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**Outokumpu Mines Ltd.**

Diamond Drilling Report  
on the  
Hynes Option

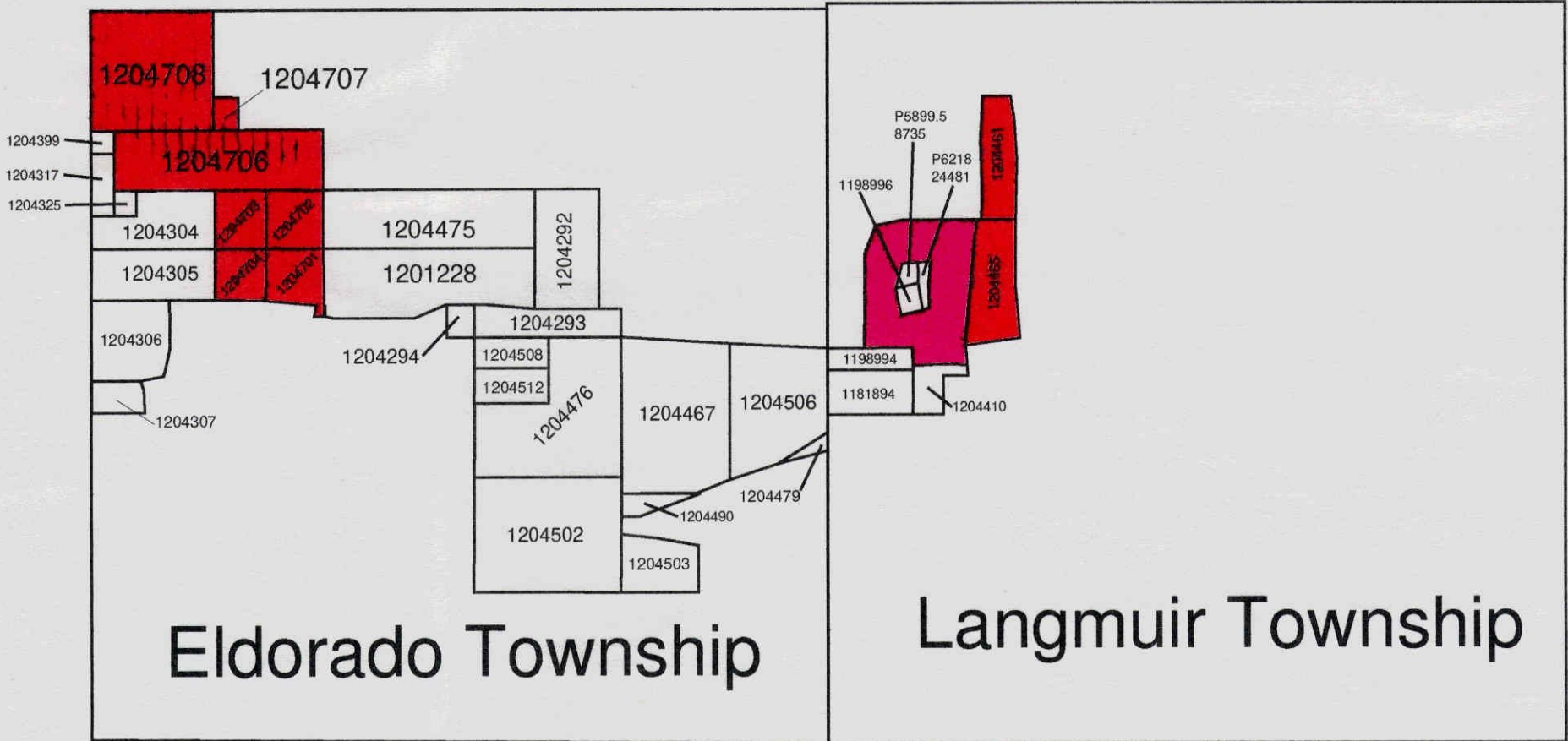
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*Niels Hendrikx*

Niels Hendrikx  
Outokumpu Mines Ltd.  
February, 1997

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 PORCUPINE MINING DIVISION



- Hynes Option
- Claims to which Hynes Option Work Credits are to be applied

*Neil Hendrix*





42A06SE0108 2.17422 LANGMUIR

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## **1.0 Introduction**

Outokumpu Mines Ltd. optioned 12 patents (both surface and mining rights) for 1 year in the spring of 1996. The patents are located in the northwest quarter of Langmuir Township and will be called the 'Hynes Option' in this report. The patents are numbered as follows: 19393, 19394, 19396, 19397, 19666, 19667, 19668, 19671, 19672, 19673, 19674, and 19675.

Bradley Brothers Limited was contracted by Outokumpu Mines Limited to drill 4 diamond drill holes on the Hynes Option. The Hynes Option is located in Langmuir Township, Porcupine Mining Division, District of Cochrane, Ontario, Canada. The property comprises the 12 patents listed above.

A total of 876 metres of BQ diamond drilling was completed in 4 diamond drill holes from 2 to 10 December 1996. All core was logged by Outokumpu personnel at the Outokumpu Mines Limited Office in Timmins, Ontario. Copies of all 4 logs are included as Appendix 1 of this report.

The objective of this program was to test the komatiitic stratigraphy of the property. A coincident high magnetic anomaly and electromagnetic conductor at the interpreted base of a thick komatiitic mesocumulate to adcumulate was targeted within this drilling program.

## **2.0 Location, Access, and Topography**

The Hynes Option is located in Langmuir (G-3226) Township, District of Cochrane, Porcupine Mining Division, Ontario, Canada. The property is south of the Langmuir Mine Road approximately 25 kilometres southeast of the City of Timmins. The property is located in the south central area of the northwest quadrant of Langmuir Township (fig. 1).

The property is accessed by the Langmuir Mine Road which intersects Stringer's Road in Shaw Township. Stringer's Road originates in South Porcupine. From the Langmuir Mine Road, the property is accessed by a well established ATV trail. The grid on which the four holes were drilled intersects the ATV trail.

The area in which the holes were drilled is of relatively low relief. In the southern end of the property, a number of outcrop ridges rise out of muskeg swamp. The northern portion of the property is almost entirely muskeg swamp. Outcrop exposure on the property is approximately 5 percent and is limited to the outcrop ridges in the southern end of the property. Vegetation in the southern portion of the property is dominated by poplar and black spruce. Vegetation in the northern portion of the property is primarily black spruce, alder and occasional small patches of cedar.

## **3.0 Property**

The Hynes Option consists of 12 patents (both surface and mining rights) arranged in a rough doughnut shape surrounding 2 other patents and a mining claim (1198996), currently held by Outokumpu Mines Ltd. (please see table 1 and figure 2). The 12 patents comprising the Hynes Option are currently under option to Outokumpu Mines Limited.

Patent Number	Township	Optioned to:
19393	Langmuir	Outokumpu
19394	Langmuir	Outokumpu
19396	Langmuir	Outokumpu
19397	Langmuir	Outokumpu
19666	Langmuir	Outokumpu
19667	Langmuir	Outokumpu
19668	Langmuir	Outokumpu
19671	Langmuir	Outokumpu
19672	Langmuir	Outokumpu
19673	Langmuir	Outokumpu
19674	Langmuir	Outokumpu
19675	Langmuir	Outokumpu

**Table 1.** Outokumpu Mines Ltd. Property Holdings - Hynes Option

#### 4.0 Regional Geology

The Hynes Option is located in the southwestern portion of the Abitibi greenstone belt (fig. 3). The Abitibi greenstone belt is characterised by east-west trending metasedimentary and metavolcanic rocks that have been intruded by a series of felsic to intermediate plutons and diabase dykes.

The area south of the Destor-Porcupine fault in the Timmins camp comprises a series of calc-alkalic mafic to felsic volcanic rocks overlain by a series of thick sulphide and oxide facies iron formations. These in turn are overlain by komatiitic dunites to basalts which are intercalated with minor amounts of tholeiitic volcanics. These rocks are capped by a thick sequence of komatiitic basalts and tholeiitic mafic to intermediate volcanics. The entire sequence has been intruded by numerous granitic and granodioritic intrusions, tholeiitic dykes and sills, and several generations of diabase dykes.

#### 5.0 Property Geology

The Hynes Option is located on the southeastern nose of the Shaw Dome. The Hynes Option is dominated by a large granitic intrusion which hosts a small gold anomaly that was tested several decades ago. In the southeastern portion of the property a thick sequence of komatiitic olivine mesocumulate to adcumulate which is bound on both sides by an intermediate to felsic volcanic. The olivine mesocumulate to adcumulate extends across the southern edge of the property with a strike length of approximately 1200 metres. The komatiitic body strikes roughly west-southwest to east-northeast and dips steeply to the southeast as interpreted from geophysical results, surface mapping, and drill core intersections. Surface mapping and drill core analysis identified an oxide facies iron formation in the extreme southern portion of the property.

#### 6.0 Diamond Drilling

Four diamond drill holes were completed for a total of 876 metres of BQ core (please see table 2). The diamond drill core was picked up daily from the drill and transported to the Outokumpu Mines Limited office in Timmins, Ontario. The core was then logged and sampled by Outokumpu personnel. Complete diamond drill logs of both holes are included as Appendix 1 of this report. A plan map and sections of the holes are included as Appendix 2 of this report.

Hole Number	Total Depth	Dip
HY-1-96	236 m	-50°
HY-2-96	224 m	-50°
HY-3-96	214 m	-50°
HY-4-96	202 m	-50°

**Table 2** Diamond Drill Hole Depths and Dips - Hynes Option

## 7.0 Results and Conclusions

No iron-nickel-copper sulphide body was encountered at the base of the olivine cumulate unit. Several thick sections of komatiitic peridotites and pyroxenites were drilled but lacked any appreciable sulphide content.

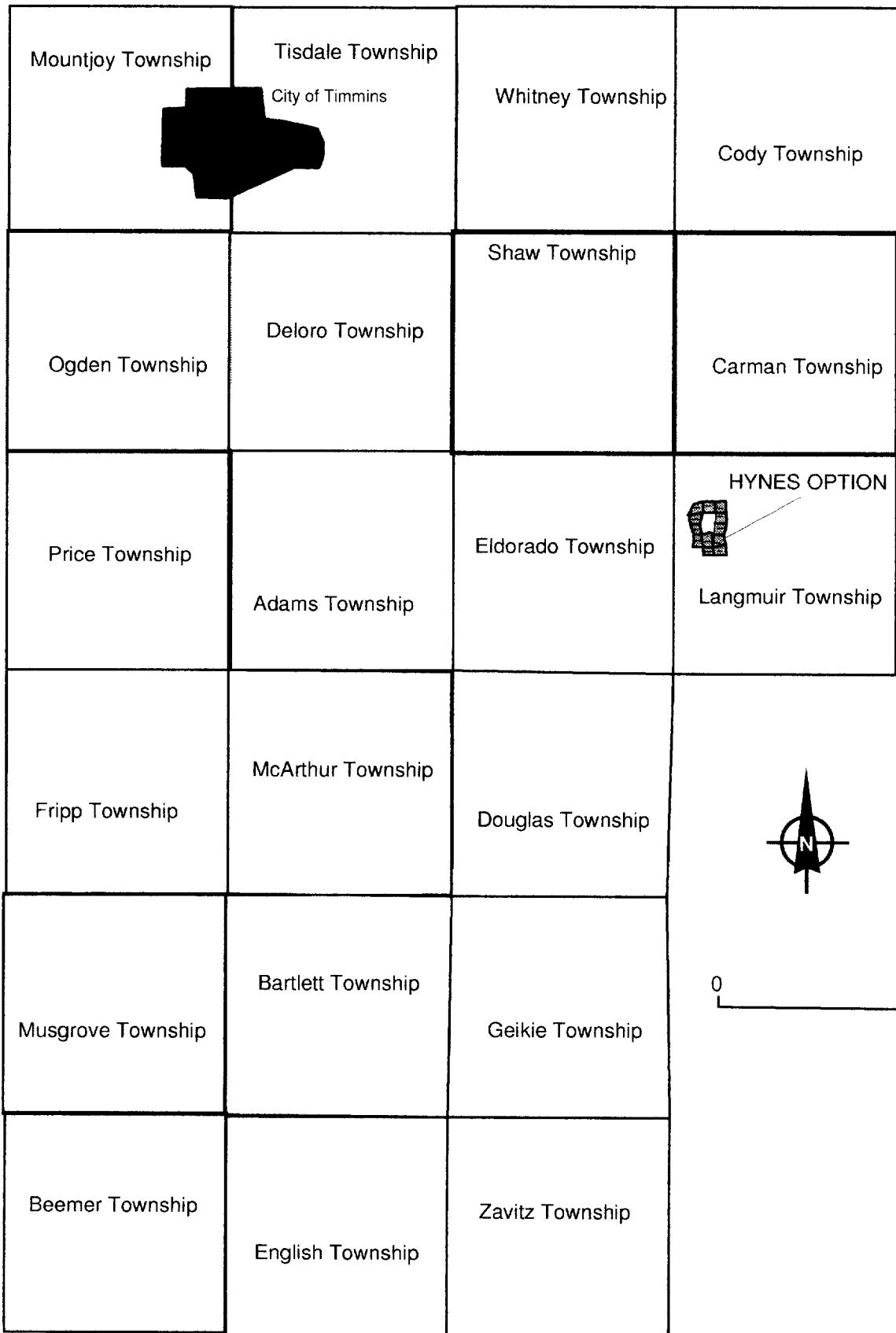
Metamorphism associated with the emplacement of the granitic pluton has highly altered the surrounding komatiitic rocks. The peridotites and pyroxenites of the area have been altered to talc-carbonate and chlorite-tremolite rocks. This pervasive alteration has destroyed many of the original igneous textures and makes accurate rock identification difficult. In a few isolated occurrences, (e.g. near the top of HY-3-96), the komatiitic rocks have not been as intensely altered and some of the original cumulate textures remain. Zones of intense carbonate and serpentine weathering within the komatiitic units tend to be associated with ductile shearing and brittle faulting. The alteration has also destroyed the magnetite component of many of the ultramafic rocks of the area making accurate geophysical interpretations of the area very difficult.

