

86-906-15458

ASSESSMENT REPORT  
ON  
GEOLOGICAL MAPPING, PROSPECTING  
AND GEOCHEMICAL SAMPLING  
OF THE  
TULAMEEN ULTRAMAFIC COMPLEX  
AND THE  
LODESTONE PROPERTY  
SIMILKAMEEN M.D., B.C.

Lat. 49°27.8' Long. 120°50.1'

Owner/Operator: Imperial Metals Corporation

FILMED

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**15,458**

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VANCOUVER, B.C.

Submitted by: R.L. Wright  
October 15, 1986

NTS: 92H/7W

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SUMMARY

The Lodestone Property is located at Lodestone Mountain, in the Tulameen ultramafic-gabbroic complex, a Triassic zoned Alaskan type intrusion, approximately 22 km west of Princeton, B.C. The purpose of this project was to evaluate the geology of the property and to examine the various lithologies on the property and elsewhere in the intrusion, for their gold and platinum potential.

A total of 37 rock samples representing the major rock types of the intrusion were analyzed for Pt, Pd, Au by fire assay methods and for 30 other elements by the ICP method. Streams draining the property were sampled for heavy minerals and silts, in an attempt to localize the sources of placer material found further downstream.

The results of this work are not encouraging, as all geochemical results were low; this is somewhat inconclusive, however, since background values were obtained from known platinum placers and hence the sampling and/or analytical methods could be suspect.

In view of the inconclusive nature of the available data, the gold and platinum potential of the property remains uncertain. Further evaluation of the property should involve a thorough review of sampling and analytical procedures. Several lines of contour soil geochemistry, particularly in areas of dunite and peridotite occurrences, would be useful.

Because of the extensive overburden in the area, and the large size of the property, the work to date has just scratched the surface. As the Tulameen intrusion remains one of Canada's major historical sources of platinum, and the Lodestone property covers a significant portion of the intrusion, further attempts at penetrating the mantle of overburden and evaluating these favourable rocks, are warranted.

## INTRODUCTION

### Objectives:

The purpose of the Tulameen project was to make an initial evaluation of the Tulameen Complex for platinum potential, with particular emphasis on the two properties held by Imperial Metals Corporation:

The J and L Property on Britton Creek, which is covered by a separate report; and

The Lodestone Property on Lodestone Mountain, which, with the regional data, is the subject of this report.

Although the Lodestone Property has received considerable attention directed at its magnetite deposits, only one previous study examined the platinum potential, and this work was confined to the iron ores contained in hornblende pyroxenites (Corvalan, 1984).

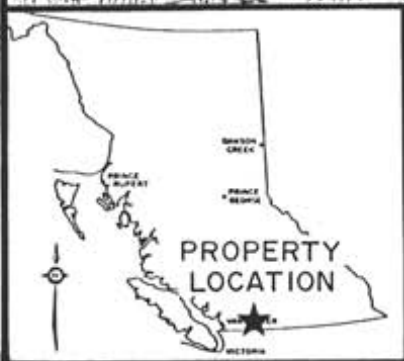
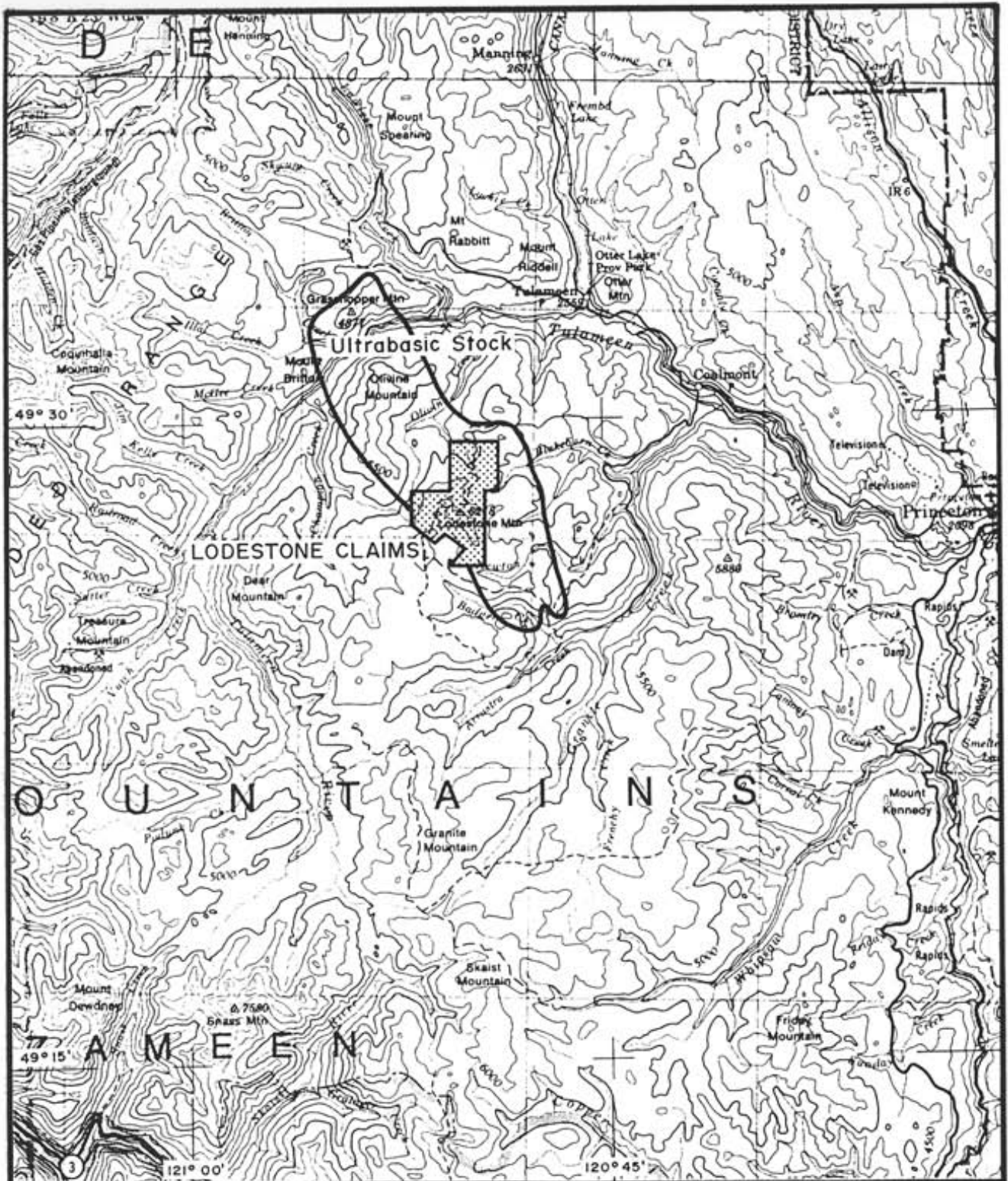
The objective of this study was, therefore, to examine the other lithological units on the property and elsewhere in the intrusion, for their gold and platinum group element (PGE) potential.

### Location:

The Tulameen Complex is located about 22km west of Princeton, B.C. It forms an elongated body approximately 16 km in length extending in a NNW-SSE direction from Arrastra Creek in the south, across the Tulameen River to Grasshopper Mountain in the north.

The Lodestone Property covers a significant portion of the southern half of the intrusion, and is centred on Lodestone Mountain which rises to 1895 metres. The lowest point within the field area is on the Tulameen River at about 800 metres.

Vegetation is quite variable, ranging from densely timbered valley bottoms to alpine meadows. Areas underlain by dunite are sparsely covered.



<b>IMPERIAL METALS CORPORATION</b>	
<b>LODESTONE</b>	
<b>FIGURE I</b>	<b>N.T.S. 92H</b>
<b>LOCATION MAP</b>	
<b>SCALE: 1:250 000</b>	<b>GEOLOGIST: R.L. WRIGHT</b>
<b>DATE: JANUARY 1987</b>	<b>DRAWN BY: S. HAWORTH</b>

Property:

The Lodestone Property consists of 3 contiguous claim blocks and a fractional claim as follows:

<u>Name</u>	<u>No. Units</u>	<u>Record No.</u>	<u>Record Date</u>	<u>Due Date</u>
Lodestone 1	18	456 (10)	Oct. 19, 1978	Oct. 1988
Lodestone 2	12	457 (10)	Oct. 19, 1978	Oct. 1986
Lodestone 3	16	458 (10)	Oct. 19, 1978	Oct. 1986
JA 1 Fraction	Fr	723 ( 9)	Sept. 6, 1979	Sept. 1987

All are wholly-owned by Imperial Metals Corporation, Vancouver, B.C.

