result of the weathering of the platiniferous rocks of the Tulameen Complex and of the other groups of rocks rich platinum and gold placers have been formed on the creeks and rivers that dissect them. While no hardrock source of gold has been clearly identified to date, the Nicola Group rocks could be one of the most important sources.

The precious metals placers of the Tulameen region have been formed before the onset of the Quaternary glacial period and as a result parts of them were obliterated by the moving ice. The wider sections of the Tulameen River valley have experienced the forming of valley glaciers which also scraped the valley's bottom and deposited glacial boulders resulting in the dilution of the placers along these sections.

As a result, even though the wider sections of the valleys are abutted by productive placers they have been rarely worked because of thicker gravels and lower grades. For example, in 1922 an attempt was made to dam the Tulameen River and work the bedrock immediately below the canyon (and Company's claims) but the bottom was found to be flat because of ice scouring it at winter time (ARMM 1922), or because of the work of a valley glacier in the not too distant past.

Older terraces have been preserved along the Tulameen River and many of them have been early on recognized as having a high tenor. The Hines Creek Placer, which is located on the Company's claims, is at over 900 m in elevation and represents an old Tulameen River bench.

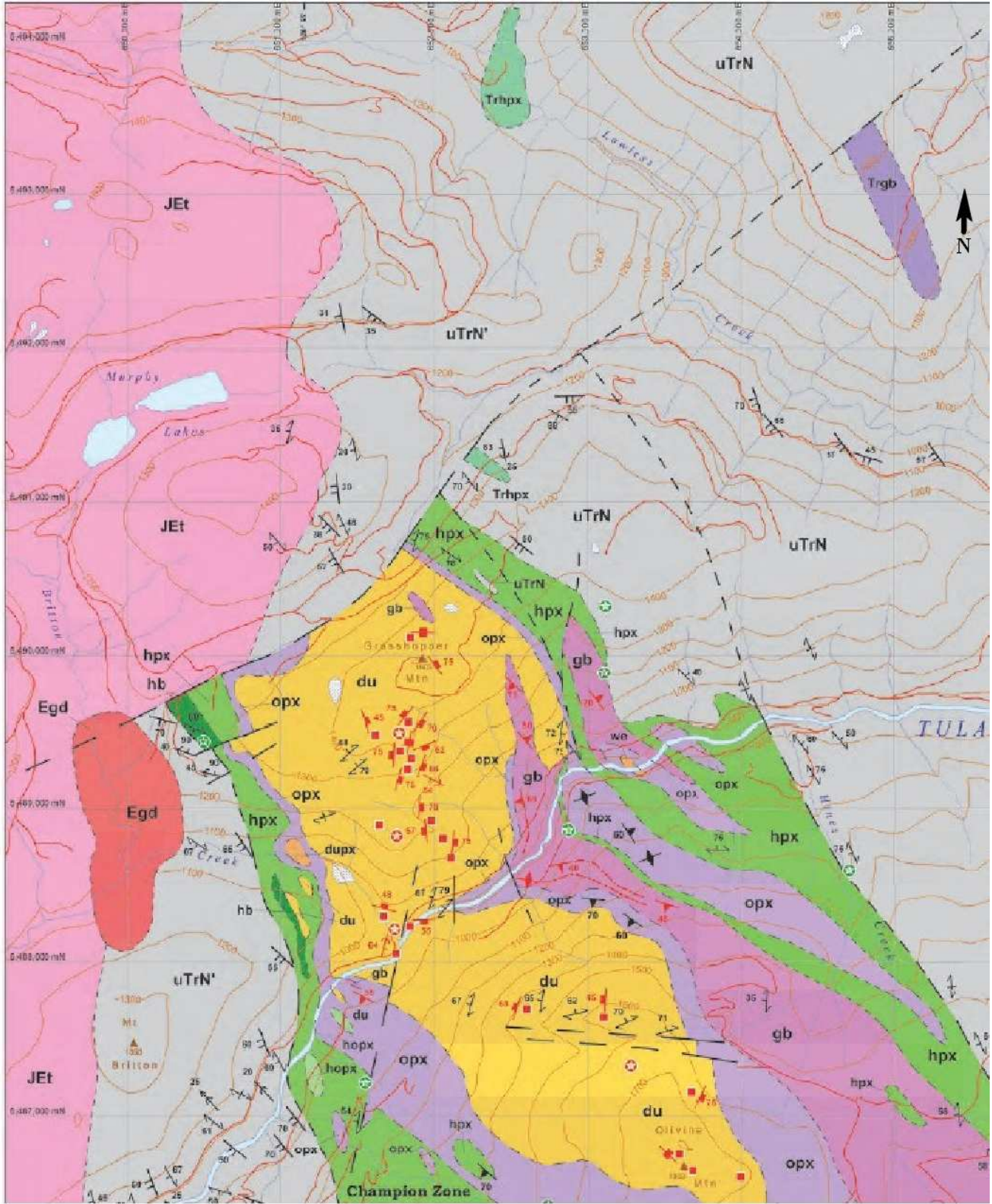
The majority of the gold recovered from the Tulameen River was rough and not worn therefore denoting a local origin. Large platinum nuggets were rare but some nuggets weighing up to 0.5 ounces have been recovered from the Tulameen River mostly from the section that is underlain by North Bay Resources' mineral claims. Typically most of the placer platinum was in the range of 1-4 mm and taking the shape of small rounded pellets. The coarsest and richest platinum was found on the stretch of the Tulameen River in between the Olivine (Slate) Creek and Champion Creek, which coincides with the Company's claims and with the outcrops of platiniferous dunite rocks. (Mertie, 1969).

It was estimated that total platinum production from the Tulameen area exceeded 20,000 ounces of which an important part came from the Tulameen River downstream of the platiniferous dunite rocks of the Tulameen Complex, and also from the Granite Creek.

Other important mineral deposits that were mined starting with 1909 are the Eocene coal deposits of the Tulameen and Princeton Basins. Nowadays the only coal producer in the Tulameen and Princeton Basins is represented by the Basin Coal Mine located 9 km south of Coalmont but the mine is presently on care and maintenance.

Numerous other types of mineral occurrences are described in the Tulameen regional Minfile database. The most important are represented by magnetite deposits in hornblende clinopyroxenite on the Lodestone Mountain (2.84 million tonnes at 24.33% magnetite) and on the Tanglewood Hill (2.84 million tonnes at 16.8% iron). They are hosted by hornblende pyroxenite rocks of the ultramafic complex.

Most of the other Minfile occurrences present in the area are represented by mineralized (copper, lead, zinc, gold, silver) quartz veins and shear zones hosted by the Nicola Group rocks or by gabbro and pyroxenites of the Tulameen Complex. Many of these mineralized zones are hosted in structures parallel to the regional grain.



**Fig 5: Regional Geological Map OF 2018-2 (1:25,000)**

## **LEGEND**

### **LAYERED ROCKS:**

**uTrN:** Nicola Group undivided volcanic-sedimentary rocks

### **INTRUSIVE ROCKS:**

#### **Eocene**

**Egd:** Britton stock granodiorites

#### **Middle to Late Jurassic**

**JEt:** Eagle tonalites to granodiorites

#### **Late Triassic**

**Trgb:** Gabbro

#### **Tulameen Ultramafic Intrusion:**

**gb:** Gabbro

**hpx:** Hornblende clinopyroxenite

**opx:** Olivine pyroxenite

**du:** Dunite

### 5.3 Property Geology and Mineralization

The Tulameen Platinum Project covers the exposed platiniferous dunite core of the zoned Tulameen Ultramafic Complex (TUC) and part of its eastern and western contact zones with the surrounding Nicola Group rocks.

The rocks making up the intrusive TUC are represented by dunite, olivine pyroxenites, hornblende pyroxenites, gabbro and monzodiorites rocks representing a typical Alaskan-type zoned intrusion.

The dunite rock is principally made of forsteritic (magnesium rich) olivine, accessory chromite, and rare diopside. The rock is medium to dark grey, buff weathering and well jointed. The serpentinized (altered) rock contain serpentine, carbonates, magnetite and talc. Concentrations of chrome spinel and massive chromitite appear to be distributed randomly throughout the dunite as discrete layers, nodular masses and schlieren up to 1 m in length and 6 cm in width. Chromitite schlieren are commonly distinguished in outcrop by a pale alteration halo (0.1 to 1 cm). Associated with chromite are microscopic grains of platinum minerals (platinum-iron alloys, sperrylite), nickel-iron sulphides (pentlandite, violarite, bravoite), chalcopyrite and pyrite (St.Louis et al. 1986).

The olivine clinopyroxenites envelop the dunite core of the Tulameen complex. The fresh rock is medium to coarse grained and has a blotchy green and black appearance due to partially serpentinized olivine (<20 per cent serpentine) and deep green clinopyroxene. Sporadic pegmatitic masses contain crystals up to 8 cm across and olivine segregations locally form schlieren (Nixon, 1987).

Breccias within the olivine clinopyroxenite unit occur near the western margin of the dunite. Angular to rounded blocks (<0.5 m) of dunite, pyroxenite and interlayered dunite-pyroxenite are enclosed in a serpentinized pyroxene-rich matrix carrying calcite and disseminated sulphides (mostly pyrite).

The hornblende clinopyroxenite occurs at the periphery of the complex. The fresh rock is medium to coarse grained and contains diopsidic augite, hornblende, relatively abundant magnetite, and minor biotite, apatite and disseminated sulphides; feldspathic variants are extremely rare. Massive magnetite could be found in this type of rocks (Nixon, 1987).

The gabbroic rocks or monzodiorites are distributed erratically on the eastern side of the complex mostly in direct contact with the olivine clinopyroxenite and hornblende clinopyroxenites rocks. The rocks are massive, sometimes well foliated, and at times affected by saussuritization processes which impart it with different shades of green (Nixon, 1987).

Nixon (1987) describes an almost continuous 530 m long section along the Tulameen River, beginning at the eastern margin of the dunite body and passing through olivine clinopyroxenite into the gabbro rocks. The rocks featured in the section are cut by unfoliated hornblende-bearing dacitic and basaltic dykes, probable feeders for Tertiary

lavas in the Princeton Group and Miocene basalts, and contains major tectonic breaks at the dunite-pyroxenite and pyroxenite-gabbro contacts. Two thin gabbro units are also well exposed within the pyroxenite.

Findlay (1963, 1969) concluded from contact relationship that gabbroic and ultramafic units represented two separate intrusions, an early gabbroic mass invaded by an ultramafic body in which dunite was the latest emplaced.

Nixon (1987) considers that the occurrence of pyroxenite dykes cutting dunite, suggests that dunite crystallized prior to the pyroxenites. The main body of gabbroic rocks to the east also predate emplacement of the ultramafic rocks. However there is evidence that points to a protracted history of gabbro crystallization involving more than one influx of parental magma.

The eastern part of the Tulameen Platinum Project straddles the contact between hornblende pyroxenites rocks of the ultramafic complex and the Upper Triassic undifferentiated sedimentary and volcanic rocks of the Nicola Group. According to the most recent geological map (OF 2010-6) the Hines Creek lies on the contact zone between the aforementioned units.

The transitional or contact zone in between the ultramafic rocks and the Nicola Group rocks is sometimes hosting PGM, gold, and copper mineralization.

Possible disseminated sulphides exist in association with silicification and shearing near contact zones.

Chromitite schlieren are 0.5 to 2 cm in width and 5 to 25 cm in length and the most extensive concentrations were reported on the southern flank of the Grasshopper Mountain (part of them on the Company's mineral claims). Chromitite schlieren represent vestiges of formerly rich extensive cumulate layers that have been subjected to tectonic stress. The platinum arsenide mineral sperrylite can be found as fracture filling in chromites (Kemp, 1902)

The following mineral occurrences are described in Minfile and/or historic assessment reports as being located on the Company's 100% owned mineral tenements:

The **Ridge Zone** (Minfile 092HNE207) platinum-chromite showing outcrops along a northwest-trending ridge on the southern slopes of Grasshopper Mountain, 10.5 kilometres west-southwest of the town of Tulameen.