Very minor amounts of pyrrhotite and pyrite were identified within the komatiitic rocks of the drill core but this is thought to be the result of secondary sulphide development associated with metamorphism and alteration. The sulphide in the komatiitic rocks of the Hynes Option is not an original igneous feature.

## 8.0 Recommendations

It is recommended that no further work be done on the Hynes Option

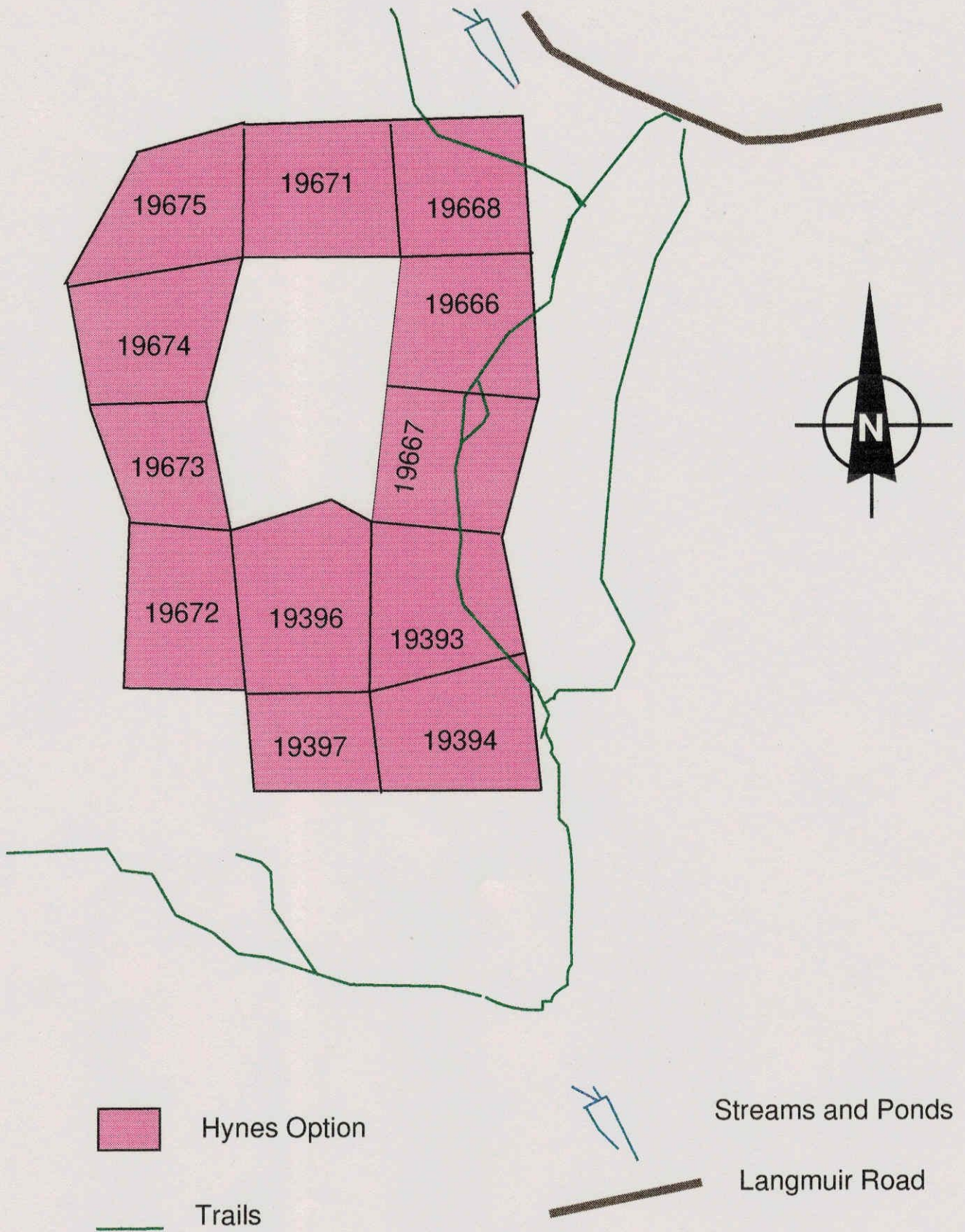
Figure 1. Location Map: Hynes Option



*Michele Handley*



Figure 2: Hynes Option- Property Outline



*Nick Hendrix*

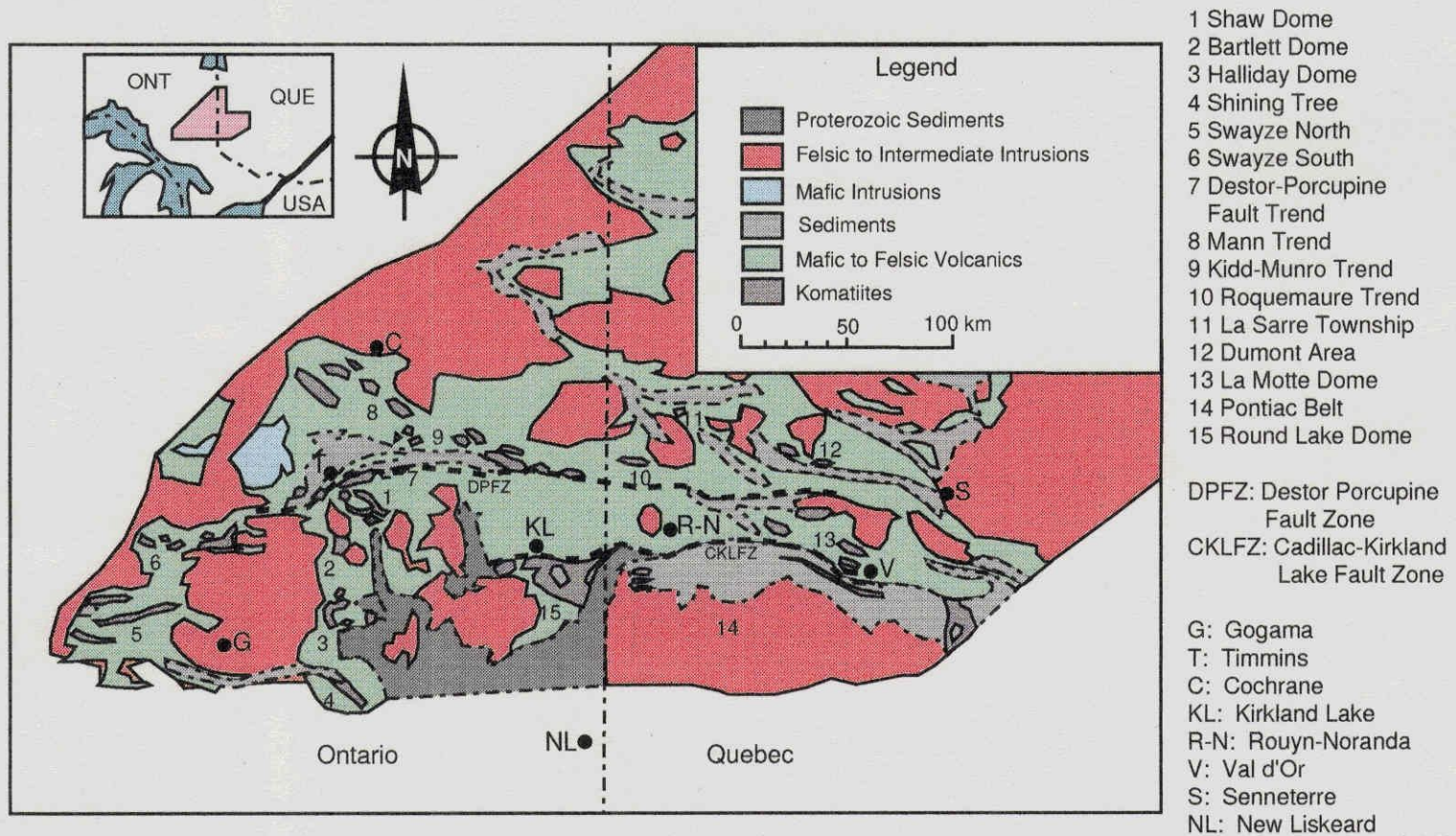


Figure 3: Regional geological map showing the distribution of komatiitic successions in the Abitibi greenstone belt (1-13) and the adjacent Pontiac metasedimentary belt (14) (modified from Goodwin and Ridler 1970; MERQ-OGS 1983; and Heather 1993).