Access:

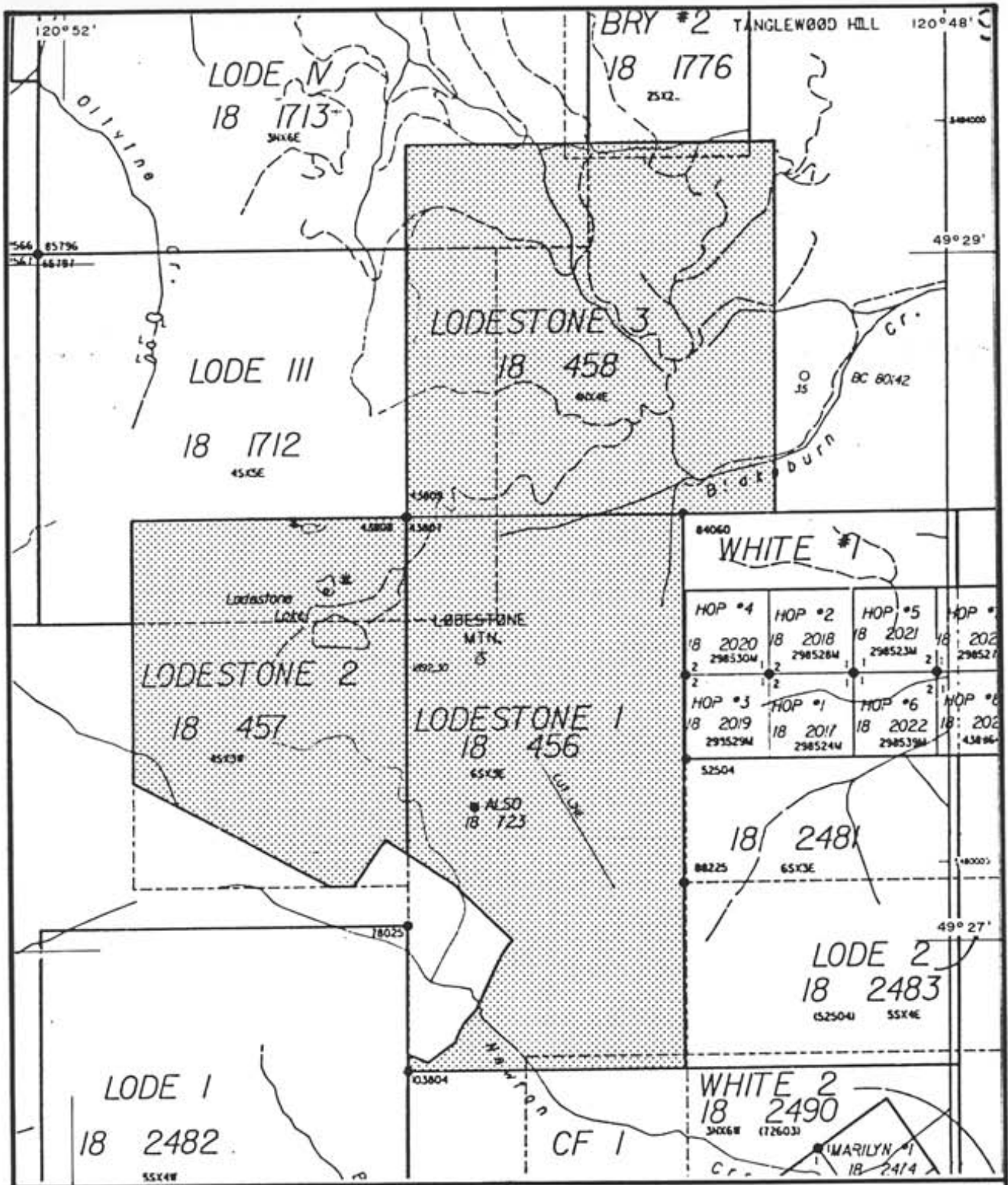
The Tulameen Complex is accessible by numerous old and new logging roads, as follows:

1) The southern end of the intrusion around Badger Creek is accessible by a 4-wheel drive road/trail which extends along the ridge north of Badger Creek, connecting the HBCo. Brigade Trail south of Lodestone Lake to the Arrastra Creek valley where an old logging road is passable to Blackburn and Tulameen.

2) The central portion of the intrusion and the Lodestone Property are accessible by a network of logging roads which extends NW from Blackburn. The passable roads are shown on Figures 3a and 3b.

3) The Tulameen River valley can be reached by the river road which goes west out of the town of Tulameen, which is 32 km by paved road from Princeton.

4) The northern portion of the Complex around Grasshopper Mtn. can be reached by a logging road which leaves the Tulameen-Coquihalla Lake road at a point 9 km from the tollbooth on the Coquihalla highway.



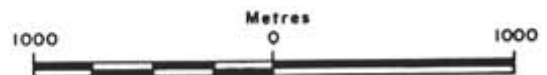
Reference: BC MEMPR Claim Map 92H.046

**IMPERIAL METALS CORPORATION**  
**LODESTONE**

FIGURE 2

N.T.S. 92H/7W

**CLAIM MAP**



SCALE: 1:31,680

DATE: JANUARY 1987

GEOLOGIST: R.L. WRIGHT

DRAWN BY: S. HAWORTH

Previous Work History:

The existence of ultramafic rocks in this area has been known since the late 1800's when gold and platinum placers were first exploited. The first systematic geological studies of the area were by Camsell (1913) and Rice (1947), but it was not until 1963 that a detailed study of the lithologies and their distribution was presented by Findlay. Recent work by St. Louis (1984, 1986) has examined the distribution of PGE's among the various lithologies.

Work on the Lodestone Property began in the 1960's when Imperial Metals and Power outlined extensive iron deposits with estimated proven reserves of 90 million tons of 17.6% Fe with additional probable and inferred reserves totalling 275 million tons of similar grade.

Additional drilling was undertaken in 1973 to further define reserves. This core was resampled in 1984 by Corvalan and assayed for platinum - the first record of platinum exploration on the property.

Program:

The field program consisted of geological mapping of the intrusion at a scale of 1:20,000, concentrating on the areas of the J and L property and Lodestone property. Representative samples of the major lithologies were collected and analysed for platinum, palladium and gold, plus 30 other elements by the ICP method.

Additional prospecting and mapping traverses were run on the Lodestone Property in areas not well exposed in road outcrops, particularly on Lodestone 2. This work was mostly unsuccessful as a continuous blanket of overburden extends westward and southward from the Lodestone Mountain ridge, and outcrops are rare.

An attempt was made to define areas of potential PGE mineralization by collecting heavy mineral concentrates on all streams draining the Lodestone property, and analyzing them for platinum, palladium and gold.

A total of 37 rock samples were analysed for 30 elements plus Pt, Pd, Au, and 11 heavy mineral concentrates and corresponding silt samples were analysed for Pt, Pd and Au.



## GEOLOGY

### Regional Geology:

The Triassic Tulameen Ultramafic-Gabbro Complex intrudes volcanics and metasediments of the Triassic Nicola Group, which are also intruded to the west by the Eagle granodiorite of Cretaceous age. Although this latter intrusion is located very close to the west contact of the Tulameen Complex, it was not observed in direct contact - a narrow wedge of Nicola rocks being present at all localities examined in this study. There are, however, numerous dikes of intermediate to acidic composition intersecting the Complex - at least some of these are probably comagmatic with the Eagle granodiorite.

The Nicola Group was not studied in any detail, but outcrops examined included 1) massive white crystalline marble north of Grasshopper Mountain, 2) hornblende-plagioclase gneiss (metabasalt) along the contact north of Tanglewood Hill, 3) rusty quartz-feldspar-sericite schist along the contact south of Lodestone Lake, and 4) black argillite with disseminated pyrite in the Arrastra Creek valley to the south. These country rocks were not included in any of the subsequent geochemical work.

The Tulameen Complex has been divided by previous workers (Findlay, 1969) into two distinct intrusions which are believed to be comagmatic - a syenitic gabbro/diorite, occupying the eastern half of the complex and also occurring in smaller lenses in the west half; and a suite of ultramafic rocks including dunite, peridotite, pyroxenite, hornblendite and intermediate members (such as olivine pyroxenite) which underlies most of the northern and western portions of the complex.