The ridge is underlain by dunite and peridotite of the Early Jurassic Tulameen Ultramafic Complex, a zoned Alaskan-type intrusive complex. The dunite contains relatively abundant chromite in a zone trending northwest for 300 metres and varying up to 100 metres in width. Chromite comprises up to 20 per cent of the dunite in this zone (AR 17170). The mineral forms irregular lenses up to 20 centimetres long and 10 centimetres wide, fracture fillings up to 2 centimetres wide and primary layers of magmatic origin up to 15 centimetres thick.



**Plate 2: Old Trench on the Ridge Zone**

Elevated platinum values are found in the southern half of this zone of chromite mineralization, with assays of up to 1.445 grams per tonne platinum (AR 17170). Analyses of eight samples taken in the southern half averaged 0.418 gram per tonne platinum (AR 15516, 17170). Seven samples from the northern half assayed up to 20 percent chromium, yet yielded less than 0.050 gram per tonne platinum (AR 15516, Map 2).

This mineral occurrence was sampled and mapped by Newmont Exploration of Canada Ltd. in 1986 and Tiffany Resources Incorporated in 1987.

The **Creek Zone** (Minfile 092HNE128) platinum-chromite showing occurs at the confluence of Britton (Eagle) Creek with the Tulameen River, 10.5 kilometres west-southwest of the town of Tulameen.

This occurrence is hosted in the dunite-rich core of the Early Jurassic Tulameen Ultramafic Complex, a zoned Alaskan-type intrusive complex. Mineralization occurs in a serpentine breccia zone containing fragments of dunite / peridotite cemented by a matrix of serpentine. The zone is 180 metres long, up to 155 metres wide and lies mostly north of the river, on either side of the creek.

Chromite occurs in the breccia and the surrounding dunite in areas of stronger magnesium alteration, mostly along Britton Creek. The mineral forms irregular lenses up to 20 centimetres long and 10 centimetres wide, fracture fillings up to 2 centimetres wide and primary layers of magmatic origin up to 15 centimetres thick.





**Plate 3: The Creek Zone on the Tulameen River's Northern Bank**

Platinum occurs in elevated values in the breccia and in the surrounding dunite / peridotite. Two samples from the breccia assayed 2.150 and 4.400 grams per tonne platinum (AR 17170). Values of up to 0.481 gram per tonne platinum occur west and south of the breccia zone, in peridotite with little visible chromite (AR17170, Fig. 3).

The breccia zone is noted to be practically free of sulphides (AR17170), yet earlier reports suggest the presence of chalcopyrite and millerite. Magnetite, sperrylite and asbestos have also been reported in the past. The writer's 2013 survey of the zone returned assays of up to 0.195 per cent copper, while the 2018 assays returned 0.024 per cent copper, 0.124 per cent nickel, 0.25 per cent chromium (sulphides including pentlandite present).

The showing was mapped and sampled by Imperial Metals Corporation, Newmont Exploration of Canada and Tiffany Resources between 1984 and 1987.



**Plate 4: The South Zone at the foot of the Olivine Mountain**

The **South Zone** occurs immediately south of the Creek Zone on the other/southern side of the Tulameen River. It lies at an elevation of 914 m to 1,067 m on the northern slopes of the Olivine Mountain.

The highest platinum value is 1.384 grams per tonne and the average of the 30 rock samples which make up the zone is 0.281 grams per tonne. The zone appears to be 1,000 meters in length and the opposite ends of the zone returned platinum assays of 0.138 grams per tonne and 0.125 grams per tonne.

The **H & H** showing (Minfile 092HNE205) occurs on Hines Creek, 1.1 kilometres southeast of the creek's confluence with the Tulameen River and 7.5 kilometres west-southwest of Tulameen.

The occurrence is hosted in hornblende clinopyroxenite of the Early Jurassic Tulameen Ultramafic Complex, a zoned Alaskan-type intrusive complex. The showing lies immediately west of the contact with metamorphosed volcanics and sediments of the Upper Triassic Nicola Group.

Medium to coarse-grained, black hornblende clinopyroxenite, comprised of augite and hornblende with minor biotite and magnetite, outcrops over a 5 by 4 metre area 5 metres east of the creek.

The clinopyroxenite is cut by a pegmatite zone 0.9 metre wide containing hornblende crystals up to 5 centimetres and minor interstitial feldspar. The zone strikes 010 degrees and dips 70 degrees east.

Stronger mineralization is present in the pegmatite, which contains up to 20 per cent patchy disseminated pyrite and up to 2 per cent disseminated chalcopyrite. The surrounding clinopyroxenite contains up to 20 per cent disseminated pyrite and trace chalcopyrite, in bands to 3 centimetres wide. A grab sample of pyroxenite, with 10 per cent interstitial pyrite and malachite staining, analysed 3.603 per cent copper, 0.066 gram per tonne gold, 17.1 grams per tonne silver, 0.247 grams per tonne platinum and 0.730 grams per tonne palladium (AR 17280, page 9, sample W461).

A quartz vein, up to 10 centimetres wide, outcrops 50 metres to the south. A grab sample of the vein assayed 0.810 gram per tonne gold and 0.025 grams per tonne platinum (AR 17280, page 9, sample W637).

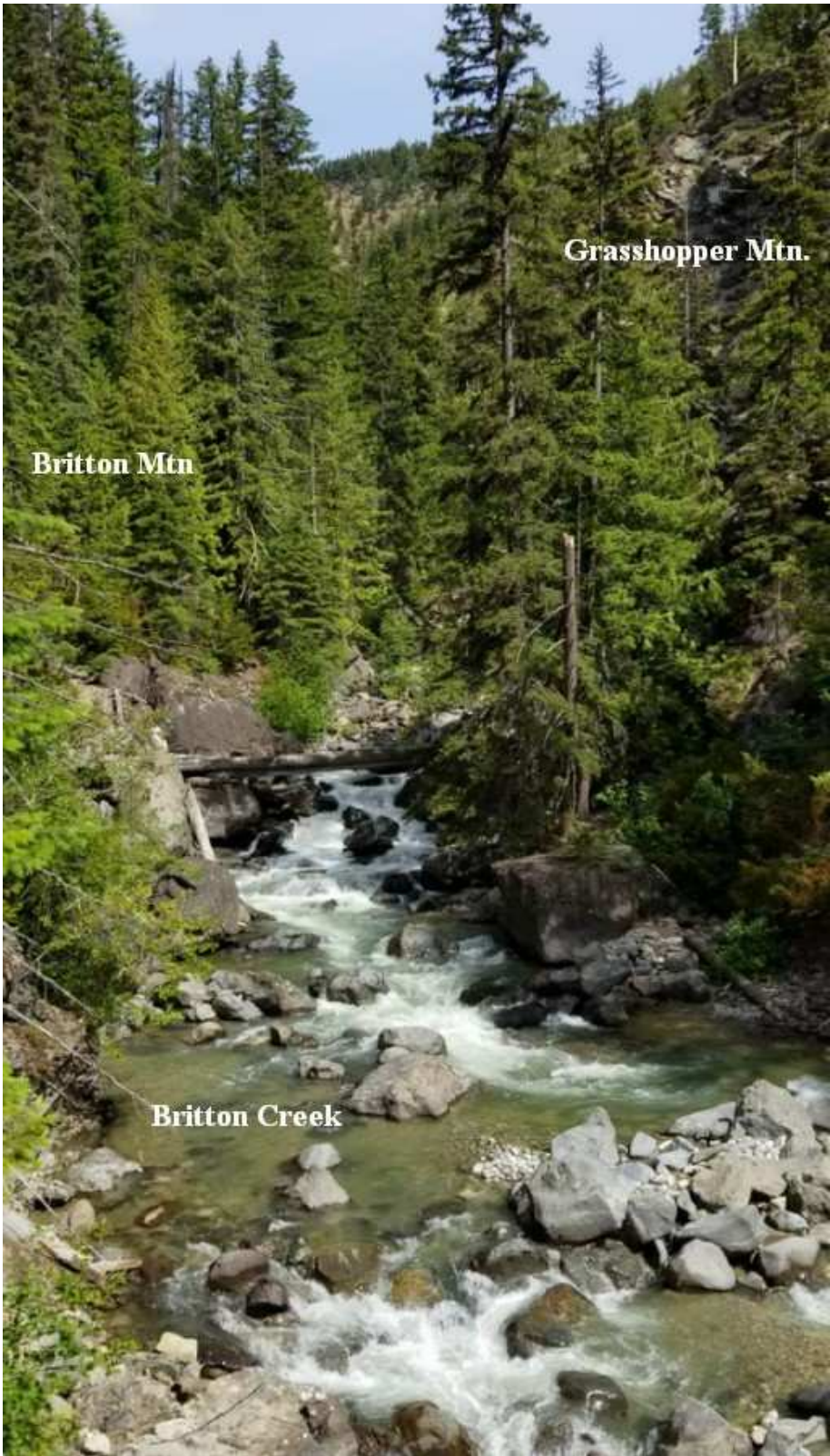
The copper showing was discovered in 1987 by North American Platinum Corporation while exploring for platinum in the Tulameen Ultramafic Complex.

Highly anomalous platinum, palladium, chromium and gold zones in stream sediment samples and clino-pyroxenites have been identified by numerous explorers in the H&H showing area e.g. a weak gold anomaly was discovered proximal to the faulted contact of the Tulameen Complex with Nicola Group volcanic and metasedimentary rocks (AR16323)

Similar to the H&H showing is the **Badger showing** (Minfile 095HNE210) located immediately adjacent or bordering the Company's mineral claim 1061115. It's exact position has not been precisely determined on the field yet. It is described as " a 210-metre wide band of coarse pyroxenite contains disseminated blebs of chalcopyrite and pyrite. Selected grab samples assayed between 1 and 1.5 per cent copper and trace to 2.4 grams per tonne gold". It is possible that an extension of the mineralized zone could be also found on the Company's claims.

The **Britton Creek Contact Zone** is located on Britton Creek 1.1 kilometer to 1.5 kilometers above its confluence with the Tulameen River. It is a 0.5 kilometer (500 meters) wide zone of extensive outcrop exposures of interlayered units of Nicola Group and hornblende clino-pyroxenites of the Tulameen Ultramafic Complex. No brecciation was remarked in the outcrops. Contacts strike at about 140 degrees. Individual sections of each unit are a minimum of 30 meters in width. Several 5 to 10 meters wide fine grained siliceous zones of Nicola rocks exhibit vivid internal color. The varicolored sections are always bordering pyrite rich zones hosted by pyroxenites or Nicola rocks.

Three main rusty outcrops were identified on the southern side of the creek. Grab rock samples collected from the pyrite rich zones assayed up to 0.484 grams per tonne platinum and 0.462 grams per tonne palladium (AR17325)



**Plate 5: Britton Creek**

A granodiorite stock of Eocene age is outcropping up creek from the Contact Zone.

The Britton Creek Contact Zone is continuing under till cover towards the eastern side of the Mt. Britton where a brecciated contact zone containing anomalous platinum and palladium values has already been identified (AR17325)



**Plate 6: Grasshopper Mountain Dunite Cliffs**

The **Grasshopper Mountain Olivine** prospect (Minfile 092HNE189) is located north of the Tulameen River. The Grasshopper Mountain dunite body was sampled and analyzed for its industrial mineral potential.