*Mick Hendrick*

**Appendix 1**  
Diamond Drill Hole Logs

Area/Township	N.T.S.	Year	Project	Property	Claim Numbers
Langmuir	42A/SW	1996	Exploration	Hynes Option	Patents 19396

Hole Number	Survey Type	Dip (Deg.)	Azim Grid (Deg.)	Azim Astro. (Deg.)	Hole Length (m)	Core Size
HY-1-96	Acid	-50	north	320	236	BQ

Northing (Grid m)	Easting (Grid m)	Northing (UTM)	Easting (UTM)	Northing (Lat.)	Easting (Long.)	Elevation (m)
110	5300					300

Logged By	Date Logged	Drilled By	Date Started	Date Finished	Core Storage
NH	Dec 10/96	Bradley Bros.	Dec 2/96	Dec 4/96	Hollinger Building

Casing Depth (m)	Casing Pulled (Y/N)	Cemented (Y/N)	Geophysics (Y/N)	Down Hole Geophysics (Type and Contractor)
3	N	N	N	

Assay Numbers	Assay Lab	Certificate #	Whole Rock Geochemistry
103777-103781	Bondar-Clegg		568173

Comments: *Mick Hendrix*

Hole Number	Survey Type	Depth (m)	Dip (Degrees)	Azimuth (Degrees)
HY-1-96	Acid	3	-51	320
		56	-52	320
		107	-52	320
		158	-52.5	320
		209	-50	320

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples		Faults and Shears (1-10)					
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)
3.00	37.31	Koc/mc		- Dark grey to black with serpentine veinlets upto 5mm in thickness - Intensely serpentinised from 20.00m to 21.30m - Unjointed, unfoliated, fairly competent core. - Highly magnetic - Very minor trace pyrrhotite throughout core with some rusty patches on slip faces - Small breccia zone at base of unit	tr		Po	diss	WR	568173	29.00	32.00				
37.31	45.38	Koc/mc		- As above, but bleached due to talc weathering - again, very minor trace pyrrhotite - Core not as competent as above; broken in places - Weakly magnetic - Fault at 43.00 to 43.40	tr		Po	diss					Yes		43.00	43.40
45.38	46.10	KPi		- Greenish - grey - Quite soft - Pyroxenitic unit - Non magnetic - Broken core at base (fault?) - Unjointed, unfoliated												
46.10	70.96	Ad/Ba		- Medium grey-blue, quite fine grained rock - Unjointed and unfoliated - Fairly hard - A little bit of pyrrhotite on the slip planes especially from 59.00m to 60.50m. Upto 2% sulphides in this zone - Quite competent core - Non magnetic - Some amydales scattered throughout entire unit	tr		Po	diss								
70.96	80.62	BIF		- Oxide facies Banded Iron Formation - Light grey 71.00m to 74.00m - Darker green and well banded from 74.00m to 77.75m - From 77.75m to 80.62m; harder with indistinct banding and gradational transitions - From 71.00m to 71.70m the unit is very Po rich; upto 30% - Semi massive Po from 71.14m to 71.32m with inclusions of Quartz and banded chert. Semi massive Po also contains disseminated pyrite crystals upto 5mm and very small crystals of pentlandite. - From 71.70m to 72.41m; as from 71.00m to 72.41m but less sulphide and much more quartz rich. - From 72.41m to 77.75m; well banded with alternating bands of greenish chert/silt and magnetite. Very highly					AS	103777	71.00	71.70				
									AS	103778	71.70	74.00				
									AS	103779	74.00	77.00				
									AS	103780	77.00	79.00				
									AS	103781	79.00	80.62				

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples				Faults and Shears (1-10)					
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)		
				magnetic - Some good core angles (bedding): 48, 62, 55 degrees to core axis - From 77.75m to bottom of unit; indistinct banding but more pyrrhoite, upto 1% in places.														
80.62	236.00 EOH	Andesite		- Medium grey - bluish rock - Fairly hard - A little internal brecciation - Occasional quartz veinlets upto 1cm in thickness - Some lighter areas due to differential weathering - Massive, homogeneous unit - No appreciable sulphide mineralisation; very minor Po as very small disseminations throughout unit and as very thin smears on some slip planes - Amygdaloidal in places (quartz filled) - Some foliated areas toward bottom of hole; some good core angles (foliation) below: 200m to 201m: 55, 60 degrees to core axis 226m: 50 degrees to core axis - Some foreign clasts near bottom of hole (gabbro) gabbro clast from 190.07m to 190.13m gabbro clast from 226.90m to 229.20m gabbro clast from 235.30m to 235.75m - Some talc weathering throughout entire unit.  End of Hole	tr		Po	diss										

Area/Township	N.T.S.	Year	Project	Property	Claim Numbers
Langmuir	42A/SW	1996	Exploration	Hynes Option	797, 30 Patents 19394 (52)

Hole Number	Survey Type	Dip (Deg.)	Azim Grid (Deg.)	Azim Astro. (Deg.)	Hole Length (m)	Core Size
HY-2-96	Acid	-50	north	320	224	BQ

Northing (Grid m)	Easting (Grid m)	Northing (UTM)	Easting (UTM)	Northing (Lat.)	Easting (Long.)	Elevation (m)
-200	5300					300

Logged By	Date Logged	Drilled By	Date Started	Date Finished	Core Storage
NH	Dec 11/96	Bradley Bros.	Dec 4/96	Dec 6/96	Hollinger Building

Casing Depth (m)	Casing Pulled (Y/N)	Cemented (Y/N)	Geophysics (Y/N)	Down Hole Geophysics (Type and Contractor)
3	N	N	N	

Assay Numbers	Assay Lab	Certificate #	Whole Rock Geochemistry
			568174-568177

Comments: *Mike Hendrix*



<b>Hole Number</b>	<b>Survey Type</b>	<b>Depth</b> (m)	<b>Dip</b> (Degrees)	<b>Azimuth</b> (Degrees)
HY-2-96	Acid	3	-49	320
HY-2-96	Acid	53	-49	320
HY-2-96	Acid	104	-48.5	320
HY-2-96	Acid	155	-48.5	320
HY-2-96	Acid	206	-49.5	320

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples		Faults and Shears (1-10)						
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)	
3.00	6.49	Kmc/ac		<ul style="list-style-type: none"> <li>- Black, fine grained</li> <li>- Occasional small serpentine veinlets upto 1cm thick</li> <li>- Strongly magnetic</li> <li>- Unfoliated, unjointed, with good core competency</li> <li>- Massive, homogeneous</li> <li>- No sulphides observed</li> <li>- Fairly hard for a meso to accumulate</li> </ul>													
6.49	7.00	Kmc/ac		<ul style="list-style-type: none"> <li>- More chloritised and bleached version of Kmc/ac above</li> <li>- Small specks of talc throughout unit</li> <li>- Softer than Kmc/ac above</li> <li>- Tremolite-actinolite weathered</li> </ul>													
7.00	9.30	Gaboro		<ul style="list-style-type: none"> <li>- Plagioclase rich, coarse grained mafic dyke</li> <li>- Coarse grained plagioclase crystals upto 2cm long</li> <li>- Plagioclase more pink near lower contact</li> <li>- Contacts relatively sharp but not quenched</li> </ul>													
9.30	11.26	Kmc/ac		<ul style="list-style-type: none"> <li>- Talc, tremolite-actinolite weathered Kmc/ac as at 6.49m to 7.00m</li> <li>- Indistinct lower contact with Kmc/ac below</li> </ul>													
11.26	24.08	Kmc/ac		<ul style="list-style-type: none"> <li>- As above from 3.00m to 6.49m</li> </ul>													
24.08	26.88	Gabbro/Dionte		<ul style="list-style-type: none"> <li>- Intermediate to mafic dyke</li> <li>- Quite coarse grained with large creamy white plagioclase crystals upto 1.5cm long</li> <li>- Non magnetic</li> <li>- Unfoliated, unjointed with good core competency</li> <li>- Quite hard</li> <li>- Both upper and lower contacts are slightly chilled</li> <li>- Coarse grained 'salt and pepper' texture</li> <li>- Upper contact at 45 degrees to core axis</li> <li>- Lower contact at 50 degrees to core axis</li> <li>- Trace of disseminated pyrite/pyrrhotite</li> </ul>	tr		Py/Po	diss	WR	568174	24.08	26.88					
26.88	63.04	Kmc/ac		<ul style="list-style-type: none"> <li>- Dark grey to black cumulate</li> <li>- Fine grained</li> <li>- Carbonate veinlets, usually less than 2mm but a few upto 3cm thick scattered throughout entire unit</li> <li>- Quite serpentinised, intensely serpentinised and carbonitised to apple green in places</li> <li>- Small veinlets of massive magnetite infrequently scattered throughout entire unit</li> <li>- Unjointed, unfoliated with fair to good core competency</li> </ul>	tr		Py/Po	diss	WR	568175	32.00	35.00	Yes		40.27	41.43	

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples				Faults and Shears (1-10)					
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)		
				Magnetism varies from very strong to moderate depending on amount of talc weathering - Massive, homogeneous unit but differentially weathered - Trace amount of extremely fine grained sulphides throughout unit (Py/Po). Also as smears on slip planes - Veinlets of amorphous carbon scattered throughout unit - Broken core from 40.27m to 48.00m, with a definite fault zone from 40.27m to 41.43m														
63.04	65.00	Gabbro		- Mafic dyke - Very fine grained - Greenish grey - Non magnetic - Upper contact quite sharp at approximately 90 degrees to the core axis - Intensely weathered - Medium hard - Unjointed, unfoliated with fair core competency - No visible sulphides - Bottom contact faulted (?) - Chill zones at both upper and lower contacts														
65.00	75.70	Kmc/ac		- As above at 26.88m to 63.04m - Fault zone at 65.85m to 65.90m	tr		Py/Po	diss						Yes		65.85	65.90	
75.70	76.85	Mafic Dyke		- Calc.alkalic mafic dyke - Greyish brown - Fine grained - Moderately soft - Unfoliated and unjointed - Fairly sharp contacts with weathering zones into surrounding Kmc/ac														
76.85	224.00	Kmc/ac		- As above at 26.88m to 63.04m - Fault zone at 102.30m to 102.61m - Intensely serpentinised/carbonitised to apple green from approximately 150m to 158.50m and 207.20m to 207.80m - Area of intense calc-alkalic weathering (rodingite) from 174.04m to 174.57m - Two faults; one at 185.95m to 188.00m and another at 191.00 to 194.00m both have pulverised core.	tr		Py/Po	diss	WR	568176	122.00	125.00	Yes		102.30	102.61		
	ECH								WR	568177	200.00	203.00	Yes		185.95	188.00		
													Yes		191.00	194.00		
				End Of Hole														

Area/Township	N.T.S.	Year	Project	Property	Claim Numbers
Langmuir	42A/SW	1996	Exploration	Hynes Option	Patents 19393

Hole Number	Survey Type	Dip (Deg.)	Azim Grid (Deg.)	Azim Astro. (Deg.)	Hole Length (m)	Core Size
HY-3-96	Acid	-50	north	320	214	BQ

Northing (Grid m)	Easting (Grid m)	Northing (UTM)	Easting (UTM)	Northing (Lat.)	Easting (Long.)	Elevation (m)
90	5500					300

Logged By	Date Logged	Drilled By	Date Started	Date Finished	Core Storage
NH	Dec 12/96	Bradley Bros.	Dec 6/96	Dec 8/96	Hollinger Building

Casing Depth (m)	Casing Pulled (Y/N)	Cemented (Y/N)	Geophysics (Y/N)	Down Hole Geophysics (Type and Contractor)
4	N	N	N	

Assay Numbers	Assay Lab	Certificate #	Whole Rock Geochemistry
			568178-568182

Comments:  
*Mike Hendrix*

Hole Number	Survey Type	Depth (m)	Dip (Degrees)	Azimuth (Degrees)
HY-3-96	Acid	3	-49.5	320
HY-3-96	Acid	56	-51	320
HY-3-96	Acid	107	-53	320
HY-3-96	Acid	158	-55	320
HY-3-96	Acid	214	-57	320

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples				Faults and Shears (1-10)			
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)
4.00	151.42	Kac		<ul style="list-style-type: none"> <li>- Grey-black</li> <li>- Moderately soft</li> <li>- Medium to coarse grained with olivine crystals upto 1cm long</li> <li>- Magnetite veinlets, sparsely scattered throughout the entire unit. Veinlets range from 1mm to 5mm in thickness</li> <li>- Asbestos veinlets from 1cm to 2cm thick scattered throughout the entire unit, some veinlets with fibre length upto 5mm</li> <li>- Unjointed, unfractured, and unfoliated</li> <li>- No sulphides observed</li> <li>- Some areas intensely serpentinised and carbonitised to apple green; especially from 9m to 10m, 54m to 55m, 74m to 83m, 92m to 116m, 123m to 126m, and from 150m to 151m. These zones are more intensely serpentine and carbonate veined and seem to be zones of increased shearing and ductility</li> <li>- Polysuture texture throughout entire unit as well as zipper fractures</li> <li>- A few veinlets of serpentine/calc-alkalic (carbonate) material</li> <li>- Areas of talc weathering; quite talc rich in places</li> <li>- Two faults; one at 82.60m to 83.00m and the second at 150.00m to 150.60m</li> <li>- The rock is more coarse grained near the top of the hole. The core becomes finer grained near the lower contact. It is a very gradational change, but by 120m the core is a fine grained adcumulate with only small sections of the coarse grained texture seen further up the hole.</li> </ul>					WR	568178	11.00	14.00	Yes		82.00	83.00
									WR	568179	80.00	83.00	Yes		150.00	150.60
									WR	568180	143.00	146.00		Yes	9.00	10.00
														Yes	54.00	55.00
														Yes	74.00	83.00
														Yes	92.00	116.00
														Yes	123.00	126.00
														Yes	150.00	151.00
151.42	174.08	KPI		<ul style="list-style-type: none"> <li>- This is the basal unit of the overlying Kac unit</li> <li>- Bleached, pyroxenitised version of the overlying Kac</li> <li>- Gradational change back and forth between KPI and Kac</li> <li>- Below 164m, the unit is solidly KPI</li> <li>- Less magnetic than overlying Kac</li> <li>- Quite soft</li> <li>- Creamy grey</li> <li>- Trace sulphides; pyrite with some pyrrhotite</li> <li>- Chlorite band at lower contact</li> <li>- Chloritised, serpentinised, and carbonitised veinlets throughout entire unit</li> <li>- Unjointed, unfoliated, with good core competency</li> <li>- Magnetism varies with intensity of weathering but the unit is always strongly to moderately magnetic.</li> </ul>	tr		Py/Po	diss	WR	568181	170.00	173.00				