The map of Findlay (1963) was used as a guide in the more detailed mapping of areas of the property, and was found to be very reliable with 3 exceptions:

- 1) areas of new exposures produced by recent road building showed minor differences which have been included in Figures 3a and 3b.

2) several of the map units were found to be very heterogeneous and unmappable at detailed scales because of lack of exposure. In such cases the broader interpretation of Findlay was retained. For example, to the northeast of Lodestone Peak, the unit mapped as olivine pyroxenite contains outcrops of dunite, peridotite, olivine pyroxenite, pyroxenite with dunite inclusions, etc.

3) it was not feasible in the field, to distinguish between syenogabbro and syenodiorite, the principal criterion used by Findlay (1963) being feldspar chemistry. Consequently all such rocks were mapped as 'gabbro'.

To avoid confusion, the terminology and map units of Findlay were retained in this study.

The lithological units which were studied and sampled during this project are as follows (for a listing of sample numbers and rock types see table 1).

Dunite (6a) is typically black, fine-grained, with a buff weathered surface. Serpentinization varies from 0 to 100%, and occurs along grain boundaries to produce the characteristic mesh texture on weathered surface. Serpentinization also occurs in shear zones in the dunite. In one location on the J and L claims a fracture zone was altered to talc and anthophyllite. Chromite occurs throughout the dunite as disseminated grains up to 3 mm in size and rarely as irregular masses and veinlets, the largest noted being 30cm in diameter.

The dunite occupies the core of the intrusion in the Grasshopper-Olivine Mountains area, and is well exposed in the Tulameen River valley.

Peridotite (6b) is uncommon within the intrusion. A single outcrop was located to the north of Lodestone Mountain. This consisted of buff weathering, black, fine-grained dunite containing approximately 25% clinopyroxene irregularly distributed throughout the rock as veins, patches and disseminations.

Olivine Pyroxenite (5a) is a heterogeneous unit representing the transition from dunite to pyroxenite. A variety of textures and compositions were observed in the field, ranging from fine-grained pyroxenite with 2-5 mm grains of olivine disseminated throughout, to coarse pegmatitic pyroxenite with irregular dunite patches ranging from several mm to several metres in

size, suggesting a mechanical mixture of the two rock types.

The olivine pyroxenite forms a shell around the dunite core in the north, with a long tail extending southwards past Lodestone Mountain toward Arrastra Creek. A related unit, hornblende olivine pyroxenite, representing an alteration of unit 5a, is reported to occur in small amounts between Newton and Arrastra Creeks, but was not observed during this study.

Clinopyroxenite (4a) and Hornblende Pyroxenite (4b) make up the remaining portion of the ultramafic intrusion, forming a shell around the olivine pyroxenite tail extending from Grasshopper Mountain to Arrastra Creek. A second ultramafic zone, separated from the main zone by gabbros, is located on Tanglewood Hill, at the north edge of Lodestone 3 claim.

The clinopyroxenite is a relatively pure equigranular aggregate of green to black augite ranging from fine-grained to coarse and pegmatitic phases. The hornblende pyroxenite occurs as irregular patches associated with the clinopyroxenite and representing replacement of the latter unit. The largest body of hornblende pyroxenite, extending through the Lodestone Mountain area contains patches of hornblendite and biotite hornblendite and hosts the magnetite deposits which have been described elsewhere (Ruckmick, 1955 and Eastwood, 1959).

Gabbro (2a, 2b) underlies much of the eastern half of the complex. Where fresh, the rock has a pinkish grey colour and is composed of pink Kspar, white plagioclase and black hornblende in roughly equal amounts. Most outcrops, however, are saussuritized to produce an apple green colour. The gabbro is generally massive although compositional layering suggestive of flow banding was observed in several places; this is produced by an alignment of amphibole grains and sometimes by an alternation between more feldspathic and more mafic layers.

A number of cross-cutting NE/SW trending faults have been recognized by previous workers in the area. It is hypothesized that such structures might act as a focus for late-stage mineralizing events. Although these faults were an important target during the mapping work, no new structures were recognized, with the possible exception of the northern contact of the intrusion, where the dunite core of the intrusion is adjacent to country rock across a relatively narrow, elongated drift-filled valley. This fault, if it exists, would be an interesting target for further exploration.

Property Geology:

The Lodestone Property is underlain by all the major units of the Tulameen Complex, with the exception of dunite/peridotite (6a, b). In general terms, the geology consists of a series of NW-SE trending lithological units which show an asymmetrical distribution about a central axis. This axis is the olivine pyroxenite unit (5a) passing through the centre of the property at the LCP. At outcrop scale, it is composed of clinopyroxenite, olivine clinopyroxenite, peridotite and dunite, which, due to insufficient outcrop and also their 'patchy' distribution, cannot be separately mapped. This central core is flanked on both sides by clinopyroxenite and hornblende clinopyroxenite units (4a, b), the zone to the southwest hosting the Lodestone Mountain magnetite deposits. The pyroxenites are flanked on both sides by the gabbro unit (2a, b), the zone to the southwest being narrow and discontinuous, while the zone to the northwest is about 2km wide. Within this latter gabbro zone is a narrow, discontinuous band of pyroxenite (4a, b) which can be traced along strike for more than 4km. In the northeast corner of the Lodestone 3 claim, a second centre of ultramafic lithology, the Tanglewood Hill ultramafic zone is located. This area was the subject of considerable exploration activity for iron in 1959 (Eastwood, 1959).

The west contact of the complex is exposed immediately south of Lodestone Lake, where rusty quartz-biotite-chlorite schist, foliated 140/50W can be seen. Further south and west is a broad plateau where outcrop is scarce. In the southwest corner of Lodestone 2, three small outcrops of a light grey dacite porphyry dike (sample (TR-17), were located. Similar dikes were seen in the Grasshopper Mountain area - these may be related to the Eagle granodiorite to the west.

The geology of the Lodestone property is shown in figure 4, along with sample locations for geochemical analyses.

## GEOCHEMISTRY

### Whole Rock Chemistry:

Samples of all the major lithologies (Table 1) were submitted for 30 element ICP analysis, plus platinum, palladium and gold, using standard geochemical methods at Acme Laboratories and Bondar-Clegg. The results of this work are discussed in the following section.

### Heavy Minerals and Silts:

Samples of heavy minerals were collected from eleven streams draining the Lodestone Property, including one sample from the J & L property. These samples were screened in the field to minus 20 mesh, then submitted to Acme Laboratories for the standard heavy mineral separation procedure using tetrabromoethane. The heavy concentrates were analyzed at Acme for platinum, palladium and gold using a Pb-bead fire assay extraction followed by ICP mass spectrometer and were checked at Bondar Clegg using a similar extraction method, but with an atomic absorption finish. The results of this work are discussed in the next section.

At each sample site, stream silts were collected and analysed by the same methods as above, at Acme and Bondar Clegg.

TABLE 1

Rock Samples submitted for 30 element ICP plus Pt, Pd and Au analyses.

<u>Sample No.</u>	<u>Rock Type</u>	<u>Unit</u>	<u>Location/Remarks</u>
TR - 3	Gabbro	2	On road, NW of Lodestone 3 (L3)
- 4	Gabbro	2	Tanglewood Hill, NE corner of L3
- 5	Gabbro	2	Tanglewood Hill, NE corner of L3
- 6	Gabbro	2	Tanglewood Hill, NE corner of L3
- 7	Gabbro	2	On road, NW corner of L3
- 8	Gabbro	2	On road, NW corner of L3
- 9	Gabbro	2	pink syenodiorite, on road, L3
-10	Gabbro	2	with hornblendite, Tanglewood Hill
-11	Gabbro	2	Tanglewood Hill
-12	Gabbro	2	on road, east of L3
-13	Clinopyroxenite	4a	south edge of L3
-14	Dunite	6a	on road, south edge of L3
-15	Peridotite	6b	on road, north edge of L1
-16A	ol. pyroxenite	5a	on road, south edge of L1
-16B	ol. pyroxenite	5a	on road, north edge of L1
-17	dacite porphyry	9	SW of L2
-18	biotite hornblenite	hb	on Lodestone Mtn, L1, from iron deposit
-19	clinopyroxenite	4a	on road, west side of L3
-20	gabbro	2	on road, west side of L3
-21	gabbro	2	on road east of L1
-22A	hornblende pyroxenite	4b	on road at south edge of L1