Mapping by Findlay (1963), outlined areas with 20 to 80 per cent serpentinization. The degree of serpentinization decreases, in general, from east to west. Essentially unaltered olivine is required for industrial purposes (Appendix 2)

Detailed mapping and sampling of the least altered zone of the core (less than 20 per cent serpentinized) was done in 1986 by G.V. White of the Geological Survey Branch. He found "Three zones with loss-on-ignition less than 2 per cent have been identified north of the Tulameen River on the southwest slopes of Grasshopper Mountain.

The northern zone, approximately 100 metres long by 75 metres wide, is open to the east.

A second, central zone is approximately 50 metres long by 40 metres wide and open to the west.

The third, irregular zone, cut by the Tulameen River road, is approximately 100 metres long by 65 metres (maximum) wide."

Samples taken from **Olivine Mountain** had loss on ignition values in excess of 2 per cent. Sampling was not carried out on the southeastern slopes of Grasshopper Mountain or the northeastern slopes of Olivine Mountain due to the difficulty of access. These areas are within the less than 20 per cent serpentinized zone as outlined by Findlay (1963) and therefore have the potential to contain fresh olivine.

In 1989, DiaMet drilled the eastern side of the Britton Mountain and "outlined a zone comprising fifteen million metric tons of geologically indicated olivine reserve, including marginal grade, to a depth of approximately 170 m. This zone measures 105 m by 270 m flanking the north side of the Tulameen River and straddling the access road into the property". (AR22527 & Appendix 2)

## 6. Field Survey

The 2018 prospecting and sampling survey was focused on assessing the olivine mineral potential of the mineral claims as well as on assessing the precious metals content of the Tulameen Ultramafic Complex rocks.

In an effort to validate historic loss-on-ignition results sampling traverses were undertaken on the Britton Mountain. The central part of the Tulameen project which is centered on the Britton Creek hosts the core of the ultramafic complex represented by dunite rocks and this is the part that was traversed and sampled.

Other traverses accompanied by rock sampling were undertaken along the main Tulameen FSR especially close to the contact zone of the ultramafic intrusion with the Nicola Group rocks.

The part of the Tulameen Platinum Project that lies to the north of the Tulameen River which is located on the eastern slopes of Britton Mountain and on the western, southern and southeastern slopes of the Grasshopper Mountain was surveyed. The part of the property that lies closer to the river is traversed by the Tulameen FSR. The road provides good access to the numerous outcrops located on the northern side of the road, which consist mostly of bluffs and rock scree.



### **Plate 7: Hines Creek Road**

Thirteen samples were submitted to the lab of which seven dunite rock samples were assayed for loss-on-ignition (LOI), four assayed for Gold-PGM, two fire assayed for Gold only, and six assayed for a range of multi-elements that included Magnesium, Chromium, Cobalt and Nickel.

Access to the southern part of the property was also assessed during the field survey. The Britton Creek Contact zone can be accessed during the low water season which usually starts in August.

### **6.1 Results**

Dunite and peridotite rock samples returned loss-on-ignition (LOI) assays in the range of 1.93 to 18.0 %. The Britton Mountain LOI values confirmed historic assay results obtained by Diamet.

Other than the Creek Zone, which is highly altered, the serpentinization / alteration increases outwards from the fresh dunite core, which is centered at the confluence of Britton Creek and Tulameen River.

Britton Mountain dunite samples returned platinum assays as high as 0.509 grams per tonne.

Tulameen FSR rock outcrops close the eastern side of the claims witness the transition zone from dunite to pyroxenites and gabbro (Station 576 to the eastern side of the claims). The contact zone is sometimes brecciated and at times cut by small (1.5 m) leucocratic volcanic rock dykes.



Fig. 6 - Tulameen Project Sampling Map 1

LEGEND

Stn 567: Station 567  
03: Sample T-18-03

Dan V. Oancea for North Bay Resources Inc. - August 2018

GARMIN

01-Jan-10



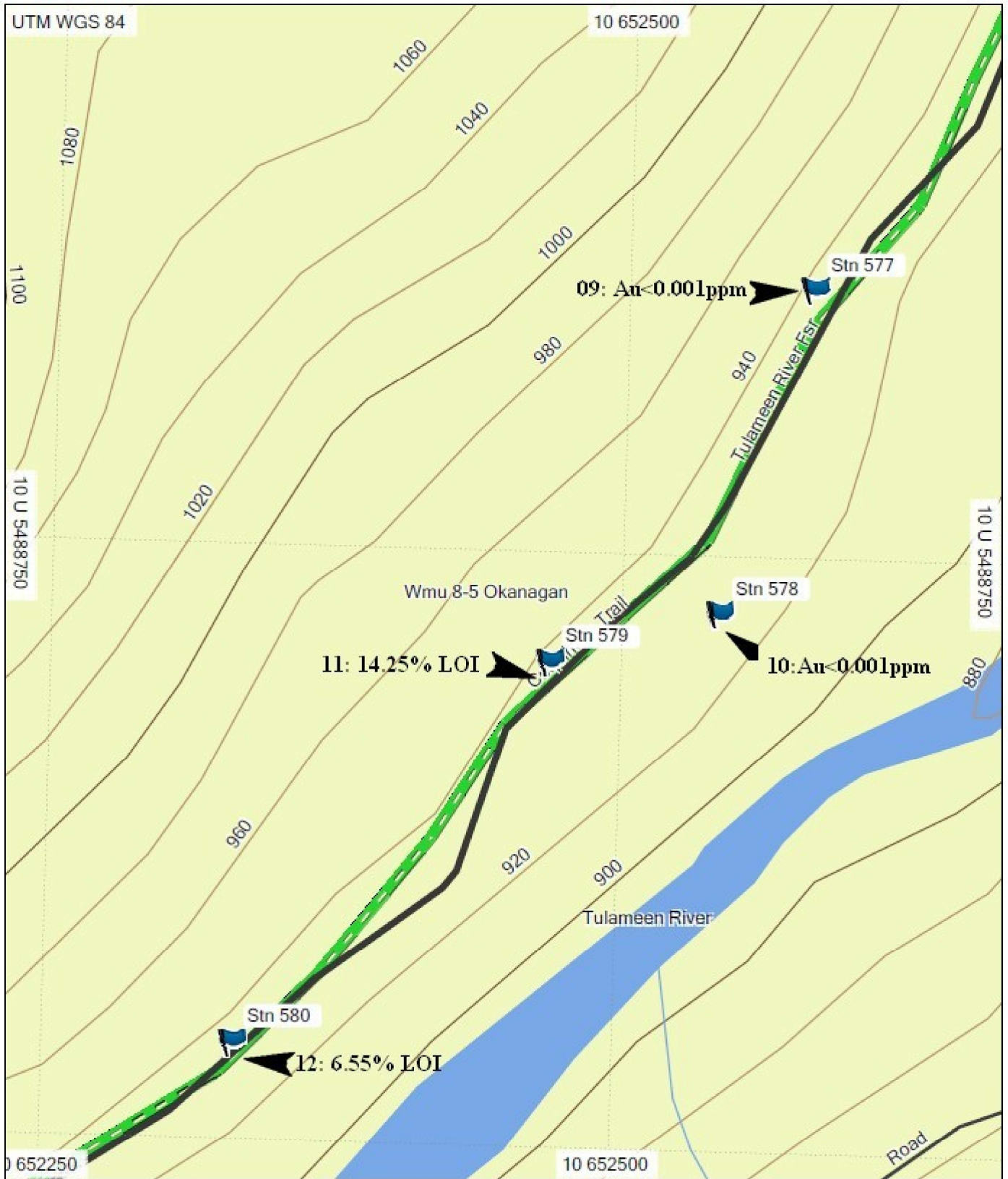
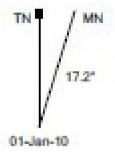


Fig. 7 - Tulameen Project Sampling Map 2

0 m 35 m 70 m 105 m 140 m



LEGEND

09: Sample T-18-09

Dan V. Oancea for North Bay Resources Inc - August 2018

Mineralized Nicola Group rock floats and seemingly mineralized leucocratic intrusive (dyke) samples were collected near the eastern side of the claims along the Tulameen FSR but they have not returned significant gold values.

Other significant assay results for the dunite rocks were nickel over 0.12%, cobalt over 0.01% , and chromium assays reported as over the analytical method's detection limit (>1%).

Magnesium assay results for the whole dunite rock were in the 24% to 25.9% range, which are equivalent to 39.79% to 42.94% magnesium oxide.

## 7. Discussion and Conclusions

### 7.1 Olivine Exploration Target

Considering that any future economic development of the Project would take into account the potential presented by the mineral olivine the writer considers that at this stage it is important to quantify an exploration target for the mineral olivine.

The writer is of the opinion that estimating an exploration target would help in the process of planning expenditures necessary for the identification, delineation and for developing of an olivine mineral resource at the Tulameen Project.

By taking into account recent geological maps of the area created by the BCGS and considering the final depth of a possible mining operation to about or below 900 m in elevation (Tulameen River's elevation) the writer estimates that a **potential exploration target for the mineral olivine** contained in the dunite rocks located within the Project Area could be in the **225 million tonnes to 240 million tonnes range**.

Taking into consideration a 60% conversion rate of the possible mineral resources to mineral reserves the writer proposes that a **possible mineable olivine mineral resource within the Project area could be in the 135 to 145 million tonnes range**.

Nevertheless the real potential, quality and size of a possible mineable olivine mineral resource at the Company's Tulameen Project has to be determined through mineral exploration, which includes drilling, and through economic and engineering studies, therefore the proposed exploration target should not be relied upon until such time that enough exploration data is available to quantify such a target.

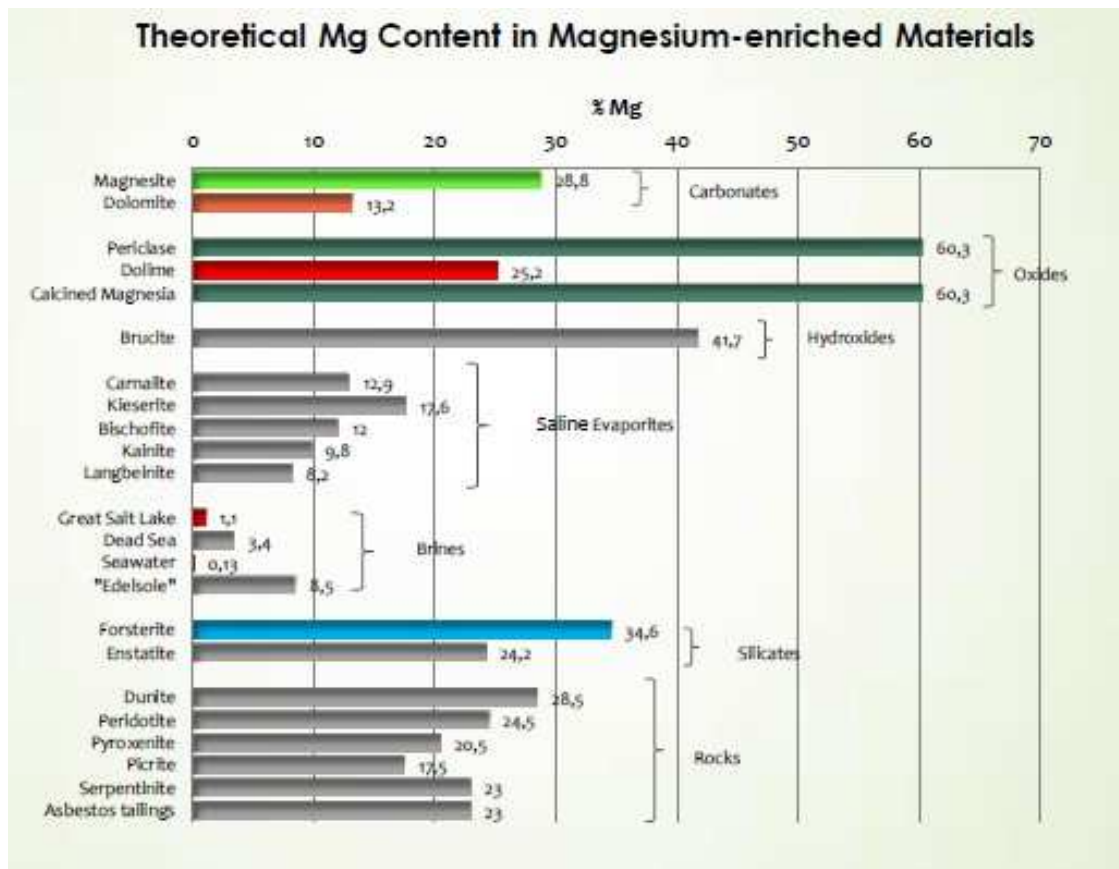
## 7.2 Olivine - Magnesium Raw Material

According to various geological publications more than 80 minerals are known to contain over 20 per cent magnesium (Mg) but only a few of them have been mined and processed for the purpose of producing magnesium metal and its chemical compounds.