Area/Township	N.T.S.	Year	Project	Property	Claim Numbers
Langmuir	42A/SW	1996	Exploration	Hynes Option	Patents 1467


Hole Number	Survey Type	Dip (Deg.)	Azim Grid (Deg.)	Azim Astro. (Deg.)	Hole Length (m)	Core Size
HY-4-96	Acid	-50	north	320	202	BQ

Northing (Grid m)	Easting (Grid m)	Northing (UTM)	Easting (UTM)	Northing (Lat.)	Easting (Long.)	Elevation (m)
90 200	5500 5720					300

Logged By	Date Logged	Drilled By	Date Started	Date Finished	Core Storage
NH	Dec 14/96	Bradley Bros.	Dec 8/96	Dec 10/96	Hollinger Building

Casing Depth (m)	Casing Pulled (Y/N)	Cemented (Y/N)	Geophysics (Y/N)	Down Hole Geophysics (Type and Contractor)
10	N	N	N	

Assay Numbers	Assay Lab	Certificate #	Whole Rock Geochemistry
			568183-568188

Comments:  




Hole Number	Survey Type	Depth (m)	Dip (Degrees)	Azimuth (Degrees)
HY-4-96	Acid	14	-50	320
HY-4-96	Acid	65	-51	320
HY-4-96	Acid	116	-51	320
HY-4-96	Acid	167	-53	320

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples				Faults and Shears (1-10)				
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)	
0.00	10.00			- Casing													
10.00	128.00	Koc/mc		- Dark grey-black to apple green - Coarse grained - Highly serpeninised and carbonatised komatiitic olivine orthocumulate - Some sections serpeninised and carbonatised to apple green - Intensely serpentine and carbonate veined - Strongly magnetic; moderately less magnetic in apple green zones - Trace pyrite as small disseminations throughout the entire unit - Apple green sections appear to be ductily folded and riddled with serpentine veinlets - Zipper fractures appear throughout entire unit - Unit is composed almost entirely of serpentine with some relict olivine crystals and magnetite - Thin magnetite veinlets throughout entire rock unit - Unfoliated, unjointed, with fair core competency - Fault zones at 60.74m to 60.78m and at 63.34m to 63.56m; both fault zones are filled with fault gouge. - Lower contact is faulted from 124.77m to 128.00m; within the fault zone, a clast of the underlying Kac/mc is included from 125.85m to 127.08m - Well developed asbestos veinlet from 18.16m to 18.24m with fibre length upto 4cm. - Larger serpentine veins seem to have low core angles approximately 15 degrees to core axis.	tr		Py	diss	WR	568183	50.00	53.00	Yes		60.74	60.78	
									WR	568184	119.00	122.00	Yes		63.34	63.56	
													Yes		124.77	128.00	
128.00	134.00	Pyroxenite		- Tremolite rich pyroxenite unit - Brecciated, with some fairly large clasts; upto cobble size (approximately 10cm) - Granite clast from 129.06m to 129.20m - Light grey, slightly brownish - Contains some sulphide; especially in clasts; py, po, perhaps a little cpy. trace throughout entire unit - Unjointed, unfoliated, with fair core competency - Some epidote weathering - Fine grained groundmass with medium to quite coarse grained clasts - Most clasts are quite rounded but a few are angular	tr		Py/Po	diss	WR	568185	131.00	134.00					
134.00	155.83	Kmc/ac		- Black - Epidote weathered					WR	568186	143.00	146.00					

From (m)	To (m)	Rock Type	Legend	Description	Sulphides				Samples		Faults and Shears (1-10)						
					%	% Frags	Type	Mode	Type	Tag #	From (m)	To (m)	Brittle	Ductile	From (m)	To (m)	
				<ul style="list-style-type: none"> <li>- Similar to Koc/mc above but less intensely serpentinised</li> <li>- Areas of coarse grained rock especially closer to the top of the unit.</li> <li>- Strongly magnetic nearer the top of the unit becoming less magnetic near the lower contact of the unit.</li> <li>- Near the lower contact from 149.50m to 151.76m; intensely serpentinised and carbonatised to apple green especially around serpentine vein from 150.10m to 150.37</li> <li>- Below 151.76m unit is bleached, carbonatised and epidote weathered to lower contact at 155.83m</li> <li>- Quartz veinlets upto 2cm throughout lower reaction rim.</li> </ul>													
155.83	165.83	Qtz - Fspar Porphyry		<ul style="list-style-type: none"> <li>- Medium to light bluish-grey</li> <li>- Very fine grained matrix with quartz and feldspar phenocrysts upto 5mm in length</li> <li>- Hard</li> <li>- Unjointed, with fair core competency</li> <li>- Very faintly foliated at 40 degrees to core axis</li> <li>- A little biotite (?) especially near the top of the unit</li> <li>- Small trace of pyrite as very small dieminations throughout entire unit</li> <li>- Non magnetic</li> <li>- Core not as competent near the top of the unit as further down the unit</li> </ul>	tr		Py	diss	WR	568187	161.00	164.00					
165.83	171.40	Andesite		<ul style="list-style-type: none"> <li>- Bluish-grey footwall rocks similar to those in HY-1-96 and HY-3-96</li> <li>- Quite hard</li> <li>- Unjointed, unfoliated, with good core competency</li> <li>- A few minor quartz veinlets upto 3mm thick</li> <li>- Broken core at top contact - possibly faulted</li> <li>- Zones of differential chloritisation and carbonatisation</li> <li>- A trace of pyrrhotite as smears on slip planes</li> <li>- Possibly pillowed</li> </ul>	tr		Po	diss						Yes		165.83	166.08
171.40	177.38	Qtz - Fspar Porphyry		<ul style="list-style-type: none"> <li>- Quartz - Feldspar Porphyry as above from 155.83m to 165.83m</li> </ul>													
177.38	202.00 EOH	Andesite		<ul style="list-style-type: none"> <li>- Andesite footwall unit as above from 165.83m to 171.40m</li> <li>- Definitely pillowed</li> <li>- Zones of differential weathering</li> <li>- A little sulphide; py/po throughout entire unit; richer in sulphide from 189.50m to 191.00m</li> <li>- One large clot of pyrite/pyrrhotite at 190.19m to 190.25m</li> <li>- Two small mafic dyklets.</li> </ul>	tr		Py/Po	diss	WR	568188	191.00	194.00					



**Appendix 2**  
Diamond Drill Hole Plan Map  
and  
Diamond Drill Hole Sections



# Inchcape Testing Services

## Bondar Clegg

Geochemical  
Lab  
Report

REPORT: T97-57026.0 ( COMPLETE )

REFERENCE: -

CLIENT: OUTOKUMPU MINES LTD.  
PROJECT: 21-502

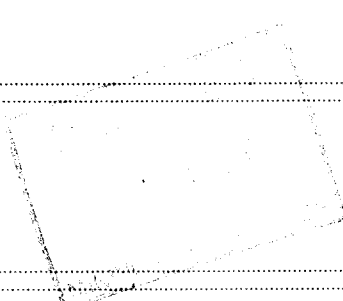
SUBMITTED BY: N.H.  
DATE PRINTED: 19-FEB-97

ORDER	ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	Au30 Gold	5	5 PPB	Fire Assay of 30g	30g Fire Assay - AA
2	Co Cobalt	5	0.01 PCT	HF-HNO3-HCLO4-HCL	AAS LOW LEVEL ASSAY
3	Cu Copper	5	0.01 PCT	HF-HNO3-HCLO4-HCL	AAS LOW LEVEL ASSAY
4	Fe Iron	5	0.01 PCT	HF-HNO3-HCLO4-HCL	AAS LOW LEVEL ASSAY
5	Ni Nickel	5	0.01 PCT	HF-HNO3-HCLO4-HCL	AAS LOW LEVEL ASSAY
6	S Tot Sulphur (Total)	5	0.02 PCT		LECO
7	Zn Zinc	5	0.01 PCT	HF-HNO3-HCLO4-HCL	AAS LOW LEVEL ASSAY

SAMPLE TYPES	NUMBER	SIZE FRACTIONS	NUMBER	SAMPLE PREPARATIONS	NUMBER
DRILL CORE	5	-150	5	CRUSH ONLY	5
				PULVERIZATION	5

REPORT COPIES TO: C/O MR. PAUL DAVIS  
FAX: PAUL DAVIS

INVOICE TO: C/O MR. PAUL DAVIS





# Inchcape Testing Services

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SAMPLE NUMBER	ELEMENT UNITS	Au30 PPB	Co PCT	Cu PCT	Fe PCT	Ni PCT	S Tot PCT	Zn PCT
AS103777		17	<0.01	0.11	24.43	<0.01	13.28	0.01
AS103778		11	<0.01	0.02	13.03	<0.01	4.66	0.01
AS103779		7	<0.01	<0.01	20.95	0.01	0.24	0.01
AS103780		13	<0.01	<0.01	33.20	<0.01	3.08	0.01
AS103781		<5	<0.01	<0.01	14.26	<0.01	0.23	0.01

*MCS*



# Inchcape Testing Services

## Bondar Clegg

Certificate  
of  
Analysis

REPORT: T96-57716.0 ( COMPLETE )

REFERENCE: -

CLIENT: OUTOKUMPU MINES LTD.


SUBMITTED BY: N.H.

PROJECT: 21-502

DATE PRINTED: 27-JAN-97

ORDER	ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	SiO2 Silica (SiO2)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
2	TiO2 Titanium (TiO2)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
3	Al2O3 Alumina (Al2O3)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
4	Fe2O3* Total Iron (Fe2O3)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
5	MnO Manganese (MnO)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
6	MgO Magnesium (MgO)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
7	CaO Calcium (CaO)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
8	Na2O Sodium (Na2O)	16	0.01 PCT	BORATE FUSION	INDUC. COUP. PLASMA
9	K2O Potassium (K2O)	16	0.05 PCT	BORATE FUSION	INDUC. COUP. PLASMA
10	P2O5 Phosphorous (P2O5)	16	0.03 PCT	BORATE FUSION	INDUC. COUP. PLASMA
11	LOI Loss on Ignition	16	0.05 PCT	Ignition 1000 Deg. C	GRAVIMETRIC
12	Total Whole Rock Total	16	0.01 PCT		
13	Ba Barium	16	10 PPM	BORATE FUSION	INDUC. COUP. PLASMA
14	Cr Chromium	16	10 PPM	BORATE FUSION	INDUC. COUP. PLASMA
15	Sr Strontium	16	1 PPM	BORATE FUSION	INDUC. COUP. PLASMA
16	Ag Silver	16	0.5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
17	Cu Copper	16	1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
18	Zn Zinc	16	2 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
19	Pb Lead	16	2 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
20	Mo Molybdenum	16	1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
21	Co Cobalt	16	1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
22	Ni Nickel	16	1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
23	Cr Chrome	16	2 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
24	V Vanadium	16	2 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
25	Cd Cadmium	16	.1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
26	Sb Antimony	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
27	Bi Bismuth	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
28	As Arsenic	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
29	Ti Titanium	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
30	Al Aluminum	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
31	Fe Tot Total Iron	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
32	Mn Manganese	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
33	Mg Magnesium	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
34	Ca Calcium	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
35	Na Sodium	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
36	K Potassium	16	0.01 PCT	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
37	Li Lithium	16	2 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA

Bondar-Clegg & Company Ltd.  
5420 Canotek Road, Ottawa, Ontario, K1J 9G2, Canada  
Tel: (613) 749-2220, Fax: (613) 749-7170

  
Lab Supervisor





# Inchcape Testing Services

## Bondar Clegg

Certificate  
of  
Analysis

REPORT: T96-57716.0 ( COMPLETE )

REFERENCE: -

CLIENT: OUTOKUMPU MINES LTD.