TABLE 1 Cont'd

<u>Sample No.</u>	<u>Rock Type</u>	<u>Unit</u>	<u>Location/Remarks</u>
-22B	biotite hornblendite	hb	On road at south edge of L1
-23	gabbro	2	on road at south edge of L1
-24	clinopyroxenite	4a	on road at south edge of L1
-25	feldspar porphyry	12	on road SE of L1, pyritic dike rock
-25B	feldspar porphyry	12	on road SE of L1, unmineralized dike rock
-26	clinopyroxenite	4a	at stream crossing, E of L1
-27	hb pyroxenite	4b	contact zone, N of J & L claims
-28	granodiorite	8	on landing north of Grasshopper Mtn
-29	Chromite	6a	massive chromite pod from dunite, J&L
-30	Olivine pyroxenite	5a	north edge of J & L claims
-31	dunite	6a	J & L claims
-32	dunite	6a	J & L claims
-33	chromite	6a	massive chromite pod from dunite, J&L
-34	dunite	6a	adjacent to TR-33
-35	chromite	6a	massive chromite pod from dunite, J&L
-36	dunite	6a	J & L claims

DISCUSSION OF RESULTS

Whole Rock Chemistry:

The ICP results given in Appendix 2 do not show any outstanding anomalies; however, a number of interesting features should be noted:

- Molybdenum (Mo) values are generally low, but the highest values (6 and 7 ppm) occur in dunites and peridotites.
- Copper (Cu) values are quite variable, with the lowest values (1 to 13 ppm) occurring in the ultramafic rocks and the higher values up to 1157 ppm occurring in gabbro. This is consistent with field observations in that traces of chalcopyrite were noted in gabbro outcrops east of Lodestone 1. A single high value of 1495 ppm was returned by a hornblende pyroxenite from the west contact of the intrusion against pyritic metasediments. Minor amounts of disseminated pyrite were noted in this sample.
- Lead (Pb), Zinc (Zn) and Silver (Ag) values are all uniformly low.
- Nickel (Ni) values are generally low in gabbros and high, up to 737 ppm, in dunite/periodite, reflecting the nickel content of olivines.
- Cobalt (Co), and Manganese (Mn) values, like nickel, are higher in olivine-bearing rocks.
- Iron (Fe) values are highest in the pyroxenites and altered hornblendites in the Lodestone Mtn area, as one might expect.
- Arsenic (As), and Bismuth (Bi) values show a slight increase in iron-rich rocks.
- Uranium (U), Thorium (Th), Cadmium (Cd) and Antimony (Sb) are all uniformly low.
- Strontium (Sr) and Potassium (K) values are highest in the gabbros, reflecting the syenitic character of these rocks.



- Vanadium (V) values are highest in the iron-rich pyroxenites and hornblendites, probably due to an association with magnetite.
- Calcium (Ca) values are, as expected, highest in gabbros and hornblendites, reflecting the Ca content of plagioclase and hornblende, respectively.
- Phosphorus (P) values are highest in gabbros, probably reflecting the presence of apatite.
- Lanthanum (La) values are generally low, the highest values of 10-11 ppm coming from the granodiorite and dacite dikes.
- Chromium (Cr) values, up to 294 ppm, are highest in dunites which would contain traces of chromite. The extremely high values from TR-29, 33 and 35, are from chromite samples high-graded from the dunite.
- Magnesium (Mg) values up to 15.2% reflect the olivine content of the dunites.
- Barium (Ba) values are erratic, but appear to be systematically higher in gabbro, indicating substitution in feldspars.
- Titanium (Ti) values are erratic but appear to be higher in pyroxenites, reflecting an association with magnetite.
- Boron (B) values are low, except in dunite and peridotite. This may reflect the amount of serpentinization of these rocks, boron being a common trace element in serpentine.
- Aluminum (Al) values, like calcium, are highest in rocks containing feldspar and hornblende, ie gabbro, hornblendites, and hornblende pyroxenites.
- Sodium (Na) values are generally low, but show a slight increase in hornblendites and pyroxenites.
- Tungsten (W) values are uniformly low.

- Gold (Au) values are low, with a weak response of 24 ppb from 2 gabbro samples from the Tanglewood Hill area.
- Platinum (Pt) values are low, but appear to be slightly elevated in ultramafic rocks as compared to gabbro.
- Palladium (Pd) values are low, the highest value of 51 ppb being found in a pyroxenite.

Heavy Minerals and Silts:

The results of the heavy mineral concentrate analyses are given in Appendix 2 - Analytical Results. These results are consistently low - which is both disappointing and puzzling, in view of the fact that several samples were taken on streams known to be platinum placers. These values are similar to background values for the rocks comprising the Tulameen Complex, for example the dunite has an average platinum content of 56 ppb (St. Louis, 1984). It would therefore appear that no enhancement of values was achieved by the heavy mineral concentration process, suggesting the possibilities that:

- 1) platinum and gold values are intimately associated with light minerals like feldspar and quartz which would produce a net density less than the separation medium or;
- 2) the concentrate samples are diluted by dense mafic minerals like olivine and pyroxene which are not separated by the procedures used or;
- 3) the field sampling procedure somehow failed to retain platinum and/or gold values which were present in the streams or;
- 4) there are no mineralized zones on the property and the best one can expect are background values.

Which of these possibilities is correct is a matter of speculation at this point - further work is required. It may well turn out that a combination of all four possibilities is involved.

The results for the silt samples are similarly low, confirming the heavy mineral results.

### CONCLUSIONS

A program of geological mapping, prospecting and geochemical sampling has failed to detect gold or platinum mineralization on the Lodestone property.

It cannot be stated that such mineralization is not present, however, because of the extensive blanket of glacial drift which obscures much of the geology and because of the inherent difficulty in detecting deposits of platinum in large volumes of favourable rock.

The absence of anomalous results among the heavy mineral concentrate samples cannot be taken as evidence of no significant mineralization on the property, since at least one sample was taken from a known platinum placer stream and results proved negative. Hence, it appears that other factors may be suppressing any anomalies that are present, such as dilution by unmineralized heavy minerals like olivine and pyroxene.

The results of the rock geochemistry do not show any significant anomalous values, with the exception of 2 high copper values of 1157 and 1495 ppm from gabbros and hornblende pyroxenite, respectively. Several high iron values, up to 17.4%, are from the vicinity of known iron deposits. Platinum, palladium and gold values were uniformly low.

### RECOMMENDATIONS

The results of this project are consistent with the results of previous work (Findlay, 1963, St. Louis, 1984) which indicate that the platinum group elements are enriched in the dunite/peridotite core of the intrusion which is located in the Olivine Mtn. - Grasshopper Mtn area to the north.

In view of the inconclusive nature and very limited amount of the available data, however, the gold and platinum potential of the Lodestone Property remains uncertain. Further evaluation of the property should involve a thorough review of sampling and analytical procedures.

The Lodestone 1 and 2 claims, which host a significant iron deposit, should be maintained in good standing, further exploration activity being aimed at increasing tonnage and generally refining reserve estimates. The Lodestone 3 claim, which is underlain almost entirely by gabbro, could be optioned out to interested parties. There is still considerable work that could be done on this ground, including soil geochemistry.

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CERTIFICATE

I, Robert L. Wright, geologist, residing at 105 Sunset Drive, in the village of Lions Bay, province of British Columbia, hereby certify that:

1. I received a Bachelor of Science degree in Honours Geology from McMaster University, Hamilton, Ontario, in 1971 and a Master of Science degree in Geology from the University of British Columbia, Vancouver, B.C. in 1974.
2. I have been practising my profession as an exploration geologist since 1975.
3. I am a Fellow of the Geological Association of Canada.
4. I am the proprietor of the exploration consulting firm, R.L. Wright and Associates.
5. The work described in this report was undertaken under my direct supervision, on a consulting basis, on behalf of Imperial Metals Corporation, #800 - 601 W. Hastings Street, Vancouver, B.C.

16th day of January, 1987

Vancouver, British Columbia

R.L. Wright  
R.L. WRIGHT, MSc, FGAC  
R.L. WRIGHT & ASSOCIATES



APPENDIX #1

Statement of Expenditure on the Tulameen Project, June 4 to September 18, 1986.