The writer's magnesium assay results (including previous assessment work) for the whole dunite rock from both Britton Mountain and Grasshopper Mountain were in the 23.1 to 27.7 per cent range, which is the equivalent of 38.30 to 45.93 per cent magnesium oxide (MgO). Most of the assay results though fall in the 25.0 to 26.0 per cent magnesium. The conversion factor magnesium to magnesium oxide is 1.6581.

The following paragraphs present a few facts related to the raw material options, magnesium processing characteristics, magnesium uses and market considerations that could affect the decision of mining and processing an olivine deposit.

There are different processing options for each of the magnesium raw materials with each of them characterized by different costs, processing requirements and environmental footprint.



**Fig. 8 - Magnesium content in Mg-rich minerals**

The most important factor that dictates the combination of raw material / processing method is represented by the price of magnesium.

Dolomite is a widespread carbonate, available on every continent and is the main magnesium ore used in China. Magnesite has a higher Mg content than dolomite, however, large magnesite deposits are geographically restricted. (Simandl, 2006)

Olivine is considered to be an economic alternative for the production of high quality magnesium metal, magnesium refractories, fertilizer components, base material for pure magnesium chemicals.

Three main processing options exist for manufacturing magnesium (Frederiksen, Jens S. 2016 presentation):

- **Electrolytic Process**

- Costly preparation of cell feed originating from brine or seawater;
- Very large units of 80,000 to 100,000 tons/year to make it viable;
- Largely dependent on cheap available electrical power.

- **Silico-thermic (Pidgeon) process**

- Feedstock prepared from dolomite (carbonate of magnesium) by calcining (heating to 1,000° C to remove CO<sub>2</sub>);
- Production units have small diameter closed pipes (retorts) with nominal capacity of only 18-22 kg per retort per 10-12 hours run cycle;
- Low reaction temperature obtained by using costly iron silicon alloy as reducing agent leads to relatively slow reaction rate;
- Depends on prevailing price of energy and of costly ferrosilicon alloy.

- **Boule Carbothermic Process**

- Feedstock consisting of MgO and carbon prepared from carbonate or silicate of magnesium by calcination after acid dissolution. The MgO contains up to 60% recoverable metal with virtually no solid waste.
- Previous problems of other carbothermic methods of recovering metal from gaseous Mg/CO mixture solved using Boule Carbothermic Metals patented and proprietary nozzle and cool zone technology.

The electrolytic process is to be used at the new Qinghai Chinese plant. The Chinese are usually using the energy intensive (and highly polluting) Pidgeon process.

The carbothermic process is suitable and recommended for processing olivine mineral deposits.

Olivine is considered to be a raw material with a significant non-magnesium component but with a potential to produce very low cost magnesia. The Fig 9 diagram shows a conceptual flow sheet for the acid treatment of olivine.

After acid digestion, the insoluble solids will largely be micro silica, which is extensively used in concrete constructions. From the solute, nickel and iron can be precipitated out, leaving only magnesium salt in the solution. The magnesium salt can be recovered by removing the water. If used for magnesium production an additional step which produces MgO and recover the acid for recycling is necessary.

**By- products** in this case could be:

- **Microsilica;**
- **Nickel sulphide;**
- **Iron sludge;**
- **Magnesium chemicals.**

Other important **by-products in the case of Tulameen olivine** are **Platinum Group Metals, Cobalt, Chromium, Copper and Gold.**

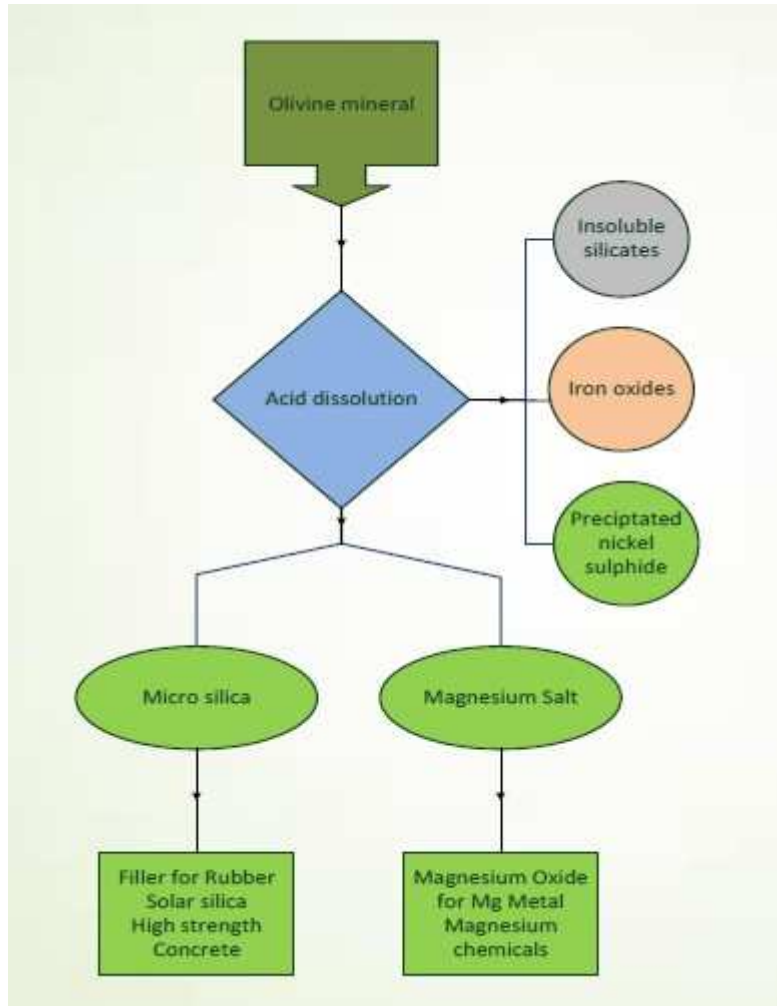
Some of the process products **uses** are listed below:

- **Magnesia (MgO):** High quality refractories, Mg Agro-Chemicals, Magnesium metal, Mg(OH)<sub>2</sub> flame retarders;
- **Micro Silica:** High strength concrete, filler for rubber, solar grade silica;
- **Iron Sludge:** Portland cement, pigments;
- **Ammonium Sulphate:** Fertilizer, textile dye chemicals.

On a separate note the carbon dioxide generated by the aforementioned process can be offset by the carbon credits gained due to the mineral sequestration properties of olivine and serpentine which are natural CO<sub>2</sub> sinks.

Magnesium is an industrial metal that is enjoying a wide range of applications.

Magnesium alloys are in use around the world in a variety of different applications. It is a preferred material when looking for weight reduction without compromising overall strength. The vibration damping capacity is also beneficial in applications in which the internal forces of high-speed components must be reduced.



**Fig. 9 - Olivine Acid Leaching Diagram**

According to the International Magnesium Association (IMA) the most common magnesium applications are:

- Aircraft and missile components;
- Aircraft engine mounts, control hinges, fuel tanks, wings;
- Automotive wheels, housings, transmission cases, engine blocks;
- Bicycles and other sporting goods equipment;
- Equipment for material handling;
- Ladders;
- Laptops, televisions, cell phones;
- Luggage;
- Portable power tools, chainsaws, hedge clippers, weed whackers;
- Printing and textile machinery;
- Steering wheels and columns, seat frames;
- Magnesium alloys have also been used as a replacement to some engineering plastics due to their higher stiffness, high recycling capabilities.

USGS reports that in 2017 the leading use for primary magnesium metal, which accounted for 34% of reported consumption, was in aluminum-base alloys that were used for packaging, transportation, and other applications. Castings accounted for 30% of primary magnesium metal consumption, desulfurization of iron and steel, 22%; wrought products, 6%; and other uses, 8%. About 52% of the secondary magnesium was consumed for structural uses and about 48% was used in aluminum alloys.

The United States has no stockpiles of magnesium.

In May 2018, the Department of the Interior published a list of 35 mineral commodities considered critical to the economic and national security of the United States.

Magnesium is one of the minerals listed as critical for the U.S. economic and national security.

The magnesium market has been dominated by China because of their cheap workforce, lax environmental regulations and low energy prices. However that could change due to the closing down of pigeon production facilities that weren't able to satisfy minimum environmental requirements enforced by the government and because of increased energy costs - the Chinese production facilities and methods are extremely energy intensive.

During the first quarter of 2018 magnesium prices in China and Europe were in the \$2,400 to \$2,500 per metric tonne range (USGS, 2018).

Magnesium market growth is expected to average 3.4 per cent per year, reaching 1.2 million tonnes per year in year 2020 (Roskill).

The titanium industry of Russia, Ukraine and Kazakhstan is expected to consume most of the magnesium according to some analysts.

Roskill considers that four companies that own advanced magnesium projects might bring them online before 2020 and those include the Qinghai Salt Lake Mine (magnesium rich lake brines), and SilMag olivine (Norway).

### **7.3 Olivine Industrial Mineral**

Primary uses for olivine incorporate the refractory, chemical, strength, thermal conductivity and high density properties of the mineral. Major consumers of olivine are steel smelters and foundries. Secondary users are brick, tile, concrete, aggregate and abrasives manufacturers (OF 1991-09).

The Loss-on-Ignition test consists in heating up a sample until it loses its water or volatiles that are related to specific minerals. In the case of dunite (olivine rock) there is a strong correlation between LOI values and the rock content of serpentine minerals (serpentine contains water of crystallization). The higher the LOI the higher the content of serpentine minerals. Serpentine minerals are considered contaminants and they are not desirable in commercial olivine applications.

Commercial olivine specifications include a loss-on-ignition (LOI) less than 2%. High magnesium levels are preferred with a minimum of 45 per cent MgO. Finally, other oxides should be below 15 weight per cent in total and iron content below 10%. Unaltered Tulameen dunite rocks exceeded all these specifications and foundry testing indicated that it favourably compares with other deposits worldwide (OF 1991-09).

G.V.White (1987) and OF 1991-09 mapping highlighted unaltered (not serpentinized) dunite rocks having less than 2% LOI in the Mt. Britton area and southwest of the Mt. Grasshopper in open ended areas. This would represent direct shipping olivine that meets commercial specifications. Most of these areas are part of by the Company's Tulameen Project.

Because of the steep terrain White did not map either the Ridge Zone or the southern part of the Grasshopper Mountain. The 2013 and 2016 surveys encountered fresh or slightly serpentinized dunite/olivine in most of the southern and western Grasshopper Mountain occurrences that had been visited.