SUBMITTED BY: N.H.

PROJECT: 21-502

DATE PRINTED: 27-JAN-97

ORDER	ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
38	Sc Scandium	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
39	Ga Gallium	16	10 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
40	Sr Strontium	16	1 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
41	Y Yttrium	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
42	Zr Zirconium	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
43	Nb Niobium	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
44	Sn Tin	16	20 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
45	Te Tellurium	16	25 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
46	Ba Barium	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
47	La Lanthanum	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
48	Ta Tantalum	16	5 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA
49	W Tungsten	16	20 PPM	HF-HNO3-HClO4-HCL	INDUC. COUP. PLASMA

SAMPLE TYPES	NUMBER	SIZE FRACTIONS	NUMBER	SAMPLE PREPARATIONS	NUMBER
DRILL CORE	16	-150	16	CRUSH ONLY	16
				PULVERIZATION	16

REPORT COPIES TO: C/O MR. PAUL DAVIS

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SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT	Total PCT
WR-568173		38.95	0.12	2.72	7.98	0.13	37.92	0.21	<0.01	<0.05	<0.03	11.46	99.75
WR-568174		49.87	0.75	14.84	9.39	0.16	6.27	12.09	2.77	2.12	0.11	1.40	99.86
WR-568175		36.98	0.10	2.34	7.82	0.10	38.40	0.03	<0.01	<0.05	<0.03	12.17	98.29
WR-568176		35.83	0.16	3.25	8.07	0.18	32.10	3.82	<0.01	<0.05	<0.03	14.51	98.10
WR-568177		36.14	0.05	1.11	7.15	0.10	39.03	1.72	<0.01	<0.05	<0.03	14.15	99.69
WR-568178		35.78	0.04	0.53	4.17	0.07	44.42	0.05	<0.01	<0.05	<0.03	15.34	100.48
WR-568179		33.20	0.03	0.59	5.28	0.06	41.85	0.14	<0.01	<0.05	<0.03	17.60	98.83
WR-568180		35.53	0.04	0.76	6.78	0.06	39.75	0.75	<0.01	<0.05	<0.03	14.71	98.50
WR-568181		33.95	0.15	3.53	8.00	0.14	26.04	8.20	<0.01	<0.05	<0.03	17.87	98.12
WR-568182		62.41	0.46	16.43	6.24	0.12	2.41	4.90	4.28	0.63	0.09	1.68	99.68
WR-568183		34.38	0.02	0.36	4.50	0.07	43.12	<0.01	<0.01	<0.05	<0.03	15.53	98.06
WR-568184		34.17	0.02	0.38	4.97	0.06	42.49	<0.01	<0.01	<0.05	<0.03	17.82	100.01
WR-568185		50.09	0.71	14.00	7.94	0.28	11.20	6.89	3.73	1.80	0.57	2.59	100.00
WR-568186		37.14	0.05	1.28	6.71	0.05	39.68	0.68	<0.01	<0.05	<0.03	13.50	99.21
WR-568187		65.30	0.40	16.34	3.15	0.06	2.09	3.62	5.14	1.60	0.09	2.24	100.09
WR-568188		65.52	0.39	16.75	3.16	0.06	2.04	3.67	5.30	1.55	0.11	2.28	100.92

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PAGE 1B

SAMPLE NUMBER	ELEMENT UNITS	Ba PPM	Cr PPM	Sr PPM	Ag PPM	Cu PPM	Zn PPM	Pb PPM	Mo PPM	Co PPM	Ni PPM	Cr PPM	V PPM
WR-568173		<10	2609	4	<0.5	<1	51	<2	<1	82	1686	1993	42
WR-568174		461	97	290	<0.5	11	44	<2	5	38	99	150	197
WR-568175		<10	3300	<1	<0.5	<1	36	<2	<1	81	1733	1446	27
WR-568176		<10	1772	96	<0.5	<1	47	<2	2	75	1401	1574	53
WR-568177		<10	2403	24	<0.5	<1	34	<2	3	50	2032	1669	20
WR-568178		<10	828	2	<0.5	<1	29	3	<1	62	2018	495	10
WR-568179		<10	875	28	<0.5	<1	28	<2	1	76	2077	572	11
WR-568180		<10	1104	13	<0.5	<1	30	<2	1	53	1979	592	14
WR-568181		<10	2267	74	<0.5	3	42	<2	4	80	1291	1802	52
WR-568182		141	98	219	<0.5	207	54	7	4	20	36	165	67
WR-568183		<10	825	<1	<0.5	<1	33	<2	<1	54	2037	574	9
WR-568184		<10	944	<1	<0.5	<1	27	<2	<1	61	2051	643	9
WR-568185		778	205	1030	0.6	41	71	8	9	30	207	320	93
WR-568186		<10	1124	14	<0.5	<1	26	<2	<1	101	2230	887	21
WR-568187		441	50	279	<0.5	48	29	7	2	10	23	114	43
WR-568188		448	65	273	<0.5	46	28	4	4	10	22	118	45

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SAMPLE NUMBER	ELEMENT UNITS	Cd PPM	Sb PPM	Bi PPM	As PPM	Ti PCT	Al PCT	Fe Tot PCT	Mn PPM	Mg PCT	Ca PCT	Na PCT	K PCT
WR-568173		<1	6	<5	9	0.06	1.34	5.35	849	>10.00	0.06	0.03	<0.01
WR-568174		<1	<5	<5	8	0.40	7.44	6.19	1077	3.39	8.15	2.23	1.49
WR-568175		<1	<5	<5	<5	0.05	1.05	4.92	661	>10.00	<0.01	0.04	<0.01
WR-568176		<1	12	<5	6	0.09	1.63	5.48	1243	>10.00	2.53	0.03	<0.01
WR-568177		<1	6	<5	14	0.02	0.56	4.54	640	>10.00	1.06	0.02	<0.01
WR-568178		<1	<5	<5	<5	0.02	0.26	2.66	460	>10.00	<0.01	0.02	<0.01
WR-568179		<1	<5	<5	<5	0.01	0.28	3.56	442	>10.00	0.03	<0.01	<0.01
WR-568180		<1	<5	<5	11	0.02	0.38	4.34	404	>10.00	0.42	0.03	<0.01
WR-568181		<1	6	<5	9	0.08	1.77	5.34	949	>10.00	5.53	0.03	<0.01
WR-568182		<1	<5	<5	<5	0.25	8.33	4.10	814	1.29	3.34	3.29	0.48
WR-568183		<1	<5	<5	<5	0.01	0.23	2.88	453	>10.00	<0.01	0.11	<0.01
WR-568184		<1	<5	<5	<5	<0.01	0.19	3.19	419	>10.00	<0.01	<0.01	<0.01
WR-568185		<1	7	8	<5	0.33	7.00	4.70	1938	5.44	4.28	2.60	1.23
WR-568186		<1	<5	<5	12	0.03	0.62	4.43	339	>10.00	0.38	0.04	<0.01
WR-568187		<1	<5	<5	<5	0.20	8.24	1.99	415	1.07	2.34	3.53	1.10
WR-568188		<1	6	<5	<5	0.21	8.42	2.07	439	1.09	2.46	3.66	1.11

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PAGE 1D

SAMPLE NUMBER	ELEMENT UNITS	Li PPM	Sc PPM	Ga PPM	Sr PPM	Y PPM	Zr PPM	Nb PPM	Sn PPM	Te PPM	Ba PPM	La PPM	Ta PPM
WR-568173		<2	9	<10	3	<5	7	10	<20	<25	<5	<5	<5
WR-568174		27	23	14	258	14	67	22	<20	<25	354	5	<5
WR-568175		<2	7	<10	<1	<5	9	9	<20	<25	<5	<5	<5
WR-568176		<2	10	<10	89	<5	<5	11	<20	<25	<5	<5	<5
WR-568177		<2	<5	<10	20	<5	<5	9	<20	<25	<5	<5	<5
WR-568178		<2	<5	<10	2	<5	<5	8	<20	<25	<5	<5	<5
WR-568179		<2	<5	<10	28	<5	<5	8	<20	<25	<5	<5	<5
WR-568180		<2	<5	<10	11	<5	<5	8	<20	<25	<5	<5	<5
WR-568181		<2	12	<10	67	<5	<5	9	<20	<25	<5	<5	<5
WR-568182		11	10	16	198	13	131	17	<20	<25	121	11	<5
WR-568183		<2	<5	<10	<1	<5	<5	7	<20	<25	<5	<5	<5
WR-568184		<2	<5	<10	<1	<5	<5	9	<20	<25	<5	<5	<5
WR-568185		44	15	<10	824	14	109	<5	<20	<25	621	50	<5
WR-568186		<2	6	<10	12	<5	5	8	<20	<25	<5	<5	<5
WR-568187		12	7	16	243	8	100	11	<20	<25	344	10	<5
WR-568188		12	7	15	246	8	104	12	<20	<25	341	10	<5



# Inchcape Testing Services

## Bondar Clegg

### Certificate of Analysis

CLIENT: OUTOKUMPU MINES LTD.  
REPORT: T96-57716.0 ( COMPLETE )

PROJECT: 21-502

DATE PRINTED: 27-JAN-97

PAGE 1E

SAMPLE NUMBER	ELEMENT UNITS	W PPM
WR-568173		<20
WR-568174		<20
WR-568175		<20
WR-568176		<20
WR-568177		<20
WR-568178		<20
WR-568179		<20
WR-568180		<20
WR-568181		<20
WR-568182		<20
WR-568183		<20
WR-568184		<20
WR-568185		<20
WR-568186		<20
WR-568187		<20
WR-568188		<20

Bondar-Clegg & Company Ltd.  
5420 Canotek Road, Ottawa, Ontario, K1J 9G2, Canada  
Tel: (613) 749-2220, Fax: (613) 749-7170

  
Lab Supervisor



# Report of Work Conducted After Recording Claim

Transaction Number  
W9760.00098

~~W9760.00099~~

Ontario

Mining Act

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

Instructions: - Please type or print and submit to:

**2.17422**

of filing assessment work or consult the Mining



42A06SE0108 2.17422 LANGMUIR

900

Work Group. Duplicate. accompany this form.

Recorded Holder(s) <i>Outokumpu Mines Ltd.</i>		Client No. <i>178525</i>
Address <i>P.O. Box 1123, Timmins, Ontario, P4N 7H9</i>		Telephone No. <i>(705) 264-5024</i>
Mining Division <i>Porcupine</i>	Township/Area <i>Langmuir</i>	M or G Plan No. <i>6-3226</i>
Dates Work Performed From: <i>Dec 1/96</i>		To: <i>Dec 10/96</i>

**Work Performed (Check One Work Group Only)**

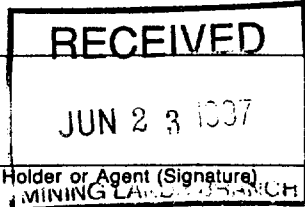
Work Group	Type
Geotechnical Survey	
Physical Work, Including Drilling	<i>Diamond Drilling</i>
Rehabilitation	
Other Authorized Work	
Assays	
Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs \$ *42,810*

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

**Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)**

Name	Address
<i>Bradley Bros. Ltd.</i>	<i>Highway 101, Timmins, Ont.</i>
<i>Paul Davis, Outokumpu Mines Ltd.</i>	<i>P.O. Box 1123, Timmins, Ont. P4N 7H9</i>



(attach a schedule if necessary)

**Certification of Beneficial Interest \* See Note No. 1 on reverse side**

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date <i>Jan 10/97</i>	Recorded Holder or Agent (Signature) <i>Paul</i> MINING LANDS BRANCH
--	--------------------------	--

**Certification of Work Report**

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.