<u>Salaries:</u>	R.L. Wright, geologist	18 days @ \$200/day	\$ 3,600.00
	S. Royea, assistant	18 days @ \$ 90/day	1,620.00
<u>Transportation:</u>	Truck rental		1,242.66
	Gas for truck		288.07
<u>Field Equipment:</u>	Rental		606.33
<u>Field Supplies:</u>	Base map, airphotos, misc.		310.25
<u>Room &amp; Board:</u>	Motel		961.29
	Meals 36 man days @ 26.15		941.22
<u>Geochemistry:</u>	Acme	390.25	1,548.95
	Bondar Clegg	489.75	
	Acme ICP	668.95	
<u>Report Preparation:</u>	5 days		<u>1,000.00</u>
		TOTAL	<u><u>\$12,118.77</u></u>

Lodestone 50%	=	6,000.00	
J & L 2 days/18	=	1,350.00	see separate report
PAC	=	<u>4,768.77</u>	
		<u><u>12,118.77</u></u>	

R.L. Wright  
R.L. Wright, MSc, FGAC

APPENDIX II

Analytical Results

ACME ANALYTICAL LABORATORIES LTD.  
852 E. HASTINGS, VANCOUVER B.C.  
PH: (604)253-3158 COMPUTER LINE:251-1011

DATE RECEIVED SEPT 19 1986

DATE REPORTS MAILED *Sept 29/86*

### GEOCHEMICAL ASSAY CERTIFICATE

SAMPLE TYPE : P1-HEAVY MINERALS P2-SILTS P3-ROCKS  
10 GRAM SAMPLE FIRE ASSAY AND ANALYSIS BY ICP MASS SPECTROMETER.

ASSAYER: *D. Toye* DEAN TOYE . CERTIFIED B.C. ASSAYER

IMPERIAL METALS PROJECT 6002 FILE# 86-2767

PAGE# 1

SAMPLE	Au** ppb	Pt** ppb	Pd** ppb	H.m. %	H.m. gm	Samole wt. gm
TH-1	31	34	7	5.02	177.76	3540
TH-2	3	11	13	11.89	252.12	2120
TH-3	6	18	17	14.83	246.25	1660
TH-4	6	16	11	10.31	263.86	2560
TH-5	4	6	16	8.62	256.95	2980
TH-6	2	23	10	13.68	411.89	3010
TH-7	3	8	13	8.14	248.15	3050
TH-8	5	10	9	13.26	273.12	2060
TH-9	4	19	11	8.74	259.64	2970
TH-10	5	19	15	6.93	153.12	2210
TH-11	13	30	3	.80	26.88	3370
DETECTION LIMIT	1	2	2	-	-	-

SAMPLE#	Au PPB	Pt PPB	Pd PPB
TS-1	1	7	10
TS-2	3	8	7
TS-3	3	10	18
TS-4	4	8	16
TS-5	2	4	16
TS-6	3	11	9
TS-7	14	9	11
TS-8	2	7	11
TS-9	5	6	19
TS-10	3	7	10
TS-11	2	2	2
DETECTION LIMIT	1	2	2

IMPERIAL METALS PROJECT 6002

FILE# 86-2767

PAGE# 3

SAMPLE

Au\*\*  
ppb

Pt\*\*  
ppb

Pd\*\*  
ppb

TR--29

1

62

2

## GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.  
THIS LEACH IS PARTIAL FOR MN, FE, CA, P, CR, MG, BA, TI, B, AL, NA, K, W, SI, ZR, CE, SM, Y, NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.  
AU AND PT BY FA-MS. SAMPLE TYPE: ROCK CHIPS

DATE RECEIVED: OCT 2 1986

DATE REPORT MAILED: *Oct 9/86*ASSAYER: *D. J. ...* DEAN TOYE. CERTIFIED B.C. ASSAYER.

IMPERIAL METALS FILE # 86-3015

PAGE 1

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Au#	Pt#	Pd#
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
TR-3	1	33	2	46	.2	27	17	451	4.31	6	5	ND	2	190	1	2	2	120	1.63	.203	3	71	1.20	99	.17	8	1.04	.04	.76	1	5	5	27
TR-4	1	1157	3	52	.4	2	9	401	2.10	4	5	ND	1	188	1	2	2	69	1.16	.167	7	6	.61	492	.11	3	1.04	.04	.43	1	24	2	13
TR-5	1	86	3	50	.2	3	12	358	2.29	9	5	ND	1	212	1	2	2	87	1.27	.206	7	3	.74	93	.15	5	1.15	.04	.53	1	4	3	11
TR-6	1	110	5	44	.1	2	12	372	2.29	3	5	ND	1	182	1	2	2	83	1.14	.184	6	3	.71	76	.13	5	1.09	.04	.45	1	1	2	9
TR-7	1	86	5	77	.3	6	18	667	3.62	8	6	ND	2	187	1	2	2	119	2.55	.208	3	10	1.85	309	.13	2	1.88	.03	.55	1	7	2	8
TR-8	1	214	2	43	.4	5	19	335	1.85	10	5	ND	1	97	1	2	2	52	2.49	.526	4	4	.44	54	.12	3	.76	.05	.64	1	24	4	7
TR-9	1	75	8	43	.2	1	12	352	3.24	9	5	ND	3	111	1	2	2	118	1.08	.161	5	6	.57	56	.14	5	.71	.05	.23	1	3	2	7
TR-10	1	3	9	35	.2	14	24	391	8.05	9	5	ND	1	85	1	2	2	284	1.71	.040	2	11	1.75	224	.24	2	1.11	.17	.29	2	1	11	6
TR-11	1	41	4	38	.1	1	13	375	2.49	6	5	ND	1	270	1	2	2	77	1.49	.214	6	3	.71	340	.11	3	1.14	.03	.25	1	3	2	8
TR-12	1	85	2	51	.2	4	16	408	3.23	4	5	ND	1	164	1	2	2	104	1.29	.226	8	4	.91	105	.15	3	1.24	.04	.61	1	3	6	9
TR-13	2	6	2	8	.1	82	11	176	.90	7	5	ND	1	11	1	2	2	7	.70	.002	2	263	2.56	9	.01	5	.14	.02	.01	1	1	31	5
TR-14	6	13	2	37	.1	731	59	914	4.35	9	5	ND	1	6	1	4	2	12	.15	.004	2	294	14.01	14	.02	53	.19	.01	.02	1	1	11	6
TR-15	7	4	4	30	.1	737	58	801	4.02	8	5	ND	1	4	1	5	2	3	.51	.001	2	244	15.24	22	.01	100	.08	.01	.01	1	1	20	4
TR-16	3	1	2	14	.1	98	17	225	1.59	4	5	ND	1	3	1	2	2	7	.28	.001	2	196	2.63	14	.01	7	.09	.01	.01	1	1	16	3
TR-16B	1	4	9	16	.2	96	43	309	12.47	9	5	ND	1	6	1	2	5	290	.51	.003	2	266	1.91	11	.25	2	.47	.01	.01	1	1	8	4
TR-17	1	31	11	60	.2	17	10	355	2.43	6	5	ND	2	27	1	2	2	58	.60	.040	11	40	.84	54	.19	6	.99	.09	.09	1	1	2	3
TR-18	1	5	14	16	.2	136	51	371	17.40	15	5	ND	1	7	1	2	9	509	.35	.001	2	109	2.19	48	.22	2	.53	.02	.14	2	1	16	3
TR-19	1	1	5	19	.3	83	34	317	12.41	12	5	ND	1	15	1	2	4	484	.66	.001	2	58	1.02	19	.25	4	.55	.07	.05	1	1	10	2
TR-20	1	78	11	63	.2	56	26	498	5.04	5	5	ND	1	163	1	2	2	140	.90	.150	2	132	2.04	210	.16	2	1.50	.03	1.34	1	1	2	13
TR-21	1	115	9	38	.2	3	13	298	2.91	8	5	ND	1	160	1	2	2	104	1.20	.176	6	6	.65	54	.12	8	.96	.05	.33	1	7	4	9
TR-22A	1	1	5	30	.2	29	24	297	6.36	4	5	ND	1	56	1	2	2	249	1.45	.005	2	5	1.85	37	.28	2	1.22	.23	.16	1	1	10	4
TR-22B	1	3	3	26	.3	24	20	324	5.93	9	5	ND	1	82	1	2	2	246	1.88	.006	2	4	2.04	54	.29	2	1.42	.33	.23	1	1	21	4
TR-23	1	175	7	46	.2	5	18	441	3.44	7	5	ND	1	153	1	2	2	132	1.10	.182	5	10	1.03	84	.15	3	1.15	.06	.57	1	4	4	28
TR-24	1	13	3	23	.3	22	18	309	5.86	6	5	ND	1	69	1	2	2	205	2.42	.009	2	69	1.48	55	.25	2	1.07	.23	.16	1	1	27	51
TR-25	1	420	4	66	.2	52	59	450	4.65	7	5	ND	1	42	1	2	2	111	1.38	.179	6	29	1.63	36	.20	2	1.58	.13	.12	1	2	7	15
TR-25B	1	72	9	94	.1	13	19	391	4.99	6	5	ND	1	51	1	2	2	156	1.28	.163	5	11	1.53	52	.19	2	1.34	.10	.18	1	1	6	10
TR-26	1	5	2	17	.2	15	11	311	3.28	3	5	ND	1	52	1	2	2	120	2.34	.084	2	174	1.43	34	.18	2	.87	.21	.13	1	1	4	7
TR-27	1	1495	5	31	.6	49	35	303	8.48	8	5	ND	1	48	1	2	2	396	1.68	.014	2	5	1.44	133	.32	2	.99	.19	.16	1	4	2	3
TR-28	1	16	7	69	.1	7	9	349	2.29	8	5	ND	1	51	1	2	2	49	1.66	.097	10	11	.86	73	.01	2	.98	.05	.14	1	1	2	2
STD C/FA-SI	21	59	38	131	7.6	66	30	1002	3.94	41	21	7	33	48	17	15	23	62	.48	.099	36	59	.88	179	.08	37	1.73	.06	.13	13	105	98	97

## GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.  
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.  
AU AND PT AND PD BY FA-MS. SAMPLE TYPE: PULP

DATE RECEIVED: OCT 9 1986

DATE REPORT MAILED:

*Oct 20/86*

ASSAYER:

*D. Toyer*

..DEAN TOYE.

CERTIFIED B.C.

ASSAYER.

IMPERIAL METALS FILE # 86-3136

PAGE 1

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Au88	Pt88	Pd88
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	%	PPM	%	PPM	%	%	%	PPM	PPB	PPB	PPB
TR-30	3	11	38	18	.1	247	53	397	11.29	8	5	ND	1	4	1	2	2	79	.19	.006	7	693	4.57	10	.08	4	.22	.01	.01	1	6	30	4
TR-31	10	3	10	32	.1	1195	72	830	4.36	10	5	ND	1	2	1	2	2	1	.10	.006	3	71	26.78	1	.01	8	.03	.01	.01	1	15	2	4
TR-32	11	9	6	37	.1	1280	76	919	4.68	10	5	ND	1	1	1	2	2	1	.08	.006	4	55	29.28	1	.01	4	.02	.01	.01	1	472	4	142
TR-33	5	4	3	18	.4	613	26	314	1.75	4	5	ND	1	1	1	4	2	1	.02	.004	2	578	10.68	1	.01	5	.04	.01	.01	1	23	13	9
TR-34	11	4	7	28	.1	1362	69	762	3.90	7	5	ND	1	2	1	2	2	1	.08	.003	2	71	29.57	1	.01	3	.02	.01	.01	1	1	2	2
TR-35	2	2	5	21	.1	421	19	253	2.00	6	5	ND	1	1	1	2	2	4	.01	.004	2	2068	3.59	1	.01	4	.13	.01	.01	1	3	173	2
TR-36	11	4	2	33	.1	1466	83	1066	5.40	81	5	ND	1	3	1	2	2	2	.08	.005	4	126	27.90	1	.01	4	.03	.01	.01	1	1	16	2
TR-29	4	17	3	10	.1	396	16	253	1.17	3	5	ND	1	3	1	2	2	1	.14	.001	2	548	7.45	1	.01	5	.05	.01	.01	1			
STD C/FA-SI	21	59	41	133	7.2	72	30	1036	3.96	40	17	8	34	49	19	16	20	64	.48	.110	38	58	.88	183	.08	37	1.73	.06	.13	13	103	97	100

Bondar-Clegg & Company Ltd.  
 130 Pemberton Ave.  
 North Vancouver, B.C.  
 Canada V7P 2R5  
 Phone: (604) 985-0681  
 Telex: 04-352667



# BONDAR-CLEGG

Geochemical  
 Lab Report

REPORT: 126-5105 ( COMPLETE )

REFERENCE INFO:

CLIENT: IMPERIAL METALS CORP.  
 PROJECT: STRATNET 6002

SUBMITTED BY: R WRIGHT  
 DATE PRINTED: 9-OCT-86

ORDER	ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	Au Gold - Fire Assay	22	5 PPB	FIRE-ASSAY	Fire Assay AA
2	Pt Platinum	22	15 PPB	FIRE-ASSAY	Fire Assay AA
3	Pd Palladium	22	2 PPB	FIRE-ASSAY	Fire Assay AA

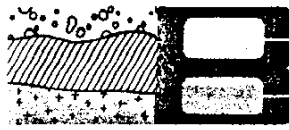
SAMPLE TYPES	NUMBER	SIZE FRACTIONS	NUMBER	SAMPLE PREPARATIONS	NUMBER
R ROCK OR BED ROCK	23	2 -150	23	DRY, SEIVE -80	22
				CRUSH, PULVERIZE -150	1

REMARKS: "IS" DENOTES INSUFFICIENT SAMPLE

REPORT COPIES TO: MR. K. L. WRIGHT

INVOICE TO: MR. K. L. WRIGHT





REPORT: 126-5105

PROJECT: STRATMET 6002

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	90 PPB	PC PPB	PC PPB
R2 TH-1		<5	<50	5
R2 TH-2		<5	<50	10
R2 TH-3		<5	<50	10
R2 TH-4		5	<50	10
R2 TH-5		<5	<50	10
R2 TH-6		<5	<50	10
R2 TH-7		<5	<50	30
R2 TH-8		<5	<50	5
R2 TH-9		<5	<50	5
R2 TH-10		<5	50	10
R2 TS-11		10	10	10
R2 TS-1		<5	<50	5
R2 TS-2		10	<50	5
R2 TS-3		<5	<50	10
R2 TS-4		10	<50	5
R2 TS-5		<5	<50	10
R2 TS-6		<5	<50	<5
R2 TS-7		5	<50	10
R2 TS-8		<5	<50	10
R2 TS-9		<5	<50	10
R2 TS-10		<5	<50	10
R2 TS-11		<5	<50	<5
R2 TX-20		<5	100	<5



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

15,458  
LEGEND

- |       |   |       |                             |
|-------|---|-------|-----------------------------|
| —     | Road                                    | —     | Old Adit                    |
| - - - | Road, Secondary                         | x     | Mineral Occurrence          |
| ---   | Stream                                  | ~ ~ ~ | Fault                       |
|       | Bridge                                  | ---   | Geological Contact, Defined |
| ⊗     | Claim Post                              | - - - | Geological Contact, Approx. |
| ---   | Claim Boundary                          | ..... | Geological Contact, Assumed |
| ○     | Drill Hole                              | ↖     | Primary Flow Structure      |
| TR-24 | Sample Location - Rock                  | ↗     | Foliation                   |
| ● H-9 | Sample Location - Heavy Minerals & Silt | △     | Breccia                     |

GEOLOGY:

TERTIARY

- |    |                                |
|----|--------------------------------|
| 12 | Olivine Basalt                 |
| 11 | Princeton Gp: Basalt, Andesite |
- JURASSIC
- |   |                                     |
|---|-------------------------------------|
| 9 | Acidic Dikes, in part related to B  |
| 8 | Coast Intrusion: Eagle Granodiorite |

TRIASSIC - TULAMEEN COMPLEX

- |   |  |
|---|--|
| 7 | Basic Pegmatite  |
| 6 | 6a: Dunite & Serpentinite<br>6b: Peridotite                          |
| 5 | 5a: Olivine Pyroxenite<br>5b: Hornblende-Olivine Pyroxenite          |
| 4 | 4a: Clinopyroxenite<br>4b: Hornblende Pyroxenite<br>4c: Hornblendite |
| 3 | Hybrid, mixed lithologies of units 2 & 4                             |
| 2 | Gabbro<br>2a: Syenogabbro<br>2b: Syenodiorite                        |

TRIASSIC - NICOLA GROUP

- |   |  |
|---|--|
| 1 | Metasediments: rusty Argillite & quartz-biotite Schist |
|---|--|

Geology after D.C. Findlay, 1963, with modifications by R.L. Wright, 1986.