The confluence of Britton Creek with the Tulameen River area features an intense zone of serpentinization ('brecciation') - i.e. the Creek Zone. A rock sample collected from 50 m above the bridge returned a 4.61 per cent LOI. (AR36194). Present survey assays of the zone returned a 6.55% LOI value.

In 2016, the part of the Britton Mountain that is covered by the company's claims and is close to the road was sampled and returned loss-on-ignition values of 1.69 per cent to 3.44 per cent ( AR36194).

The writer's 2018 Britton Mountain survey indicated that LOI values are lower (<2 per cent) in locations that are farther away from the highly serpentinized Creek Zone (LOI 7.73 per cent to 18.0 per cent) .

The Grasshopper Mountain ridge zone loss-on-ignition located on the Tulameen Platinum claim (1044312) was for the first time assessed in 2016. Assay results were lower than expected (considering historic assessments) being in the range of 1.86 per cent to 3.16 per cent (2.54 per cent average) - AR36194.



The part of the Grasshopper Mountain close to the Tulameen FSR located east of the Britton Creek and featuring cliffs and extensive rock slides was also sampled by the writer in 2016. It assayed 3.35 per cent to 10.45 per cent LOI (5.72 per cent on average excluding the westernmost 10.45 per cent sample). The degree of serpentinization increases eastward. (AR36194)

Assay results for samples collected within the same area during the 2018 field traverse indicated the same alteration pattern - a western sample presenting a 6.55 per cent LOI, while another eastern sample returned a 14.25 per cent LOI.

There is also additional potential for unaltered dunite rocks on the northern slopes of the Olivine Mountain. Part of these areas are also covered by the Company's mineral claims but they have not been surveyed yet as they are in steep and covered ground. They could be accessed from the Tulameen Olivine FSR and by following some old forestry roads.

In 1989, Diamet Minerals (the original discoverers of diamonds in North America) reported on an exploratory testwork of beneficiation of olivine from the eastern side of the Britton Mountain, which featured partially serpentinized dunite rock. The method (wet gravity separation) involved was not able to produce a commercial olivine concentrate (LOI < 2%) in cases where the feed had a LOI >3.5%.

As reported in AR22527, a drill-indicated historical olivine resource was estimated by Diamet in 1989. The company outlined a potential deposit of 15 million tonnes of olivine by taking into consideration a 105 m x 270 m x 170 m (depth) zone, only (AR27009A). Since the dunite core of the present-day North Bay property covers a wider area than that which was originally drilled by Diamet in 1989, it is believed that the historical drill-indicated estimate of 15 million tonnes olivine may be significantly expanded upon by future drilling and exploration.

The report further states that the tested serpentinized dunites could produce a clean commercial olivine concentrate by grinding to -100 mesh and possibly by using the flotation method.

The results of the 2016 and 2018 surveys indicated that extensive dunite / peridotite rocks having a less than 3.5 per cent LOI exist on the company's claims, and according to the Diamet study they were suitable candidates for upgrading to commercial olivine by using their antiquated technology. At the same time the olivine (dunite) rock above 3.5 per cent LOI can also be subjected to a modern beneficiation process, which could also result in the production of commercial olivine.



**Fig 10: Olivine Production by Country**

Numerous studies have been completed on the topic of the beneficiation of serpentinized olivine - some of them worked with 29 per cent LOI olivine. The tests were successful in obtaining commercial olivine concentrates by using a variety of beneficiation methods ranging from gravity, heavy media separation, and flotation. One has also to consider the significant advances made in metallurgy and mineral beneficiation during the last few decades, which resulted in improved recovery and significantly reduced processing costs.

It is beyond the scope of the present report to discuss the viability of any of these beneficiation methods but the writer considers that **a combination of these methods could result in the production of high quality commercial olivine from the company's Tulameen Project.** (Lewis R.M., 1970; McDaniel W., 1979; Wells W.G., 1959)

In conclusion, there is a good potential for the identification and development of an economic industrial olivine deposit on the part of the Grasshopper Mountain, Britton Mountain and Olivine Mountain covered by the Company's Tulameen Project.

## 7.4 Carbon Dioxide Mineral Sequestration Potential

Carbon dioxide (CO<sub>2</sub>) mineral sequestration involves reacting magnesium silicates (forsteritic olivine, or serpentine) with CO<sub>2</sub> emissions. The resulting products are the chemically inert magnesite (MgCO<sub>3</sub>) and silica (SiO<sub>2</sub>).

Dunite rocks with high magnesium oxide MgO (forsteritic olivine) and low Fe<sub>2</sub>O<sub>3</sub> (iron oxide), calcium oxide CaO (pyroxene, amphibols and carbonates), water (serpentine) and LOI (serpentine minerals) are the most promising (Danae et al.)

Laboratory and bench-test studies conducted in 2004 by A.V. Danae indicated that the Tulameen dunite rocks olivine is suitable for carbon dioxide mineral carbonation. Test results indicated that **one tonne of Tulameen dunite could potentially sequester up to 0.4 tonnes of CO<sub>2</sub>.**

The next paragraphs quote '**Purchasing Carbon Offsets**' by the **David Suzuki Foundation**:

*Demand for carbon offsets around the world has led to a large and growing carbon market. Players in the carbon market include businesses, governments, financial institutions, non-profit organizations, and individuals that develop, broker, buy, sell, and trade carbon offsets. It has been estimated that over CAD\$139 billion was transacted in the global carbon market in 2008—almost double the amount for 2007.*

*The carbon market itself is divided into two segments. The first is the compliance carbon market, which includes government-regulated programs (such as the Kyoto Protocol and the European Union Emission Trading System) that require countries and large industries to reduce their emissions. Carbon offsets sold through these programs are regulated to ensure a certain level of quality and to enforce restrictions on project types and locations.*

*The second is the voluntary, or retail carbon market, which is the focus of this guide. As its name suggests, the voluntary market covers carbon offset trading that is not required by government regulation as a part of mandatory greenhouse gas reduction programs. The voluntary market serves individuals, businesses, and organizations that aren't legally required by governments to reduce their emissions, but choose to voluntarily take responsibility for their climate impact.*

A separate study into the economics of a possible mining operation of olivine at the company's Tulameen claims should definitely consider the benefits that could be derived from selling carbon credits, for olivine minerals and tailings (serpentine) are known carbon dioxide sinks.

## 7.5 Platinum Group Metals Potential

The writer considers that the presence of highly anomalous values of Platinum Group Metals/Platinum Group Elements (PGM/PGE) in certain zones of the Company's Tulameen Project has the potential to significantly improve the economics of a future mining operation.

Five main **PGM** enriched zones are known to occur within the Project Area:

- The **Ridge Zone** - It had been drilled by previous explorers. High importance in the context of a future olivine mining operation;
- The **Creek Zone** - Delineated by surface mapping and sampling, only. High importance.
- The **South Zone** - Delineated by surface mapping and sampling, only; High importance.
- The **Britton Creek Contact Zone** - Delineated by surface mapping and sampling, only. Medium importance. If proven economic and delineated by further exploration programs then it can be mined along with the Britton Mountain olivine.
- The **H&H Zone** - Not fully understood and delineated but might include a hydrothermal component. Historic work included rock, soil and stream sediment sampling. Lower importance in the context of developing an olivine mining operation.

As proved by historic work on the Tulameen Ultramafic Complex other serpentinized clinopyroxenite zones that are highly anomalous in platinum and palladium have been identified at its eastern margin (deformation zone) including the H&H Zone.

## 7.6 Base Metals Potential

The writer considers that the base metals potential of the Tulameen claims is significant because in most of the mining scenarios nickel (Ni), chromium (Cr), cobalt (Co), copper (Cu), and iron (magnetite) can be recovered as by-products.

The writer's surveys have revealed that the Tulameen dunite rocks usually contain 0.09 to 0.14 per cent nickel, 0.14 to over 20 per cent chromium, 0.01 per cent cobalt, and 0.02 per cent copper. Local enrichments that returned assay results over the stated grades also exist.

Microscopic analyses tentatively identified awaruite (Ni<sub>2</sub>Fe) in altered dunite rocks (AR11666, p51)

Magnetite that occurs in dunite is associated with serpentine. It usually occurs in even larger quantities in pyroxenites.

New geological interpretations of the Alaskan-type intrusion represented by the Tulameen Project consider Cu-PGE (copper-PGE) sulphide mineralization present in pyroxenites as analogue for Cu-PGE reefs in layered intrusions.

The British Columbia Geological Survey (BCGS) Geofile 2018-2 mentions that:

*This class of intrusions is gaining prominence as an exploration target for magmatic Ni-Cu platinum group element (PGE) mineralization. The subclass of Alaskan-type intrusions is well known for economic concentrations of Pt in placer deposits derived from chromitites in the dunite core (e.g., Tulameen). However, Ni-depleted Cu mineralization spatially associated with such intrusions has not been adequately investigated.*

*Here we present preliminary petrographic, mineralogical and geochemical data pertinent to the development of a new mineral deposit **model for orthomagmatic Cu-PGE(-Au-Ag) sulphide mineralization in Alaskan-type intrusions** in convergent margin settings.*

This new interpretation is in accordance with field data that indicates that numerous base metals (Cu, Ni)-PGM-Au occurrences are hosted by the Tulameen Complex pyroxenites. It also helps in generating new exploration targets on the Company's mineral tenements.

## **7.7 Gold Potential**

Several different types of geological environments and targets that are known to be anomalous in gold exist within the Project area.

They include:

- Gold in Ultramafic rocks of the Tulameen Complex.

Gold assays up to 0.472 grams per tonne have been returned from dunite samples collected from the western side of the Grasshopper Mountain nowadays located on the Company's claims. No visible mineralization or structures have been noted in the aforementioned dunite sample. (AR15976)

Structural gold hosted by hornblende clinopyroxenites had been reported from the H&H mineral occurrence. Several gold-in-soil anomalies have also been reported from the

aforementioned zone and from many other zones that cover ultramafic rocks (e.g. up to 1.237 g/t gold in soil anomalies on the Olivine Mountain - AR11666).

- Low gold values from within the contact zone of the Tulameen Ultramafic rocks with the surrounding Nicola Group rocks e.g. the brecciated Britton Mountain Ridge Contact Zone, which is located adjacent to the Company's Britton Creek Contact Zone and possibly represents its continuation.

In this case as well in other cases where structural gold is to be found either in the contact zone or in the adjacent Nicola Group rocks it should be noted that an intrusive is never too far away.

## **7.8 Final Conclusions**

The mining of the olivine rich core of the Tulameen Ultramafic Complex has to be envisioned as a possible open pit mining operation that would include on-site processing. (crushing, grinding, flotation and/or gravity concentration).

One of the developmental alternatives that has to be considered would be olivine commercialized as an industrial mineral. The main product would be represented by olivine, while by-products could be represented by metals (PGM, chromite, nickel, cobalt, copper, magnetite).

The tailings could be marketed for their CO<sub>2</sub> sequestration potential.

Olivine could also be used for the production of magnesium as described in the 7.2 sub-chapter.

Historic work and metallurgical testwork indicated that the Tulameen olivine is of the same good quality and can have the same uses as olivine from other similar mining operations or development projects around the world.

It is the writer's opinion that North Bay Resources Tulameen Platinum Project represents a property of merit and further exploration work as well as engineering studies targeting the development of a commercial mining operation are warranted.

It is also recommended that exploration work focused on the gold-base metals potential of the pyroxenites and their contact zone with the surrounding country rock has to be undertaken and if successful these subordinate projects could be spinned out or farmed out to maximize the benefit that the Company can derive from this Project.

## 8. Recommended Work

In keeping with the final conclusions of this report the **main exploration target** at the Company's Tulameen Project is represented by an **olivine resource**.