Name and Address of Person Certifying  
*Paul Davis, Outokumpu Mines Ltd., P.O. Box 1123, Timmins, Ont. P4N 7H9*

Telephone No. <i>(705) 264-5024</i>	Date <i>Jan 10/97</i>	Certified By (Signature) <i>Paul</i>
--	--------------------------	---

**For Office Use Only**

Total Value Cr. Recorded <i>\$42,818.</i>	Date Recorded	Mining Recorder	 FEB 26 1997 011,100 (0) PORCUPINE MINING DIVISION
	Deemed Approval Date <i>MAY 28/97</i>	Date Approved	
	Date Notice for Amendments Sent <i>MAY 27/97</i>		







Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de transaction  
W9760.00098

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute question sur la collecte de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4<sup>e</sup> étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert- conseil	Type Diamond Drill/Rig	42,	
			42,818
Supplies Used Fournitures utilisées	Type		
Equipment Rental Location de matériel	Type		
<b>Total Direct Costs Total des coûts directs</b>			<b>42,818</b>

2. Indirect Costs/Coûts indirects

\*\* Note: When claiming Rehabilitation work Indirect costs are not allowable as assessment work.  
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type		
Food and Lodging Nourriture et hébergement			
Mobilization and Demobilization Mobilisation et démobilisation			
<b>Sub Total of Indirect Costs Total partiel des coûts indirects</b>			
<b>Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)</b>			
<b>Total Value of Assessment Credit (Total of Direct and Allowable indirect costs)</b>		<b>Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)</b>	

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.
2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
	x 0.50 =

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.
2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Valeur totale demandée
	x 0,50

Certification Verifying Statement of Costs

I hereby certify:  
that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as Project Geologist I am authorized  
(Recorded Holder, Agent, Position in Company)

to make this certification

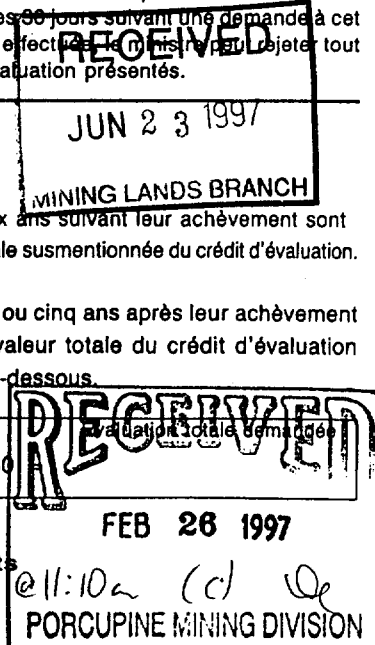
Attestation de l'état des coûts

J'atteste par la présente :  
que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de \_\_\_\_\_ je suis autorisé  
(titulaire enregistré, représentant, poste occupé dans la compagnie)

à faire cette attestation.

Signature \_\_\_\_\_ Date  
Jan 10/97





Geoscience Assessment Office  
933 Ramsey Lake Road  
6th Floor  
Sudbury, Ontario  
P3E 6B5

Telephone: (705) 670-5853  
Fax: (705) 670-5863

July 15, 1997

Gary White  
Mining Recorder  
Ontario Government Complex  
P.O. Bag 3060, Hwy 101 East  
South Porcupine, ON  
P0N 1H0

Dear Sir or Madam:

**Submission Number:** 2.17422

**Status**

**Subject: Transaction Number(s):** W9760.00098 Approval After Notice

---

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. **WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.**

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in **DUPLICATE** to the Geoscience Assessment Office, by the response date on the summary.

**NOTE:** This correspondence may affect the status of your mining lands. Please contact the Mining Recorder to determine the available options and the status of your claims.

If you have any questions regarding this correspondence, please contact Bruce Gates by e-mail at [gates\\_b@torv05.ndm.gov.on.ca](mailto:gates_b@torv05.ndm.gov.on.ca) or by telephone at (705) 670-5856.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Blair Kite".

ORIGINAL SIGNED BY  
Blair Kite  
Supervisor, Geoscience Assessment Office  
Mining Lands Section

# Work Report Assessment Results

**Submission Number:** 2.17422

**Date Correspondence Sent:** July 15, 1997

**Assessor:** Bruce Gates

**General Comment:**

NOTE: ALL REVISIONS ARE REQUIRED IN DUPLICATE, ONE FOR EACH COPY OF THE TECHNICAL REPORTS.

---

<b>Transaction Number</b>	<b>First Claim Number</b>	<b>Township(s) / Area(s)</b>	<b>Status</b>	<b>Approval Date</b>
W9760.00098		LANGMUIR	Approval After Notice	July 15, 1997

**Section:**

10 Physical PDRILL

The revisions outlined in the Notice dated June 27, 1997, have been corrected. Accordingly, assessment work credit has been approved as outlined on the Declaration of Assessment Work Form accompanying this submission.

**Correspondence to:**

Mining Recorder  
South Porcupine, ON

Resident Geologist  
South Porcupine, ON

Assessment Files Library  
Sudbury, ON

**Recorded Holder(s) and/or Agent(s):**

Paul Davis  
OUTOKUMPU MINES LTD.  
TIMMINS, Ontario

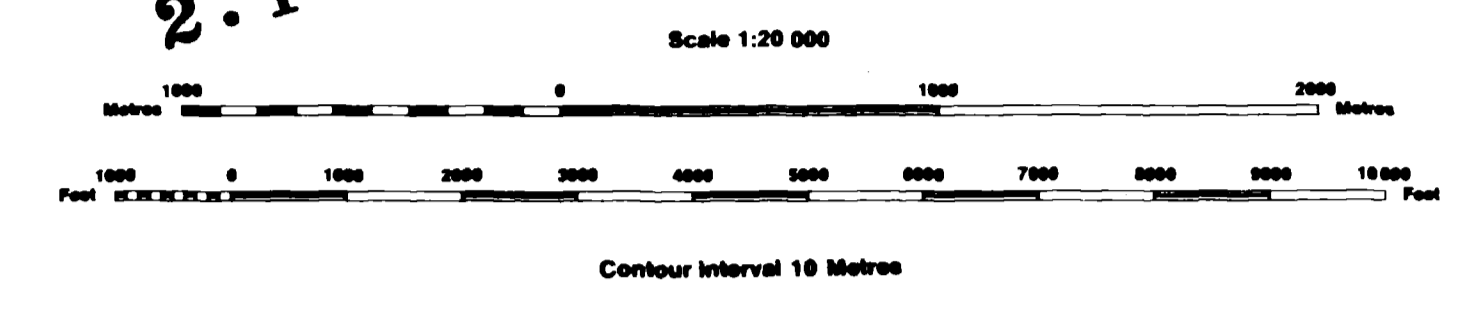
INDEX TO LAND DISPOSITION

PLAN G-3226 TOWNSHIP

M.N.R. ADMINISTRATIVE DISTRICT TIMMINS MINING DIVISION PORCUPINE LAND TITLES/REGISTRY DIVISION COCHRANE

LANGMUIR

2.17422



RECEIVED JUN 23 1997 MINING LANDS BRANCH

AREAS WITHDRAWN FROM DISPOSITION MRO - Mining Rights Only SRO - Surface Rights Only M+S - Mining and Surface Rights

SYMBOLS

- Boundary Township, Meridian, Baseline... Road allowance, surveyed... Lot/Concession, surveyed... Parcel, surveyed... Right-of-way, road... Reservation... Contour... Control point (horizontal)... Flooded land... Mine head frame... Pipeline (above ground)... Railway, single track... Road, highway, county, township... Shoreline (original)... Transmission line... Wooded area...

Open June 1/97. See Ont. Gazette

NOTES

THIS TOWNSHIP LIES WITHIN THE MUNICIPALITY OF THE CITY OF TIMMINS FLOODING RIGHTS ON NIGHT HAWK LAKE TO THE CONTOUR ELEVATION 903.5' RESERVED TO ONT. HYDRO.

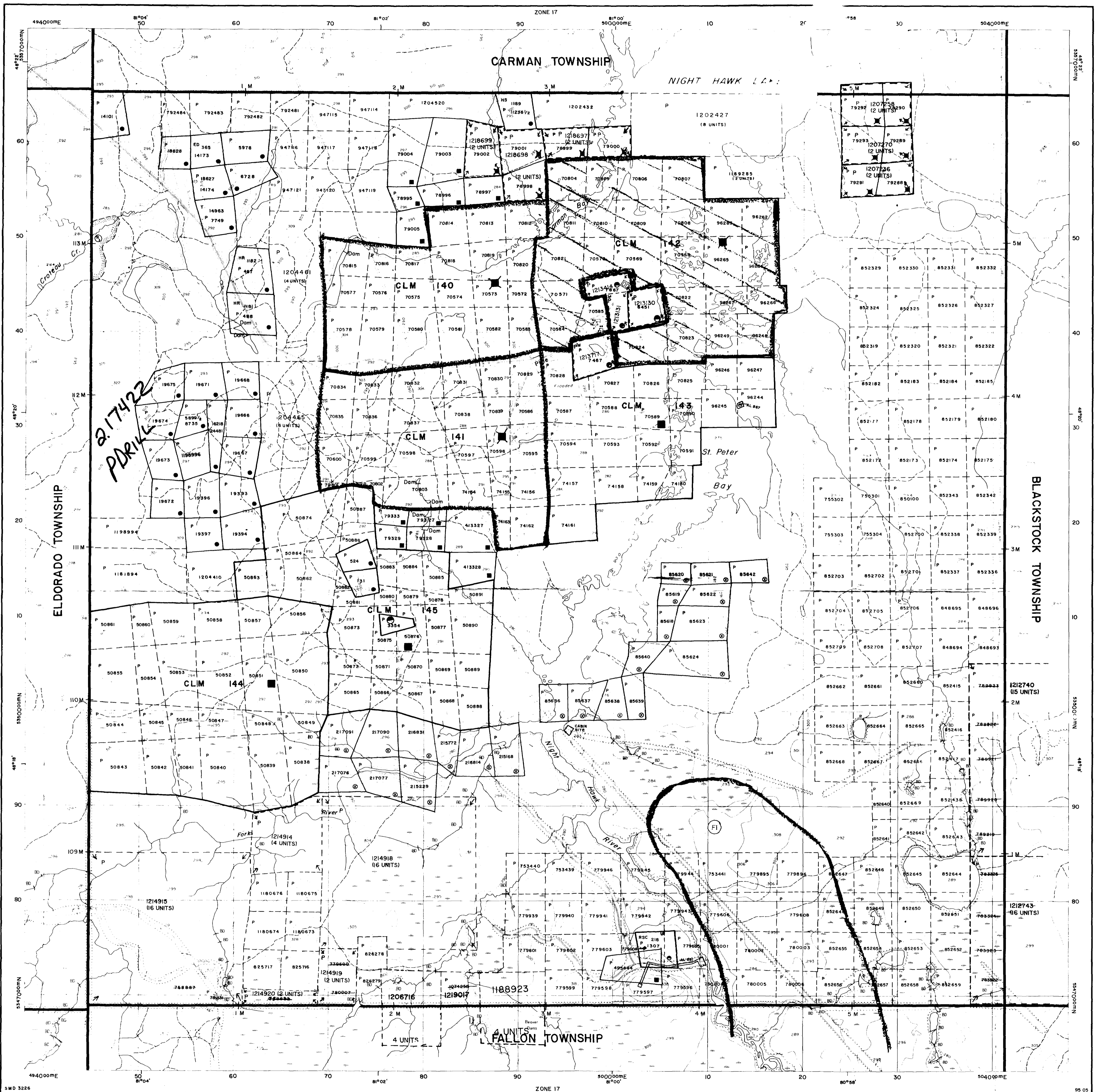
DISPOSITION OF CROWN LANDS

- Patent Surface & Mining Rights... Surface Rights Only... Mining Rights Only... Lease Surface & Mining Rights... Surface Rights Only... Mining Rights Only... Licence of Occupation... Order-in-Council... Cancelled... Reservation... Sand & Gravel...