IMPERIAL METALS CORPORATION

LODESTONE

FIGURE 3a

N.T.S. 92H/10W

NORTH HALF  
GEOLOGY & GEOCHEMISTRY

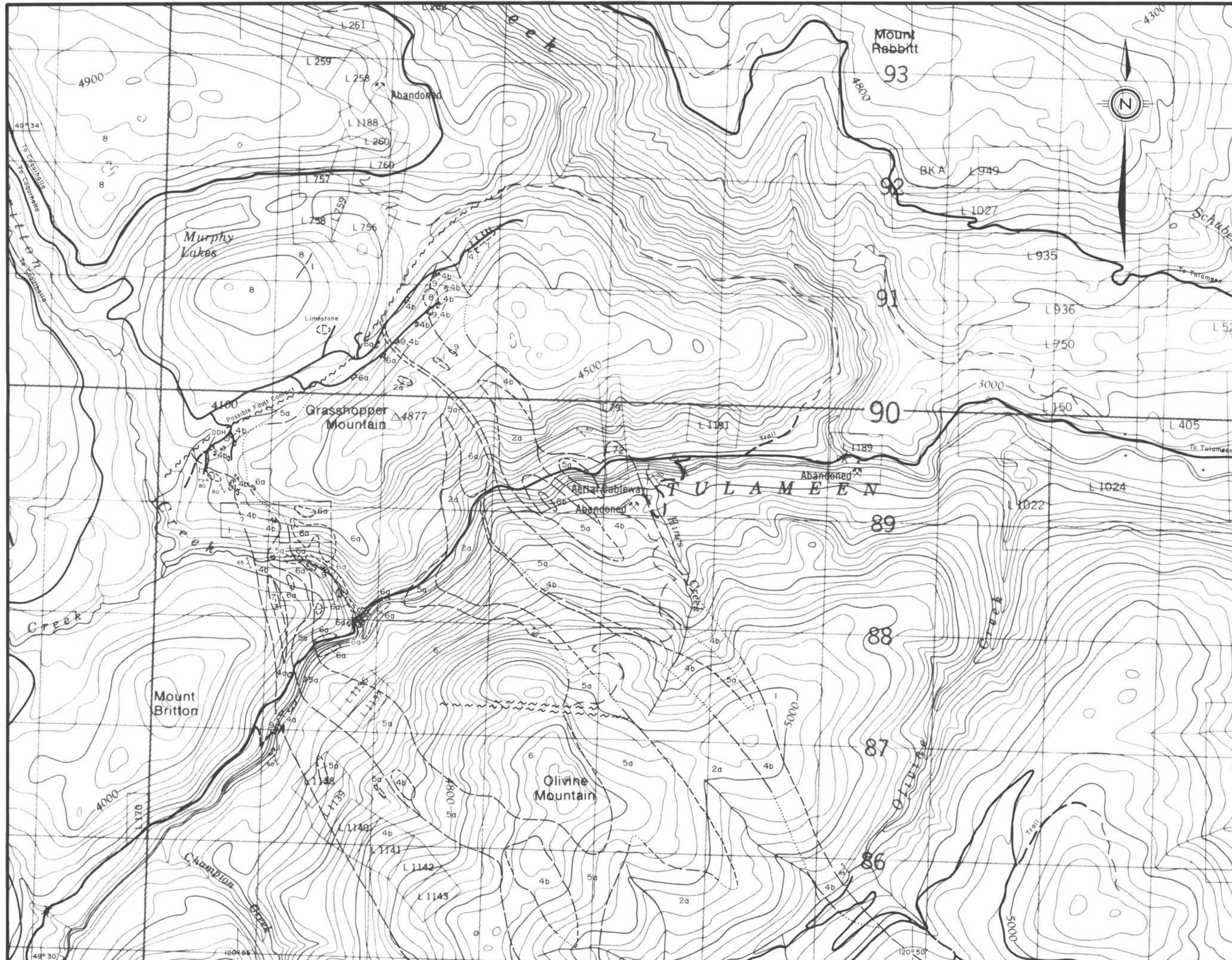


SCALE: 1:20 000

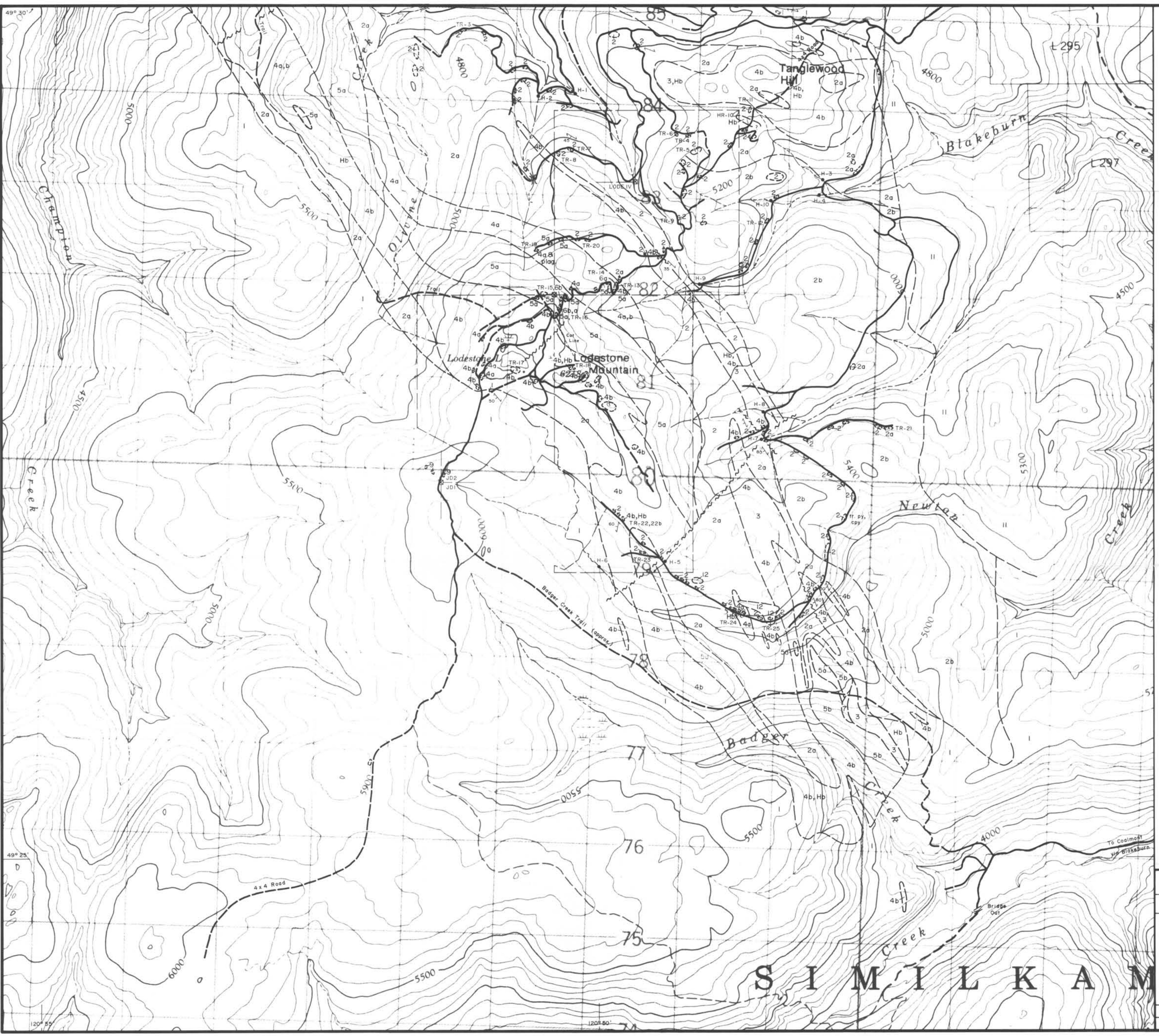
GEOLOGIST: R.L. WRIGHT

DATE: JANUARY 1987

DRAWN BY: S. HAWORTH







**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**15,458**

**LEGEND**

- |       |   |       |                             |
|-------|---|-------|-----------------------------|
| —     | Road                                    | —     | Old Adit                    |
| - - - | Road, Secondary                         | x     | Mineral Occurrence          |
| - - - | Stream                                  | ~ ~ ~ | Fault                       |
| ( )   | Bridge                                  | - - - | Geological Contact, Defined |
| □     | Claim Post                              | - - - | Geological Contact, Approx. |
| —     | Claim Boundary                          | ..... | Geological Contact, Assumed |
| ○     | Drill Hole                              | ↗     | Primary Flow Structure      |
| TR-24 | Sample Location - Rock                  | ↖     | Foliation                   |
| ● H-9 | Sample Location - Heavy Minerals & Silt | △     | Breccia                     |