The figures advanced by the writer as an exploration target are to be validated by an adequate exploration program that should include drilling on 100 m centers to or below 900 m in elevation on the parts of mineral property that are hosting the potential olivine mineral resource.

Considering the wide array of commodities present in the Tulameen dunite rocks it is recommended that a systematic and extensive assaying program has to be implemented. Assays should be comprehensive and should include all the commodities present in the dunite rocks including magnesium, PGM, chromium, nickel, cobalt, copper, gold and also loss-on-ignition assays that would characterize the degree of alteration for the dunite rock.

By acknowledging that many of the known PGM prospects located within the Project area have not been properly assessed the writer considers that there is potential for them to be expanded and new zones to be found and delineated and grades to be improved by running systematic exploration and drilling programs focused on and around the most prospective PGM enriched areas.

The writer agrees with the conclusions of previous historic reports that were stating that numerous attempts have been made to find economic platinum lode deposits, but low grade sample results (plus the presence of erratic mineralization) and expensive assay fees discouraged a systematic testing of the area (AR12121).

Historic assessment reports also reported that drilling done by majors (Newmont at Grasshopper Mountain in this case) clearly indicates that the style of mineralization at the Tulameen Ultramafic Complex is a "large bulk tonnage, low grade PGE-type exploration target that should be systematically and continuously sampled."

Historic results indicated that PGM are not always associated with chromite therefore it is recommended that the whole dunite drill intercepts have to be split and analyzed for a wide range of elements according to the writer's aforementioned instructions.

Metallurgical studies adequate to the type of the envisioned commodity / final product have to be undertaken in parallel with the exploration program in order to provide the necessary information for making development decisions.

Engineering studies have to be also undertaken. Data generated by a comprehensive exploration and drilling program as recommended in this report would fulfill the needs of a Preliminary Economic Assessment (PEA).

The part of the Company's mineral tenements located south of the Tulameen River (H & H) as well as the Britton Creek Contact Zone should also be explored, as they are hosting prospective mineralized outcrops and geochemical soil anomalies. A mapping, rock sampling and geochemical soil sampling program should be designed based on the results obtained by previous explorers. Contingent on positive Phase I exploration results trenching and drilling of prospective exploration targets have to be undertaken.



## 9. Cost Statement

<b>Salaries</b>		June 25-29, 2018	
Dan Oancea PGeo	4.5 days Fieldwork @\$550/day		\$2,475.00
	(Mob/Demob incl.)		
Gabriela Oancea Geo	4.5 days Fieldwork @\$300/day		\$1,350.00
	(Mob/Demob incl)		
<b>Accommodation:</b>			\$46.00
<b>Food:</b>	\$4.5 days @\$150/day (2 pers.)		\$675.00
<b>Truck Rental:</b>	-		\$297.20
<b>Gas:</b>	-		\$292.78
<b>Equipment/Misc:</b>	-		\$206.55
<b>Analytical</b>	-		\$549.38
<b>Report:</b>			\$2,750.00
<b>GST</b>			\$432.09
<b>TOTAL</b>			<b>\$9,074.00</b>

## 10. References

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## 11. Statement of Qualifications

I, **Dan V. Oancea**, of 507-1148 Heffley Crescent, Coquitlam do hereby certify that:

1. I am a member in good standing with the Association of Professional Engineers and Geoscientists of the Province of Columbia, Canada. I hold a Professional Geoscientist designation. I am also a Fellow of the Geological Association of Canada (GAC), and of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).
2. I have graduated a 5 year Engineering Program (Thesis) equivalent to a Master Degree and obtained a Geological Engineering Diploma in Geology and Geophysics (1987) from the Babes Bolyai University of Cluj-Napoca, Romania.
3. I have practiced my profession for 20 years. As a professional geologist in the mining industry, I have extensive geological, geochemical, and exploration experience, management skills, and a solid background in research techniques, and training of technical personnel. I have been involved in underground and surface exploration projects in Canada and Europe.
4. As a result of my experience and qualification I am a Qualified Person as defined in National Instrument 43-101.
5. I have authored this report which is based upon review and compilation of data relating to the Tulameen Platinum Project and upon personal knowledge of the property gained from on-site survey work carried out in 2013, 2016, and 2018.
6. I do not own an interest in the Tulameen Platinum mineral property.

Vancouver,

August 25, 2018

Respectfully submitted

Dan V. Oancea PGeo

**Table 2 – Tulameen Platinum Project Samples & Other Important Locations**

<b>0.Location</b>	<b>Sample No./ Type</b>	<b>Easting*</b>	<b>Northing*</b>	<b>Description</b>
566	T-18-01/Grab T-18-02/Grab	651649	5488129	Mt. Britton slightly serpentinized dunite rock + calcite on fissures (both samples)
567	T-18-03/Grab T-18-04/Grab	651608	5488100	Mt. Britton slightly serpentinized dunite rock (both samples) - Mt. Britton;  -04 visible chromite
568	T-18-05/Grab T-18-06/Grab	651540	5488153	Mt. Britton dunite rock (both samples);  -06 visible chromite
569	T-18-07/Grab	651665	5488177	Slightly altered dunite cliffs on W side of Britton Creek  -07 visible chromite
570	T-18-08/Grab	651723	5488182	Grasshopper Mtn: Fresh dunite rock
577	T-18-09/Float	652581	5488862	Silicified altered leucocratic (dacitic?) dyke rock with limonitic specks

578	T-18-10/Float	652543	5488725	Fine grained silicified black rock (argillite Nicola?) with fissures filled with sulphides (pyrite) - hydrothermal alteration
579	T-18-11/Grab	652469	5488703	Grasshopper Mtn: Altered dunite rock (serpentine on mm thick fissures)
580	T-18-12/Grab	652334	5488540	Grasshopper Mtn: Altered dunite rock (serpentine on mm thick fissures)
581	T-18-13/Grab	651732	5488180	Creek Zone: 'Brecciated' dunite rock fragments in serpentine mass. Sulphides (chalcopyrite, pentlandite, etc) visible.

**\*UTM Zone 10 NAD 83**

# **APPENDIX 1**

**ALS CHEMEX INVOICES, ANALYTICAL CERTIFICATES**

**&**

**CHEMICAL PROCEDURES**

### **Analytical Method Description:**

**Au-ICP22** refers to an analytical method that requires a fire assay fusion of a 50 g sample which is then cupelled to yield a precious metal bead.

The bead is then digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by inductively coupled plasma-atomic emission spectrometry.

Results are corrected for spectral inter-element interferences.





## Geochemical Procedure

### ME- ICP61

## Trace Level Methods Using Conventional ICP- AES Analysis

### Sample Decomposition:

HNO<sub>3</sub>-HClO<sub>4</sub>-HF-HCl digestion, HCl Leach (GEO-4ACID)

### Analytical Method:

Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)

A prepared sample (0.25 g) is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by inductively coupled plasma-atomic emission spectrometry. Results are corrected for spectral interelement interferences.

**NOTE:** Four acid digestions are able to dissolve most minerals; however, although the term "*near-total*" is used, depending on the sample matrix, not all elements are quantitatively extracted.

Element	Symbol	Units	Lower Limit	Upper Limit	Default Overlimit Method
Silver	Ag	ppm	0.5	100	Ag-OG62
Aluminum	Al	%	0.01	50	
Arsenic	As	ppm	5	10000	
Barium	Ba	ppm	10	10000	
Beryllium	Be	ppm	0.5	1000	
Bismuth	Bi	ppm	2	10000	
Calcium	Ca	%	0.01	50	
Cadmium	Cd	ppm	0.5	500	
Cobalt	Co	ppm	1	10000	Co-OG62
Chromium	Cr	ppm	1	10000	
Copper	Cu	ppm	1	10000	Cu-OG62
Iron	Fe	%	0.01	50	
Gallium	Ga	ppm	10	10000	

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## Geochemical Procedure

Element	Symbol	Units	Lower Limit	Upper Limit	Default Overlimit Method
Potassium	K	%	0.01	10	
Lanthanum	La	ppm	10	10000	
Magnesium	Mg	%	0.01	50	
Manganese	Mn	ppm	5	100000	
Molybdenum	Mo	ppm	1	10000	Mo-OG62
Sodium	Na	%	0.01	10	
Nickel	Ni	ppm	1	10000	Ni-OG62
Phosphorus	P	ppm	10	10000	
Lead	Pb	ppm	2	10000	Pb-OG62
Sulphur	S	%	0.01	10	
Antimony	Sb	ppm	5	10000	
Scandium	Sc	ppm	1	10000	
Strontium	Sr	ppm	1	10000	
Thorium	Th	ppm	20	10000	
Titanium	Ti	%	0.01	10	
Thallium	Tl	ppm	10	10000	
Uranium	U	ppm	10	10000	
Vanadium	V	ppm	1	10000	
Tungsten	W	ppm	10	10000	
Zinc	Zn	ppm	2	10000	Zn-OG62

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## Geochemical Procedure

Elements listed  
below are available upon request

Element	Symbol	Units	Lower Limit	Upper Limit	Default Overlimit Method
Lithium	Li	ppm	10	10000	
Niobium	Nb	ppm	5	2000	
Rubidium	Rb	ppm	10	10000	
Selenium	Se	ppm	10	1000	
Tin	Sn	ppm	10	10000	
Tantalum	Ta	ppm	10	10000	
Tellurium	Te	ppm	10	10000	
Yttrium	Y	ppm	10	10000	
Zirconium	Zr	ppm	5	500	

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**Assay Procedure – OA-GRA05, Loss on Ignition (LOI)**

**Sample Decomposition:** Furnace  
**Analytical Method:** Gravimetric

**OA-GRA05:**

A prepared sample is placed in an oven at 1000°C for one hour, cooled and then weighed. The percent loss on ignition is calculated from the difference in weight.

<b>Method Code</b>	<b>Analyte</b>	<b>Symbol</b>	<b>Units</b>	<b>Lower Limit</b>	<b>Upper Limit</b>
OA-GRA05	Loss on Ignition	LOI	%	0.01	100



## Fire Assay Procedure

### PGM- ICP23 and PGM- ICP24 Precious Metals Analysis Methods

#### Sample Decomposition:

Fire Assay Fusion (FA-FUSPG1, FA-FUSPG2)

#### Analytical Method:

Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP-AES)

A prepared sample (30 – 50 g) is fused with a mixture of lead oxide, sodium carbonate, borax and silica, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested for 2 minutes at high power by microwave in dilute nitric acid. The solution is cooled and hydrochloric acid is added. The solution is digested for an additional 2 minutes at half power by microwave. The digested solution is then cooled, diluted to 4 mL with 2 % hydrochloric acid, homogenized and then analyzed for gold, platinum and palladium by inductively coupled plasma – atomic emission spectrometry.