ACTIVATED JULY 18, 1995 BY: [Signature]

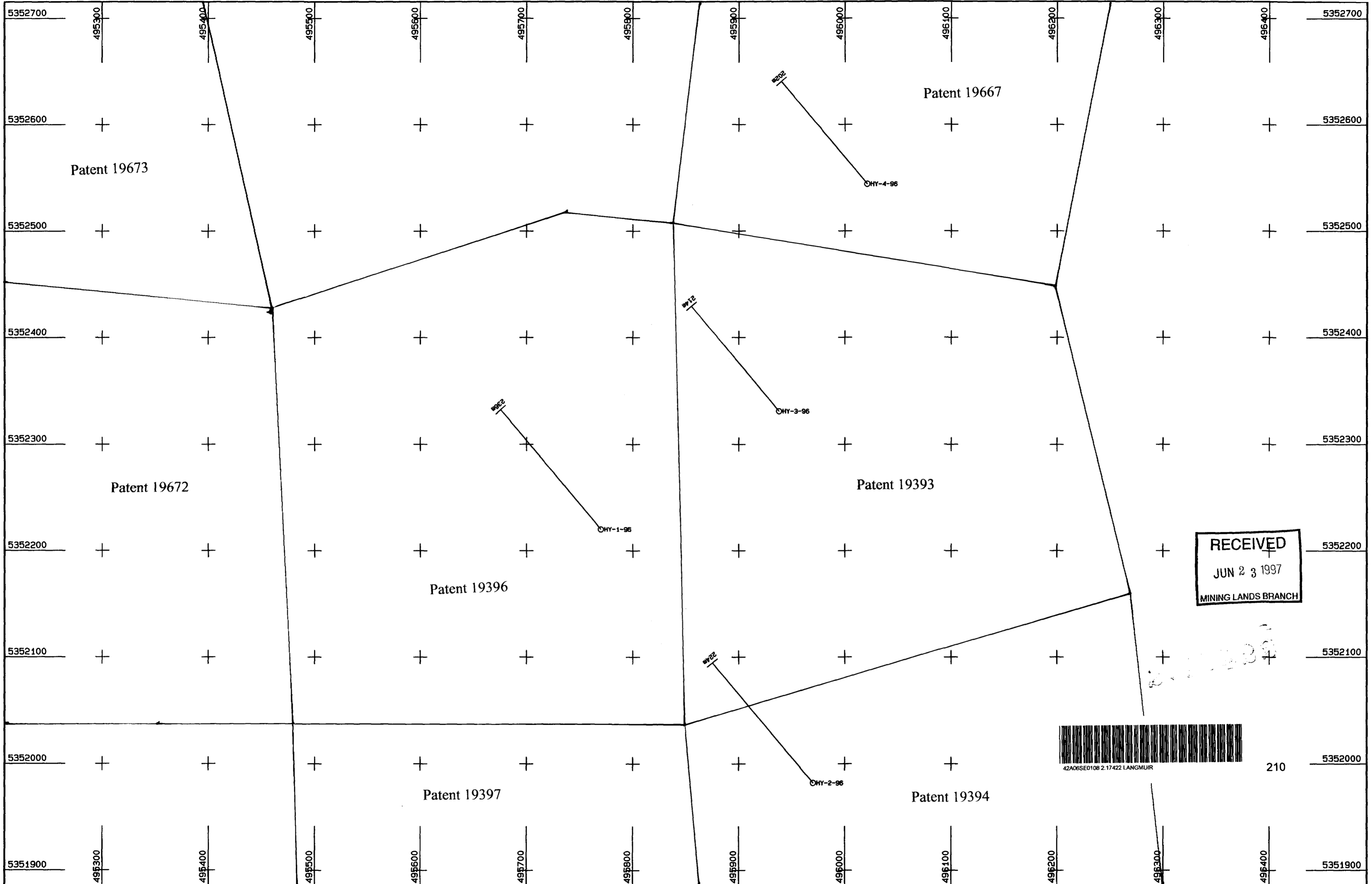
Map base and land disposition drafting by Surveys and Mapping Branch, Ministry of Natural Resources.

The disposition of land, location of lot fabric and parcel boundaries on this index was compiled for administrative purposes only.



INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES. ACCURACY IS NOT GUARANTEED. THOSE CLAIMING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING DEPARTMENT, MINISTRY OF NORTHERN DEVELOPMENT AND MINES FOR ADDITIONAL INFORMATION ON THE STATUS OF THE RIGHTS SHOWN HEREON.






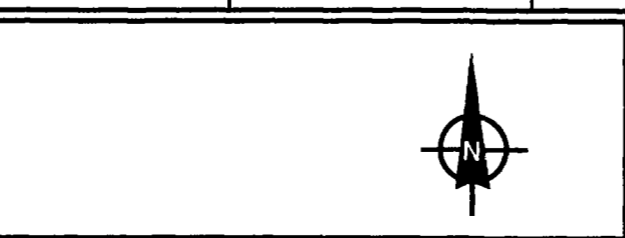
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 JUN 23 1997  
 MINING LANDS BRANCH



210


Plotted with  
 MICROMINE  
 Resources Software  
 Perth, Australia  
 Tel +61 9 389 8722  
 Fax +61 9 386 7462

*Nick Senalibx*














Scale  
 1: 2500

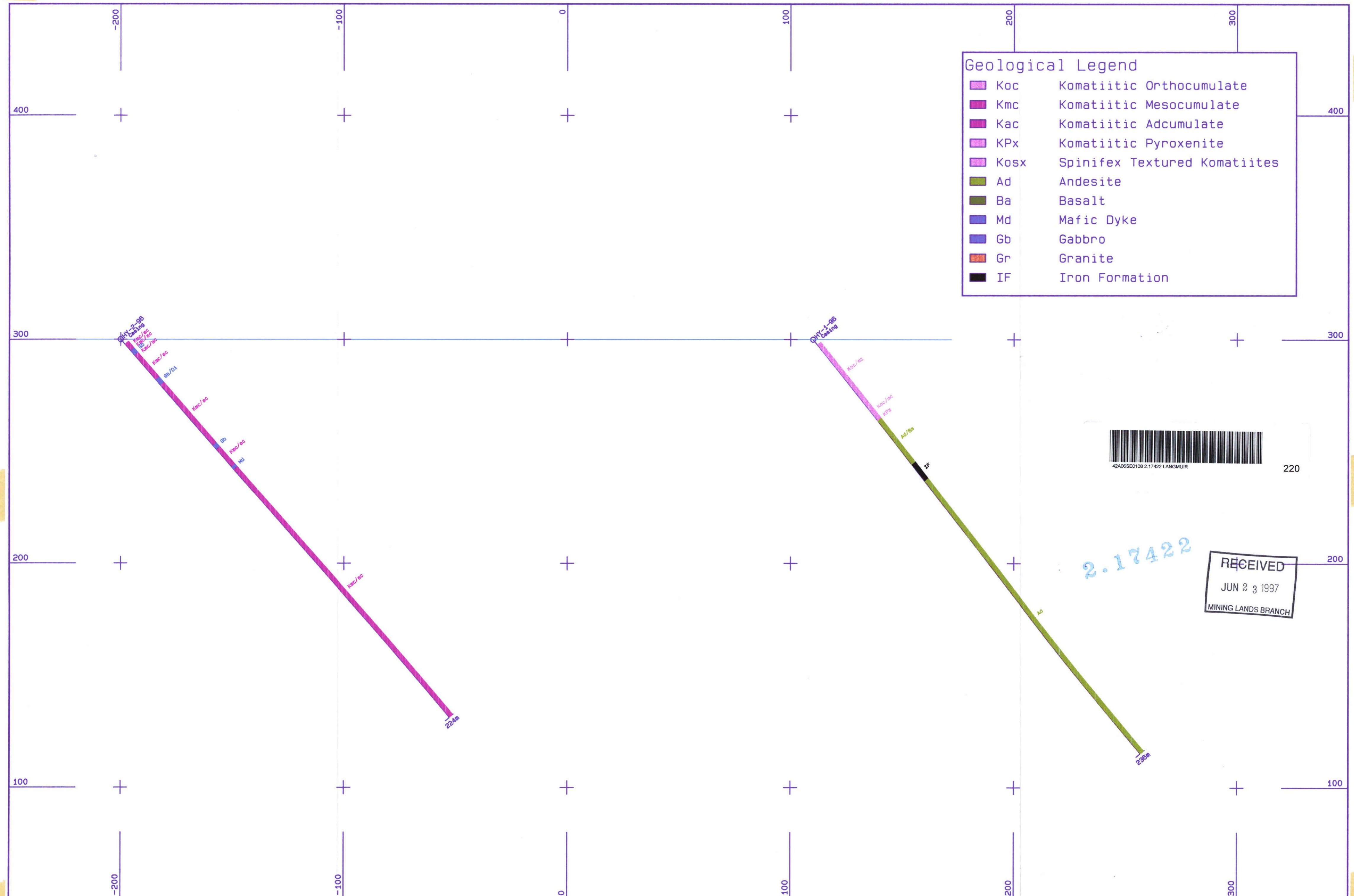
DATE 21/02/97	SHEET 1 of 1
REF No. 1	FILE hynepian.PLT



Diamond Drill Holes  
 Plan Map  
 Hynes Option

Outokumpu Mines Ltd.  
 Hynes Option  
 Langmuir Township

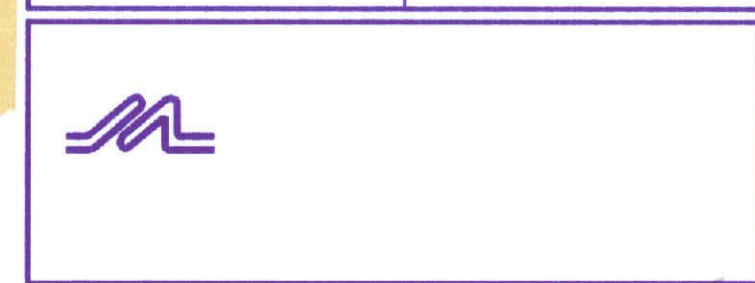
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	Kmc Komatiitic Mesocumulate
	Kac Komatiitic Adcumulate
	KPx Komatiitic Pyroxenite
	Kosx Spinifex Textured Komatiites
	Ad Andesite
	Ba Basalt
	Md Mafic Dyke
	Gb Gabbro
	Gr Granite
	IF Iron Formation



220

2.17422

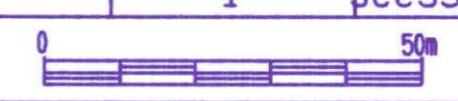
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JUN 23 1997  
MINING LANDS BRANCH