**GEOLOGY:**

**TERTIARY**

- 12 Olivine Basalt
- 11 Princeton Gp: Basalt, Andesite

**JURASSIC**

- 9 Acidic Dikes, in part related to 8
- 8 Coast Intrusion: Eagle Granodiorite

**TRIASSIC - TULAMEEN COMPLEX**

- 7 Basic Pegmatite
- 6 6a: Dunite & Serpentinite  
6b: Peridotite
- 5 5a: Olivine Pyroxenite  
5b: Hornblende-Olivine Pyroxenite
- 4 4a: Clinopyroxenite  
4b: Hornblende Pyroxenite  
Hb: Hornblende
- 3 Hybrid, mixed lithologies of units 2 & 4
- 2 Gabbro  
2a: Syenogabbro  
2b: Syenodiorite

**TRIASSIC - NICOLA GROUP**

- 1 Metasediments: rusty Argillite & quartz-biotite Schist

Geology after D.C. Findlay, 1963, with modifications by R.L. Wright, 1986.

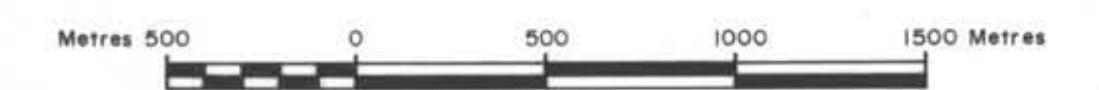
**IMPERIAL METALS CORPORATION**

**LODESTONE**

FIGURE 3b

N.T.S. 92H/7W

**SOUTH HALF  
GEOLOGY & GEOCHEMISTRY**



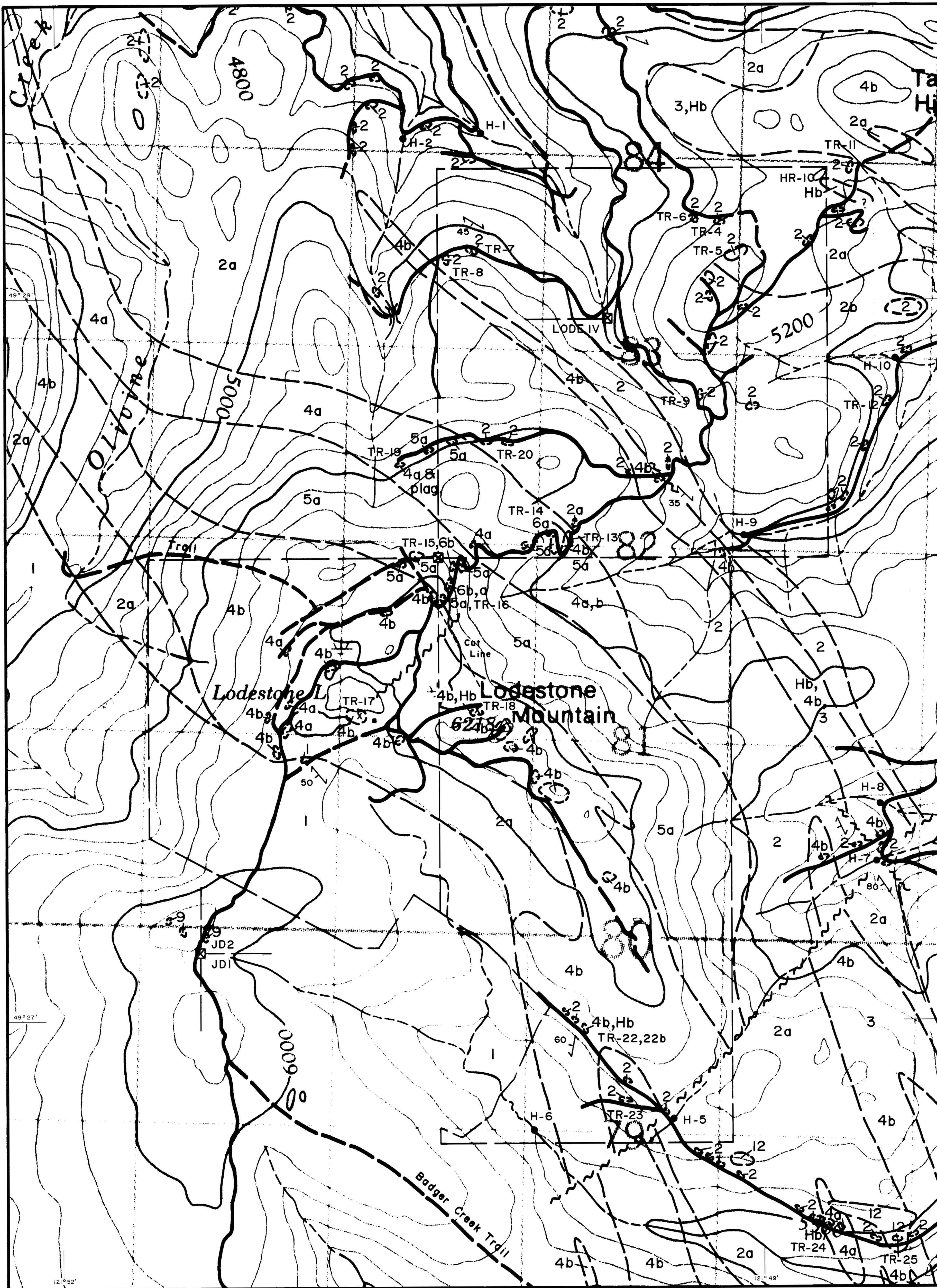
SCALE: 1 : 20 000

GEOLOGIST: R. L. WRIGHT

DATE: JANUARY 1987

DRAWN BY: S. HAWORTH





**LEGEND**

- |  |   |  |                             |
|--|---|--|-----------------------------|
|  | Road                                    |  | Old Adit                    |
|  | Road, Secondary                         |  | Mineral Occurrence          |
|  | Stream                                  |  | Fault                       |
|  | Bridge                                  |  | Geological Contact, Defined |
|  | Claim Post                              |  | Geological Contact, Approx. |
|  | Claim Boundary                          |  | Geological Contact, Assumed |
|  | Drill Hole                              |  | Primary Flow Structure      |
|  | Sample Location - Rock                  |  | Foliation                   |
|  | Sample Location - Heavy Minerals & Silt |  | Breccia                     |

**GEOLOGY:**

**TERTIARY**

- 12 Olivine Basalt
- 11 Princeton Gp: Basalt, Andesite

**JURASSIC**

- 9 Acidic Dikes, in part related to 8
- 8 Coast Intrusion: Eagle Granodiorite

**TRIASSIC - TULAMEEN COMPLEX**

- 7 Basic Pegmatite
- 6a: Dunite & Serpentinite  
6b: Peridotite
- 5a: Olivine Pyroxenite  
5b: Hornblende-Olivine Pyroxenite
- 4a: Clinopyroxenite  
4b: Hornblende Pyroxenite  
Hb: Hornblende
- 3 Hybrid, mixed lithologies of units 2 & 4
- 2 Gabbro  
2a: Syenogabbro  
2b: Syenodiorite

**TRIASSIC - NICOLA GROUP**

- 1 Metasediments: rusty Argillite & quartz-biotite Schist

Geology after D.C. Findlay, 1963, with modifications by R.L. Wright, 1986.

**GEOLOGICAL BRANCH ASSESSMENT REPORT**

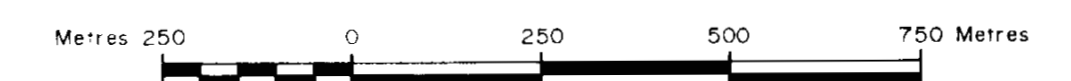
**15,458**

IMPERIAL METALS CORPORATION

LODESTONE

FIGURE 4 NTS 92H/7W

**PROPERTY GEOLOGY**



SCALE: 1 : 10 000  
DATE: JANUARY 1987  
GEOLOGIST: R. L. WRIGHT  
DRAWN BY: S. HAWORTH