Method Code	Element	Symbol	Units	Sample Mass (g)	Lower Limit	Upper Limit	Default Overlimit Method
PGM-ICP23	Gold	Au	ppm	30	0.001	10	Au-GRA21
PGM-ICP23	Platinum	Pt	ppm	30	0.005	10	PGM-ICP27
PGM-ICP23	Palladium	Pd	ppm	30	0.001	10	PGM-ICP27
PGM-ICP24	Gold	Au	ppm	50	0.001	10	Au-GRA21
PGM-ICP24	Platinum	Pt	ppm	50	0.005	10	PGM-ICP27
PGM-ICP24	Palladium	Pd	ppm	50	0.001	10	PGM-ICP27

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Oct 04, 2005

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## Fire Assay Procedure



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To: NORTH BAY RESOURCES  
 3995 YERKES ROAD  
 COLLEGEVILLE PA 19426  
 USA

INVOICE NUMBER 4365616

BILLING INFORMATION	
Certificate:	VA18164842
Sample Type:	Rock
Account:	NOBARE
Date:	26- JUL- 2018
Project:	Tulameen
P.O. No.:	
Quote:	
Terms:	Due on Receipt C2
Comments:	

QUANTITY	CODE	ANALYSED FOR - DESCRIPTION	UNIT PRICE	TOTAL
1	BAT- 01	Administration Fee	35.80	35.80
13	LOG- 22	Sample login - Rcd w/o BarCode	1.30	16.90
13	PUL- 31	Pulverize split to 85%<75 um	4.65	60.45
4	PGM- ICP24	Pt, Pd, Au 50g FA ICP	23.85	95.40
2	Au- ICP22	Au 50g FA ICP- AES finish	21.35	42.70
7	OA- GRA05	Loss on Ignition at 1000C	9.10	63.70
6	ME- MS61	48 element four acid ICP- MS	30.75	184.50
13	CRU- 31	Fine crushing - 70%< 2mm	3.05	39.65
2.70	CRU- 31	Weight Charge (kg) - Fine crushing - 70%<2mm	0.55	1.49
4	SPL- 21	Split sample - riffle splitter	2.05	8.20
1.30	SPL- 21	Weight Charge (kg) - Split sample - riffle splitter	0.45	0.59

SUBTOTAL (CAD) \$ 549.38

R100938885 GST \$ 27.47

TOTAL PAYABLE (CAD) \$ 576.85

To: NORTH BAY RESOURCES  
 ATTN: PERRY LEOPOLD  
 3995 YERKES ROAD  
 COLLEGEVILLE PA 19426  
 USA

Payment may be made by: Cheque or Bank Transfer

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 SMFT: ROYCCAT2  
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Page: 1  
 Total # Pages: 2 (A - D)  
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**CERTIFICATE VA18164842**

Project: Tulameen

This report is for 13 Rock samples submitted to our lab in Vancouver, BC, Canada on 9-JUL-2018.

The following have access to data associated with this certificate:

PERRY LEOPOLD	DAN OANCEA
---------------	------------

SAMPLE PREPARATION	
ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% < 2mm
PUL-31	Pulverize split to 85% < 75 um
SPL-21	Split sample - riffle splitter
PUL-QC	Pulverizing QC Test

ANALYTICAL PROCEDURES		
ALS CODE	DESCRIPTION	INSTRUMENT
Au- ICP22	Au 50g FA ICP- AES finish	ICP- AES
OA- GRA05	Loss on Ignition at 1000C	WST- SEQ
ME- MS61	48 element four acid ICP- MS	
PGM- ICP24	Pt, Pd, Au 50g FA ICP	ICP- AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*

Signature:   
 Colin Ramshaw, Vancouver Laboratory Manager





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 Total # Pages: 2 (A - D)  
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Project: Tulameen

CERTIFICATE OF ANALYSIS VA18164842

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg	PGM-ICP24 Au ppm	PGM-ICP24 R ppm	PGM-ICP24 Pt ppm	Au-ICP22 Au ppm	OA-GRA05 LOI %	ME-MS61 Ag ppm	ME-MS61 Al %	ME-MS61 As ppm	ME-MS61 Ba ppm	ME-MS61 Be ppm	ME-MS61 B ppm	ME-MS61 Ca %	ME-MS61 Cd ppm	ME-MS61 Ce ppm	
T-18-01		0.12					18.00										
T-18-02		0.28	<0.001	0.032	0.001			0.03	0.10	8.1	10	<0.05	0.26	0.17	0.04	0.27	
T-18-03		0.10					12.85										
T-18-04		0.16	<0.001	0.509	0.004			0.01	0.16	6.5	<10	<0.05	0.12	0.09	<0.02	0.09	
T-18-05		0.06					1.93										
T-18-06		0.26						0.09	0.14	6.3	<10	<0.05	0.09	0.13	0.10	0.10	
T-18-07		0.34	<0.001	0.011	<0.001		7.73										
T-18-08		0.30	<0.001	<0.005	<0.001		1.96										
T-18-09		0.38				<0.001		0.09	0.64	5.2	20	0.25	0.01	12.25	0.30	2.35	
T-18-10		0.22				<0.001		0.25	6.68	4.3	660	0.85	0.07	2.68	0.15	21.0	
T-18-11		0.08					14.25										
T-18-12		0.24					6.55										
T-18-13		0.16						0.17	0.10	5.8	<10	<0.05	0.11	0.23	0.04	0.29	

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



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Project: Tulameen

CERTIFICATE OF ANALYSIS VA18164842

Sample Description	Method Analyte Units LOD	ME-MS61 Co ppm 0.1	ME-MS61 Cr ppm 1	ME-MS61 Cs ppm 0.05	ME-MS61 Cu ppm 0.2	ME-MS61 Fe % 0.01	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05
T-18-01																
T-18-02		103.0	1570	0.39	27.1	5.75	0.52	0.08	<0.1	0.007	0.01	<0.5	4.4	23.1	1140	0.31
T-18-03																
T-18-04		133.0	>10000	<0.05	7.8	7.58	1.22	0.11	<0.1	0.005	0.01	<0.5	2.4	25.4	1540	0.32
T-18-05																
T-18-06		90.9	4400	0.28	49.4	4.28	0.86	0.09	<0.1	0.006	0.01	<0.5	6.5	24.0	883	24.7
T-18-07																
T-18-08																
T-18-09		25.0	1450	1.27	54.3	2.67	2.02	0.08	0.1	0.017	0.14	0.9	11.6	7.17	987	0.36
T-18-10		7.7	73	0.91	23.2	2.86	12.70	0.13	2.9	0.059	2.20	11.3	3.0	1.22	342	1.15
T-18-11																
T-18-12																
T-18-13		113.0	2500	<0.05	245	6.55	0.80	0.09	<0.1	0.010	0.01	<0.5	0.9	25.9	1360	16.95

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CERTIFICATE OF ANALYSIS VA18164842

Sample Description	Method Analyte Units LOD	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	
		Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Rb ppm	Re ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm
T-18-01		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
T-18-02		0.01	0.1	852	40	1.3	0.8	<0.002	0.18	0.35	3.3	1	<0.2	6.5	<0.05	0.15
T-18-03		0.01	<0.1	880	10	<0.5	0.2	<0.002	0.05	0.14	3.7	1	<0.2	1.4	<0.05	0.39
T-18-04																
T-18-05																
T-18-06		0.02	<0.1	888	20	0.8	0.7	0.046	0.14	0.68	3.0	1	<0.2	4.3	<0.05	0.12
T-18-07																
T-18-08																
T-18-09		0.01	<0.1	132.5	50	11.0	4.9	<0.002	<0.01	1.77	47.5	1	<0.2	357	<0.05	<0.05
T-18-10		1.10	5.6	21.0	690	8.7	62.6	0.004	1.09	0.53	14.9	1	1.1	160.5	0.36	<0.05
T-18-11																
T-18-12																
T-18-13		<0.01	0.1	1245	20	1.2	0.2	0.028	0.37	0.15	3.8	1	0.2	9.5	<0.05	0.18

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



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 Plus Appendix Pages  
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 Account: NOBARE

Project: Tulameen

CERTIFICATE OF ANALYSIS VA18164842

Sample Description	Method Analyte Units LOD	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	
		Th ppm 0.01	Ti % 0.005	Ti ppm 0.02	U ppm 0.1	V ppm 1	W ppm 0.1	Y ppm 0.1	Zn ppm 2	Zr ppm 0.5
T-18-01										
T-18-02		0.02	0.007	<0.02	<0.1	8	1.1	0.1	73	0.8
T-18-03										
T-18-04		0.01	0.015	<0.02	<0.1	20	1.6	0.1	107	<0.5
T-18-05										
T-18-06		0.01	0.007	<0.02	<0.1	10	1.0	<0.1	88	<0.5
T-18-07										
T-18-08										
T-18-09		0.04	0.072	0.02	<0.1	33	0.6	2.4	53	1.9
T-18-10		2.43	0.437	0.32	1.3	78	0.4	19.7	85	100.0
T-18-11										
T-18-12										
T-18-13		0.02	0.008	<0.02	<0.1	13	1.2	0.2	76	0.5

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



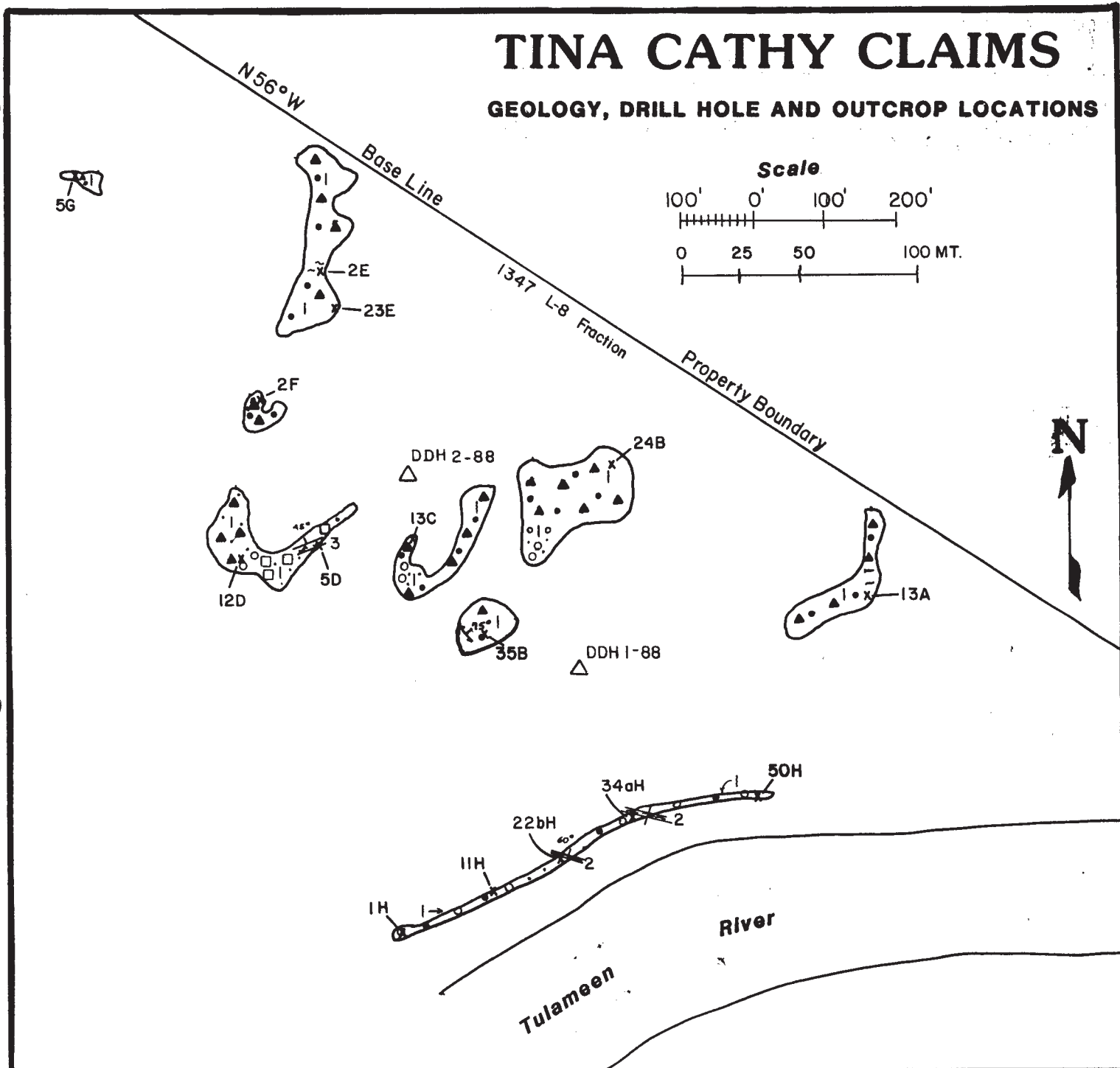
## **APPENDIX 2**

### **Historic Maps**

- Britton Mountain Olivine Map (Diamet, 1988);
- Olivine Alteration Map (Findlay, 1963);
- Platinum Anomalous Zones (Tiffany Resources, 1987).