*M. J. ...*

Scale 1: 1000

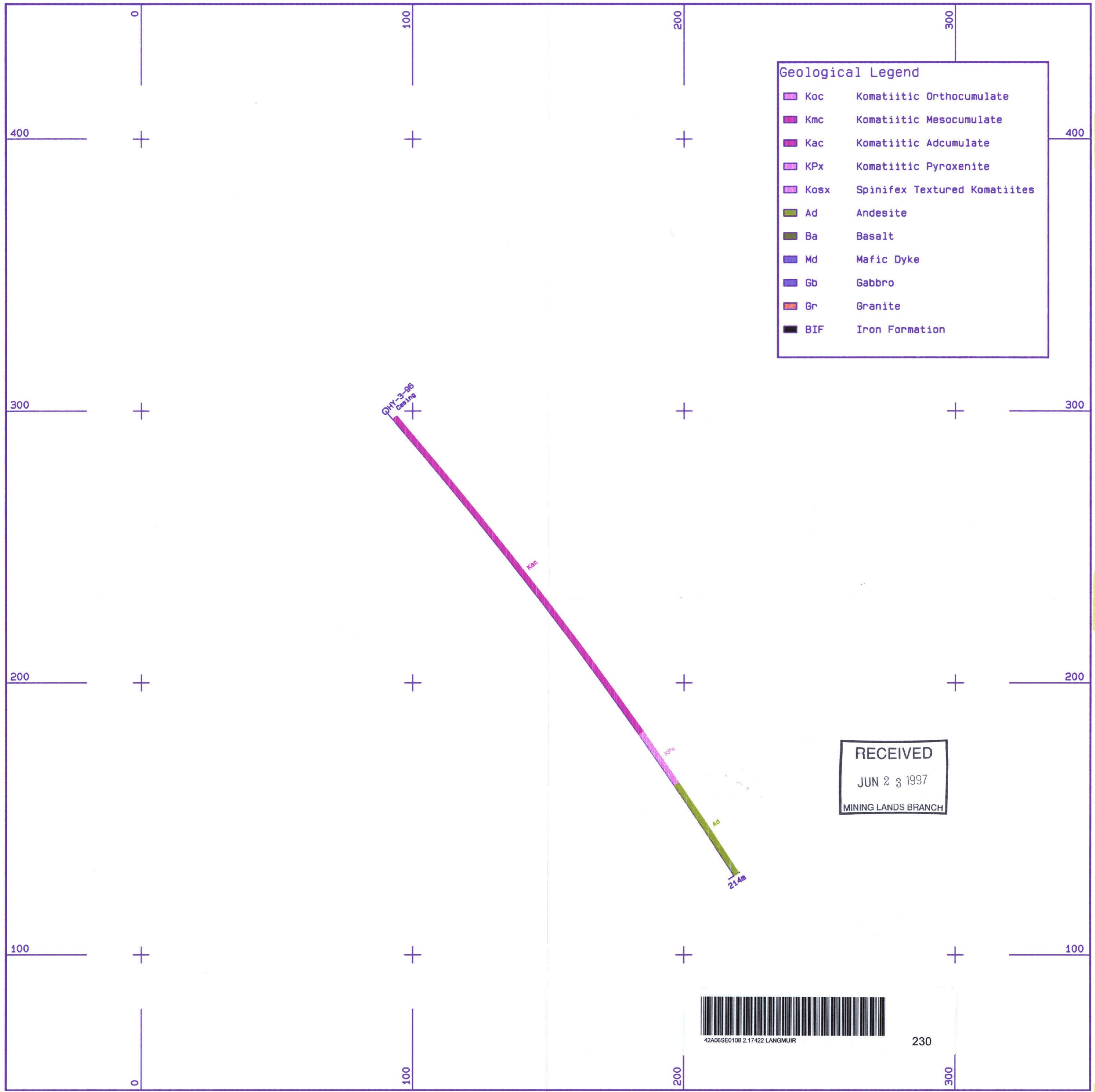
DATE 24/02/97	SHEET 1 of 1
REF No. 1	FILE sec5300.PLT



Diamond Drill Holes  
Section 5300  
Looking Grid West

Outokumpu Mines Ltd.  
Hynes Option  
Langmuir Township

Geological Legend	
	Koc Komatiitic Orthocumulate
	Kmc Komatiitic Mesocumulate
	Kac Komatiitic Adcumulate
	KPx Komatiitic Pyroxenite
	Kosx Spinifex Textured Komatiites
	Ad Andesite
	Ba Basalt
	Md Mafic Dyke
	Gb Gabbro
	Gr Granite
	BIF Iron Formation



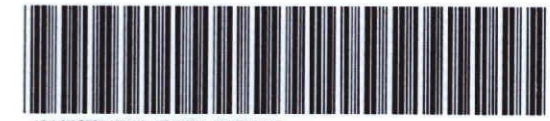
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 MINING LANDS BRANCH



42A065E0108 2.17422 LANGMUIR 230

	<i>Mike Plenderley</i>	Scale 1:1000	DATE 24/02/97	SHEET 1 of 1	Diamond Drill Holes Section 5500 Looking Grid West	Outokumpu Mines Ltd. Hynes Option Langmuir Township
			REF No. 1	FILE sec5500.PLT		

Geological Legend	
	Koc Komatiitic Orthocumulate
	Kmc Komatiitic Mesocumulate
	Kac Komatiitic Adcumulate
	KPx Komatiitic Pyroxenite
	Kosx Spinifex Textured Komatiites
	Ad Andesite
	Ba Basalt
	Md Mafic Dyke
	Gb Gabbro
	Gr Granite
	IF Iron Formation
	Por Qtz-Fspar Porphyry



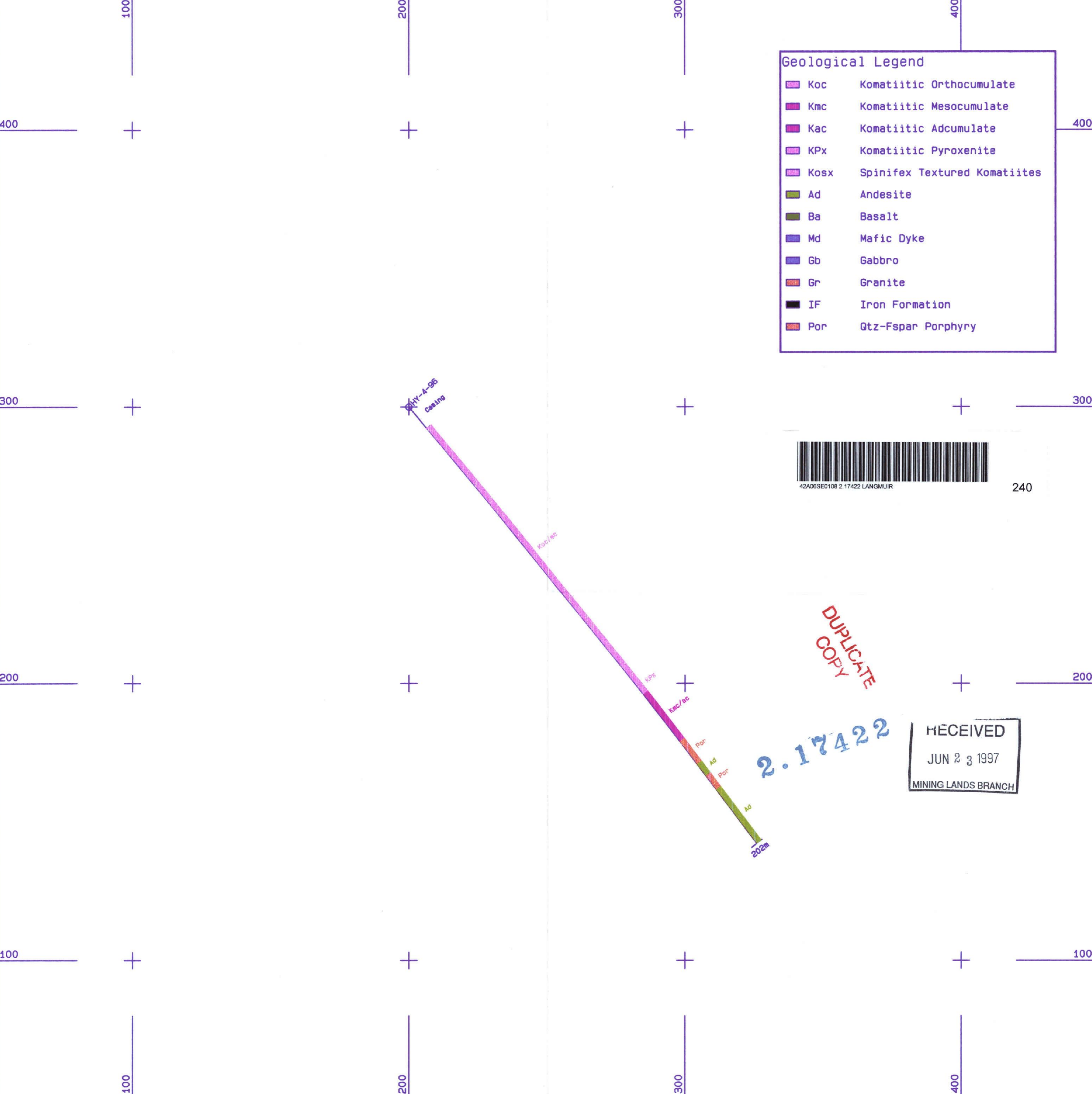
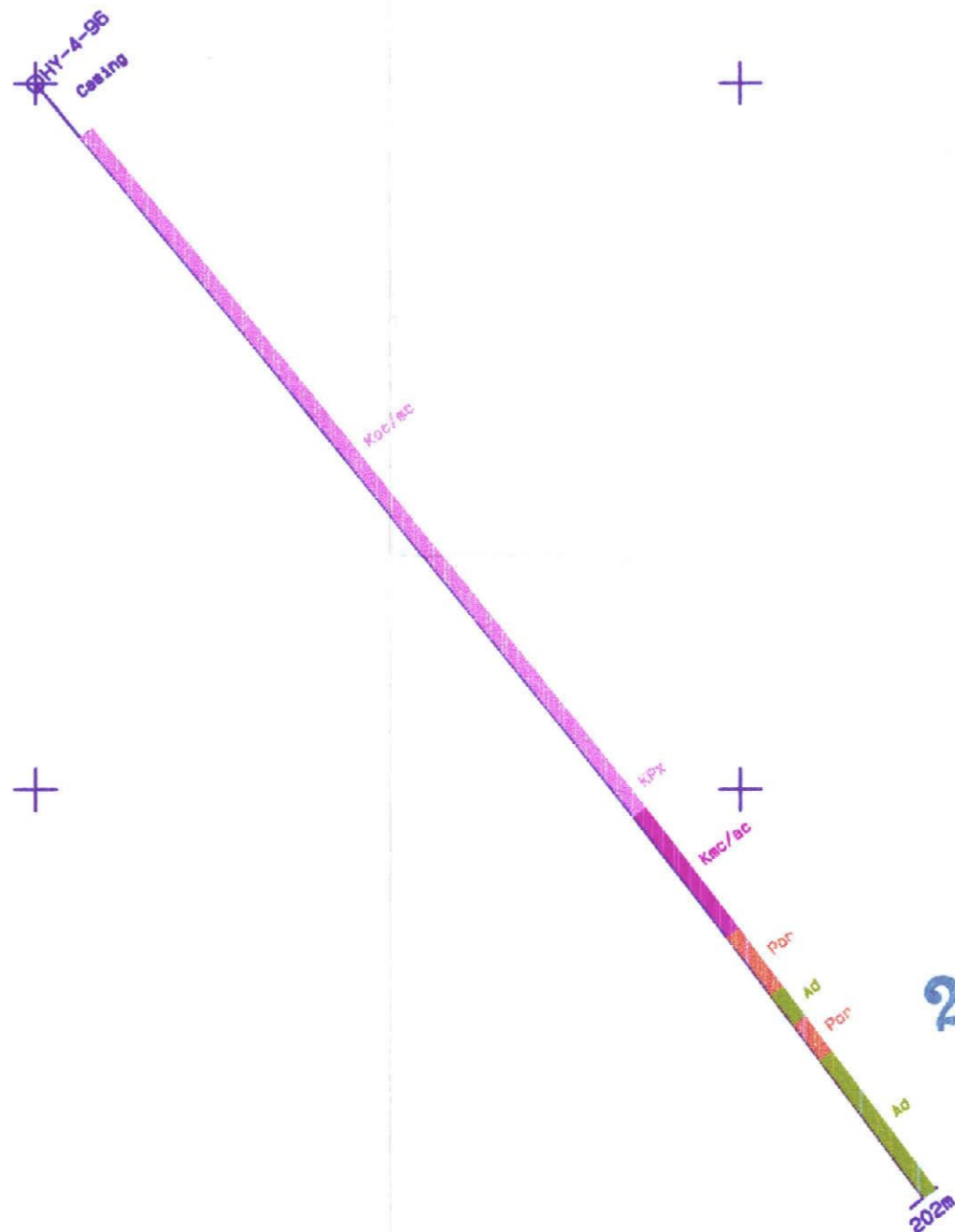
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MINING LANDS BRANCH



*Thilo Bendix*

DATE 24/02/97 SHEET 1 of 1  
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Diamond Drill Holes  
Section 5700  
Looking Grid West

Outokumpu Mines Ltd.  
Hynes Option  
Langmuir Township