# TINA CATHY CLAIMS

## GEOLOGY, DRILL HOLE AND OUTCROP LOCATIONS



### LEGEND

#### A. ROCK UNITS B. SERPENTIZATION C. MINERALIZATION D. SYMBOLS

<span style="border: 1px solid black; padding: 2px;">1</span> DUNITE	<span style="border: 1px solid black; padding: 2px;">○ ○</span> SLIGHTLY	<span style="border: 1px solid black; padding: 2px;">: :</span> < 1% CHROMITE	<span style="border: 1px solid black; padding: 2px;">//</span> DIKE: DIP < 90°
<span style="border: 1px solid black; padding: 2px;">2</span> DIORITE	<span style="border: 1px solid black; padding: 2px;">▲</span> MODERATELY	<span style="border: 1px solid black; padding: 2px;">•</span> 1-3% "	<span style="border: 1px solid black; padding: 2px;">X</span> DIKE: DIP PERPENDICULAR
<span style="border: 1px solid black; padding: 2px;">3</span> SYENITE	<span style="border: 1px solid black; padding: 2px;">□ □</span> HIGHLY	<span style="border: 1px solid black; padding: 2px;">~ ~</span> 4-5% "	<span style="border: 1px solid black; padding: 2px;">/</span> FABRIC
			<span style="border: 1px solid black; padding: 2px;">△</span> DIAMOND DRILL HOLE
			<span style="border: 1px solid black; padding: 2px;">X</span> GC T.S. SAMPLE LOCATIONS

FIGURE 1.

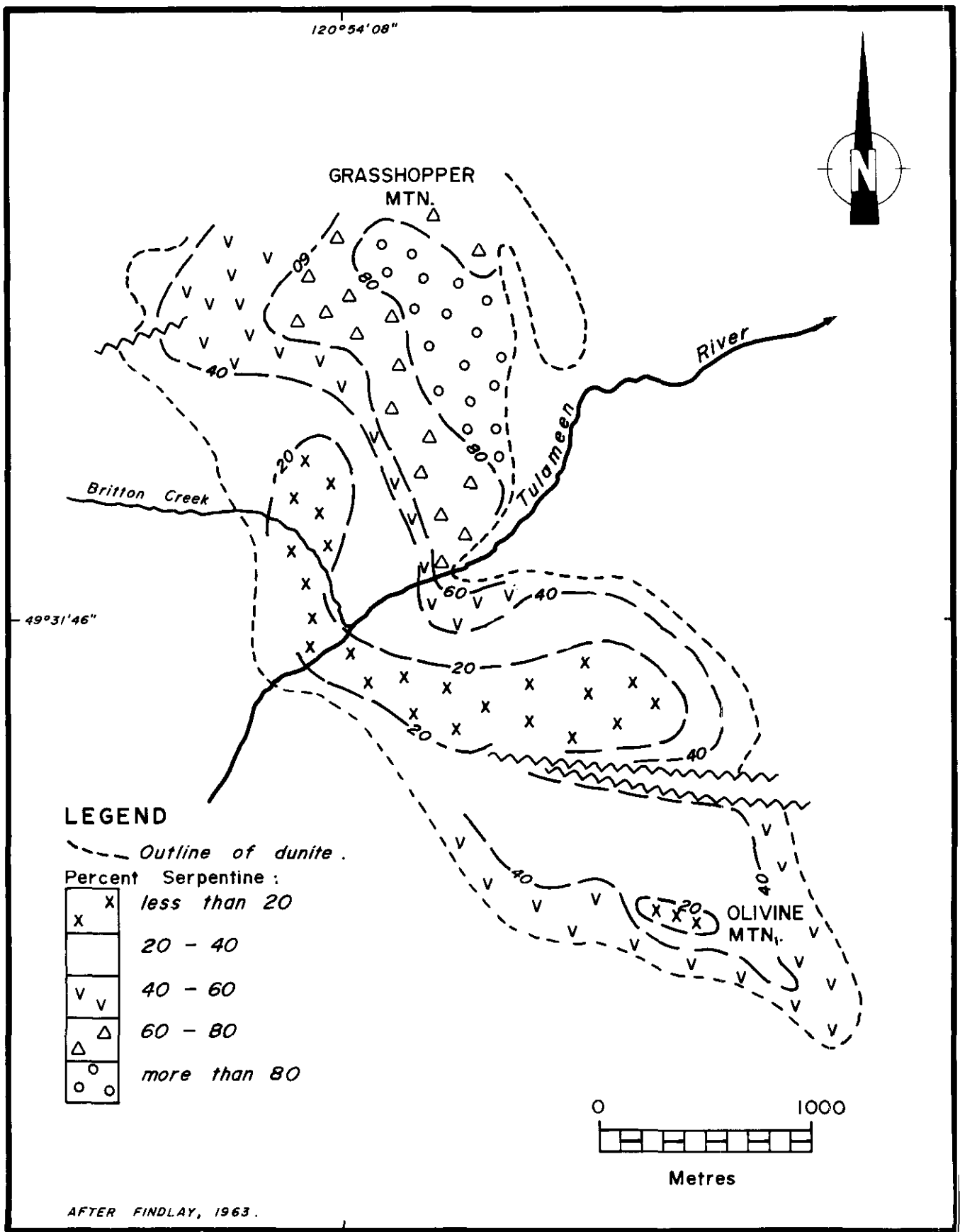
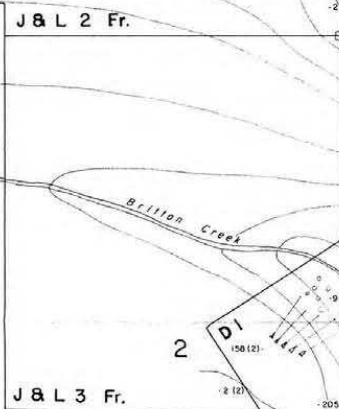
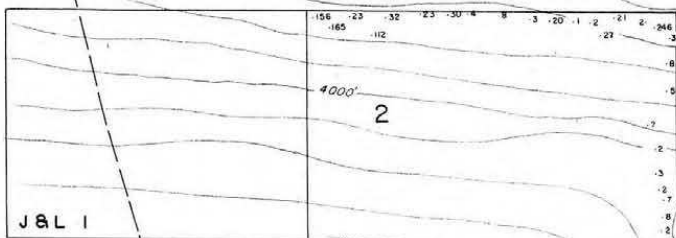
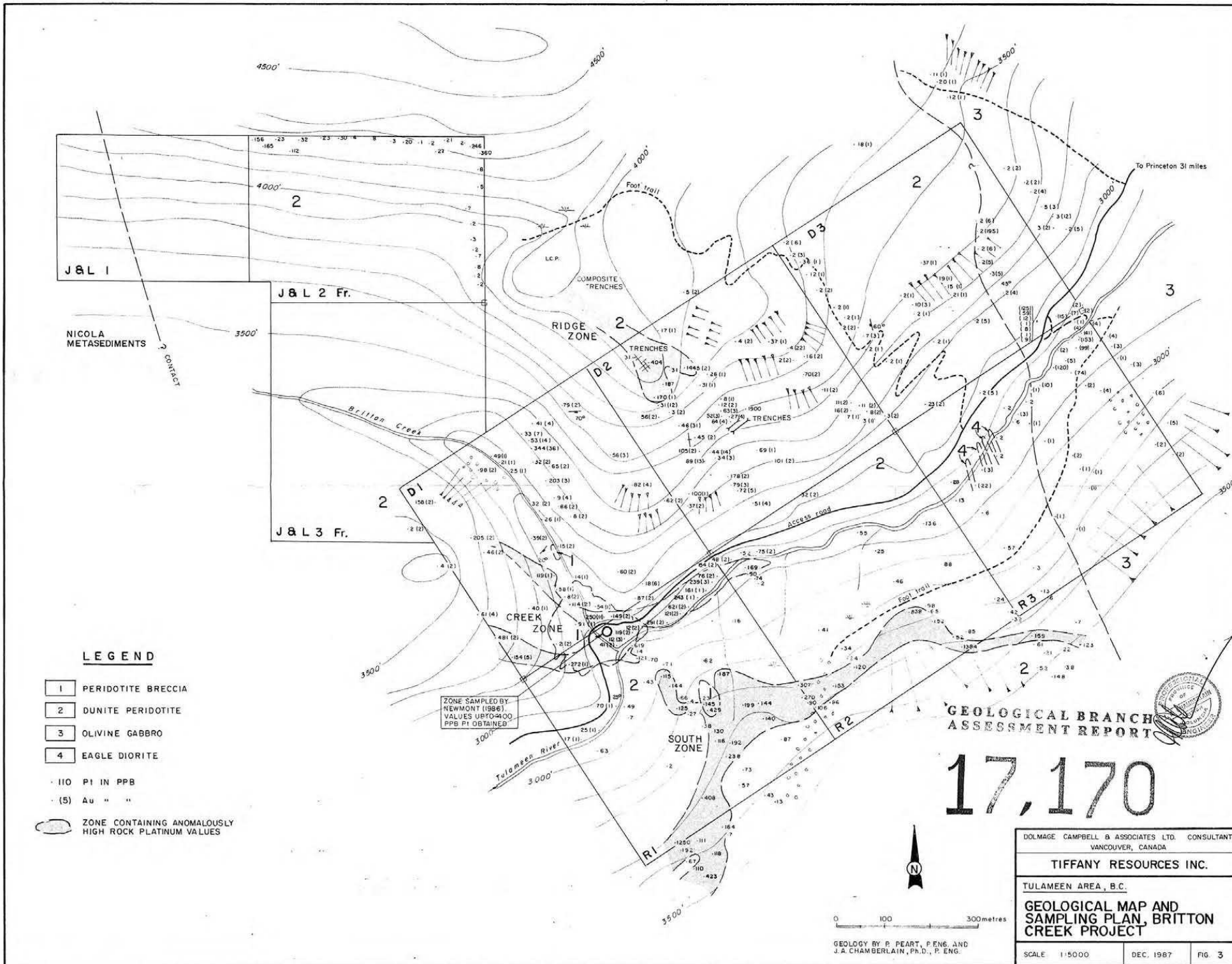


Figure 4-7-1. Serpentinized zones in the dunite core, Tulameen ultramafic complex.





**LEGEND**

- 1 PERIDOTITE BRECCIA
- 2 DUNITE PERIDOTITE
- 3 OLIVINE GABBRO
- 4 EAGLE DIORITE
- 110 P1 IN PPB
- (5) Au " "
- ZONE CONTAINING ANOMALOUSLY HIGH ROCK PLATINUM VALUES

ZONE SAMPLED BY  
NEWMONT (1986).  
VALUES UP TO 400  
PPB P1 OBTAINED

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

17,170

DOLMAGE CAMPBELL & ASSOCIATES LTD. CONSULTANTS VANCOUVER, CANADA		
TIFFANY RESOURCES INC.		
TULAMEEN AREA, B.C.		
GEOLOGICAL MAP AND SAMPLING PLAN, BRITTON CREEK PROJECT		
SCALE 1:5000	DEC. 1987	FIG. 3

GEOLOGY BY P. PEART, P. ENG. AND  
J.A. CHAMBERLAIN, PH.D., P. ENG.